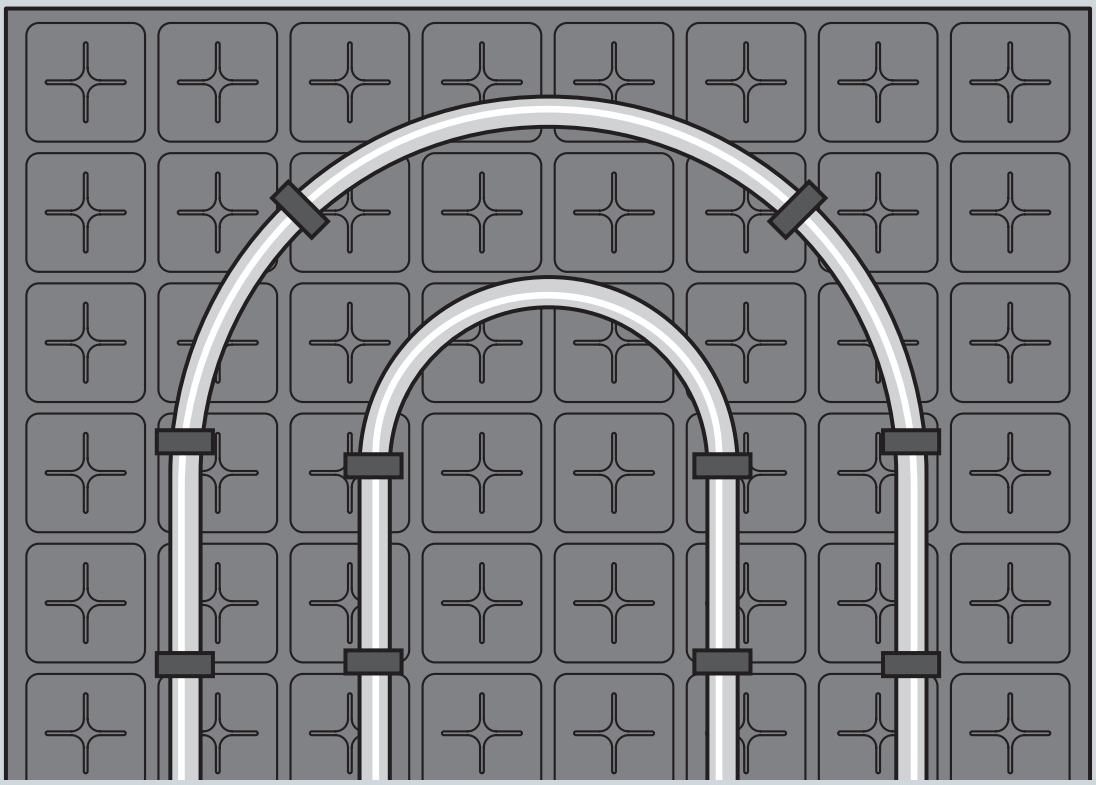


Installation
and user manual

Heating and Cooling

EMMETI FLOOR Riscaldamento a pavimento
/ Floor heating systems / Calefacción por suelo radiante
October 2022

IT EN ES

IT

pagina 3

Vi ringraziamo per la fiducia concessaci nell'acquisto di questo prodotto. Vi invitiamo a leggere attentamente questo manuale dove sono riportate le caratteristiche tecniche e tutte le informazioni utili per ottenere un corretto funzionamento.

I dati contenuti in questa pubblicazione possono, per una riscontrata esigenza tecnica e/o commerciale, subire delle modifiche in qualsiasi momento e senza preavviso alcuno.
L'installazione, la regolazione, la manutenzione e la ricerca guasti, così come tutte le operazioni tecniche descritte nel presente documento devono essere eseguite da personale tecnico qualificato e formato, anche in relazione ai rischi riferiti alle attività citate.

Attenzione!
Conservare i manuali in luogo asciutto per evitare il deterioramento, per eventuali riferimenti futuri.

EN

page 47

Thanks you for the trust you have shown by purchasing this produtc. Carefully read this manual which contains the specifications and all the information useful for the correct functioning.

The information contained in this publication may be subject to changes at any time and without any notice whatsoever for technical and/or commercial reasons as they arise.

Installation, regulation, maintenance and fault finding as well as all technical operations described in this document, have to be performed by technical, qualified and trained personnel also in relation to the risks referred to the mentioned activities.

Warning!
Keep these manuals in a dry place avoiding in this way to spoil them.

ES

página 91

Le agradecemos la confianza que nos ha otorgado al comprar este producto. Le invitamos a leer atentamente este manual donde le explicamos las características técnicas y toda la información necesaria para obtener un funcionamiento correcto de este producto.

El continuo desarrollo para el mejoramiento del producto, puede comportar, sin necesidad de preaviso, modificaciones o cambios en lo descrito.

Atención!
Aconsejamos conservar los manuales en lugar seguro, para posibles consultas futuras.

Este manual ha sido traducido por Dña. Conchi Martínez y revisado por el Responsable Técnico D. Ginés Romera ambos de Emmeti Iberica, S.L.U. España.

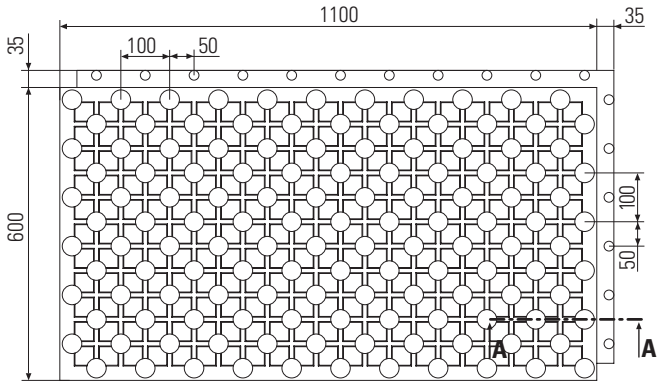
Effettuare un controllo preliminare, verificando che in ogni locale l'altezza disponibile per l'impianto sia quella prevista in funzione del tipo di supporto (massetto o doppio strato di lastre zincate), del sistema utilizzato (tubo e pannelli) e dell'altezza abitabile di progetto ([1]).
I sistemi di riscaldamento a pavimento Emmeti richiedono spessori minimi variabili da 30 a 119 mm ([2]), rivestimento del pavimento escluso, in funzione del tipo di pannello e del supporto utilizzato (Fig. 2-10).

([1]) Lo spessore dello strato di supporto deve essere calcolato in funzione della capacità di carico del materiale utilizzato.

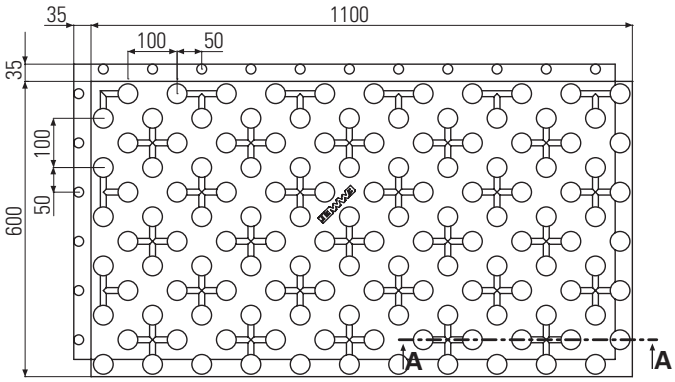
([2]) Per impianti in edifici ad uso civile-terziario.
Per applicazioni in ambito industriale, la struttura del pavimento dovrà essere dimensionata dal progettista edile.

Standard Floor pannello isolante

Modello H = 10



Modelli H = 20/30



Modello H = 40/50/60

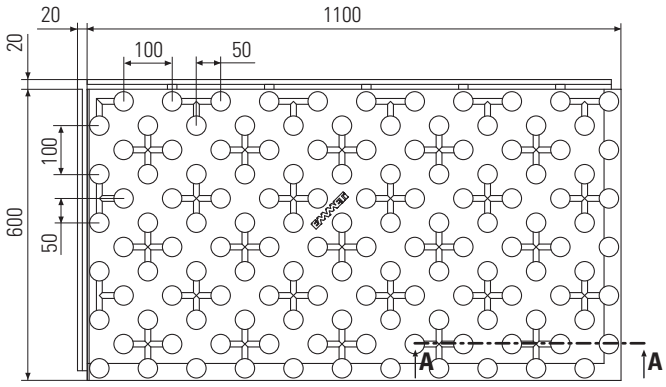
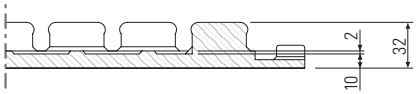


Fig. 1

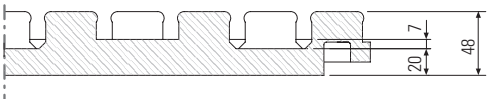
Pannello 1100 x 600 H 10

Sezione A-A



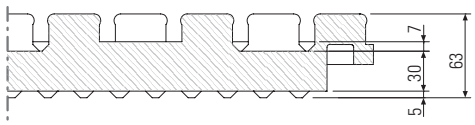
Pannello 1100 x 600 H 20

Sezione A-A



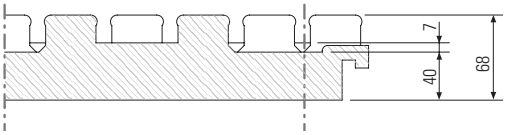
Pannello 1100 x 600 H 30

Sezione A-A



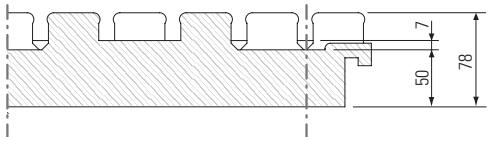
Pannello 1100 x 600 H 40

Sezione A-A



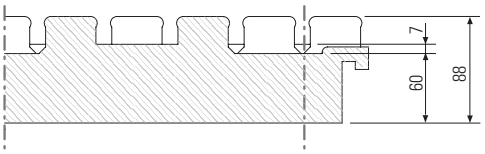
Pannello 1100 x 600 H 50

Sezione A-A

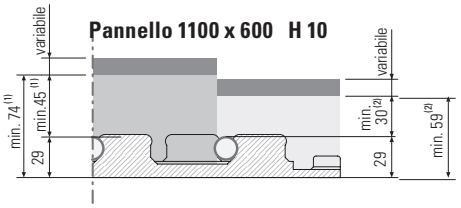


Pannello 1100 x 600 H 60

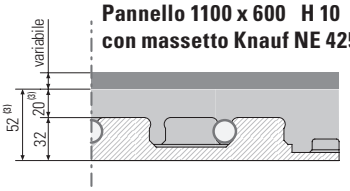
Sezione A-A



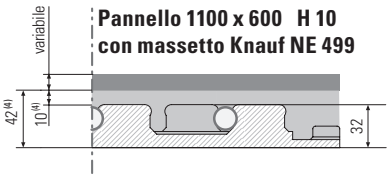
Pannello 1100 x 600 H 10



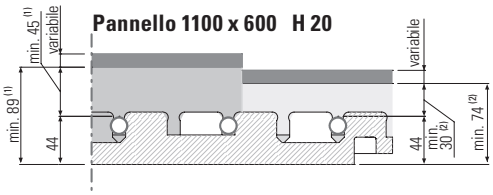
Pannello 1100 x 600 H 10
con massetto Knauf NE 425



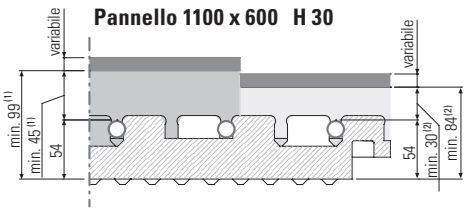
Pannello 1100 x 600 H 10
con massetto Knauf NE 499



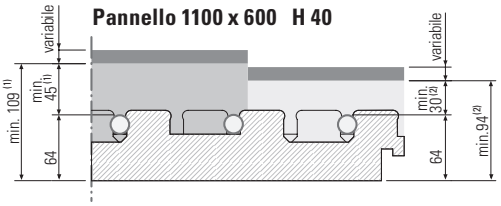
Pannello 1100 x 600 H 20



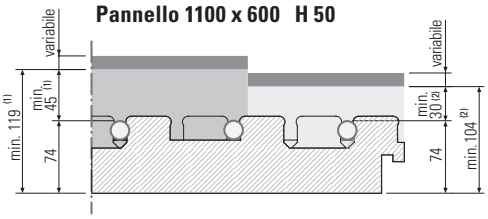
Pannello 1100 x 600 H 30



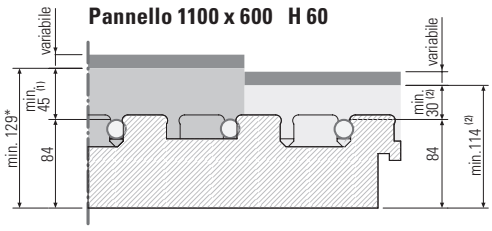
Pannello 1100 x 600 H 40



Pannello 1100 x 600 H 50



Pannello 1100 x 600 H 60



Ingombri minimi del sistema per edifici civili (mm)

(1) Massetto cementizio tradizionale*

(2) Massetto autolivellante*

(3) Massetto fluido a basso spessore Knauf Autolivellina NE 425

(4) Massetto fluido a basso spessore Knauf Superlivellina NE 499

Nota
I massetti **non** vengono forniti da Emmeti

Fig. 2

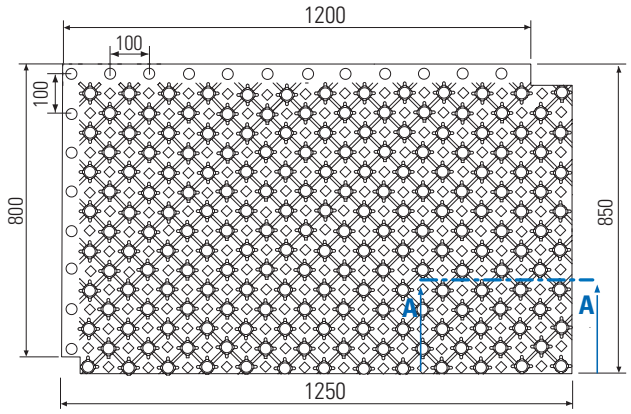
Lo spessore effettivo del massetto e la modalità di realizzazione dello stesso sono da definire con il produttore / fornitore dello stesso secondo le sue specifiche, in funzione delle condizioni di installazione (dimensione e tipologia superficie di posa, tipologia solaio, ecc.) e del tipo di massetto scelto.

* Nel caso di abbinamento del sistema Emmeti Floor con la pompa di calore Mirai SMI + Febos HP, si consiglia di aumentare lo spessore del massetto di circa 1 cm rispetto ai valori minimi.

Standard Combi Floor

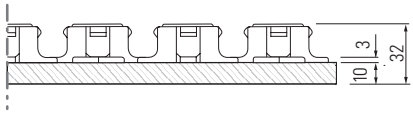
Pannello isolante

Modelli H = 10/20/30



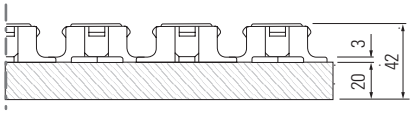
Pannello 1200 x 800 H 10

Sezione A-A



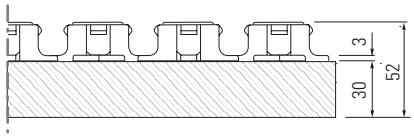
Pannello 1200 x 800 H 20

Sezione A-A

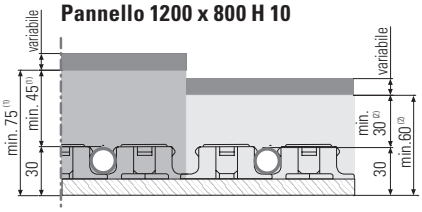


Pannello 1200 x 800 H 30

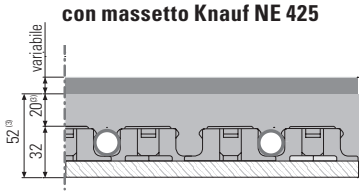
Sezione A-A



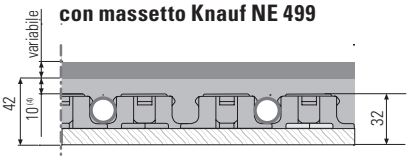
Pannello 1200 x 800 H 10



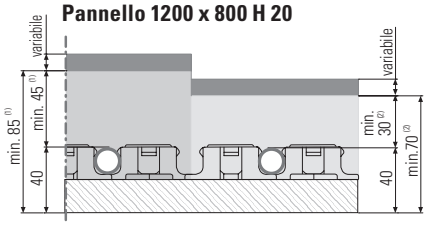
Pannello 1200 x 800 H 10
con massetto Knauf NE 425



Pannello 1200 x 800 H 10
con massetto Knauf NE 499



Pannello 1200 x 800 H 20



Pannello 1200 x 800 H 30

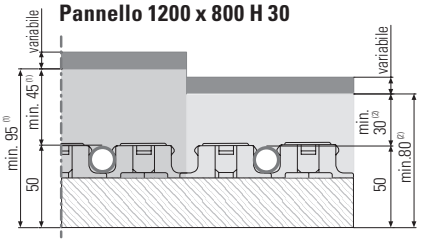


Fig. 3

Ingombri minimi del sistema per edifici civili (mm)

(1) Massetto cementizio tradizionale*
(2) Massetto autolivellante*
(3) Massetto fluido a basso spessore Knauf Autolivellina NE 425
(4) Massetto fluido a basso spessore Knauf Superlivellina NE 499

Lo spessore effettivo del massetto e la modalità di realizzazione dello stesso sono da definire con il produttore / fornitore dello stesso secondo le sue specifiche, in funzione delle condizioni di installazione (dimensione e tipologia superficie di posa, tipologia solaio, ecc.) e del tipo di massetto scelto.

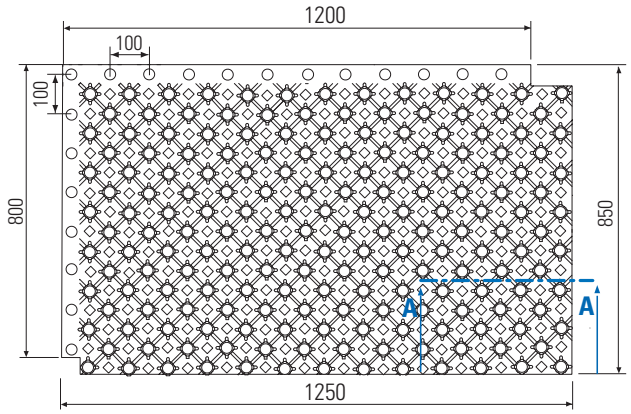
* Nel caso di abbinamento del sistema Emmeti Floor con la pompa di calore Mirai SMI + Febos HP, si consiglia di aumentare lo spessore del massetto di circa 1 cm rispetto ai valori minimi.

Nota I massetti **non** vengono forniti da Emmeti

Standard Combi Floor con grafite

Pannello isolante

Modelli H = 10/18/33/40/50



Ingombri minimi del sistema per edifici civili (mm)

(1) Massetto cementizio tradizionale*
(2) Massetto autolivellante*
(3) Massetto fluido a basso spessore Knauf Autolivellina NE 425
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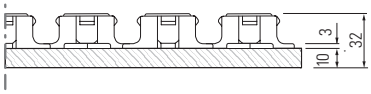
Lo spessore effettivo del massetto e la modalità di realizzazione dello stesso sono da definire con il produttore / fornitore dello stesso secondo le sue specifiche, in funzione delle condizioni di installazione (dimensione e tipologia superficie di posa, tipologia solaio, ecc.) e del tipo di massetto scelto.

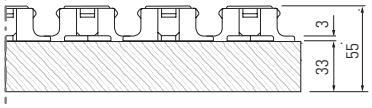
Pannello 1200 x 800 H 10

Sezione A-A



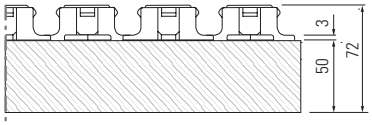
Pannello 1200 x 800 H 33

Sezione A-A



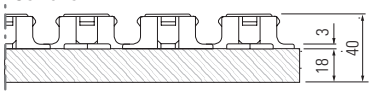
Pannello 1200 x 800 H 50

Sezione A-A



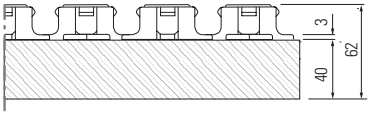
Pannello 1200 x 800 H 18

Sezione A-A

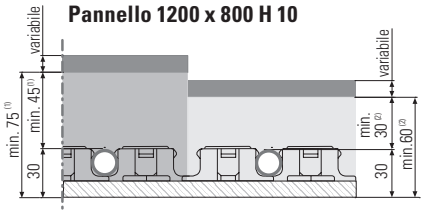


Pannello 1200 x 800 H 40

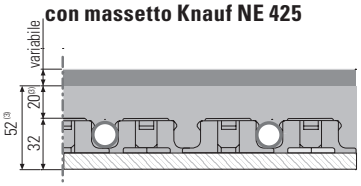
Sezione A-A



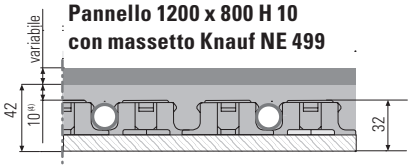
Pannello 1200 x 800 H 10



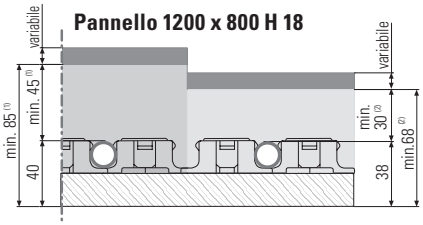
Pannello 1200 x 800 H 10 con massetto Knauf NE 425



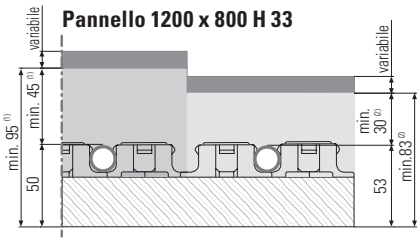
Pannello 1200 x 800 H 10 con massetto Knauf NE 499



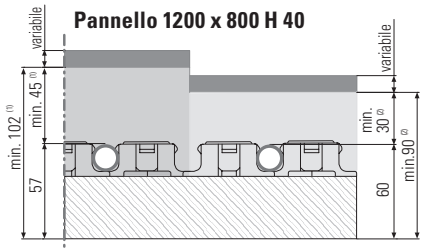
Pannello 1200 x 800 H 18



Pannello 1200 x 800 H 33



Pannello 1200 x 800 H 40



Pannello 1200 x 800 H 50

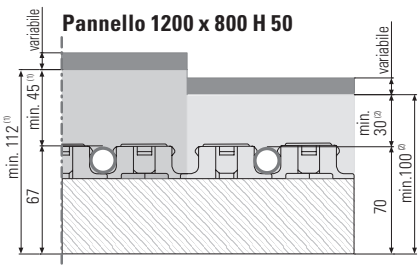


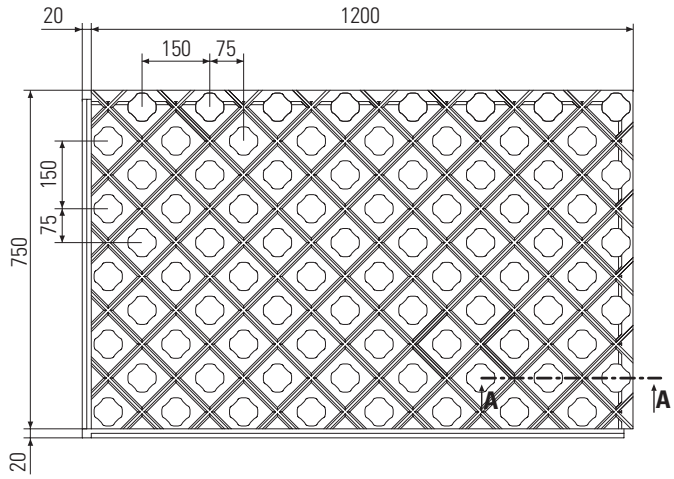
Fig. 3a

* Nel caso di abbinamento del sistema Emmeti Floor con la pompa di calore Mirai SMI + Febos HP, si consiglia di aumentare lo spessore del massetto di circa 1 cm rispetto ai valori minimi.

Nota I massetti **non** vengono forniti da Emmeti

Classic Floor
Pannello isolante

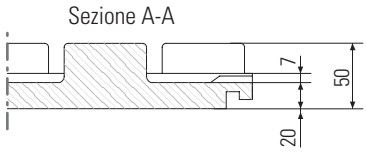
Modelli H = 20/30



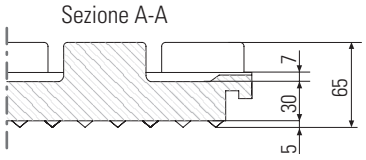
Ingombri minimi del sistema per edifici civili (mm)

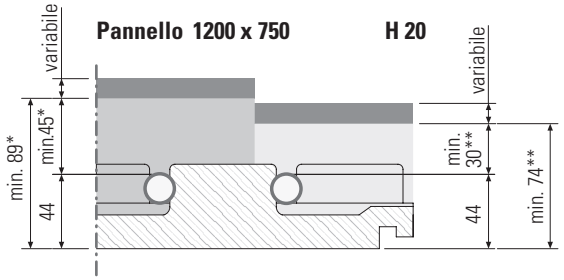
* Massetto cementizio tradizionale
** Massetto autolivellante

Pannello 1200 x 750 H 20



Pannello 1200 x 750 H 30





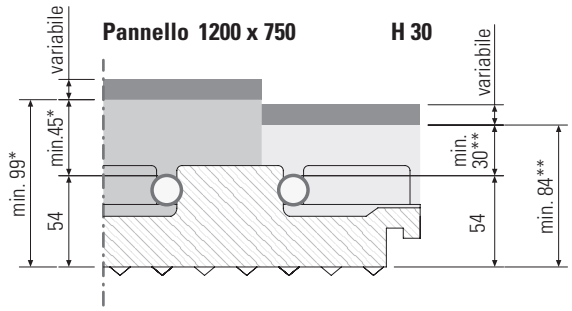


Fig. 4

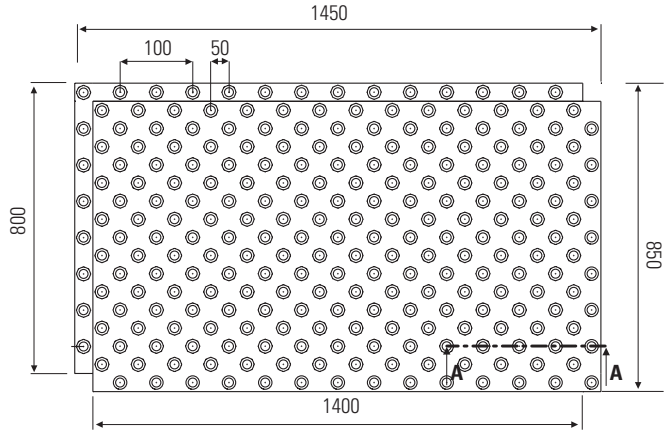
Nel caso di abbinamento del sistema Emmeti Floor con la pompa di calore Mirai SMI + Febos HP, si consiglia di aumentare lo spessore del massetto di circa 1 cm rispetto ai valori minimi.

Nota I massetti **non** vengono forniti da Emmeti

Step Combi Floor / Step Combi Floor c/grafite

Pannello fono-isolante

Modello H = 30-2



Ingombri minimi del sistema per edifici civili (mm)

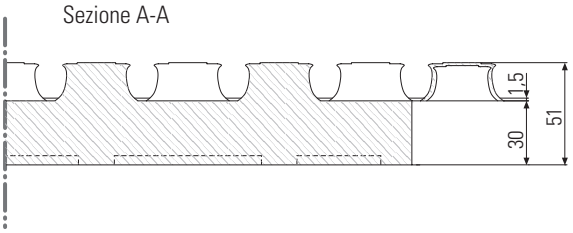
* Massetto cementizio tradizionale

** Massetto autolivellante

Nel caso di abbinamento del sistema Emmeti Floor con la pompa di calore Mirai SMI + Febos HP, si consiglia di aumentare lo spessore del massetto di circa 1 cm rispetto ai valori minimi.

Nota I massetti **non** vengono forniti da Emmeti

Pannello 1400 x 800 H 30 - 2



Pannello 1400 x 800 H 30 - 2

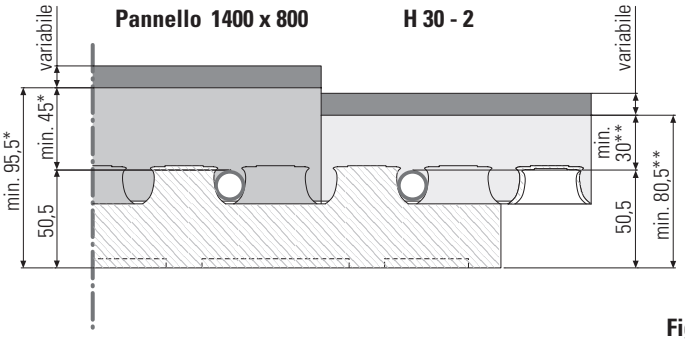
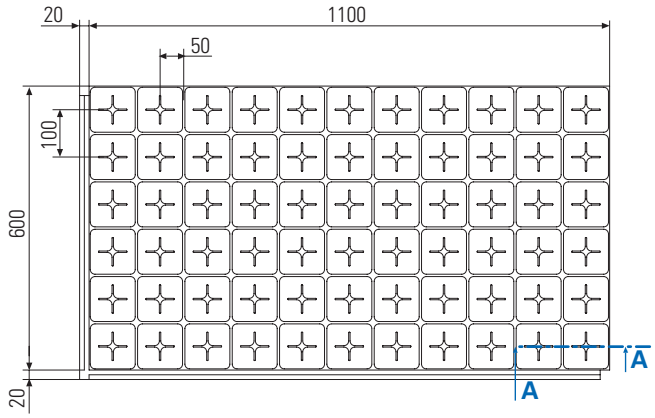


Fig. 5

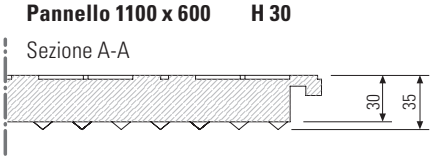
Plan Floor

Pannello isolante

Modello H = 30



Pannello 1100 x 600 H 30



Ingombri minimi del sistema per edifici civili (mm)

* Massetto cementizio tradizionale

** Massetto autolivellante

Nel caso di abbinamento del sistema Emmeti Floor con la pompa di calore Mirai SMI + Febos HP, si consiglia di aumentare lo spessore del massetto di circa 1 cm rispetto ai valori minimi.

Nota I massetti **non** vengono forniti da Emmeti

Pannello 1100 x 600 H 30

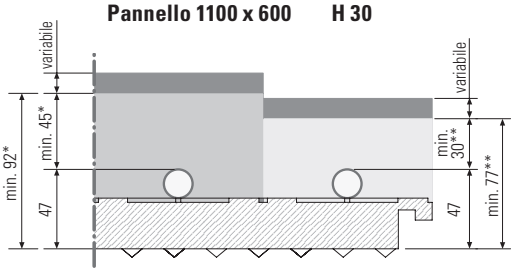
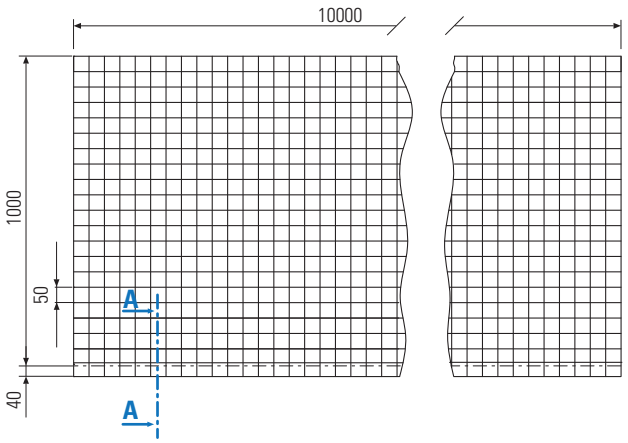


Fig. 6

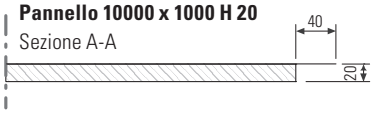
Roll Floor

Pannello Isolante

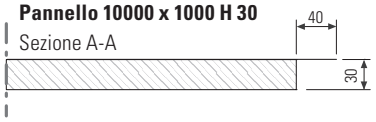
Modello H 20/30/40/50



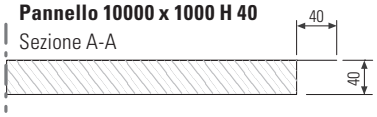
Pannello 10000 x 1000 H 20
Sezione A-A



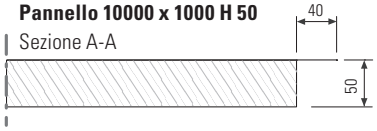
Pannello 10000 x 1000 H 30
Sezione A-A



Pannello 10000 x 1000 H 40
Sezione A-A



Pannello 10000 x 1000 H 50
Sezione A-A



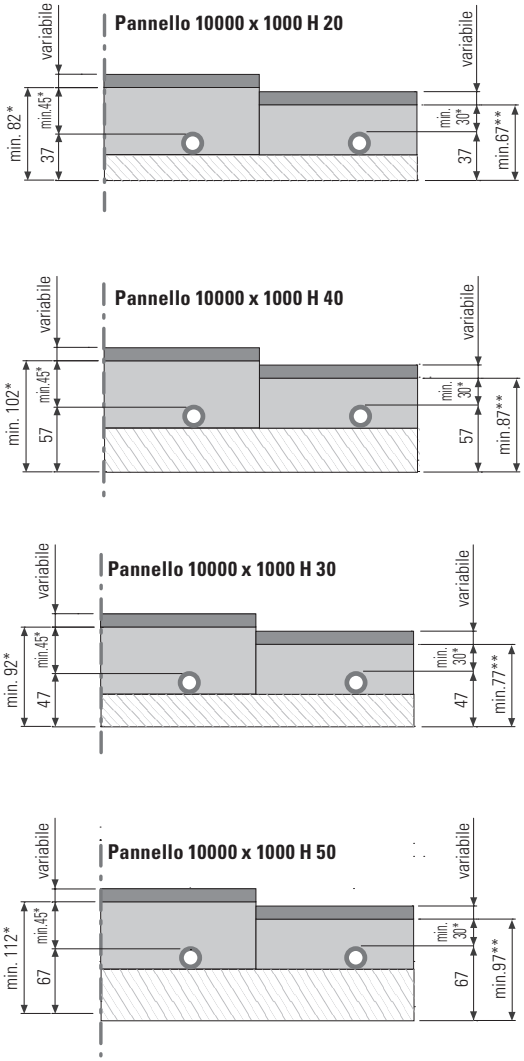


Fig. 7

Ingombri minimi del sistema per edifici civili (mm)

* Massetto cementizio tradizionale

** Massetto autolivellante

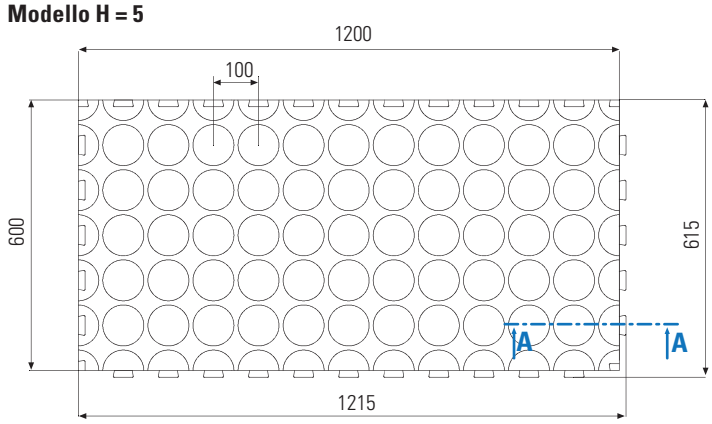
Nel caso di abbinamento del sistema Emmeti Floor con la pompa di calore Mirai SMI + Febos HP, si consiglia di aumentare lo spessore del massetto di circa 1 cm rispetto ai valori minimi.

Nota I massetti **non** vengono forniti da Emmeti

Thin Floor

Pannello Isolante

Modello H = 5



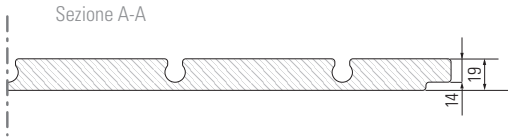
Ingombri minimi del sistema per edifici civili (mm)

* Massetto autolivellante
** Massetto fluido a basso spessore Knauf Autolivellina NE 425
*** Massetto fluido a basso spessore Knauf Superlivellina NE 499

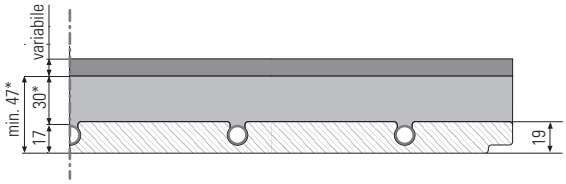
Lo spessore effettivo del massetto e la modalità di realizzazione dello stesso sono da definire con il produttore / fornitore dello stesso secondo le sue specifiche, in funzione delle condizioni di installazione (dimensione e tipologia superficie di posa, tipologia solaio, ecc.) e del tipo di massetto scelto.

Nota: i massetti **non** vengono forniti da Emmeti

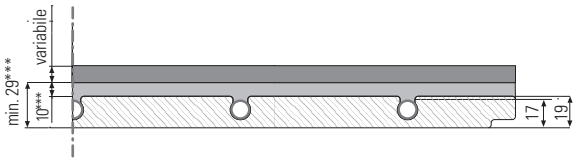
Pannello 1200 x 600 H 5



Pannello 1200 x 600 H 5



Pannello 1200 x 600 H 5
con massetto Knauf NE 499



Pannello 1200 x 600 H 5
con massetto Knauf NE 425

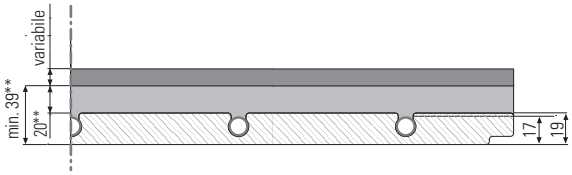
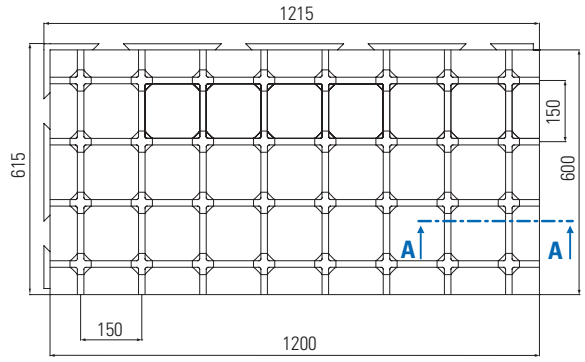


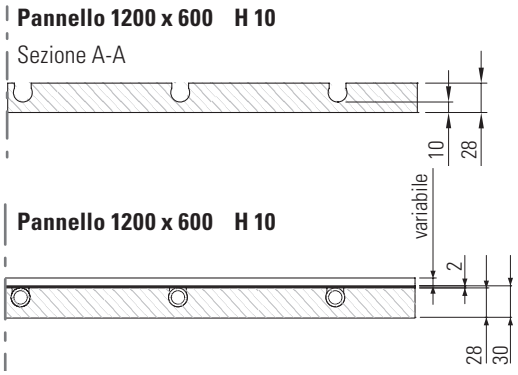
Fig. 8

Dry Alu Floor

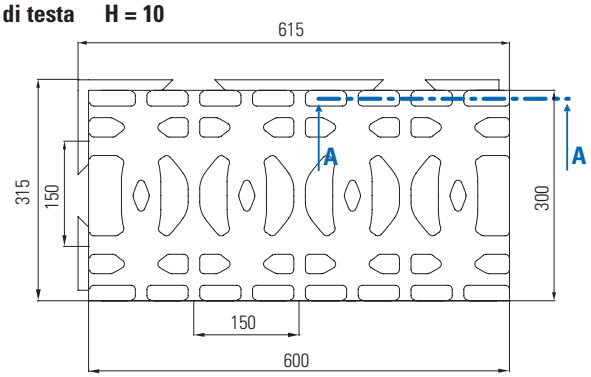
Pannello isolante H = 10



Pannello 1200 x 600 H 10



Pannello isolante
di testa H = 10



Pannello 600 x 300 H 10

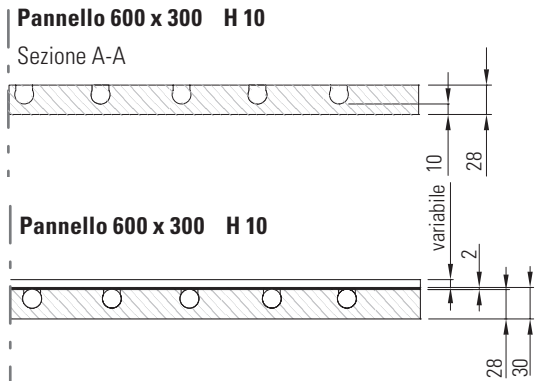
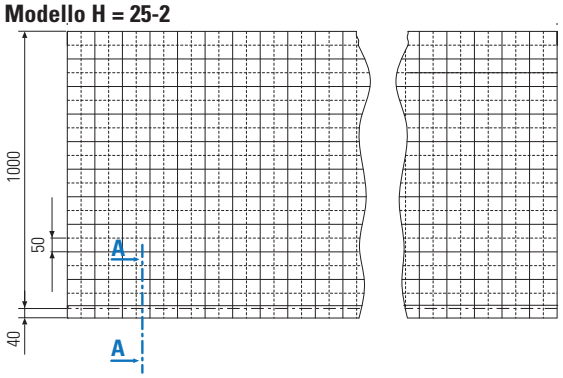


Fig. 9

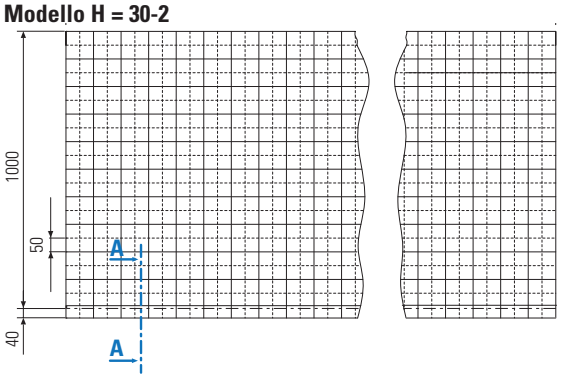
Klettjet

Pannello Isolante

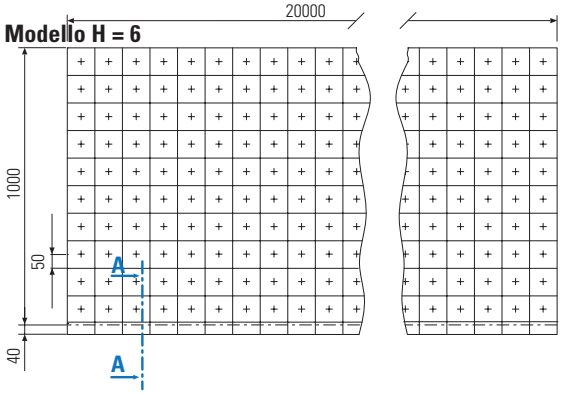
Modello H = 25-2



Modello H = 30-2

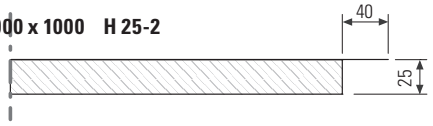


Modello H = 6



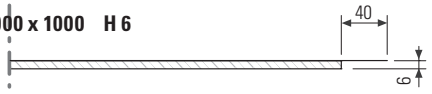
Pannello 12000 x 1000 H 25-2

Sezione A-A



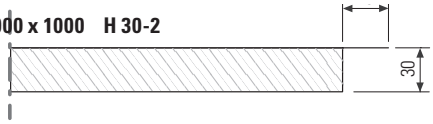
Pannello 20000 x 1000 H 6

Sezione A-A

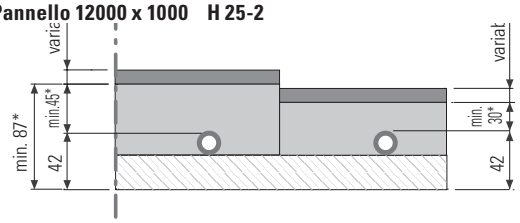


Pannello 10000 x 1000 H 30-2

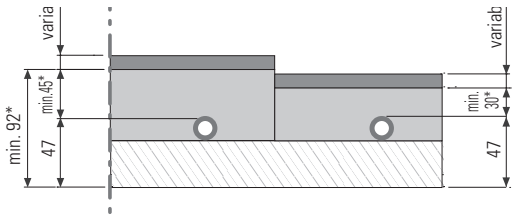
Sezione A-A



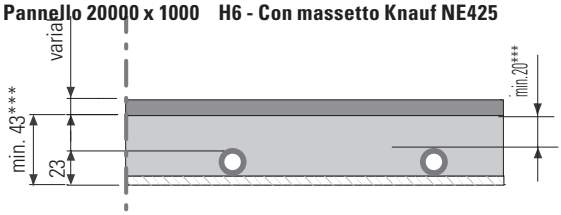
Pannello 12000 x 1000 H 25-2



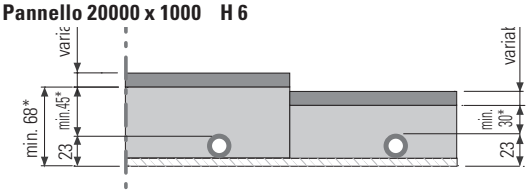
Pannello 12000 x 1000 H 30-2



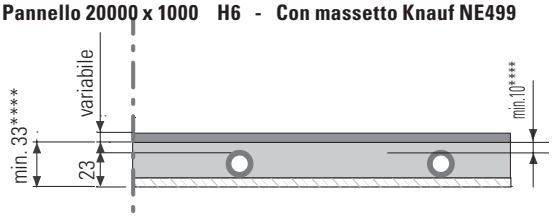
Pannello 20000 x 1000 H6 - Con massetto Knauf NE425



Pannello 20000 x 1000 H 6



Pannello 20000 x 1000 H6 - Con massetto Knauf NE499



Ingombri minimi del sistema per edifici civili (mm)

* Massetto cementizio tradizionale
** Massetto autolivellante
*** Massetto fluido a basso spessore Knauf Autolivellina NE 425
**** Massetto fluido a basso spessore Knauf Superlivellina NE 499

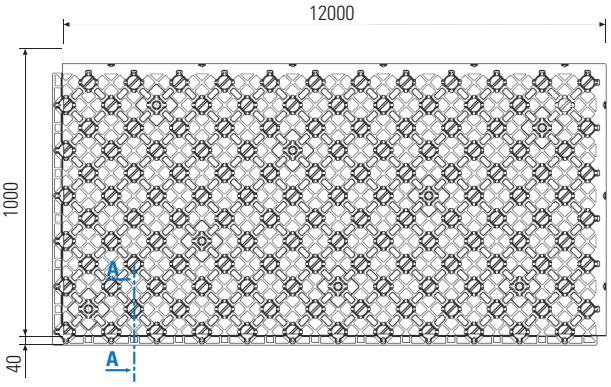
Nel caso di abbinamento del sistema Emmeti Floor con la pompa di calore Mirai SMI + Febos HP, si consiglia di aumentare lo spessore del massetto di circa 1 cm rispetto ai valori minimi.

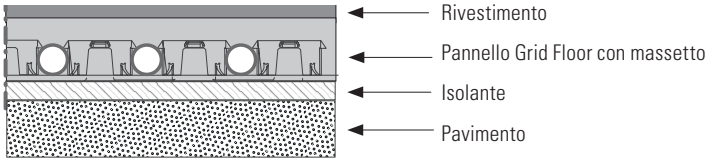
Nota I massetti **non** vengono forniti da Emmeti

Grid floor

Pannello Isolante

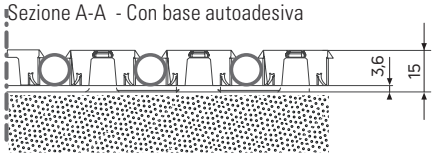
Modello H = 0/10 dn12





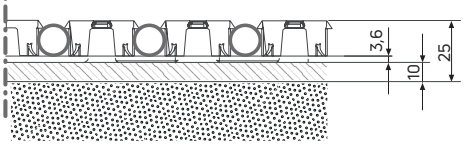
Pannello 1200 x 600 H 0

Sezione A-A - Con base autoadesiva



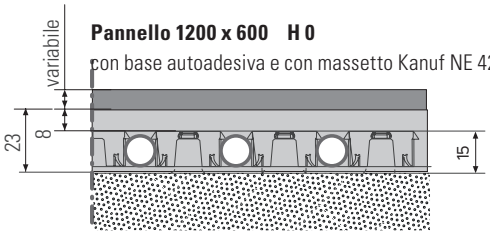
Pannello 1200 x 600 H 10

Sezione A-A - Con isolante



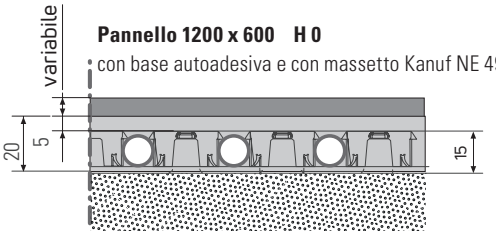
Pannello 1200 x 600 H 0

con base autoadesiva e con massetto Kanuf NE 425



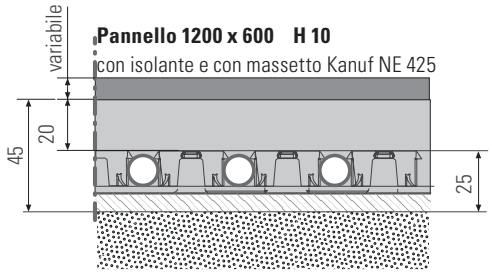
Pannello 1200 x 600 H 0

con base autoadesiva e con massetto Kanuf NE 499



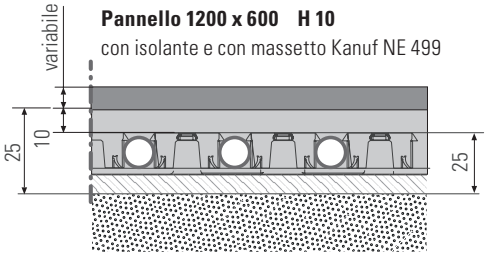
Pannello 1200 x 600 H 10

con isolante e con massetto Kanuf NE 425



Pannello 1200 x 600 H 10

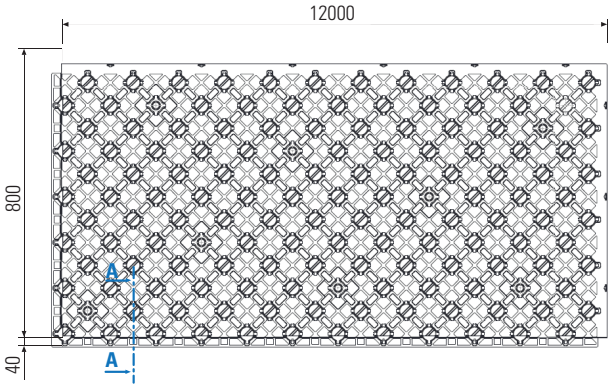
con isolante e con massetto Kanuf NE 499

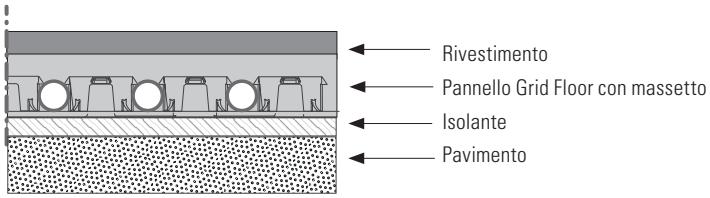


Nota: Lo spessore effettivo del massetto e la modalità di realizzazione dello stesso sono da definire con il produttore / fornitore dello stesso secondo le sue specifiche, in funzione delle condizioni di installazione (dimensione e tipologia superficie di posa, tipologia solaio, ecc) e del tipo di assetto scelto.

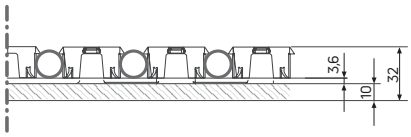
Grid floor
Pannello Isolante

Modello H = 10 / 25 / 42 DN16/17

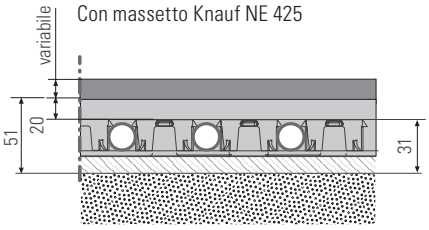




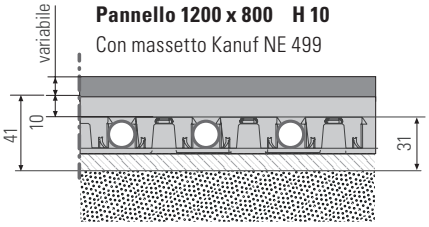
Pannello 1200 x 800 H 10
Sezione A-A



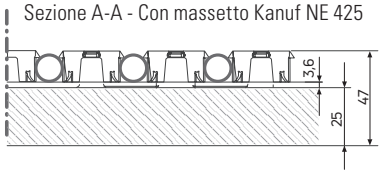
Pannello 1200 x 800 H 10
Con massetto Knauf NE 425



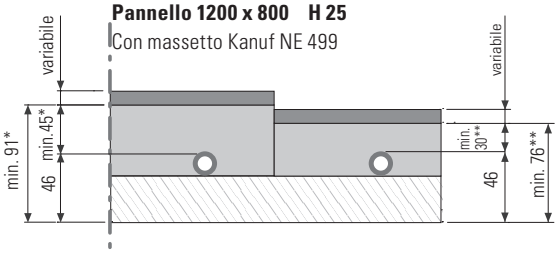
Pannello 1200 x 800 H 10
Con massetto Kanuf NE 499



Pannello 1200 x 800 H 25
Sezione A-A - Con massetto Kanuf NE 425

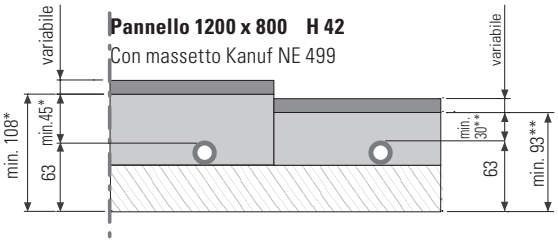


Pannello 1200 x 800 H 25
Con massetto Kanuf NE 499



Pannello 1200 x 800 H 42
Sezione A-A - Con massetto Kanuf NE 425

Pannello 1200 x 800 H 42
Con massetto Kanuf NE 499



* Massetto cementizio tradizionale
** Massetto autolivellante

Nota: Lo spessore effettivo del massetto e la modalità di realizzazione dello stesso sono da definire con il produttore / fornitore dello stesso secondo le sue specifiche, in funzione delle condizioni di installazione (dimensione e tipologia superficie di posa, tipologia solaio, ecc) e del tipo di assetto scelto.

Avvertenza
Il sottofondo dovrà essere ben pulito, privo di residui di malta, sufficentemente piana, per permettere un appoggio uniforme dei pannelli isolanti.

Per procedere alla posa dell'impianto di riscaldamento a pavimento radiante, gli intonaci interni e gli impianti idrotermici ed elettrici dovranno essere già completati; quest'ultimi in particolare dovranno essere coperti da un massetto ben livellato e di adeguata resistenza meccanica.
Eventuali strati di materiale bituminoso dovranno essere isolati dai pannelli con fogli di polietilene (spessore minimo 0,2 mm), sovrapposti sui lati di almeno 20 cm e uniti nei punti di giunzione con adesivo appropriato (Fig. 11).

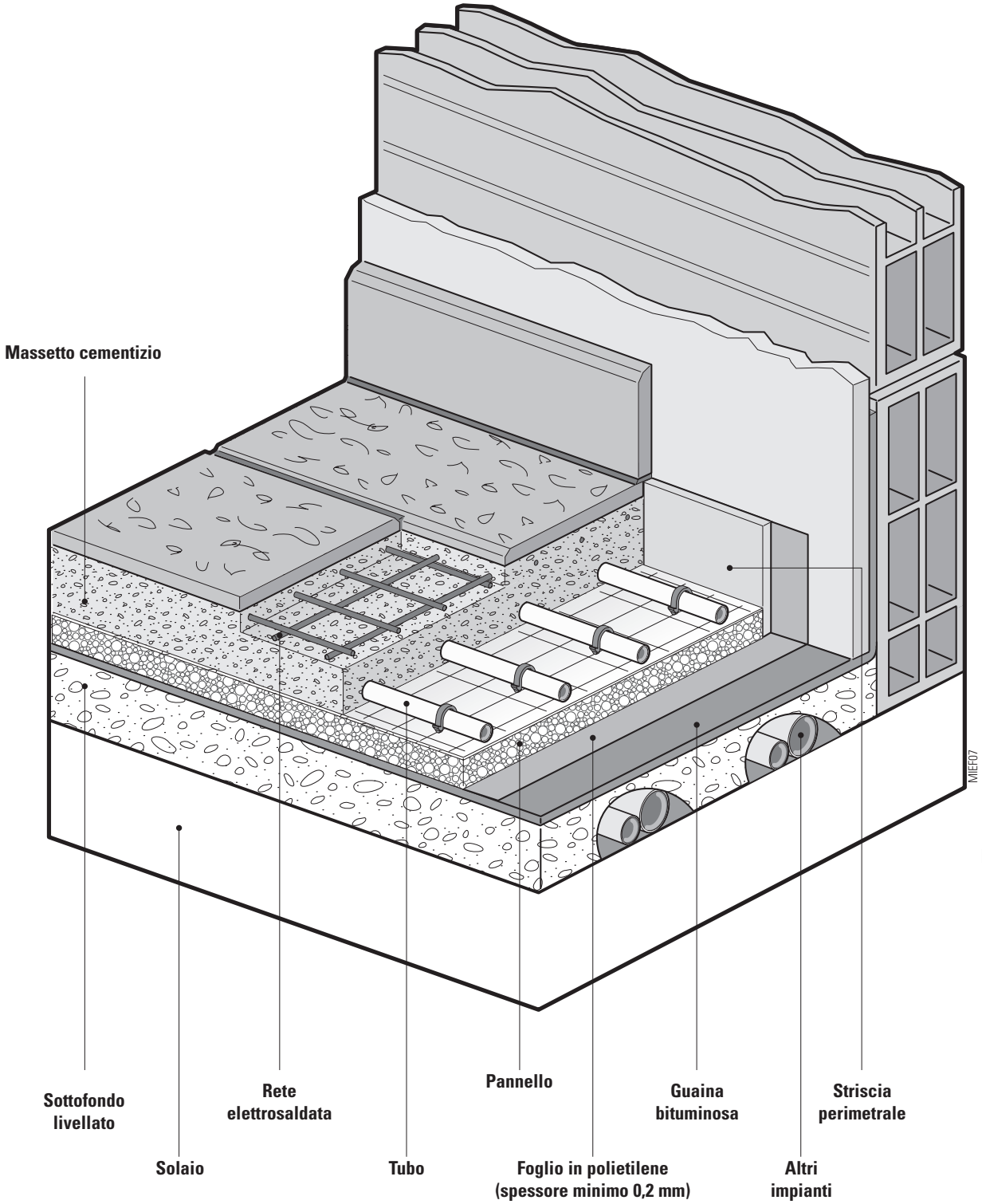


Fig. 11

Se per ragioni strutturali o d'altezza utile disponibile insufficiente, non fosse possibile realizzare un'adeguata copertura degli impianti idrotermici ed elettrici, si possono disporre tali tubazioni a ridosso delle pareti (Fig. 12), verificando che il massetto di copertura raggiunga lo spessore di almeno 30 mm.

È importante garantire un perfetto appoggio dei pannelli sul solaio per evitare cedimenti dei massetti e cricche nelle pavimentazioni.

Attenzione!
Nel caso di realizzazione di un pavimento galleggiante per ridurre la trasmissione del rumore di calpestio, utilizzando i pannelli fono-isolanti STEP COMBI FLOOR, le zone di passaggio di altri impianti costituiscono un ponte acustico e quindi vanno assolutamente evitate. Tali impianti dovranno essere preferibilmente incassati nella soletta oppure rivestiti con idoneo materiale fono-isolante certificato.

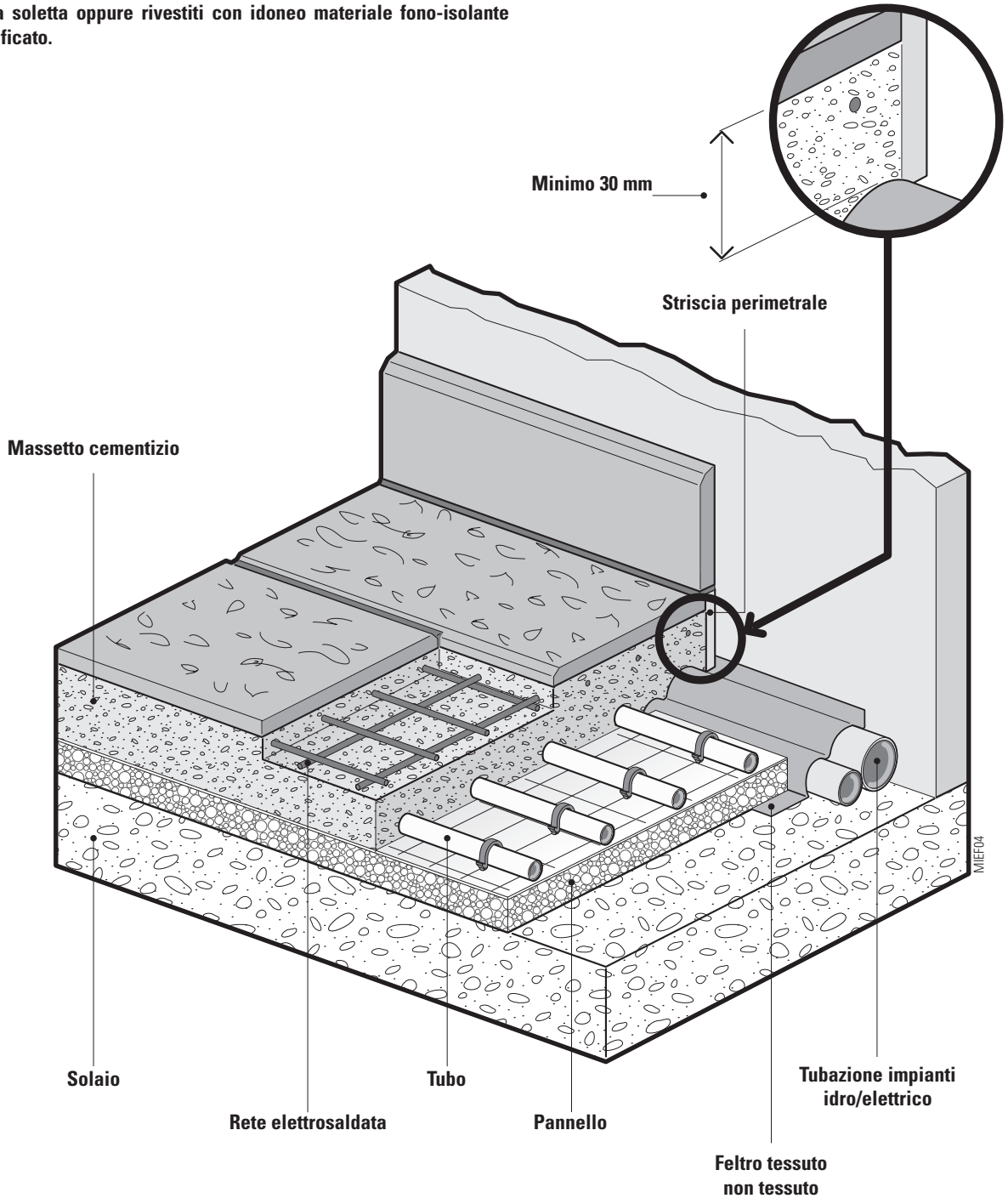


Fig. 12

Negli impianti che presentano tubazioni idrotermiche ed elettriche disposte lungo le pareti, si deve fare in modo che i pannelli risultino appoggiati completamente al solaio.
Per questo motivo è consigliata la realizzazione di uno "scalino" ad angolo retto sopra tali tubazioni, su cui appoggiare lateralmente i pannelli (Fig. 13 e 14).

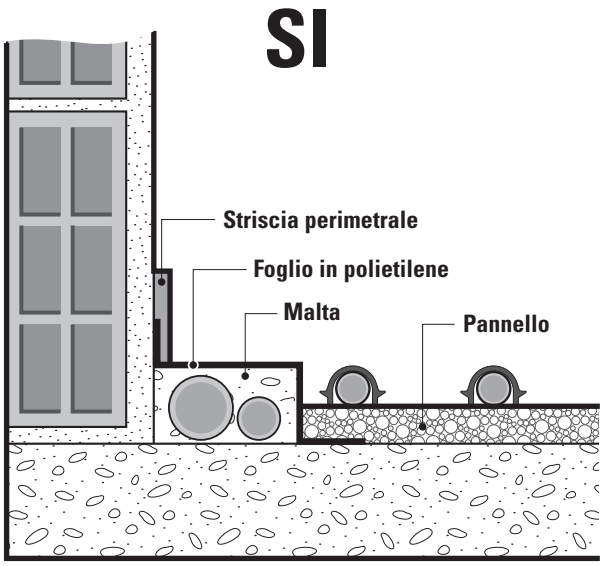


Fig. 13

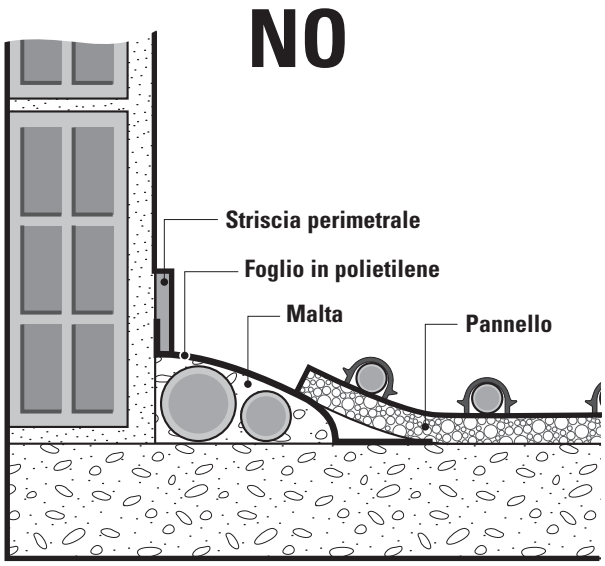


Fig. 14

L'altezza di tale scalino possibilmente non dovrà essere superiore a quella dell'impianto a pavimento (pannello + tubo), e dovrà comunque garantire uno spessore minimo superiore di 30 mm di massetto (Fig. 12).
Per evitare un'eventuale adesione del massetto radiante (che deve risultare libero di "galleggiare" rispetto alla struttura circostante) a tale scalino, si deve posizionare uno strato separatore (foglio in polietilene, "feltro tessuto non tessuto", ecc).
La compensazione dei livelli non potrà essere realizzata con materiale sciolto (sabbia) o isolanti a bassa densità.

I collettori di distribuzione devono essere installati ad almeno 30 cm dalla soletta grezza.
I collettori di distribuzione Emmeti Top Way, prevedono il collegamento della tubazione di mandata, con la barra inferiore dotata di detentori di regolazione semplice (tappo rosso) o con misuratori di portata e la tubazione tubazione di ritorno con la barra superiore, dove sono presenti le valvole d'intercettazione (tappo blu) sulle quali è possibile applicare le teste elettrotermiche (Fig. 15).

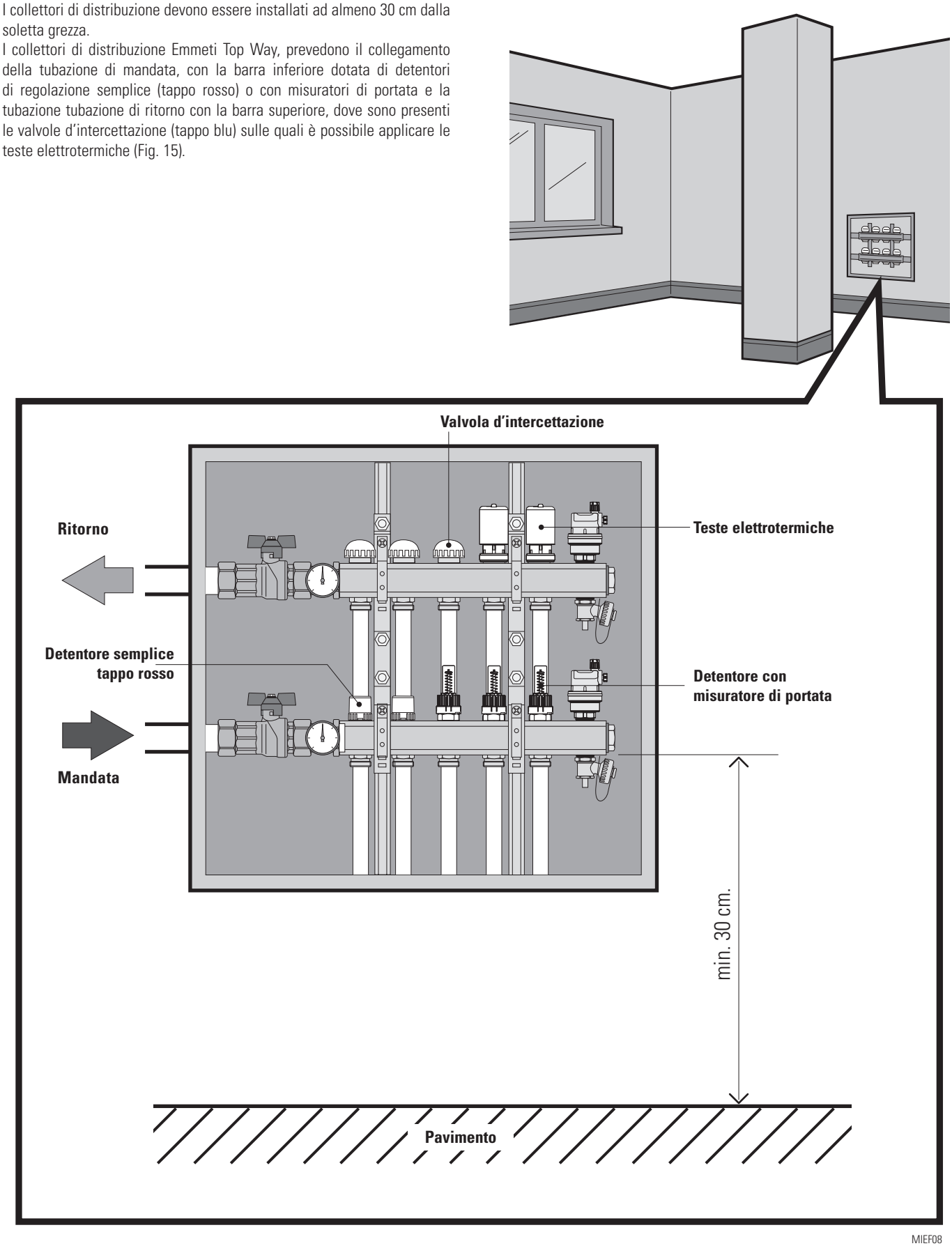
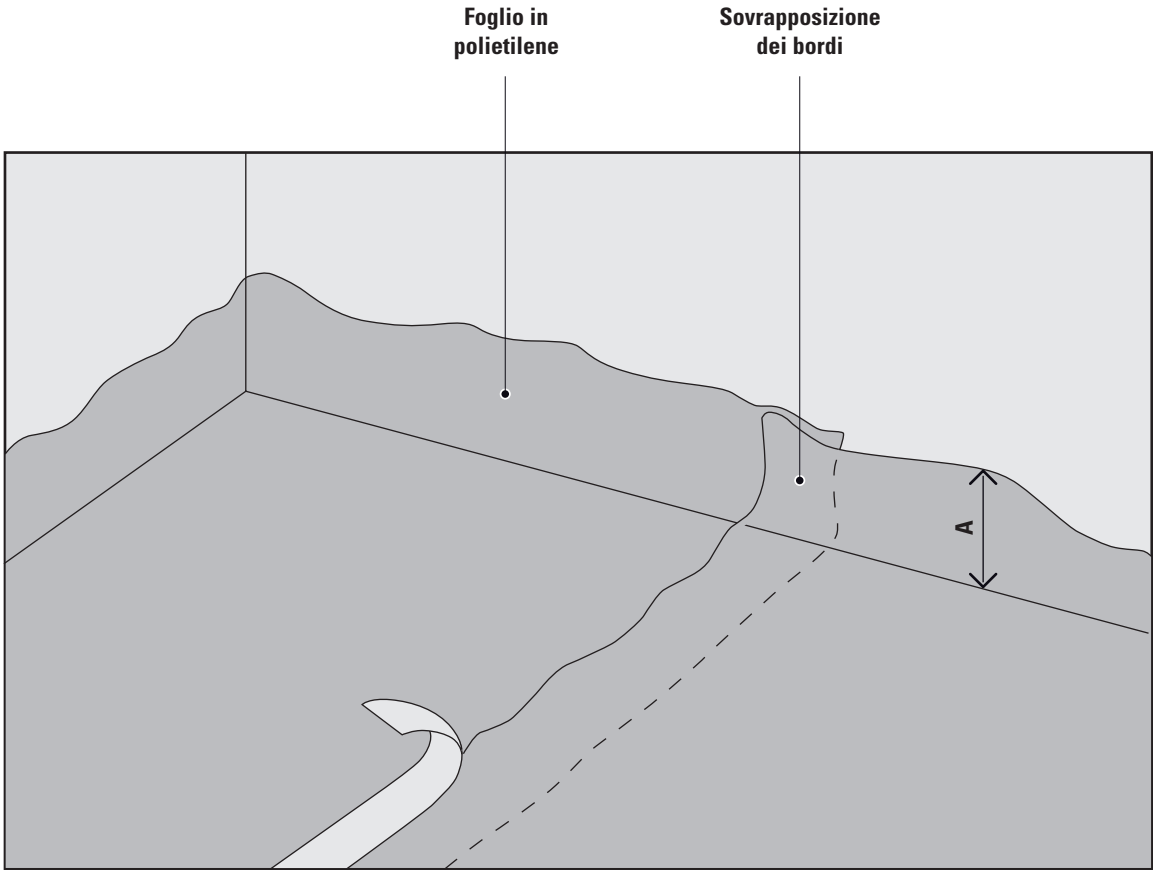


Fig. 15

Nei casi di possibile risalita di umidità dal sottofondo verso i pannelli isolanti, va posato il foglio in polietilene su tutta la superficie della soletta rialzandone i bordi lungo le pareti. I fogli vanno sovrapposti e uniti con nastro adesivo. Tale prescrizione va adottata nel caso di impianti poggianti su sottofondi a contatto con il terreno (piani terra, scantinati) oppure nel caso di utilizzo del pavimento per il raffrescamento estivo.



A = 5 cm circa

Fig. 16

La striscia perimetrale è un elemento assolutamente necessario, sia per compensare le dilatazioni termiche, che per isolare termicamente e acusticamente il massetto radiante dalle pareti dell'edificio.
L'altezza della striscia perimetrale (150/250 mm) dovrà essere sufficiente a coprire l'ingombro totale dell'impianto (isolante + massetto + pavimento).
Essa va posata lungo tutto il perimetro d'ogni elemento strutturale verticale (pareti, scale, pilastri, colonne, ecc.) fissandola dal lato adesivo (se necessario con chiodi, graffette o adesivi in modo da evitare eventuali spostamenti durante la gettata del massetto radiante) (Fig. 17).
La striscia perimetrale dovrà essere posizionata anche in corrispondenza delle soglie di ingresso verso i vani scala e delle soglie di accesso alle terrazze (fig. 18)
La bandella in polietilene applicata alla striscia deve essere piegata verso i pannelli e sovrapposta agli stessi, in modo da impedire la penetrazione del massetto sotto lo strato isolante.
In corrispondenza degli spigoli e degli angoli delle pareti, praticare un'incisione della striscia con un taglierino per la metà dello spessore in modo tale da favorirne un contatto adeguato alle pareti (Fig. 19).

Fig. 17

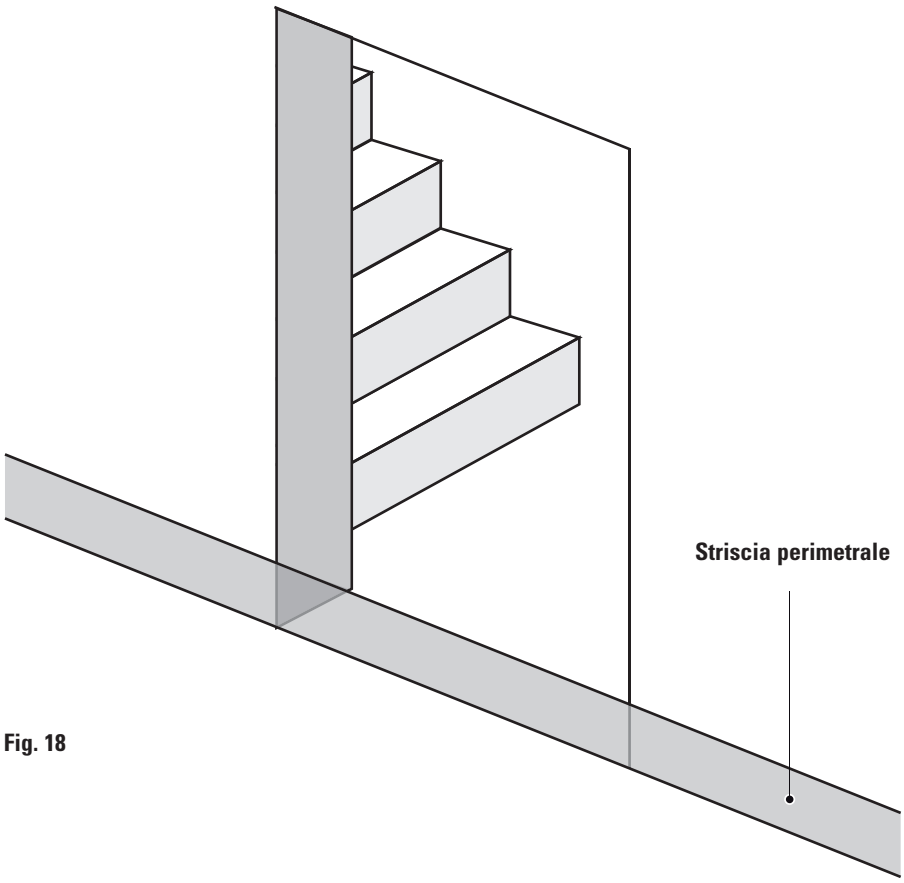


Fig. 18

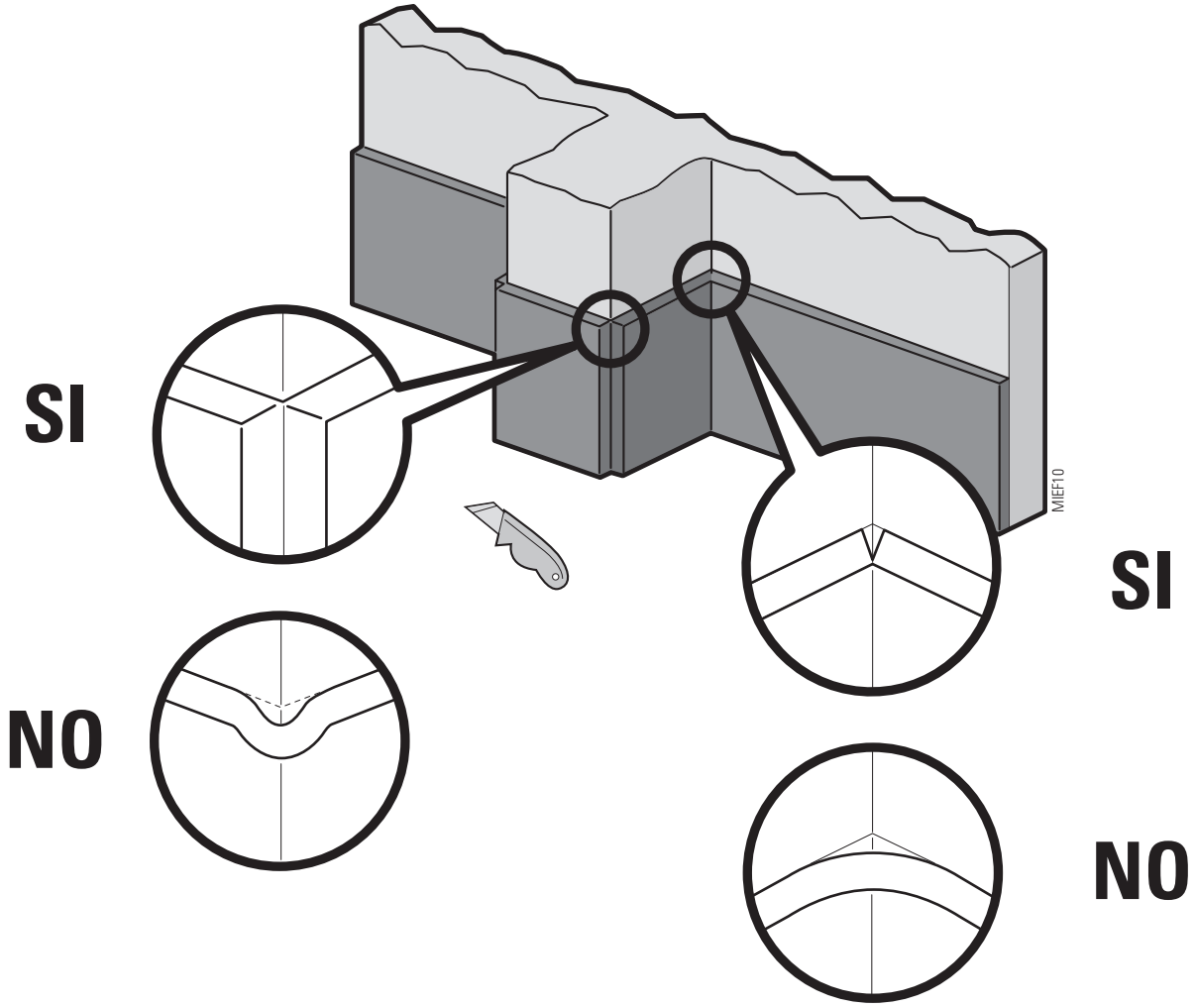


Fig. 19

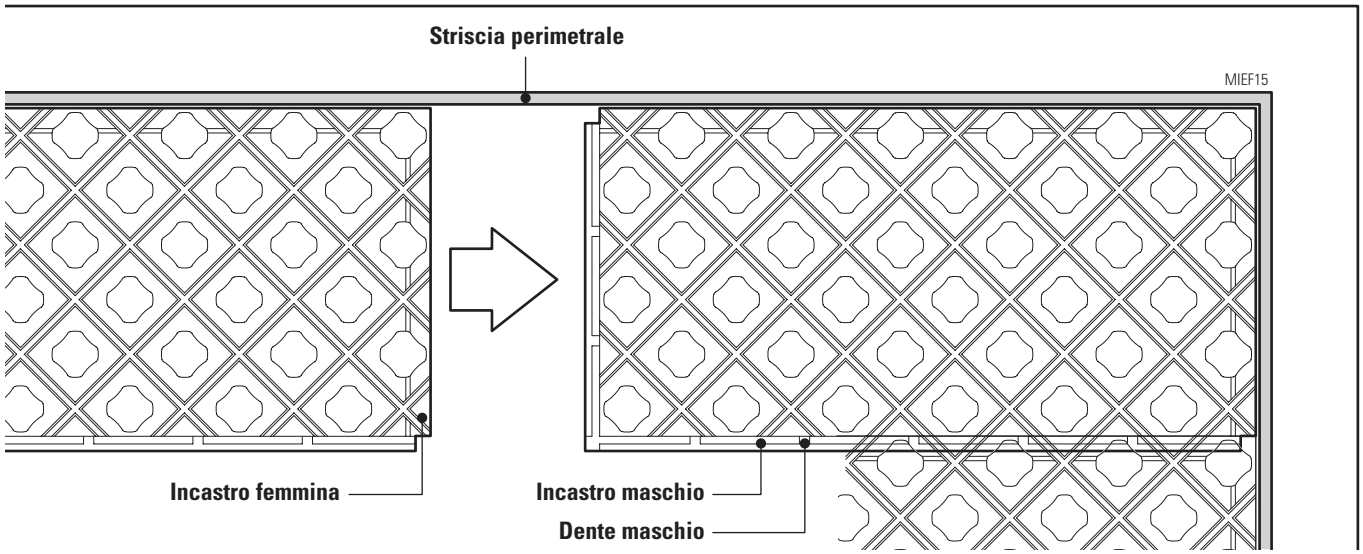
6. POSA DEI PANNELLI ISOLANTI

Pannelli Standard Floor, Standard Combi Floor, Classic Floor e Step Combi Floor

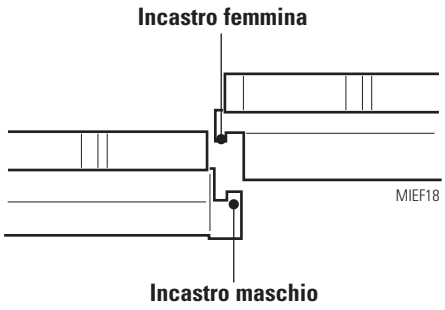
Si consiglia di iniziare la posa dei pannelli partendo da un angolo del locale in direzione della parete più lunga dello stesso (Fig. 20).
Appoggiare i pannelli con il lato femmina dell'incastro verso il giunto di dilatazione perimetrale.
Proseguire unendo i pannelli con gli appositi incastri, tagliandoli con un taglierino e riutilizzando le parti eccedenti per le file successive, verificando l'allineamento delle bugne tra una fila e l'altra (Fig. 21) e la corretta sovrapposizione dei denti maschio con le scanalature degli incastri femmina.

Fig. 20

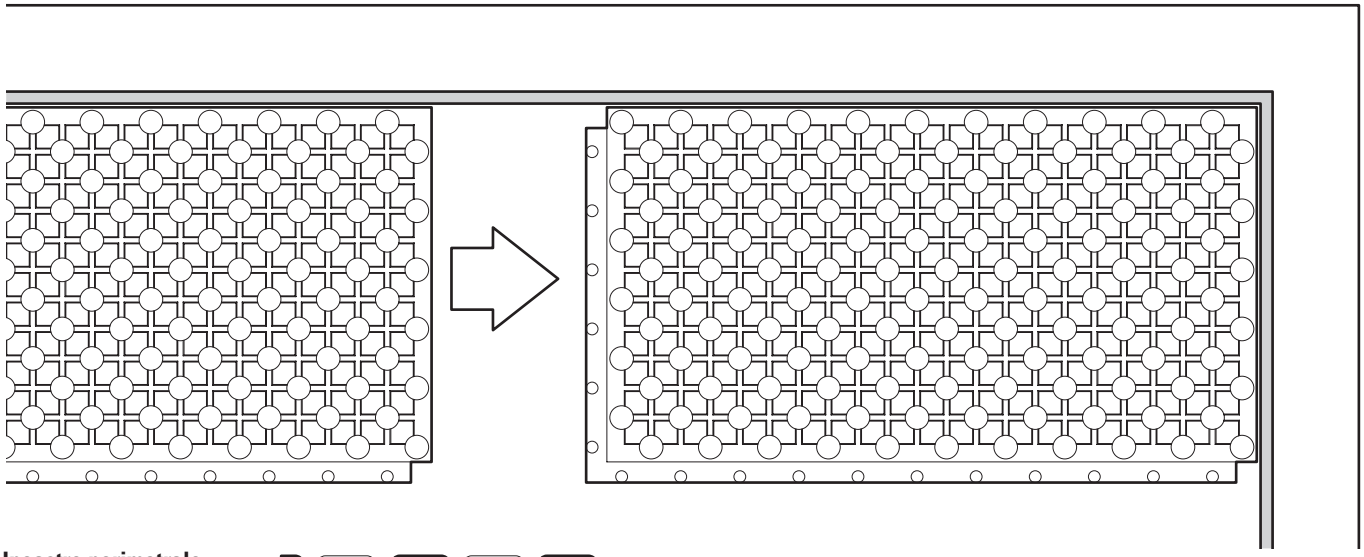
Pannelli Classic Floor, Step Floor



Incastro perimetrale



Pannelli Standard Floor, Standard Combi Floor, Step Combi Floor



Incastro perimetrale

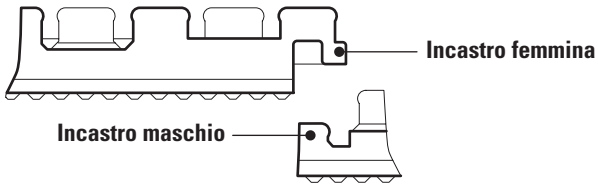


Fig. 21

Pannello Plan Floor

Si consiglia di iniziare la posa dei pannelli partendo da un angolo del locale in direzione della parete più lunga dello stesso (Fig. 22).
Appoggiare i pannelli con il lato femmina dell'incastro verso il giunto di dilatazione perimetrale.
Proseguire unendo i pannelli con gli appositi incastri, tagliandoli con un taglierino e riutilizzando le parti eccedenti per le file successive, verificando l'allineamento delle impronte superficiali tra una fila e l'altra.

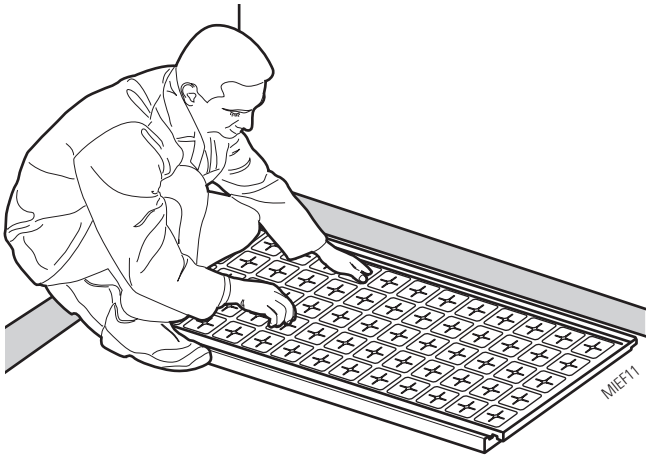


Fig. 22

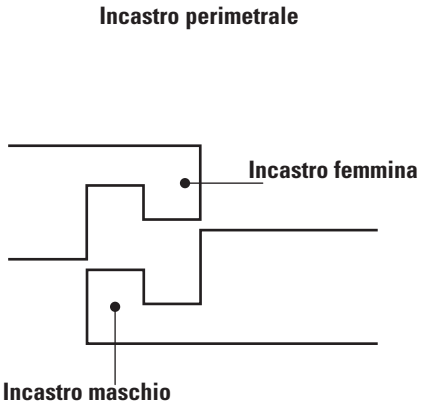


Fig. 23

Esempio di posa con recupero della parte tagliata dei pannelli isolanti del sistema Emmeti Floor (Standard, Classic, Plan, Step)

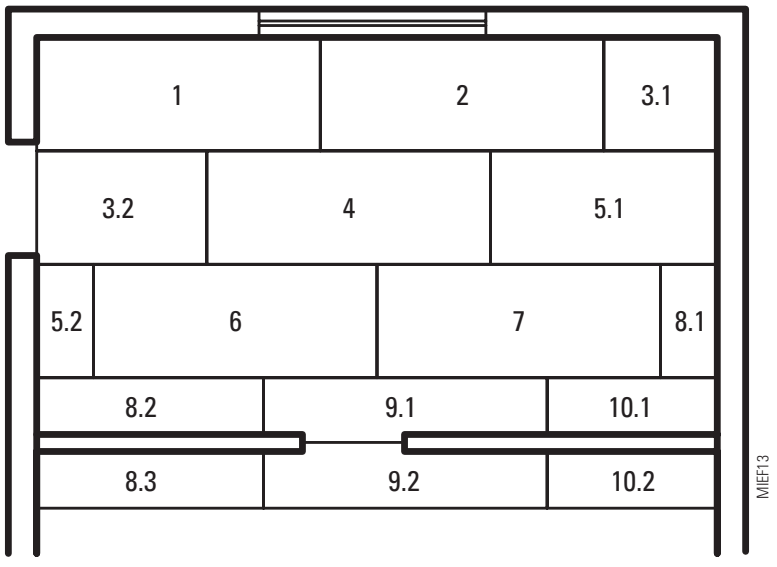


Fig. 24

Pannello Roll Floor

Si consiglia di iniziare la posa del rotolo partendo da un angolo del locale in direzione della parete più lunga dello stesso, facendo in modo che il bordo adesivo sia accostato alla striscia perimetrale (Fig. 25).
Terminata la prima fila di pannello, proseguire la posa della successiva unendole mediante la sovrapposizione del bordo adesivo (Fig. 26).
Le parti tagliate eccedenti vanno riutilizzate nella fila successiva, rispettando se possibile gli allineamenti della griglia stampata sulla pellicola superficiale, per minimizzare gli scarti di materiale (Fig. 27); la sigillatura dei pannelli (lato corto), andrà effettuata con nastro adesivo Emmeti.

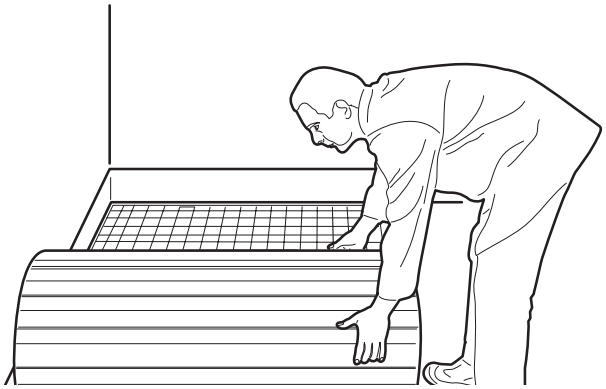


Fig. 25

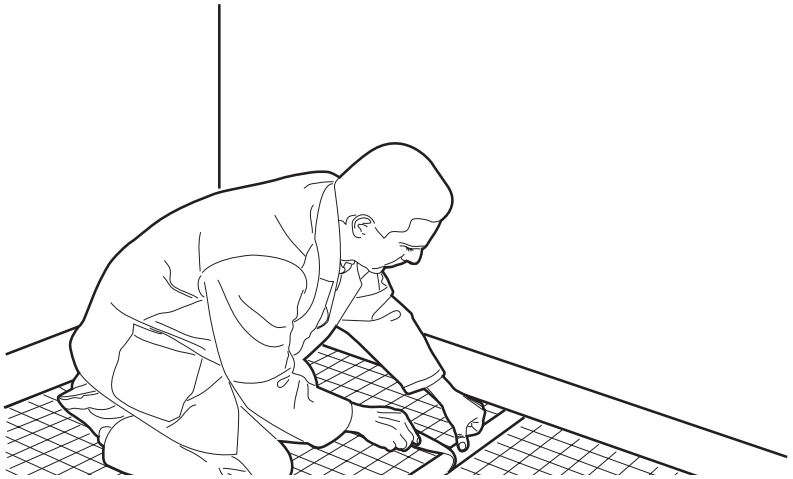


Fig. 26

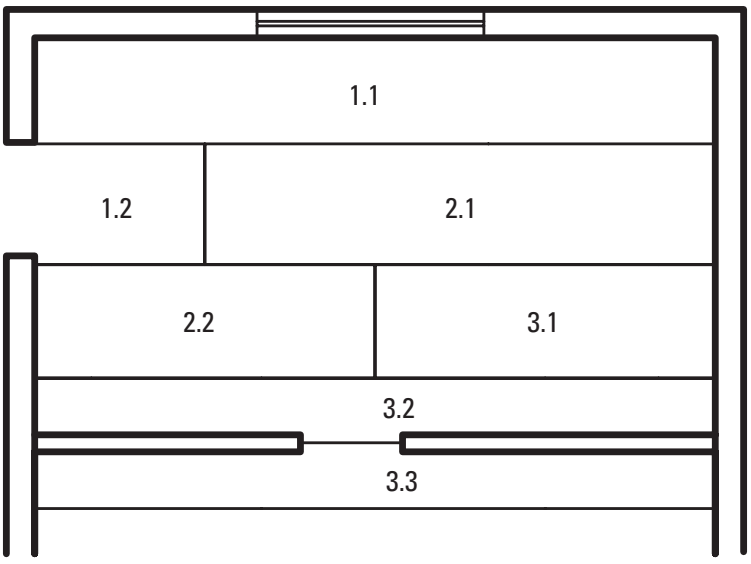


Fig. 27

Pannello Grid floor

La nuova gamma di pannelli Grid Floor per la realizzazione di impianti radianti a pavimento, si caratterizza per la particolare conformazione della griglia in materiale plastico riciclato (polipropilene), che unisce la semplicità di posa delle tubazioni dei sistemi bugnati, con i vantaggi dei sistemi piani in termini di scambio termico.
Infatti i tubi si agganciano saldamente ai pannelli e sono completamente a contatto con il massetto, che riempie le bugne forate, migliorando lo scambio termico del sistema.
Nella versione senza isolamento è sufficiente un massetto sopra la bugna di spessore ridotto grazie all'ancoraggio del massetto allo strato sottostante. Risulta quindi particolarmente indicato per le ristrutturazioni in quanto permette di ottenere spessori totali ridotti.
L'impianto risulta inoltre avere una minor inerzia termica.
Il pannello Grid Floor dovrà essere ben fissato allo strato di supporto. A tal fine si consiglia l'utilizzo di colla, schiuma poliuretanica o fissaggi meccanici (tasselli) nel caso questo non vada a compromettere la continuità di isolamenti inferiori al fine di ottimizzare l'adesione, in modo da evitare distaccamenti del pannello in fase di posa della tubazione e del massetto.
Non sono ammessi sottofondi in argilla espansa o altro materiale aggregato.

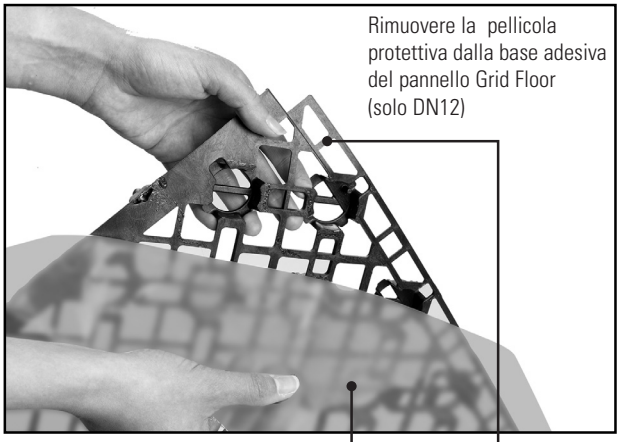
Con fondo adesivo
Il fondo deve essere:
- Portante
- Stabile (no fessure, crepe, ecc.)
- Superfici perfettamente piane
- Pulito da polvere, residui, ecc.
- Trattate con primer per superfici cementizie
- Se necessario utilizzare tasselli (cod. 28130037) avendo cura di non forare impianti preesistenti

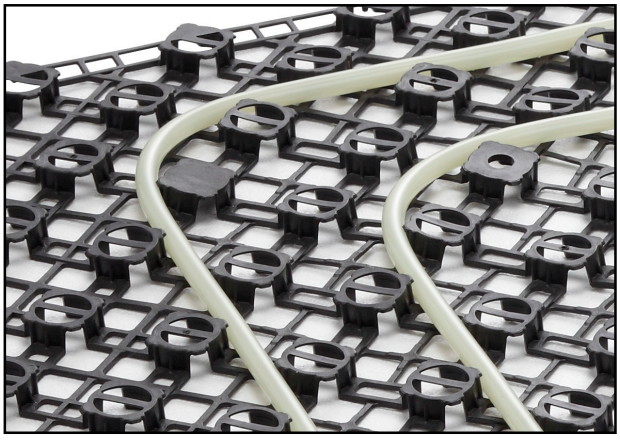
Taglio pannelli: cesoia per lamiera o cutter per cartongesso.

Con isolante
- Va incollato con colla tipo cappotto (Prodotto consigliato: fischer FASTGRIP 800)

Taglio pannelli: smerigliatrice angolare (flex)

Particolare incastri perimetrali





Sistema Klettjet

Prima della posa assicurarsi che il supporto, sul quale il pannello va posato, sia il più possibile piano, liscio e pulito.
Si consiglia di iniziare la posa del rotolo, sia per il pannello EPS-T Klettjet che per il pannello PE Klettjet R, partendo da un angolo del locale in direzione della parete più lunga dello stesso, in modo che il bordo sia accostato alla striscia perimetrale (Fig. 28). Le parti tagliate eccedenti vanno riutilizzate nella fila successiva, rispettando se possibile gli allineamenti della griglia stampata sulla pellicola superficiale, per minimizzare gli scarti di materiale (Fig. 30).

Nel caso di pannelli EPS-T (spessore 25 o 30 mm) giuntare i pannelli utilizzando l'apposito nastro adesivo 50 mm (Fig. 29). Nel caso di pannello PE (spessore 6 mm) prima della posa va tolta la pellicola posta sulla parte posteriore del pannello in modo da scoprire la superficie adesiva. Qualora il supporto sia grezzo si consiglia di verificare che la superficie garantisca il perfetto incollaggio dei pannelli. Valutare eventualmente l'applicazione di primer specifici.

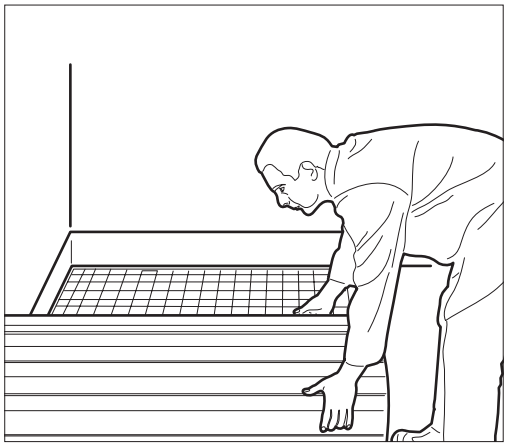


Fig. 28

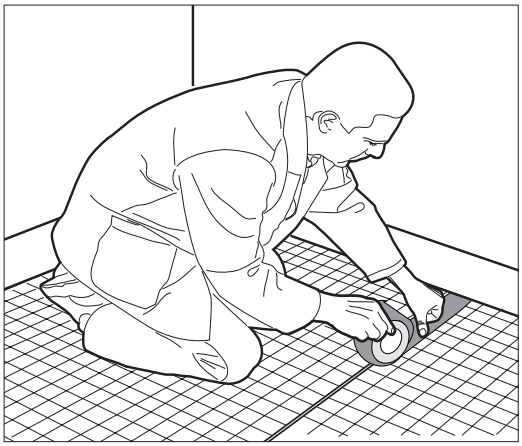


Fig. 29

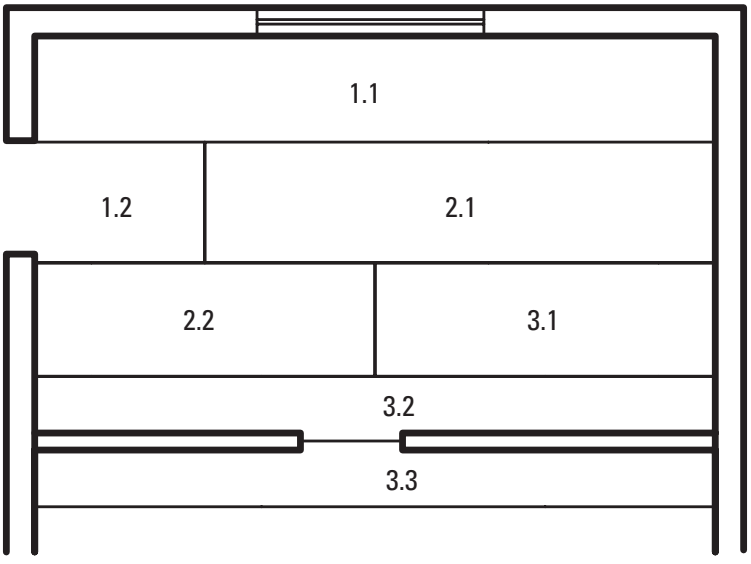


Fig. 27

Pannello Thin Floor

Si consiglia di iniziare la posa dei pannelli partendo da un angolo del locale in direzione della parete più lunga dello stesso (Fig. 31).

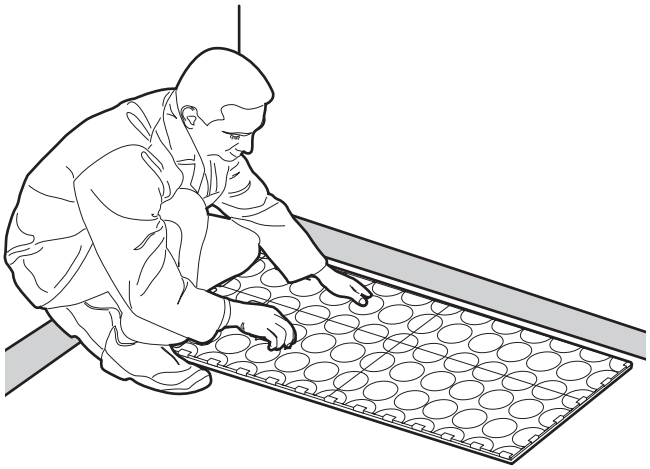
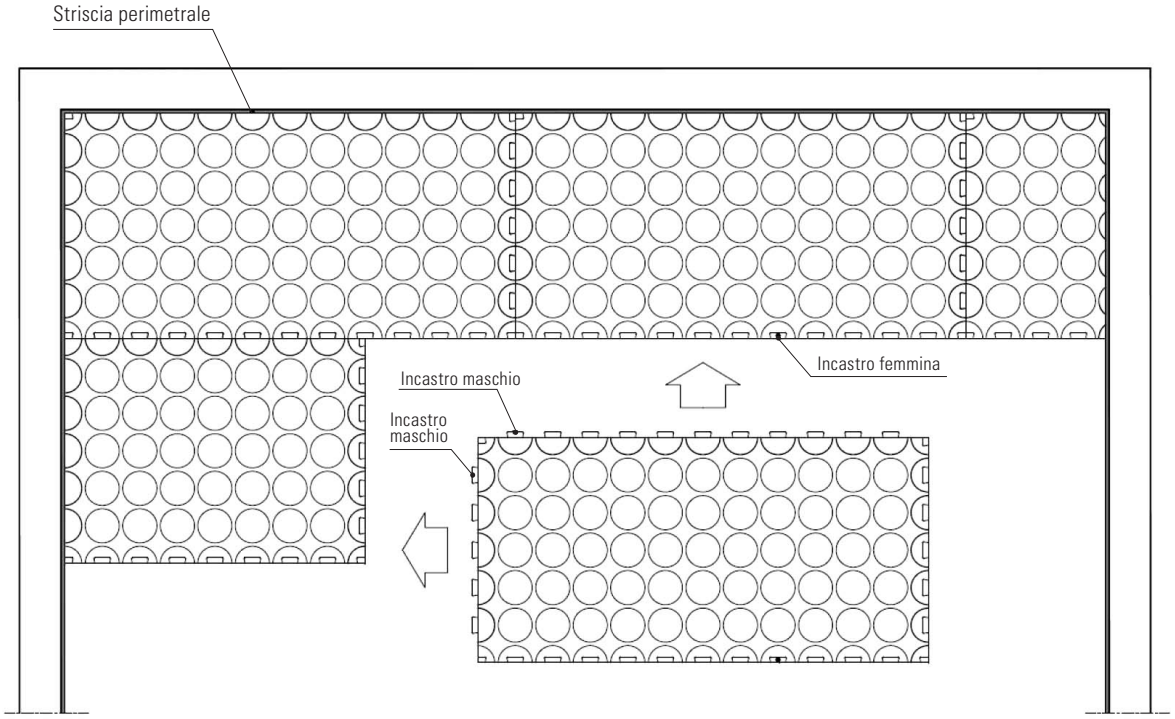


Fig. 31

Dopo aver tolto la pellicola protettiva della base autoadesiva, appoggiare i pannelli con il lato maschio dell'incastro verso il giunto di dilatazione perimetrale (gli incastri maschio sul lato in appoggio al giunto di dilatazione perimetrale devono essere preventivamente rimossi con un taglierino a lama grande).
Fare attenzione che la superficie di posa sia pulita adeguatamente per evitare difficolta di adesione.
Proseguire unendo i pannelli con gli appositi incastri, tagliandoli con un taglierino a lama grande e riutilizzando le parti eccedenti per le file successive, verificando l'allineamento delle bugne tra una fila e l'altra (Fig. 32) e la corretta sovrapposizione degli incastri maschio con i corrispondenti incastri femmina.



Incastro perimetrale

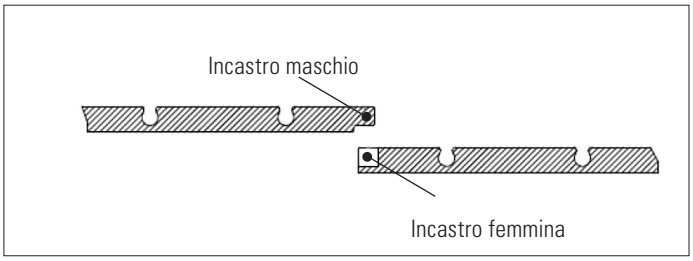


Fig. 32

Pannello Dry Alu Floor

Avvertenze

Per la posa del sistema Emmeti "a secco" attenersi sempre a quanto previsto dalla UNI EN 1264. La superficie di posa deve essere perfettamente piana e pulita. Se necessario realizzare preventivamante una finitura superficiale con del massetto autolivellante. Posizionare i pannelli (iniziando da quelli di testa) secondo il disegno di posa del termotecnico (che dovrà riportare la posizione dei pannelli e dei pannelli di testa, nonché lo sviluppo delle serpentine). Si consiglia di incollare i pannelli, in particolare quelli di testa, alla superficie sottostante con idonei collanti. I pannelli di testa dovranno risultare adiacenti alla parete più corta della stanza in cui vengono posati, in tal modo il circuito richiederà un minor numero di curve dei tubi e quindi minori perdite di carico.

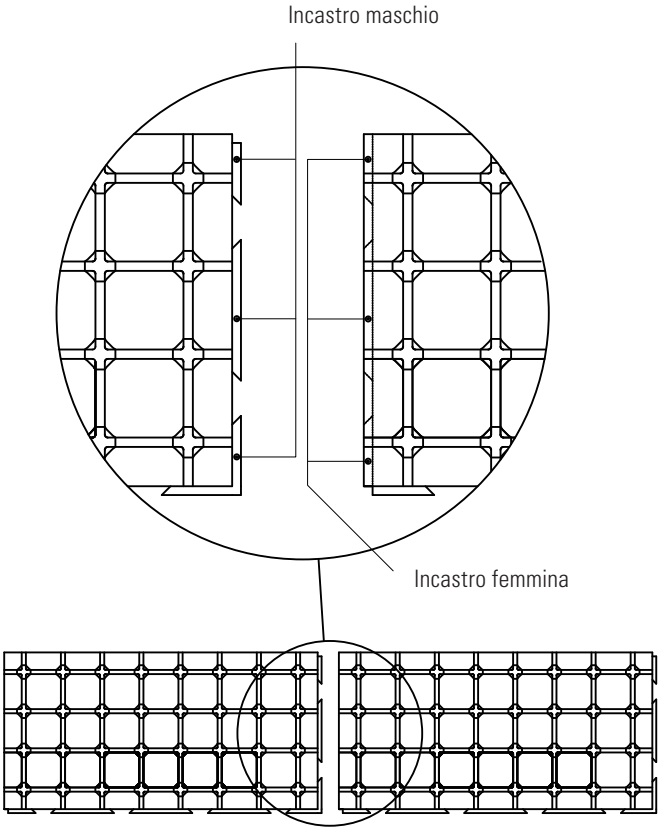
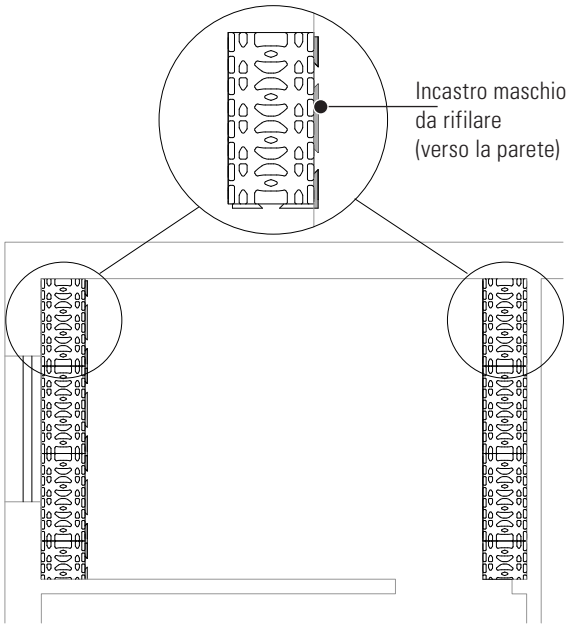
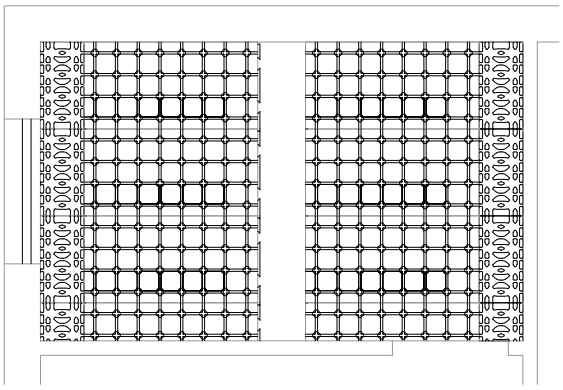


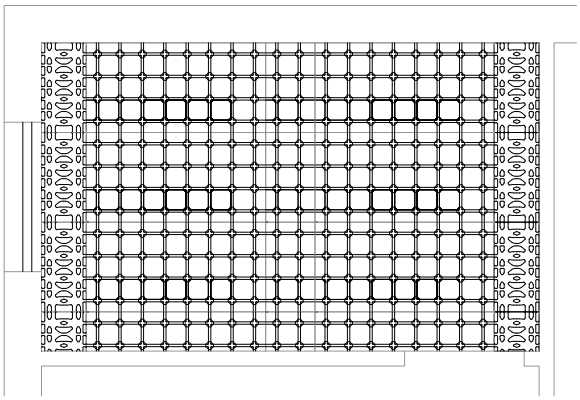
Fig. 33



Fase 1:
Posa dei pannelli di testa



Fase 2 :
Posa dei pannelli laterali incastrati a quelli di testa



Fase 3:
Posa dei pannelli centrali (da tagliare se necessario)

Fig. 34

Qualora si renda necessario, in base allo schema di posa, tagliare i pannelli il taglio degli stessi dovrà essere eseguito con idonea attrezzatura che permetta un taglio lineare e regolare (senza sbavature,…). Si consiglia di tagliare dal lato dell'incastro maschio. Il pannello successivo dovrà essere posato adiacente a quello tagliato vista l'impossibilità di incastro.
Esempio: dallo schema di posa è richiesto che uno dei pannelli sia lungo 750 mm (pannello B). Poiché tagliando il pannello gli incastri maschio non risultano più presenti il pannello tagliato (pannello B) ed il pannello adiacente (pannello C) vanno appoggiati uno all'altro.

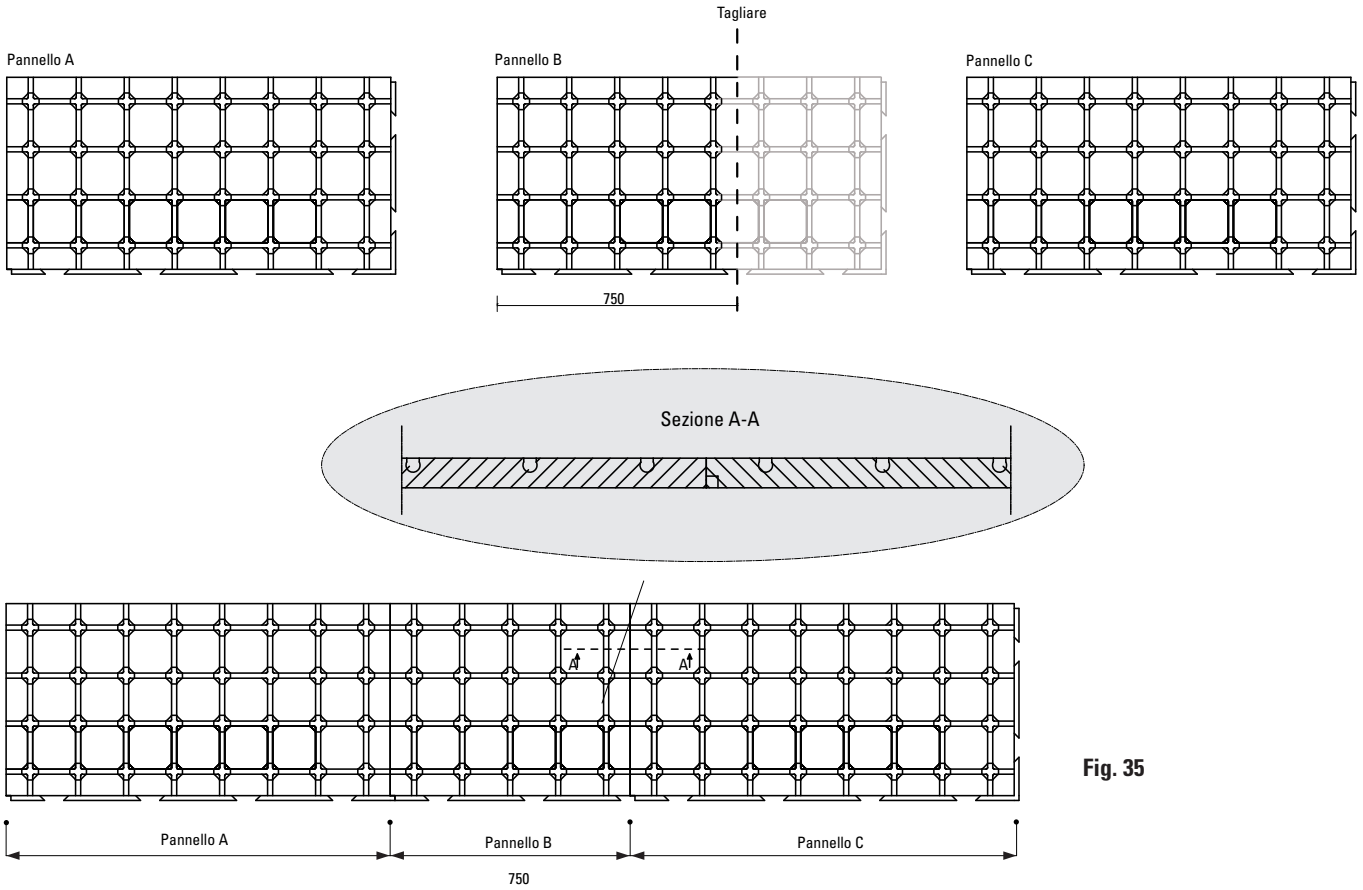


Fig. 35

In corrispondenza dei collettori di distribuzione o di punti particolari (quali porte, spazi perimetrali, ecc.) con uno sviluppo superficiale limitato e difficili da coprire con il pannello, è consigliabile utilizzare al posto dello stesso del materiale riempitivo (tipo massetto cementizio) da portare in quota con i pannelli.

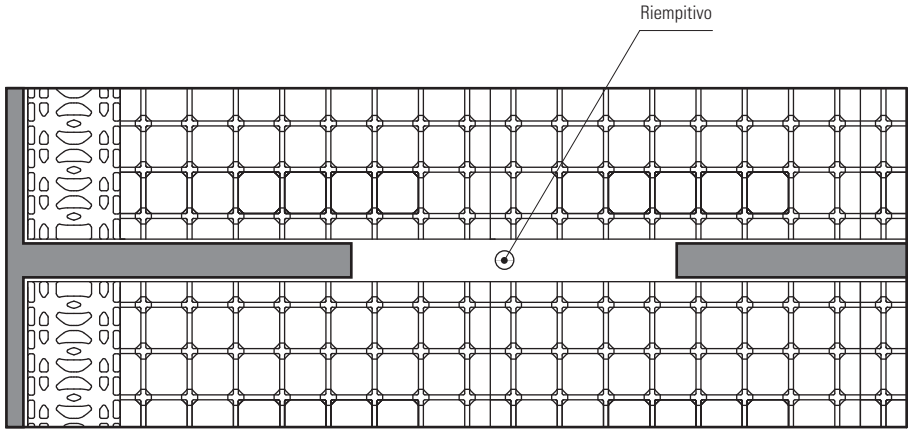


Fig. 36

Operazioni preliminari

Unire i tubi al collettore di mandata (utilizzando per il tubo PE-X le apposite curve di sostegno, Fig. 37), mediante tenute monoblocco Emmeti (raccordi a stringere) e isolare i tratti iniziali dei circuiti (dal collettore fino a circa 25 cm all'interno del massetto), con morbide guaine isolanti.

Tra i sistemi di posa il più utilizzato è quello "a chiocciola", che rispetto al sistema "a serpentina", permette di alternare i tubi più caldi con quelli più "freddi", ottenendo una temperatura superficiale più omogenea, ed inoltre di effettuare una posa con curve a 90° che limitano lo stress alle tubazioni e le perdite di carico alla circolazione dell'acqua.
Il progetto dei circuiti di un riscaldamento a pavimento può prevedere distanze (o "passi") fra i tubi diverse all'interno dello stesso locale.
Questo determina una suddivisione delle zone in "soggiornali" e "marginali" (o perimetrali).
La zona marginale (Fig. 38), è la fascia, di larghezza max 1 m, lungo le pareti esterne. In tale zona, il passo fra i tubi può essere inferiore rispetto alla zona soggiornale, più interna.
Se il circuito si sviluppa entro un'area che comprende la zona soggiornale e marginale, il circuito è definito "misto" (Fig. 39 e 40).
Si utilizza invece la tipologia "separata" per sviluppare circuiti che servano esclusivamente solo aree marginali o aree soggiornali (Fig. 41).

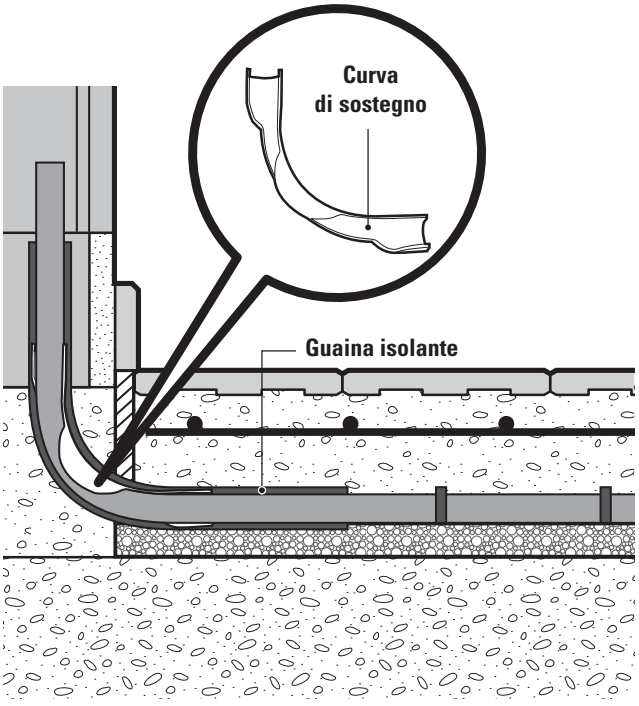


Fig. 37

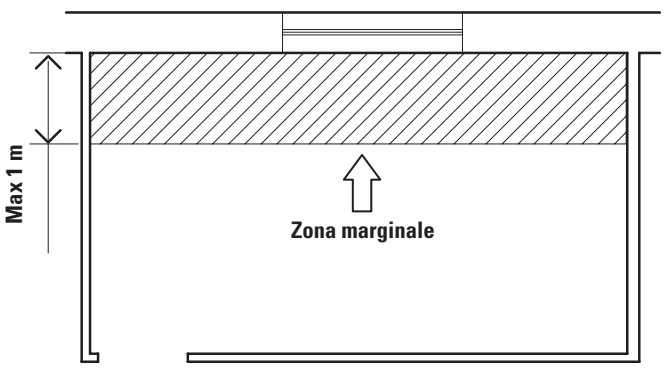


Fig. 38

Verifica che il diametro dei tubi che si intendono installare sia compatibile con il pannello prescelto:	
Pannello	**Diametro tubi installabili (mm)**
Standard, Standard Combi	16 - 17
Classic, Plan, Roll	16 - 17 - 20
Step Combi	16 - 17
Dry Alu	17
Thin Floor	12

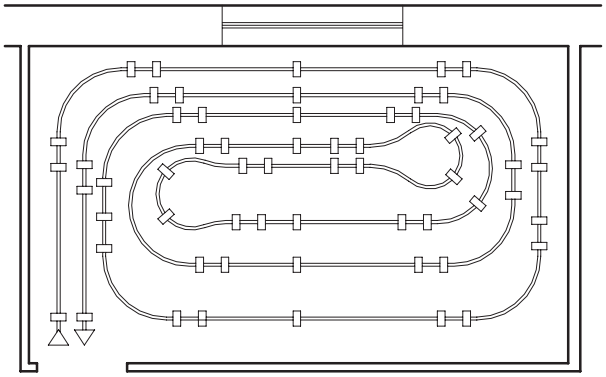


Fig. 39

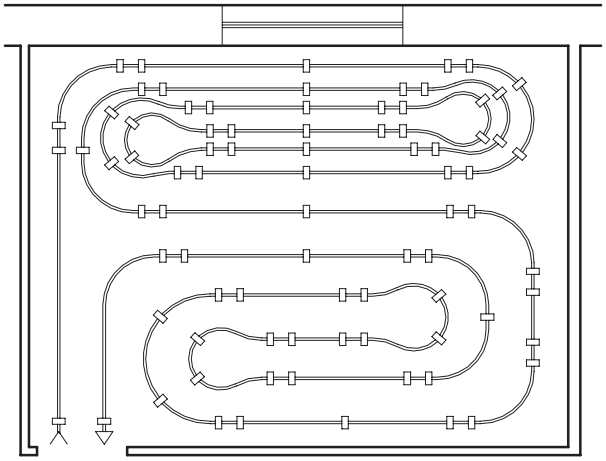


Fig. 40

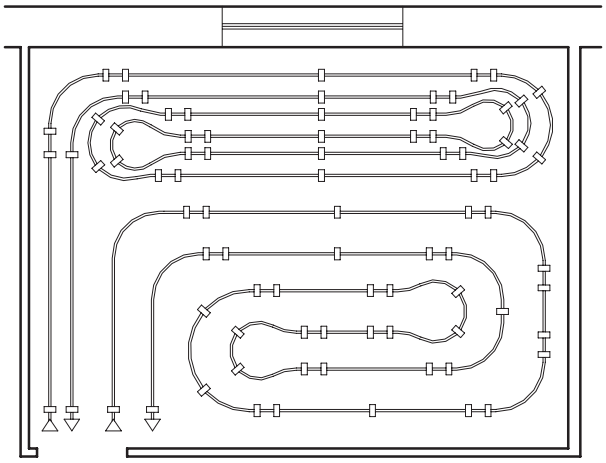


Fig. 41

Curve

Il raggio minimo di curvatura per i tubi del sistema Emmeti è di 5 volte il diametro esterno del tubo (solo nel caso di tubo 12x2 PE-Xc, abbinato al pannello Thin Floor, questo valore è inferiore).
Rispettare con attenzione questo limite, per evitare spiacevoli fenomeni di "frappatura" dei tubi.

Distanza dalle strutture verticali

I tubi devono rispettare una distanza minima di 50 mm dalle strutture verticali.
Prima di effettuare la posa del tubo, si consiglia di segnare sui pannelli le aree interessate da ogni circuito, per facilitare l'operazione di installazione senza possibilità di errori.
In base al progetto esecutivo dell'impianto, verificare che il rotolo sia di lunghezza idonea alla realizzazione dei vari circuiti, in modo da limitare il più possibile gli sfridi.
Si rammenta che è indispensabile tagliare le estremità dei rotoli nuovi per una lunghezza di circa 10 cm in quanto risultano danneggiate dalle operazioni di collaudo.

Svolgirotolo

L'utilizzo del pratico svolgirotolo Emmeti (per rotoli fino a 600 mt), permette di posare il tubo in modo semplice e veloce (Fig. 42).

Sistema Plan Floor

Iniziare la posa in opera del tubo svolgendo il rotolo nel senso inverso a quello di arrotolamento e quindi fissarlo sui pannelli con l'apposito utensile fissa clips Tacker (Fig. 43).
Si consiglia di posizionare le clips ad una distanza di circa 30-40 cm, facendo attenzione a non porle mai in corrispondenza del centro di curvatura del tubo. La figura 44 mostra il posizionamento corretto delle clips lungo le curve a 90° e 180°.

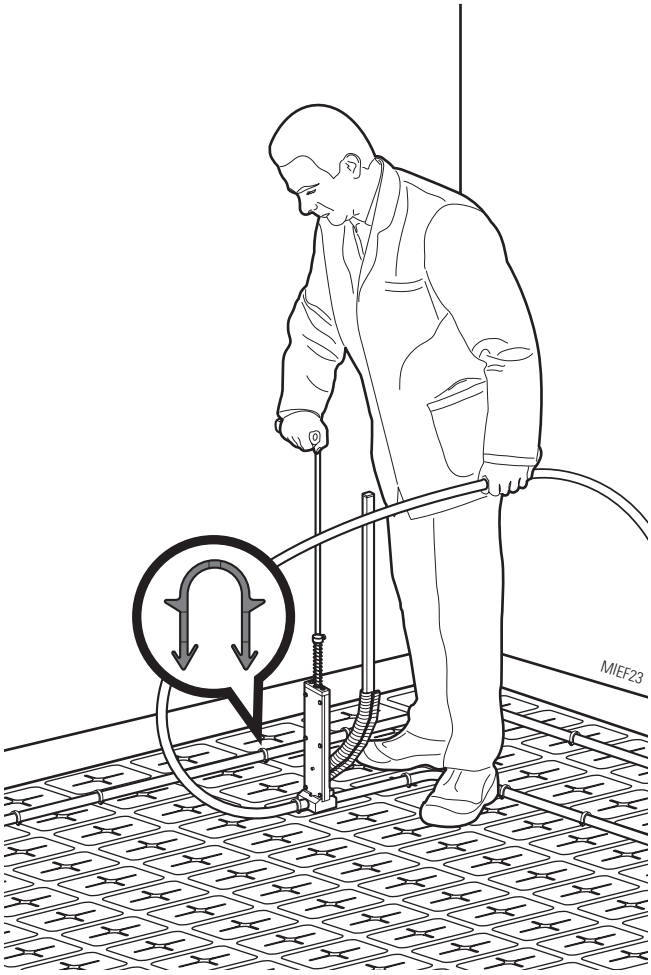


Fig. 43

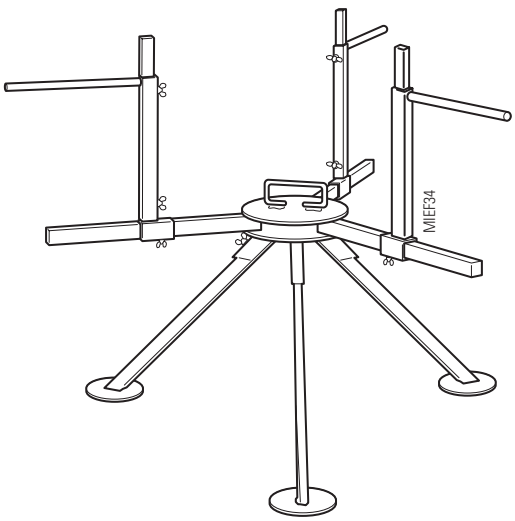


Fig. 42

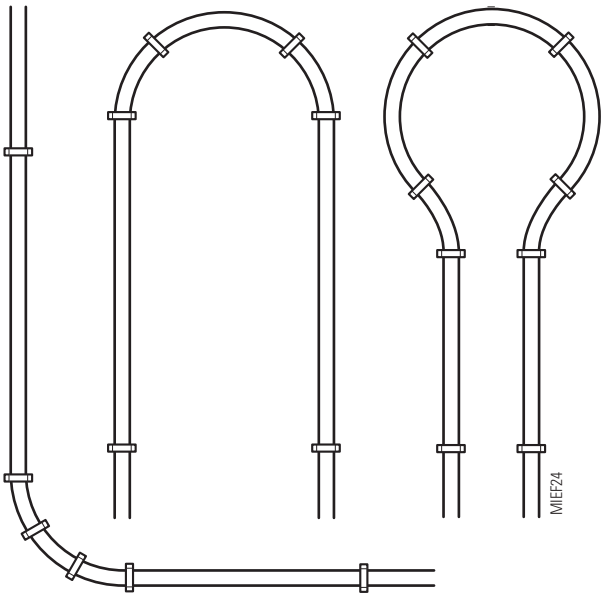


Fig. 44

Sistema Standard Floor, Standard Combi Floor, Classic Floor, Classic Floor, Step Combi Floor e Grid Floor

Per i pannelli Standard Floor e Standard Combi Floor (*), Classic Floor, Steep Combi Floor e Grid Floor (**) la corretta operazione di posa della tubazione non richiede l'utilizzo di attrezzature; questo è reso possibile grazie alla particolare conformazione superficiale dei pannelli caratterizzati da bugne in rilievo che permettono di inserire i tubi negli incastri con la semplice pressione del piede (Fig. 45) e assicurano il bloccaggio delle tubazioni mantenendole al di sotto del piano di calpestio prevenendo quindi accidentali graffiature.
In caso di necessità si consiglia di utilizzare le specifiche clips a cavaliere o manuali (Fig. 46) per ancorare il tubo al pannello.

(*) Su Standard Floor e Standard Combi Floor ribassato H = 10 mm, si consiglia di utilizzare tubo multistrato Alpert e clip a cavaliere.
(**) Su Grid Floor si consiglia di utilizzare il tassello di fissaggio per migliorare l'ancoraggio di tubo e pannello.

Fig. 45

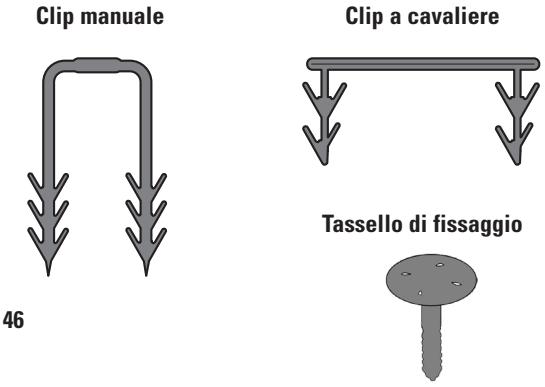


Fig. 46

Pannello Standard Floor, Standard Combi Floor, Grid Floor, Step Floor e Step Combi Floor passo 50 mm

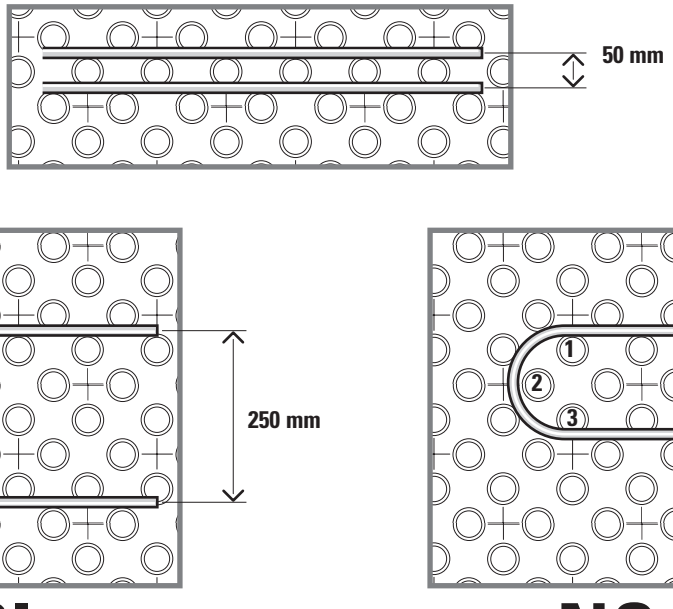
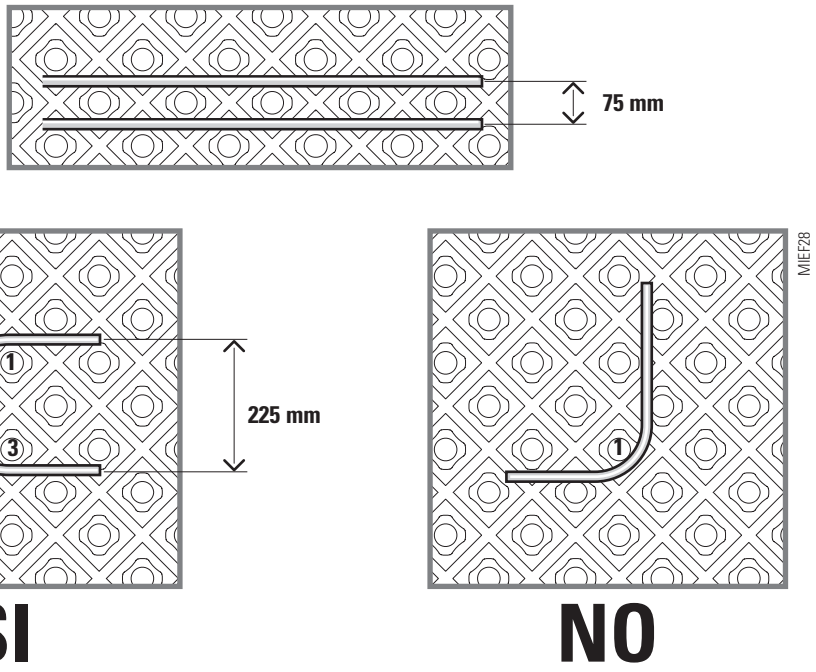


Fig. 47

Pannello Classic Floor - passo 75 mm

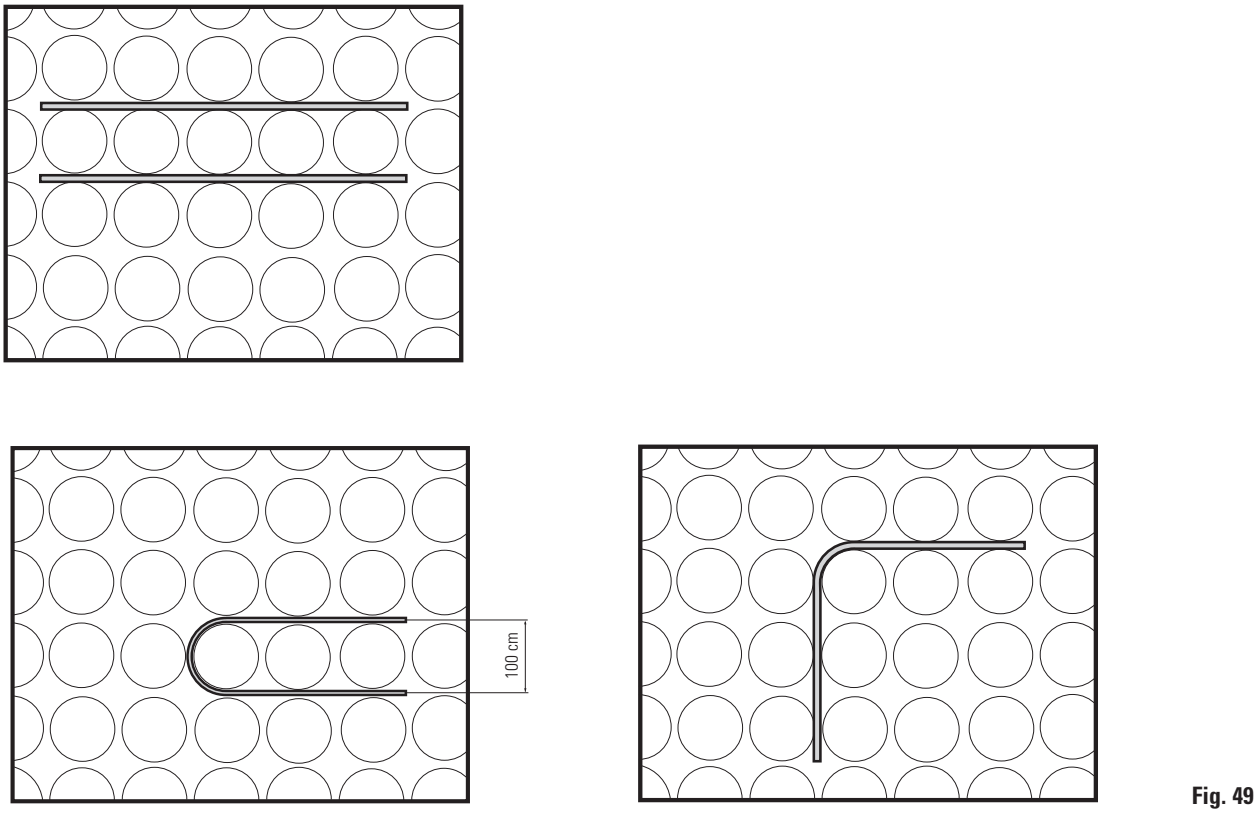


Curva a 180° su 3 bugne

Curva a 90° su 1 bugna

Fig. 48

Pannello Thin Floor - passo 100 mm



SI - Curva a 180° su 1 bugna

SI - Curva a 90° su 1 bugna

Fig. 49

Pannello Dry Alu Floor

Per la realizzazione dei circuiti utilizzare tubo 17x2 (si consiglia PE-Xa).
Con questo tipo di pannello il sistema di posa può essere solo “a serpentina” (Fig. 50).

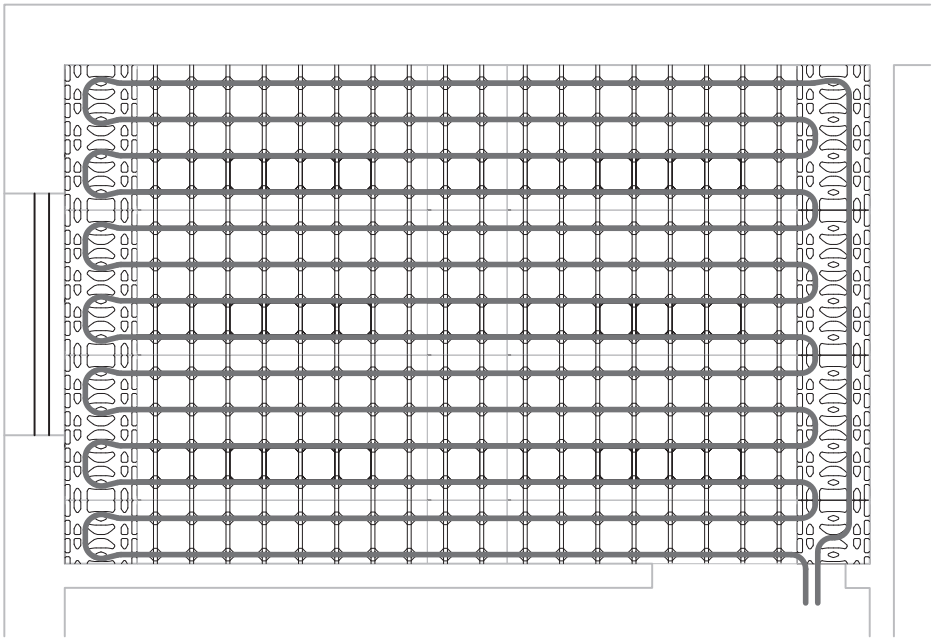
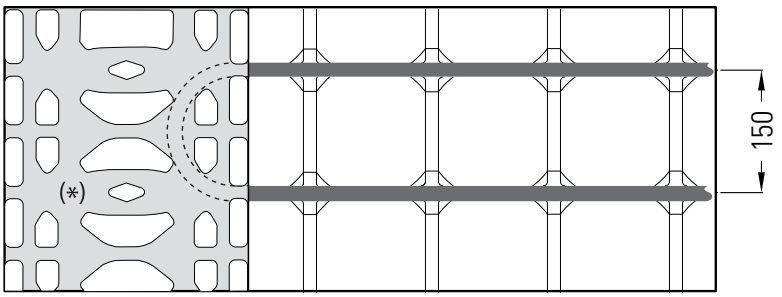
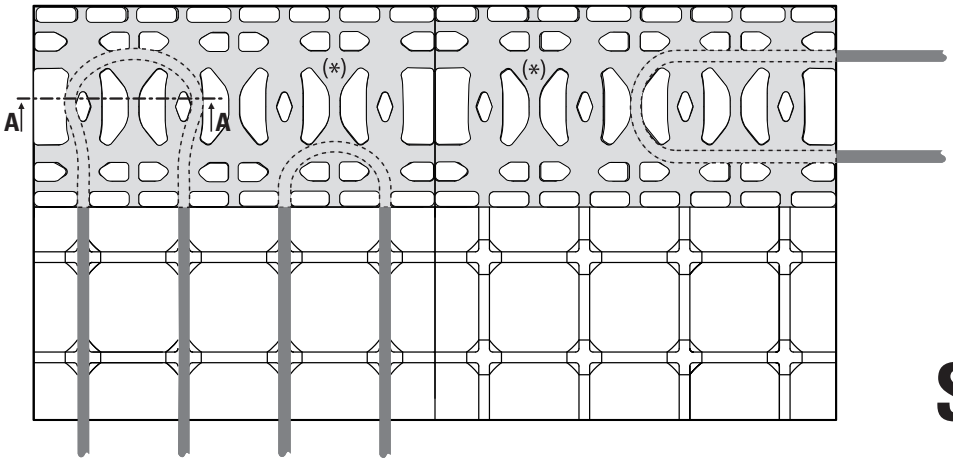


Fig. 50



Si raccomanda di annegare i tubi in corrispondenza dei pannelli di testa (*) con boiacca o massetto autolivellante, avendo curva di riempire ogni spazio vuoto tra le bugne rasando e livellando a filo della parte superiore del pannello.



SI

Sezione A-A

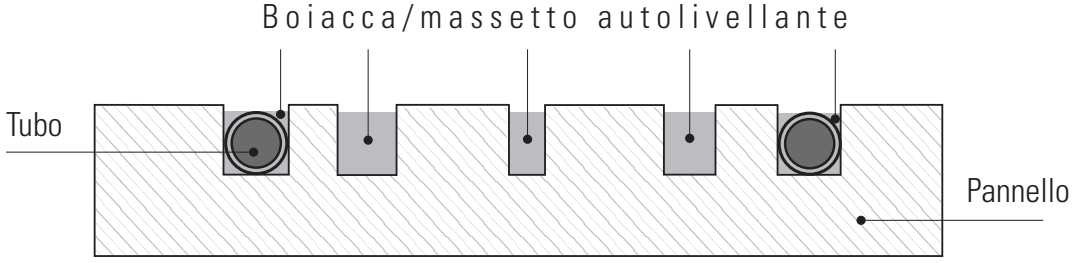
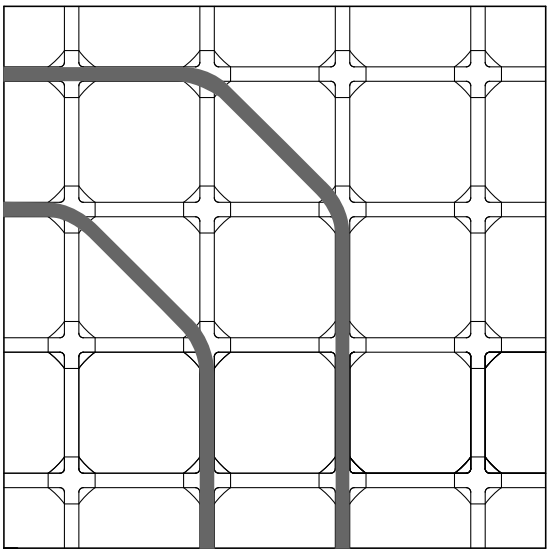


Fig.51



Il pannello Dry è predisposto per la posa dei tubi a 45°, previo ritaglio della lamina in alluminio.

Operazioni conclusive

Terminata la posa del circuito, collegare i tubi con il collettore di ritorno, utilizzando lo stesso sistema descritto per la mandata. Infine si consiglia di prendere nota della lunghezza dei singoli circuiti e dei locali di appartenenza (i tubi sono marchiati numericamente ogni metro) segnandola sul collettore, per semplificare le verifiche fra le lunghezze di progetto e quelle esecutive. Questo dato è molto utile per poter effettuare successivamente il corretto bilanciamento idraulico dell'impianto.
Terminata la posa dell'impianto, in caso di modifiche rispetto al progetto esecutivo, si dovrà indicare su una pianta dell'immobile il rilievo della distribuzione dei circuiti a partire dal collettore. Tale documentazione andrà consegnata in copia al proprietario dell'immobile.

Attenzione
L'impianto a pavimento è invisibile e il tempo confonde i ricordi.

Fig. 52

Sistema Klettjet

Per la posa del tubo Pex Penta Klett si consiglia di utilizzare gli appositi guanti.
Fissare il sostegno per il tubo (Fig. 53) fra le spallette di una porta d'accesso secondo le seguenti indicazioni.

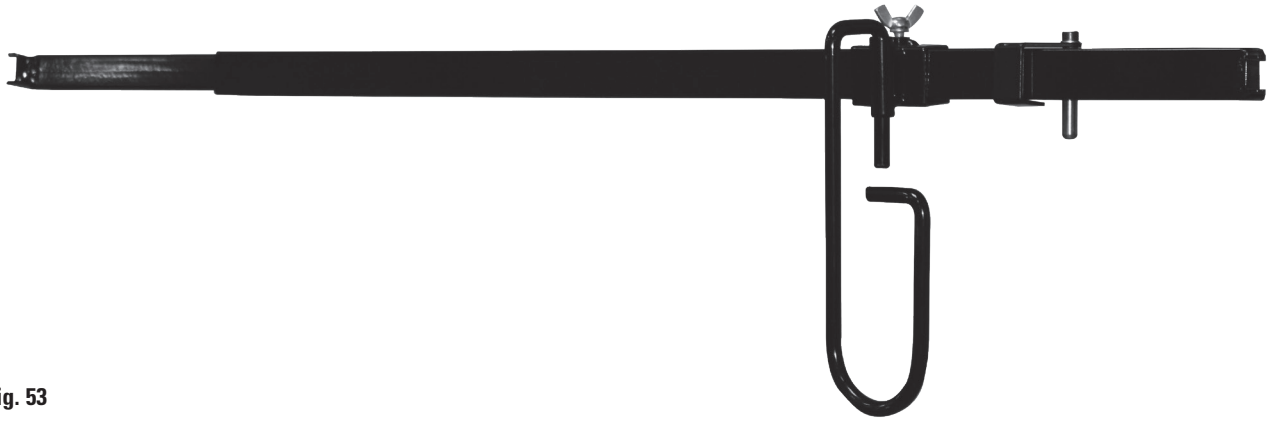
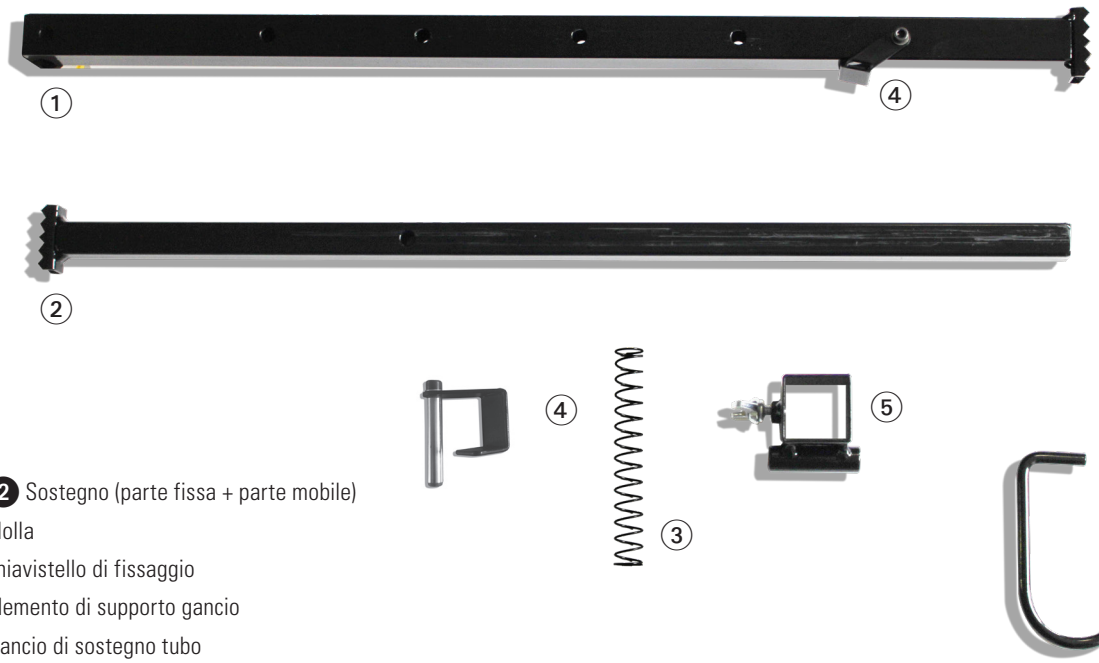


Fig. 53



1 + 2 Sostegno (parte fissa + parte mobile)
3 - Molla
4 - Chiavistello di fissaggio
5 - Elemento di supporto gancio
6 - Gancio di sostegno tubo

- Sfilare il chiavistello di fissaggio (4)
- Sfilare la parte mobile del sostegno (2) e la molla (3) dalla parte fissa (1)
- Inserire il chiavistello in uno dei fori presenti sulla parte fissa del sostegno in funzione della larghezza della porta (per una porta larga 90 cm posizionarlo sul secondo foro come da figura 53-1)
- Reinserire prima la molla poi la parte mobile del sostegno
- Posizionare l'elemento di supporto gancio (5) in corrispondenza di uno dei rimanenti fori e bloccarlo serrando il dado a farfalla
- Comprimere la parte mobile del sostegno su quella fissa e rilasciarla dopo averlo posizionato in corrispondenza della porta ad una altezza di 140 cm dal pavimento. Inserire il gancio (6) nel relativo supporto.
- Far passare il tubo all'interno del gancio e posarlo sopra i pannelli installati secondo lo schema di progetto seguendo la griglia disegnata sui pannelli (vedi figura 54) con la semplice pressione del piede (figura 55). Il tubo risulterà fissato al pannello per la presenza del velcro su entrambi.
  In caso di modifiche della posa il tubo potrà venire facilmente rimosso e poi riattaccato.

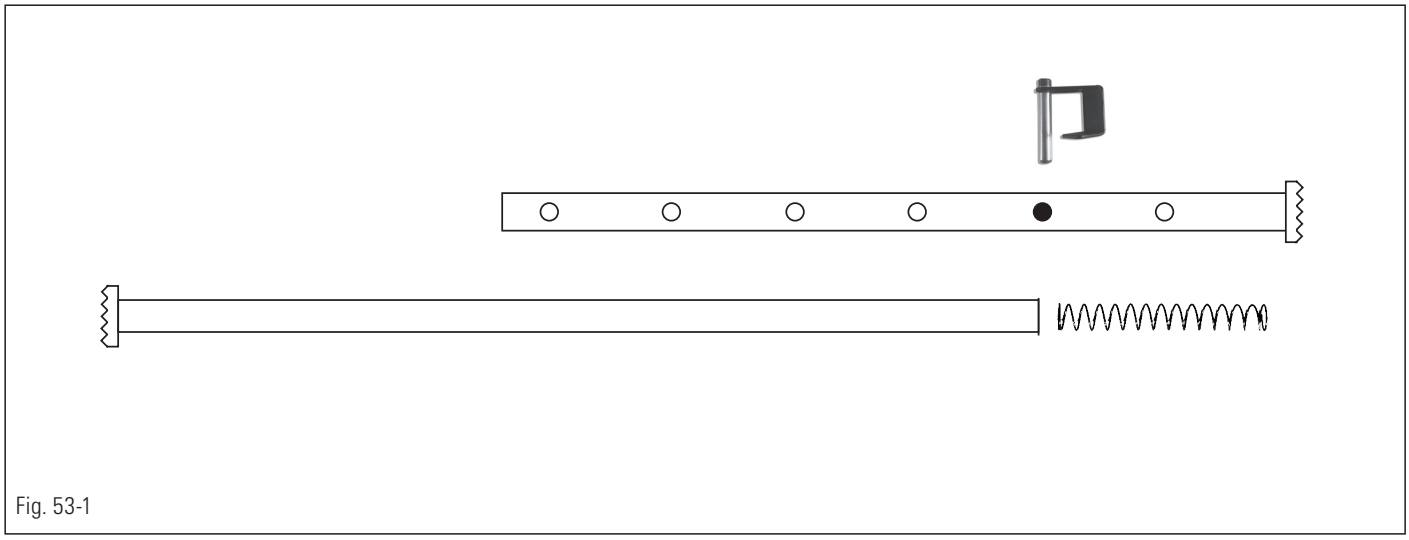
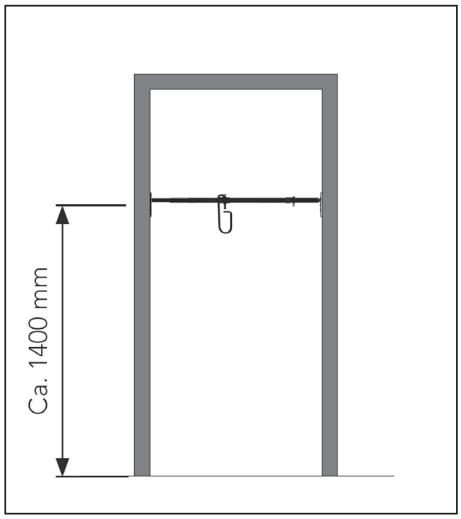


Fig. 53-1

Foro di inserimento chiavistello per porte di larghezza 90 cm



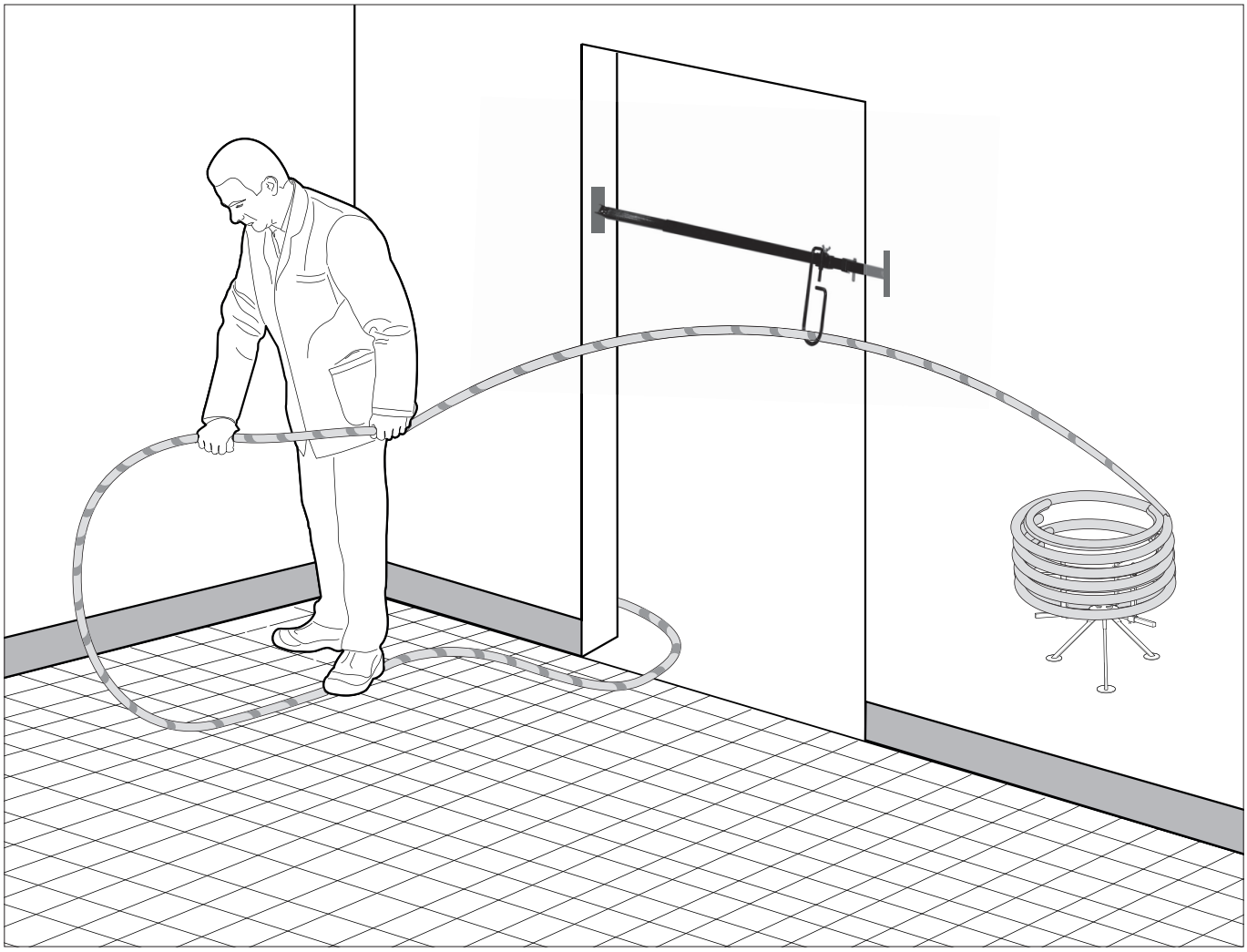


Fig. 54

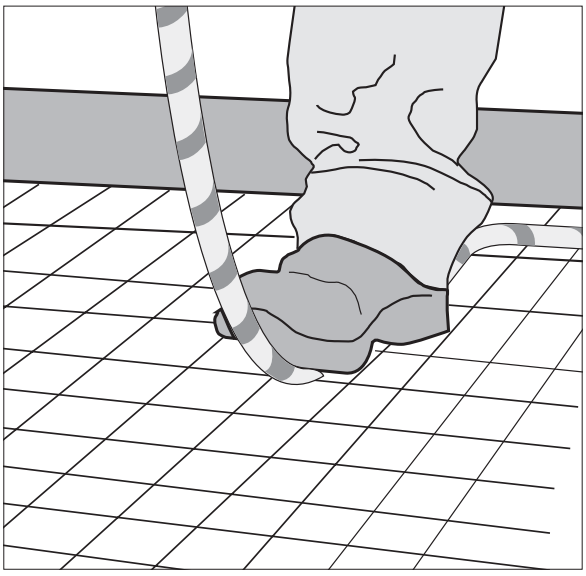


Fig. 55

8. COLLAUDO E PROTEZIONE DELL' IMPIANTO

Una volta ultimata la posa dei circuiti si dovrà provvedere al caricamento dell'impianto utilizzando acqua potabile con durezza totale minore di 15 °F e procedendo gradualmente, con un circuito per volta, per consentire una rapida espulsione dell'aria.
Di seguito collaudare l'impianto con acqua ad una pressione di almeno 6 bar.
Qualora vi sia pericolo di congelamento utilizzare dei prodotti antigelo; questi ultimi, una volta cessata la necessità, dovranno essere rimossi tramite svuotamento e risciacquo dell'impianto.
In ogni caso si dovrà mantenere la pressione di esercizio anche durante il getto del massetto radiante.

Il trattamento dell'acqua negli impianti termici (norma UNI 8065) prevede un condizionamento chimico per prevenire formazioni microbiologiche quali alghe, funghi, muffe, batteri che si sviluppano nei circuiti in presenza o meno di ossigeno.
Tali inconvenienti sono favoriti dai periodi di assenza di circolazione (fermo impianto) e dalle basse temperature di funzionamento dell'impianto a pavimento.
Si consiglia pertanto il trattamento dell'acqua mediante l'apposito liquido filmante antialga e anticalcare Emmeti.
Per eliminare l'aria in modo efficace e continuativo, si consiglia di installare un disaeratore (separatore di microbolle d'aria) e di chiudere tutti i punti di possibile assorbimento di aria nell'impianto, compresi i tappi delle valvole di sfogo aria automatiche.

I collaudo dell'impianto può essere eseguito con acqua potabile, pulita e filtrata o aria compressa priva di olio o gas inerte.
Collaudo con acqua:
La **prova idraulica** per gli **impianti di riscaldamento** si esegue secondo quanto previsto dalla UNI EN 14366 ed UNI EN 1264-4, con una pressione di prova maggiore o uguale ad (1,3 x Pressione di Esercizio), ma comunque compresa tra 4 e 6 bar, da mantenere per almeno 120 minuti. Per i dettagli, riferirsi a quanto indicato nelle norme.
Collaudo con aria:
Il collaudo viene effettuato in due fasi, prova di tenuta e prova di carico, utilizzando manometri con risoluzione 1 mbar ed un adeguato metodo di rilevazione (ad esempio acqua saponata). La prova di carico segue la prova di tenuta, se quest'ultima ha esito positivo.
La **prova di tenuta** si esegue riempiendo l'impianto con aria compressa ad una pressione compresa tra 110 e 150 mbar, da mantenere per almeno 30 minuti, per volumi fino a 100 litri. Per volumi superiori, la durata della prova va incrementata di 10 minuti per ogni 100 litri aggiuntivi.
La **prova di carico** si esegue riempiendo l'impianto con aria compressa ad una pressione di 3 bar (fino alla misura 50x4) o 1 bar (per le misure ≥ 63x4.5), da mantenere per almeno 30 minuti per volumi fino a 100 litri. Per volumi superiori, la durata della prova va incrementata di 10 minuti per ogni 100 litri aggiuntivi.
Al termine del collaudo, l'installatore deve compilare e rilasciare al committente/cliente l'apposito report, scaricabile tramite il seguente link:

9. REALIZZAZIONE DEL MASSETTO DI COPERTURA

Il massetto di copertura è un elemento strutturale di fondamentale importanza che deve essere realizzato entro breve tempo dalla posa delle tubazioni (per evitare un'eccessiva esposizione alla luce dei tubi) ed in un unico getto monolitico, con estrema cura da personale specializzato e secondo le indicazioni del progettista edile.
Deve presentare buone caratteristiche di resistenza meccanica, di conducibilità termica ($\lambda \geq 1{,}2$ W/mK, secondo UNI 10351 e UNI EN 1264) ed un'adeguata fluidità, che si può migliorare con l'utilizzo dello specifico additivo fluidificante Emmeti (*).
Un massetto radiante di tipo cementizio viene di regola ottenuto miscelando in modo opportuno i seguenti componenti:
- cemento di qualità certificata e a basso ritiro igrometrico.
- aggregati puliti; composizione: 50% sabbia (0-4 mm) e 50% ghiaietto (4-8 mm).
- acqua potabile pulita.
- additivi privi di cloruri ed esenti da effetti negativi sul massetto e sui componenti dell'impianto.

(*) Dosaggio: 1 litro x 100 Kg di cemento

L'utilizzo di un massetto radiante contenente leganti od inerti speciali dovrà essere approvato dal progettista edile e la composizione di tale supporto dovrà essere garantita e certificata dal produttore.
La classe di resistenza meccanica del massetto riscaldante dovrà essere adeguata all'entità dei carichi previsti da progetto per la struttura (pavimento) ed a quanto richiesto dalla normativa edilizia.

Attenzione!
Sono vietati tutti i prodotti che possono provocare un peggioramento della conduttività del massetto (es. additivi aeranti).
L'impiego di altri additivi insieme al fluidificante Emmeti va concordato con il nostro ufficio tecnico.
Evitare massetti premiscelati o leganti sensibili all'umidità nel caso di impianti predisposti al raffrescamento estivo.
Le reti elettrosaldate devono essere disposte preferibilmente verso la superficie inferiore del massetto (a circa 15 - 20 mm dal tubo) e in ogni caso non a contatto con le tubazioni (vedi Fig. 56).
Si consigliano reti di ferro zincato, per massetti (tipo antiritiro), Ø 1,75 - 2 mm.

Attenzione!
In caso di posa di massetti anidritici (autolivellanti), l'utilizzo di reti elettro-saldate dovrà essere verificato dalla direzione lavori, con il produttore degli stessi.

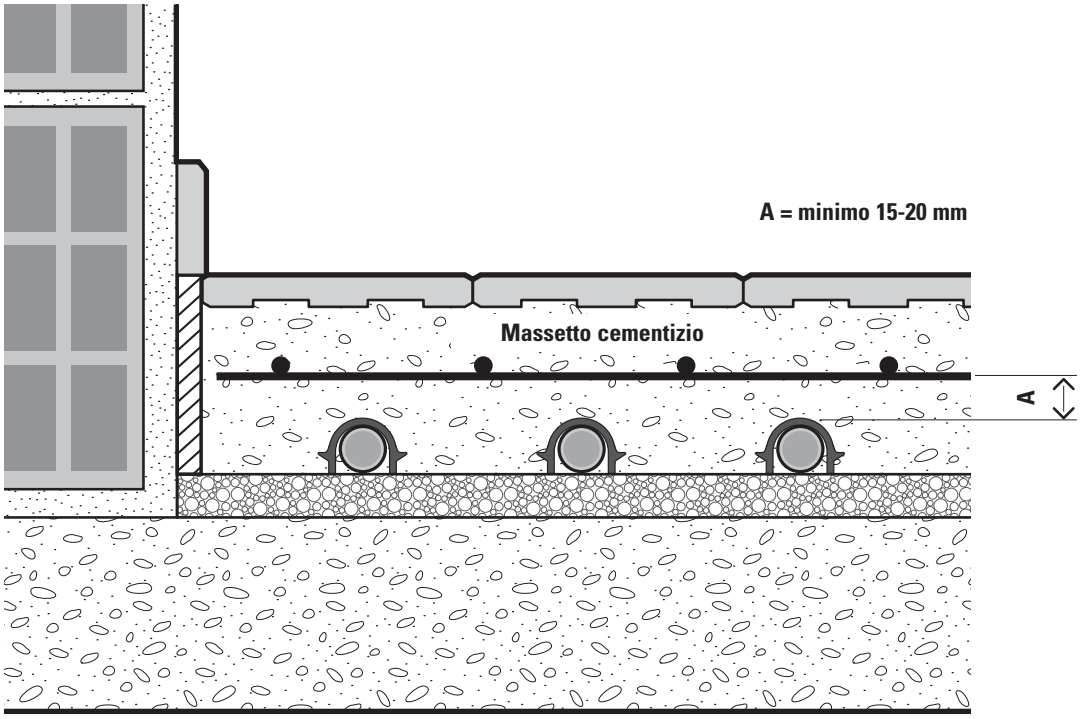


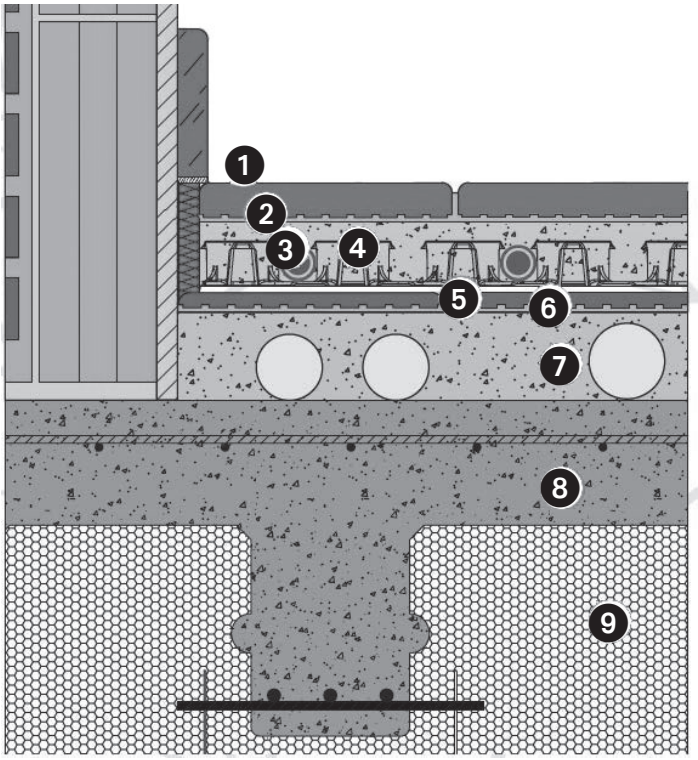
Fig. 56

I pannelli isolanti e le tubazioni dovranno essere preservati prima e durante l'esecuzione del massetto da eventuali danneggiamenti; predisporre eventualmente assi o attrezzature atte ad evitare che il passaggio di carriole e di operatori possano deteriorarli.
Evitare assolutamente sollecitazioni eccessive che gravino sui pannelli affinchè il loro effetto isolante non venga compromesso.
La realizzazione di un massetto radiante su strato isolante richiede particolari precauzioni anche durante la fase di presa e stagionatura; in particolare, una volta posato, lo stesso dovrà essere protetto dall'essiccazione, dall'insolazione diretta, dall'effetto negativo di calore e correnti d'aria per evitare la formazione di fessurazioni o ritiri anomali (effetto "vela").
Durante la posa del massetto, la temperatura dello stesso e la temperatura ambiente non devono scendere al di sotto di 5°C.
Successivamente, occorre mantenere una temperatura di almeno 5°C per un periodo non minore di 3 giorni.
I serramenti dovranno perciò essere già montati e chiusi, altrimenti si dovrà provvedere a tamponare le aperture con fogli di polietilene.
Si consiglia comunque, una volta effettuato il getto di calcestruzzo, di proteggerlo bagnando la superficie con dei panni umidi o con dell'acqua nebulizzata, oppure ricoprendolo con dei teli di polietilene in modo tale da ridurne il ritiro plastico.

Massetti fluidi di ultima generazione
In caso di posa di massetti fluidi di ultima generazione, particolarmente indicati per la realizzazione di impianti a basso spessore (ad esempio in abbinamento a pannelli ribassati come il THIN FLOOR), spessore effettivo e modalità di posa dovranno essere definiti con il produttore di tali massetti, in funzione delle condizioni di installazione (dimensioni e tipologia superficie di posa, tipologia solaio, ecc.) e del tipo di massetto scelto.
La scelta del tipo di finitura superficiale dovrà tener conto del tipo e spessore di massetto impiegato.

Pannello in ancoraggio

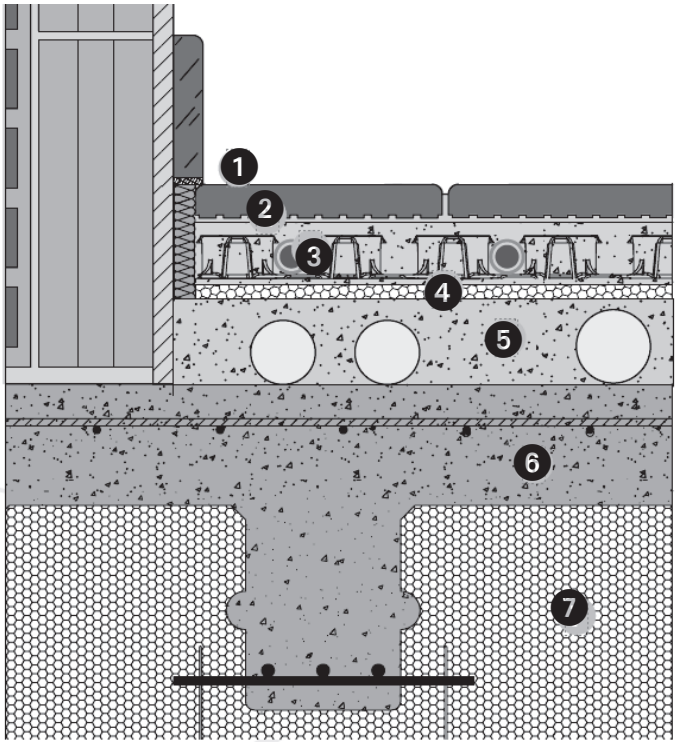
Utilizzando un massetto fluido di ultima generazione ed utilizzando un sistema a pompa per la posa è necessario ottenere uno spessore di almeno 8 mm sopra la bugna. Per garantire in tutti i punti dell'impianto lo spessore minimo di massetto è fondamentale che il sistema pannello/tubo sia ben ancorato al sottofondo, a tal fine si consiglia di assicurarsi che il fondo sia perfettamente piano pulito e privo di crepe. E' inoltre consigliato l'utilizzo di un primer e ove necessario utilizzare fissaggi meccanici (tasselli) per garantire una perfetta adesione.



1. Finitura in ceramica
2. Massetto cementizio
3. Tubazioni
4. Pannello
5. Finitura esistente
6. Primer
7. Massetto allegerito per la copertura degli impianti
8. Soletta in calcestruzzo
9. Solaio termoisolante

Pannello flottante

Per i pannelli con isolante lo spessore di massetto consigliato sale a 13 mm. E' fondamentale che il sistema pannello/tubo sia ben ancorato al sottofondo per garantire in tutti i punti dell'impianto lo spessore minimo di massetto sopra la bugna. A tal fine si consiglia l'utilizzo di con colla tipo cappotto.



1. Finitura in ceramica
2. Massetto cementizio
3. Tubazioni
4. Pannello
5. Massetto allegerito per la copertura degli impianti
6. Soletta in calcestruzzo
7. Solaio termoisolante

Modalità

Lo strato di ripartizione del carico e di distribuzione del calore, viene realizzato per questo sistema attraverso una doppia copertura di lastre in acciaio zincato.

Una volta completata l'installazione dei circuiti, prima di procedere con la posa del doppio strato di lastre è necessario prevedere la stesura di uno strato di separazione costituito dal foglio di copertura in polietilene. Al di sopra di questo va posato il primo strato di lastre zincate. In questo primo strato vanno utilizzate le lastre senza lato adesivo. Per la posa del secondo strato vanno invece utilizzate le lastre con lato adesivo rivolto verso quelle del primo strato (verso il basso). In tal modo i due strati risulteranno attaccati tra di loro. I due strati di lastre dovranno risultare sfalsati l'uno rispetto all'altro (in pratica le fughe del primo strato non devono mai coincidere con le fughe del secondo).

E' importante evitare sovrapposizioni tra le lastre di uno stesso strato.

E' necessario inoltre lasciare uno spazio di 1 o 2 mm tra una lastra e l'altra.

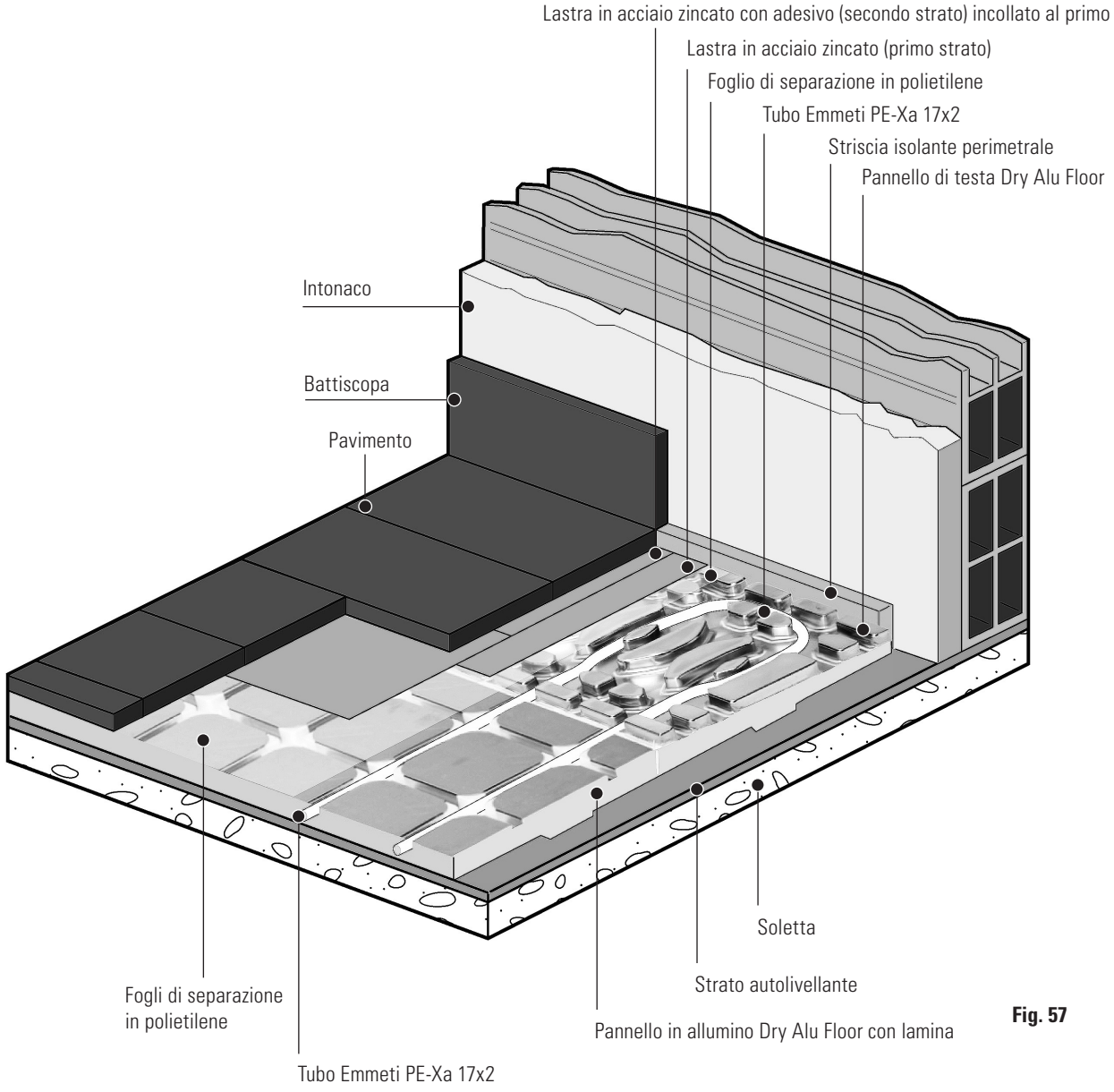
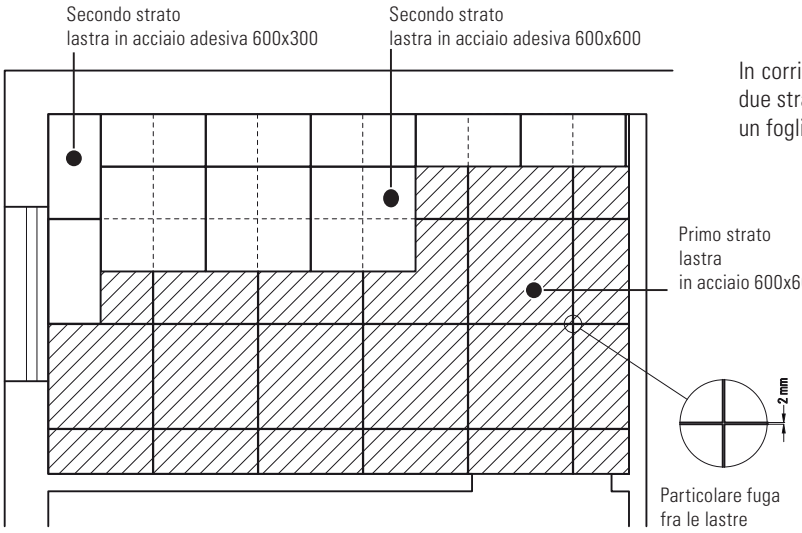


Fig. 57



In corrispondenza di un giunto elastico (vedi capitolo 11. Tagli parziali) i due strati di lastre non vanno incollati. Si consiglia di interporre tra i due un foglio di separazione in polietilene (fig. 59)

Fig. 58

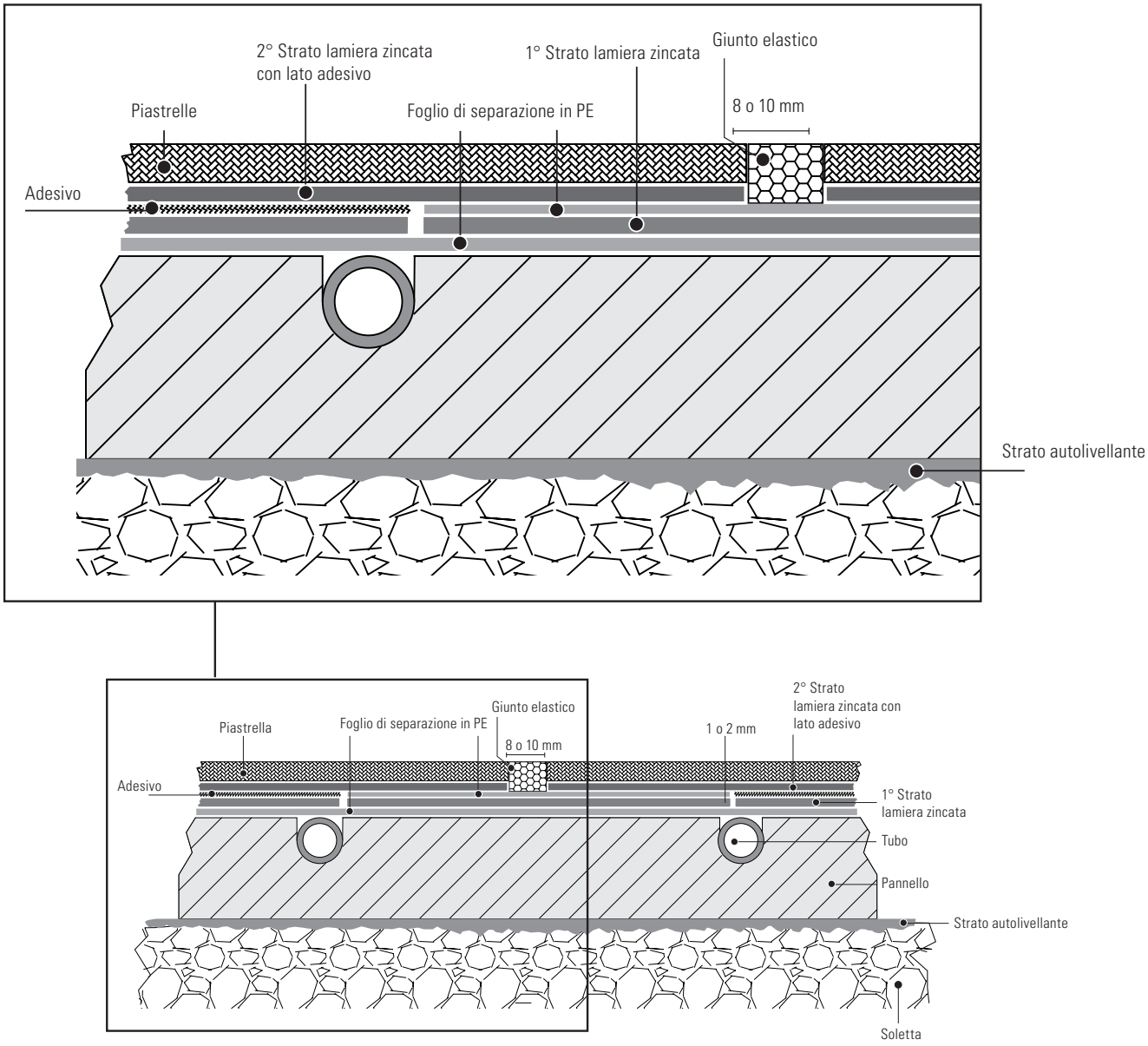


Fig. 59

La copertura dell'impianto a secco può essere realizzata mediante la posa di doppie lastre in gesso fibra (denominato anche sottofondo a secco), le cui caratteristiche e modalità di impiego sono di competenza del produttore.

In corrispondenza di porte e superfici maggiori di 40 m^2 o con lati superiori a 8 metri (come anche indicato nei progetti esecutivi) è necessario predisporre dei tagli parziali da realizzarsi per un terzo dello spessore del massetto, ripresi fino a pavimentazione finita e quindi riempiti con idoneo materiale elastomerico (Fig. 60). Per il sistema a secco il taglio interesserà solo lo strato di lastra superiore (vedi fig. 59).
In caso di pavimentazioni di legno, moquette o linoleum si potrà evitare di riportare tali tagli sulla pavimentazione stessa.

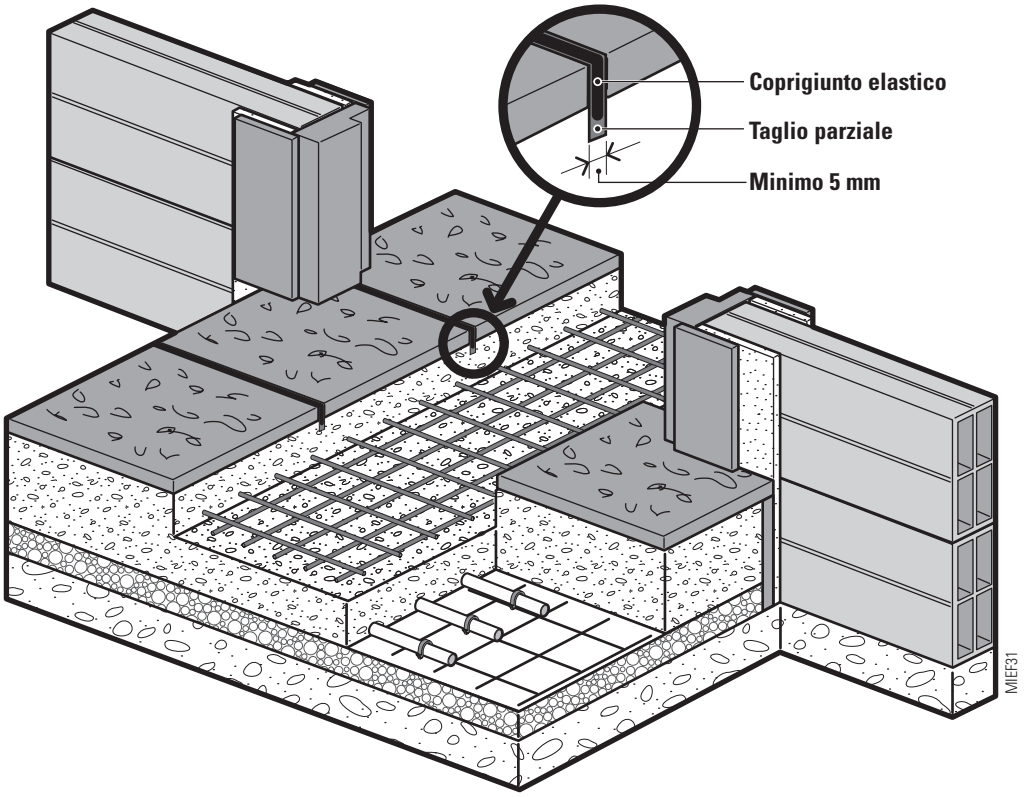


Fig. 60

Esempi di tagli parziali

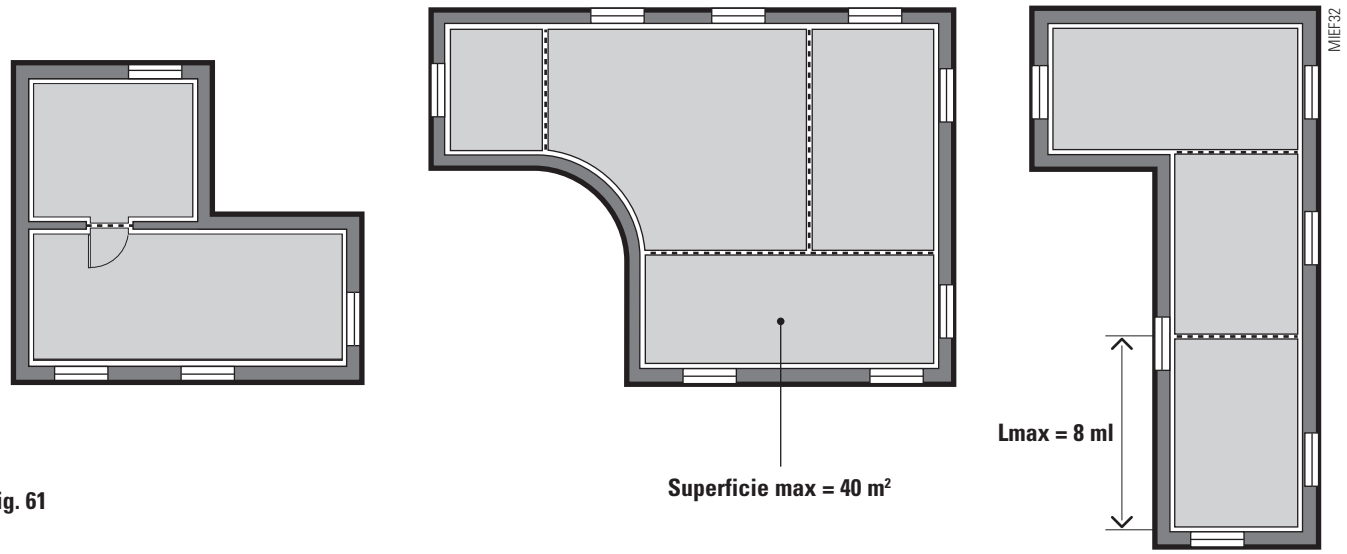


Fig. 61

Qualora le tubazioni attraversino giunti di dilatazione del massetto o giunti strutturali, provvedere a rivestirle in corrispondenza dei tratti d'attraversamento con una guaina isolante almeno di 20 cm per parte (Fig. 62).
Il giunto di dilatazione andrà ricopiato sulla pavimentazione con gli appositi profili coprigiunto (a cura del posatore dei pavimenti).

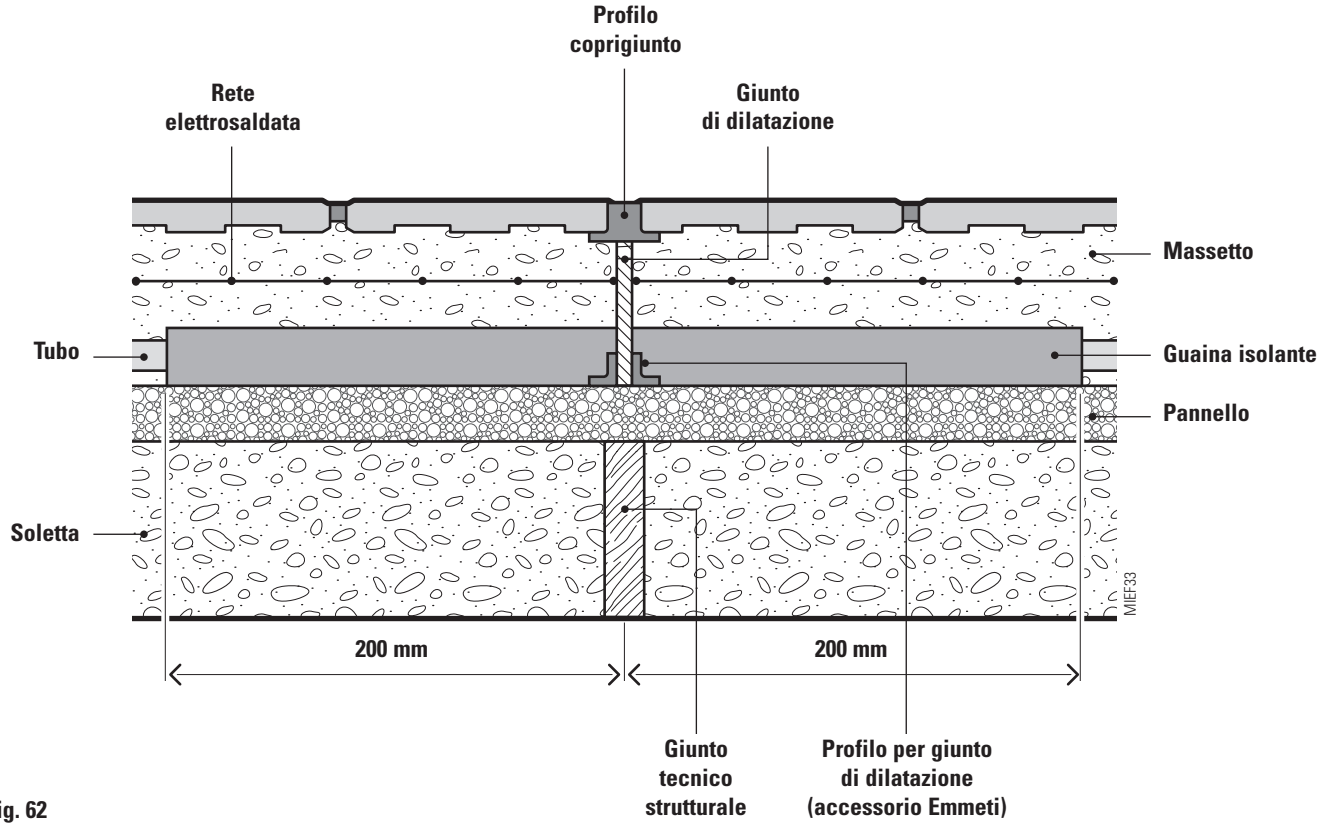


Fig. 62

Particolare profilo coprigiunto (esempio)

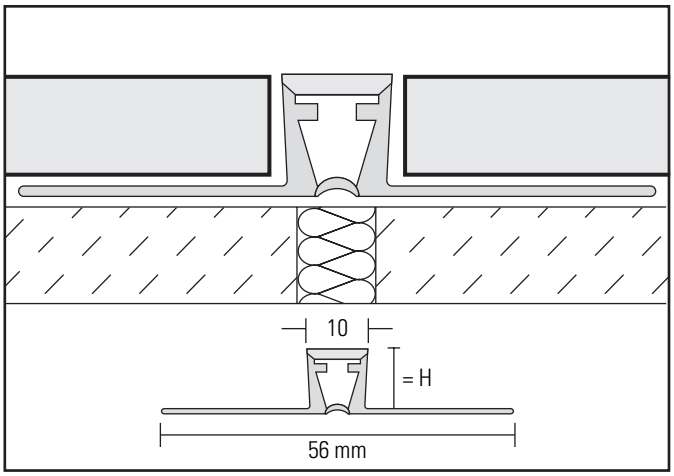


Fig. 63

Nota: non necessari per GRID FLOOR

13. AVVIAMENTO INIZIALE DELL'IMPIANTO

Questa operazione deve essere eseguita almeno 21 giorni dopo la posa del massetto in cemento o in conformità alle istruzioni del fabbricante e comunque dopo almeno 7 giorni in caso di massetti di anidrite.
Il riscaldamento iniziale comincia ad una temperatura di alimentazione compresa tra 20 °C e 25 °C, che deve essere mantenuta per almeno 3 giorni. Successivamente, occorre impostare la temperatura massima di progetto, che deve essere mantenuta per almeno altri 4 giorni.
Nel caso di avviamento del riscaldamento di massetti con pavimentazioni già posate (ad esempio posa a fresco di pavimenti in pietra, cotto, ecc.), la procedura di riscaldamento dovrà essere progressiva. Iniziare mantenendo la temperatura dell'acqua di mandata dell'impianto tra 20 e 25 °C per tre giorni e quindi aumentandola di 5 °C ogni tre giorni fino ad arrivare alla temperatura massima di progetto che dovrà essere mantenuta per minimo quattro giorni. Il processo di avviamento del riscaldamento deve essere documentato.
È possibile scaricare il report tramite il seguente link

14. POSA DELLE PAVIMENTAZIONI E DEI BATTISCOPA

Non esistono limiti nella scelta del tipo di rivestimento per i sistemi di riscaldamento a pavimento radiante, purchè questo presenti una resistenza termica inferiore a 0.15 m^2K/W (UNI EN 1264). Pavimentazioni in ceramica, cotto, pietra naturale, marmo o "alla veneziana", sono quelli che meglio si prestano per realizzare questo tipo di impianti; nel caso del legno è invece necessario verificare attentamente lo spessore per evitare fenomeni di eccessivo isolamento con conseguente peggioramento della resa termica. Vanno inoltre evitate in modo assoluto sacche d'aria tra massetto e rivestimento. Prima di procedere alla posa di qualsiasi tipo di pavimento, è necessario riscaldare il massetto radiante per completarne l'asciugatura e verificare il corretto comportamento legato alle dilatazioni termiche.
I rivestimenti potranno essere posati solo ad impianto spento e sufficientemente raffreddato. Per pavimenti in legno è consigliabile lasciare i listoni/parquettes per un periodo di almeno una settimana all'interno dei locali prima della loro posa, affinchè si adattino alle nuove condizioni termoigrometriche.

Attenzione
I pavimenti andranno posati accostandoli alla striscia, la cui parte in eccesso potrà essere tagliata a filo rivestimenti al termine della loro posa (Fig. 65).
La mancanza di questo spazio di dilatazione, provocherà la rottura dei pavimenti e causerà un ponte acustico!
La sigillatura della fuga fra pavimento e battiscopa (o piastrella) dovrà essere effettuata con idoneo materiale elastico.

Sistema a secco
Nel caso del sistema Dry Alu Floor per la posa delle superfici finite è necessario l'utilizzo di specifici collanti per superfici metalliche (in genere colle di tipo poliuretanico).
Nel caso di posa di piastrelle, prevedere delle fughe di almeno 4/5 mm e idonei riempitivi elastici. E' opportuno che le piastrelle siano di dimensioni non superiori ai 40 cm per lato.

Posa dei battiscopa
Il contatto dei battiscopa con i pavimenti causa ponti acustici di passaggio del rumore. Si consiglia perciò l'utilizzo di uno spessore distanziatore (0,5 mm circa) per la posa del battiscopa.
Per i battiscopa in cotto, marmo, oppure per la giunzione parete/pavimento di ambienti piastrellati o rivestiti in pietra/marmo, utilizzare sigillanti elastici (base siliconica) per riempire la fuga tra pavimento e battiscopa.

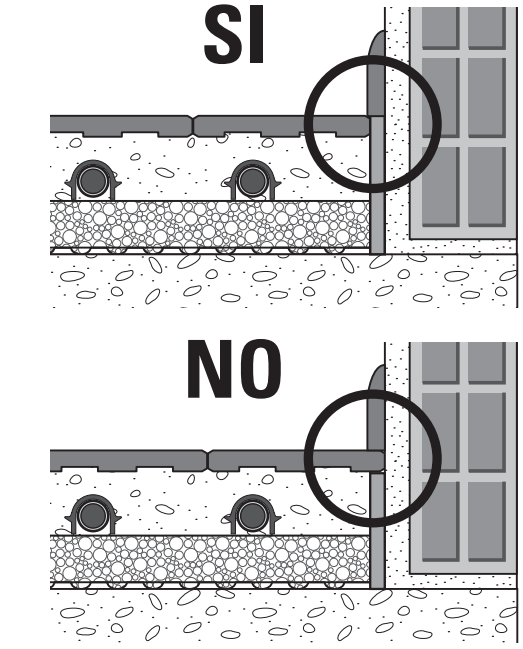


Fig. 64

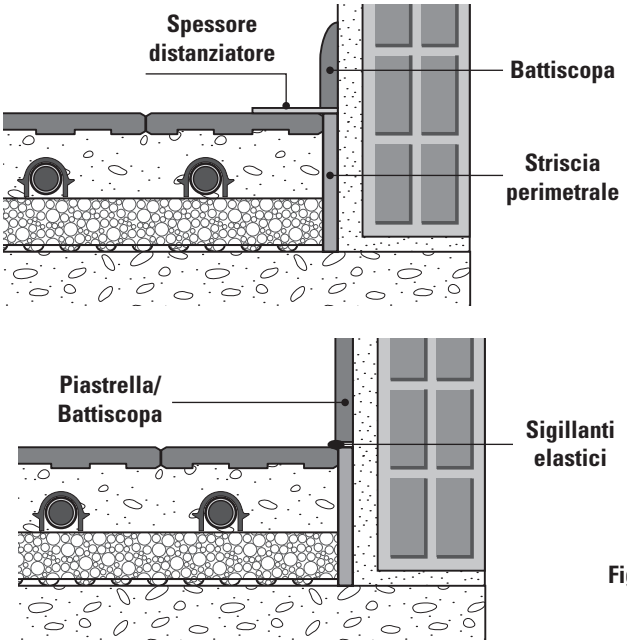


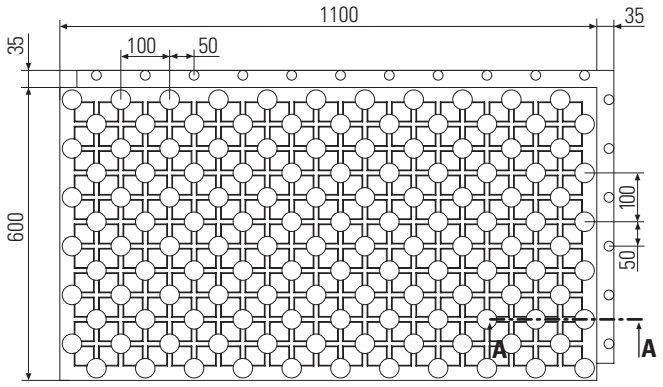
Fig. 65

Carry out a preliminary check to ensure that there is enough height available for the system according to the type of substrate (screed or a double layer plate galvanized) for the system (pipes and panels) and ceiling height for habitable rooms ([1]).
Emmeti floor heating systems require a minimum thickness ranging between 30 and 119 mm ([2]), excluding the floor covering, according to the type of panel and support used. (Fig. 2-10).

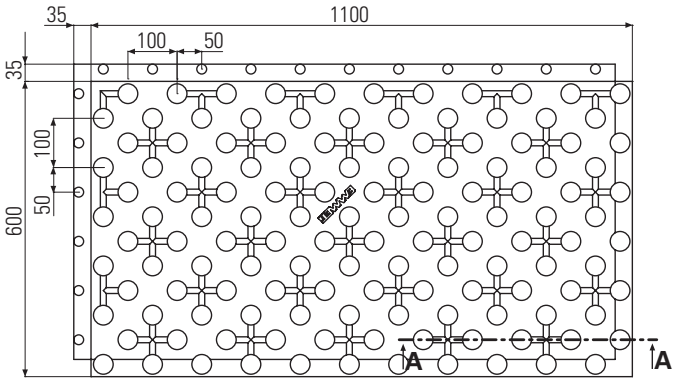
([1]) The substrate thickness must be calculated according to the load capacity of the material used.
([2]) For systems in buildings for civilian and tertiary use.
For industrial applications, the flooring structure must be sized by the construction designer.

Standard Floor insulation panel

Model H = 10



Model H = 20/30



Model H = 40/50/60

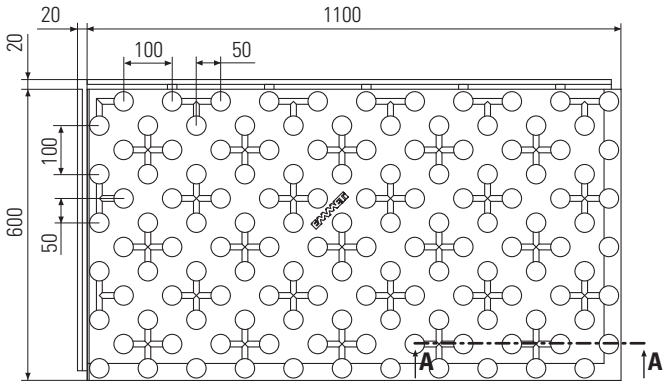
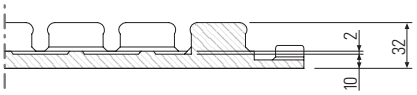


Fig. 1

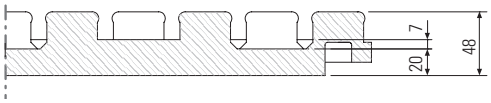
Panel 1100 x 600 H 10

Section A-A



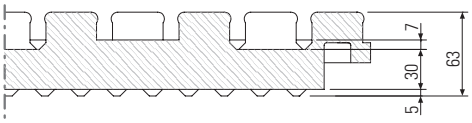
Panel 1100 x 600 H 20

Section A-A



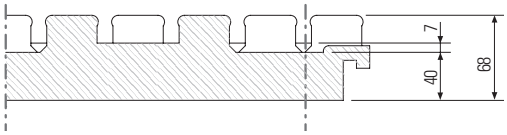
Panel 1100 x 600 H 30

Section A-A



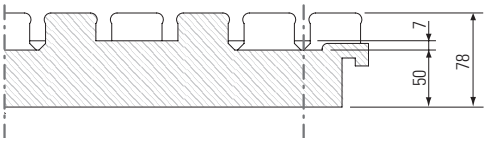
Panel 1100 x 600 H 40

Section A-A



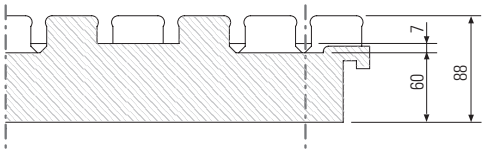
Panel 1100 x 600 H 50

Section A-A

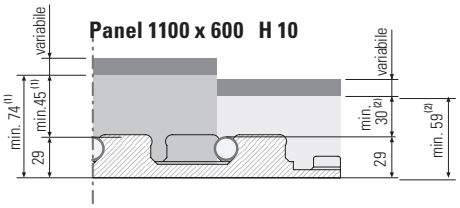


Panel 1100 x 600 H 60

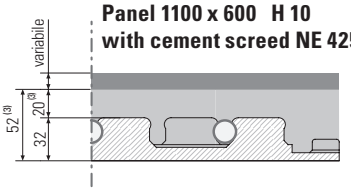
Section A-A



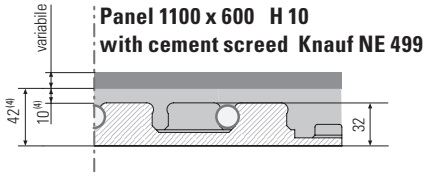
Panel 1100 x 600 H 10



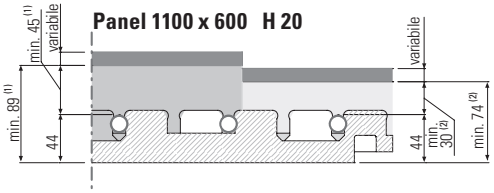
Panel 1100 x 600 H 10
with cement screed NE 425



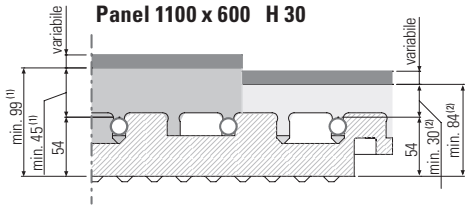
Panel 1100 x 600 H 10
with cement screed Knauf NE 499



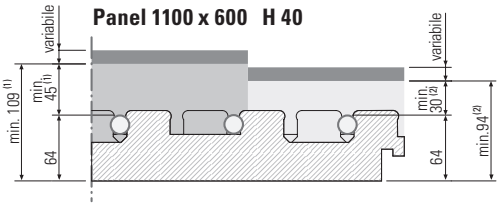
Panel 1100 x 600 H 20



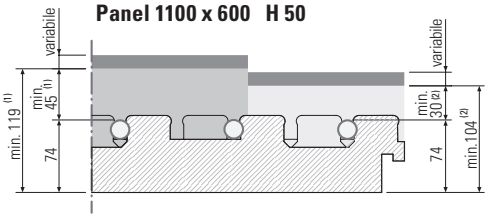
Panel 1100 x 600 H 30



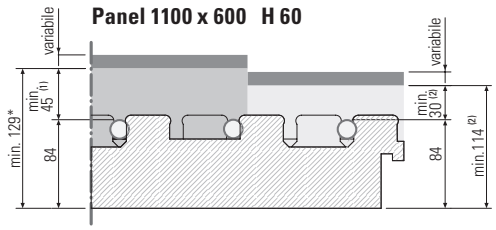
Panel 1100 x 600 H 40



Panel 1100 x 600 H 50



Panel 1100 x 600 H 60



Minimum system clearance for civilian buildings (mm)

(1) Traditional cement screed*

(2) Self-leveling screed*

(3) fluid screed at low thickness Knauf Autolivellina NE 425

(4) fluid screed at low thickness Knauf Superlivellina NE 499

Nota
Screeds **are not** provided by Emmeti

Fig. 2

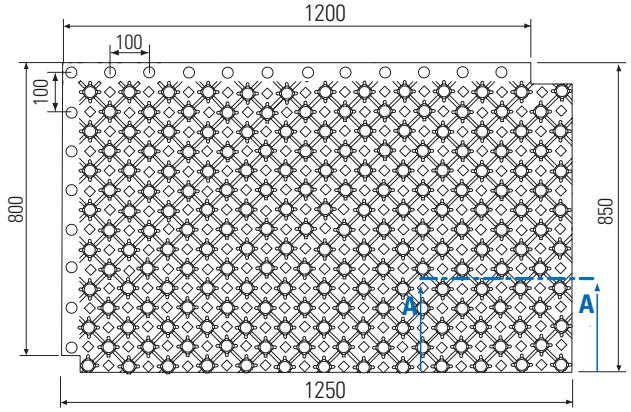
The actual thickness of the slab and the methods used the same are to be determined by the manufacturer / supplier of the same according to his specifications, depending on the installation conditions (size and type of the laying surface, floor type, etc.) and the type of substrate chosen.

* In the event of combination between Emmeti Floor system with Mirai SMI heat pump + Febos HP, it is recommended to increase the screed thickness of about 1 cm with respect to the minimum values.

Standard Combi Floor

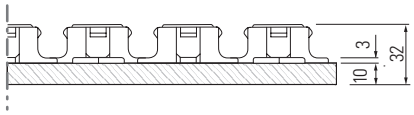
Insulation panel

Model H = 10/20/30



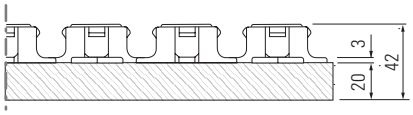
Panel 1200 x 800 H 10

Section A-A



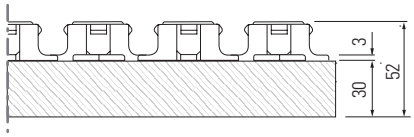
Panel 1200 x 800 H 20

Section A-A

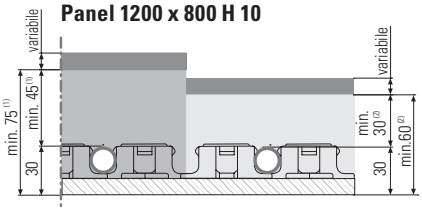


Panel 1200 x 800 H 30

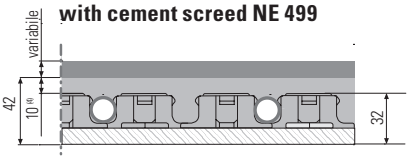
Section A-A



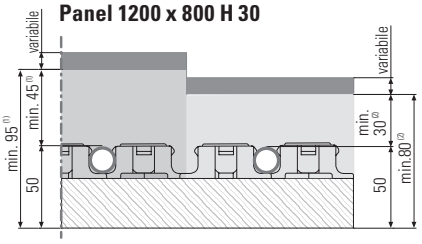
Panel 1200 x 800 H 10



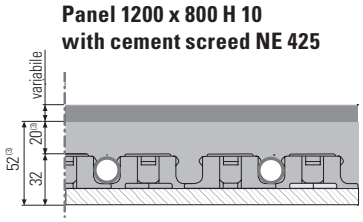
Panel 1200 x 800 H 10
with cement screed NE 499



Panel 1200 x 800 H 30



Panel 1200 x 800 H 10
with cement screed NE 425



Panel 1200 x 800 H 20

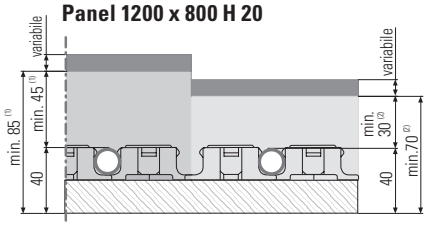


Fig. 3

Minimum dimensions of the system for civil buildings (mm)
(1) traditional cement screed*
(2) self-levelling screed*
(3) fluid screed at low thickness Knauf Autolivellina NE 425
(4) fluid screed at low thickness Knauf Superlivellina NE 499

The actual thickness of the slab and the methods used the same are to be determined by the manufacturer / supplier of the same according to his specifications, depending on the installation conditions (size and type of the laying surface, floor type, etc.) and the type of substrate chosen.*

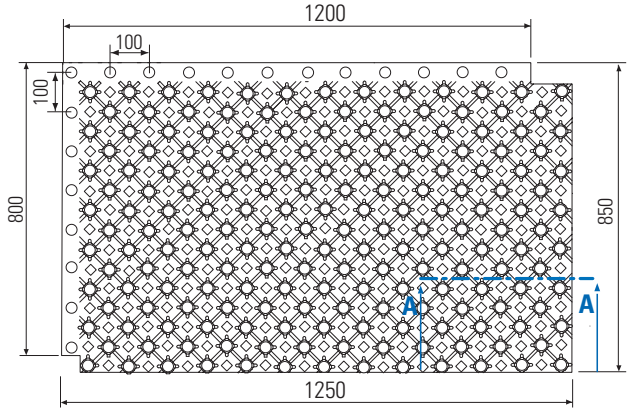
* In the event of combination between Emmeti Floor system with Mirai SMI heat pump + Febos HP, it is recommended to increase the screed thickness of about 1 cm with respect to the minimum values.

Nota: Screeds **are not** provided by Emmeti

Standard Combi Floor with the coating film

Insulation panel

Model H = 10/18/33/40/50

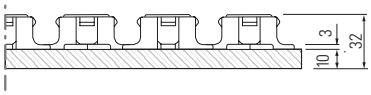


Minimum dimensions of the system for civil buildings (mm)
(1) traditional cement screed*
(2) self-levelling screed*
(3) fluid screed at low thickness Knauf Autolivellina NE 425
(4) fluid screed at low thickness Knauf Superlivellina NE 499

The actual thickness of the slab and the methods used the same are to be determined by the manufacturer / supplier of the same according to his specifications, depending on the installation conditions (size and type of the laying surface, floor type, etc.) and the type of substrate chosen.*

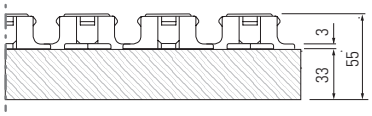
Panel 1200 x 800 H 10

Section A-A



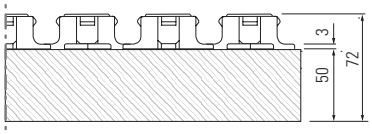
Panel 1200 x 800 H 33

Section A-A



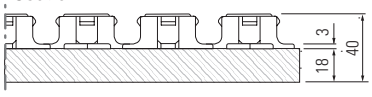
Panel 1200 x 800 H 50

Section A-A



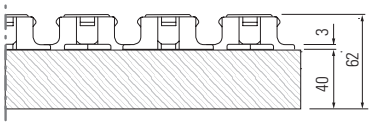
Panel 1200 x 800 H 18

Section A-A

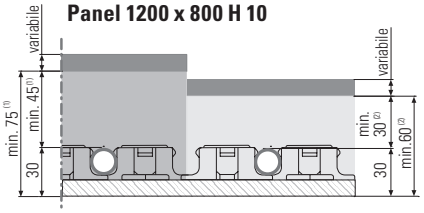


Panel 1200 x 800 H 40

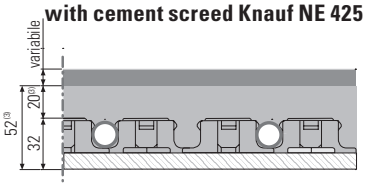
Section A-A



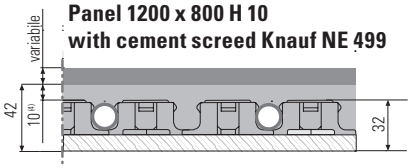
Panel 1200 x 800 H 10



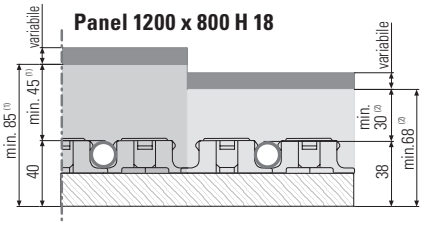
Panel 1200 x 800 H 10
with cement screed Knauf NE 425



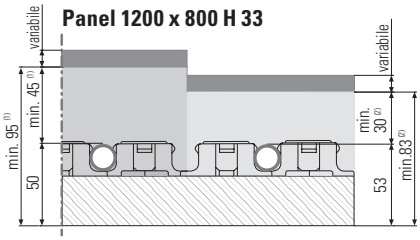
Panel 1200 x 800 H 10
with cement screed Knauf NE 499



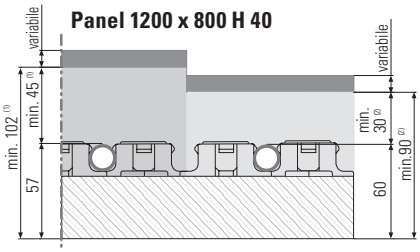
Panel 1200 x 800 H 18



Panel 1200 x 800 H 33



Panel 1200 x 800 H 40



Panel 1200 x 800 H 50

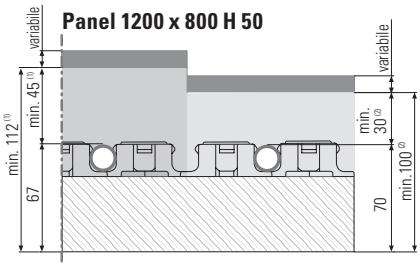


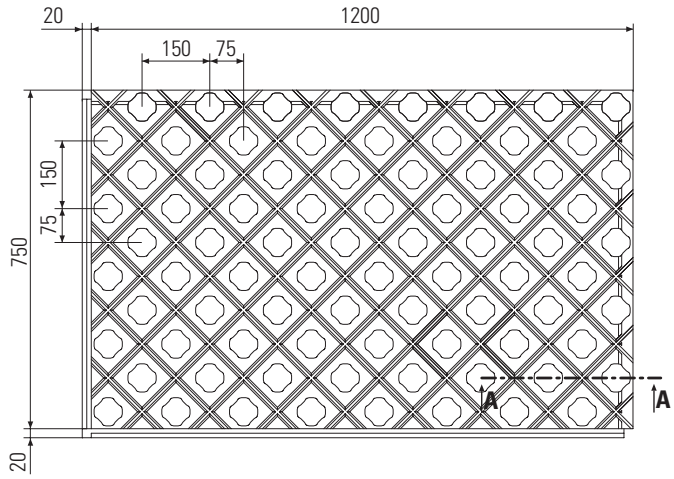
Fig. 3a

* In the event of combination between Emmeti Floor system with Mirai SMI heat pump + Febos HP, it is recommended to increase the screed thickness of about 1 cm with respect to the minimum values.

Nota: Screeds **are not** provided by Emmeti

Classic Floor
Insulation panel

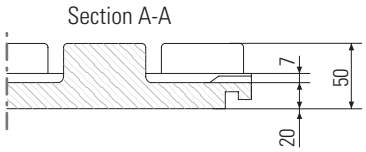
Model H = 20/30

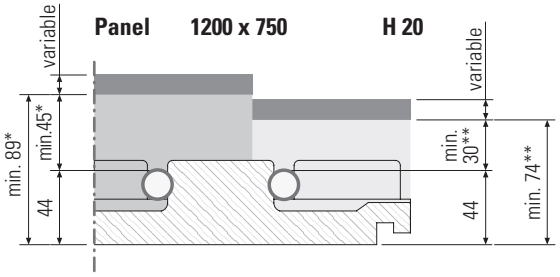


Minimum system clearance for civilian buildings (mm)

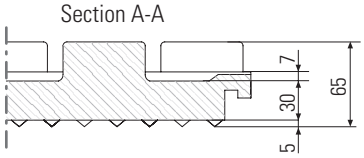
* Traditional cement screed
** Self-levelling screed

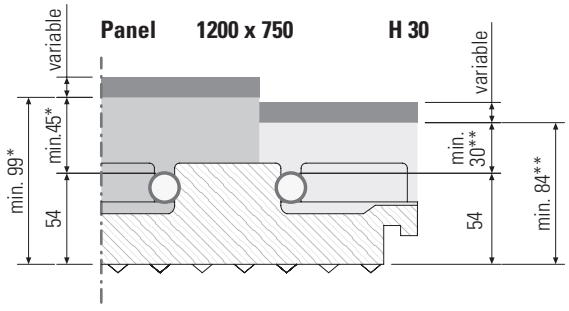
Panel 1200 x 750 H 20





Panel 1200 x 750 H 30





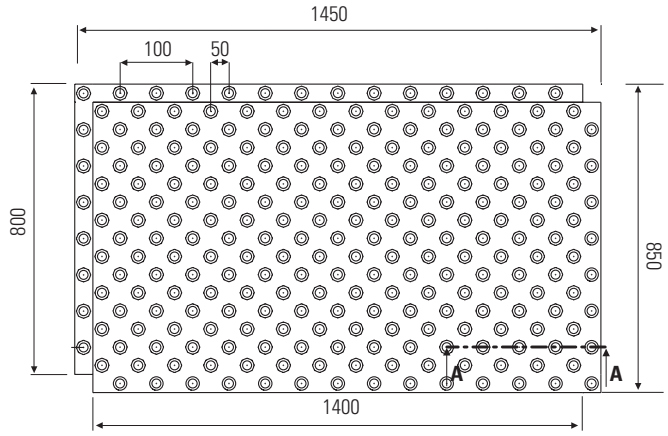
* In the event of combination between Emmeti Floor system with Mirai SMI heat pump + Febos HP, it is recommended to increase the screed thickness of about 1 cm with respect to the minimum values.

Nota: Screeds **are not** provided by Emmeti

Step Combi Floor / Step Combi Floor with graphite

Sound insulation panel

Model H = 30-2



Minimum system clearance for civilian buildings (mm)

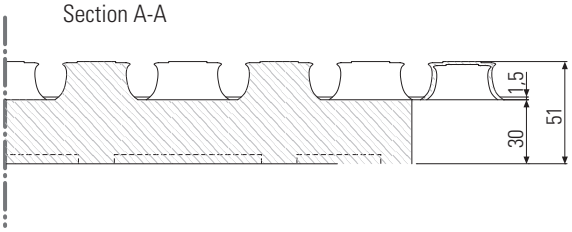
* Traditional cement screed

** Self-levelling screed

* In the event of combination between Emmeti Floor system with Mirai SMI heat pump + Febos HP, it is recommended to increase the screed thickness of about 1 cm with respect to the minimum values.

Nota: Screeds **are not** provided by Emmeti

Panel 1400 x 800 H 30



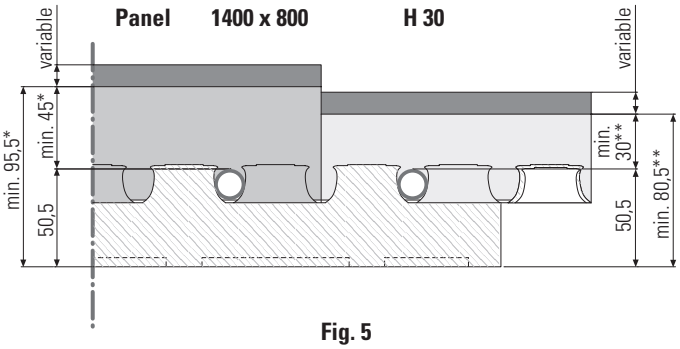
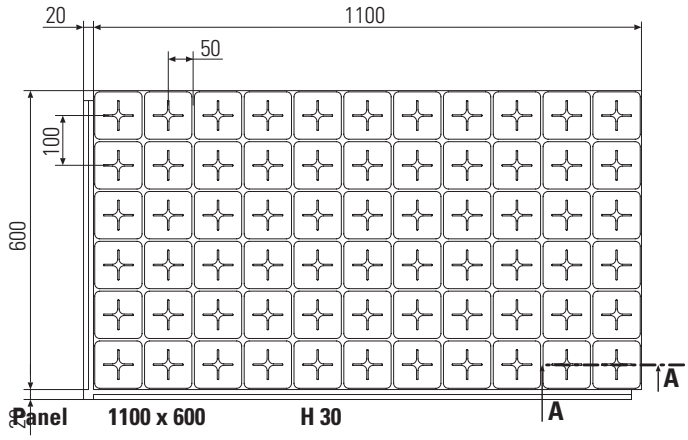


Fig. 5

Plan Floor

Insulation panel

Model H = 30



Minimum system clearance for civilian buildings (mm)

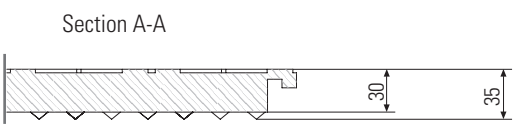
* Traditional cement screed

** Self-levelling screed

* In the event of combination between Emmeti Floor system with Mirai SMI heat pump + Febos HP, it is recommended to increase the screed thickness of about 1 cm with respect to the minimum values.

Nota: Screeds **are not** provided by Emmeti

Panel 1100 x 600 H 30



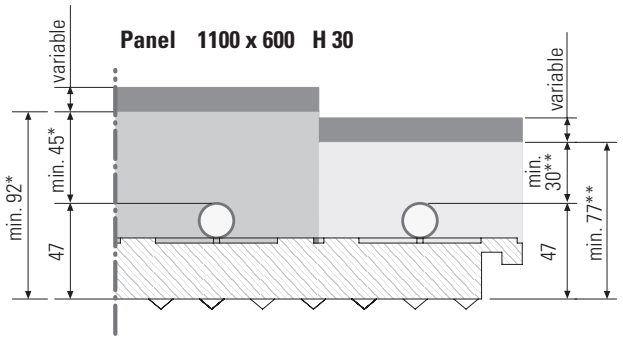
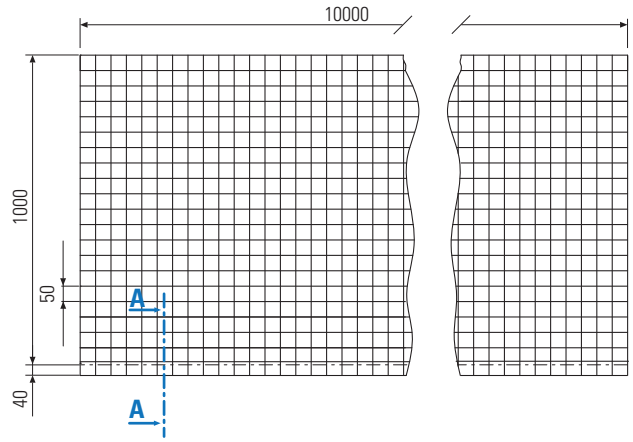


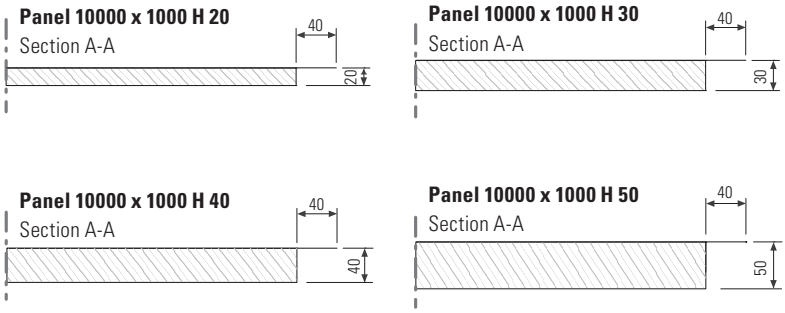
Fig. 6

Roll Floor

Insulation panel

Model H = 20/30/40/50





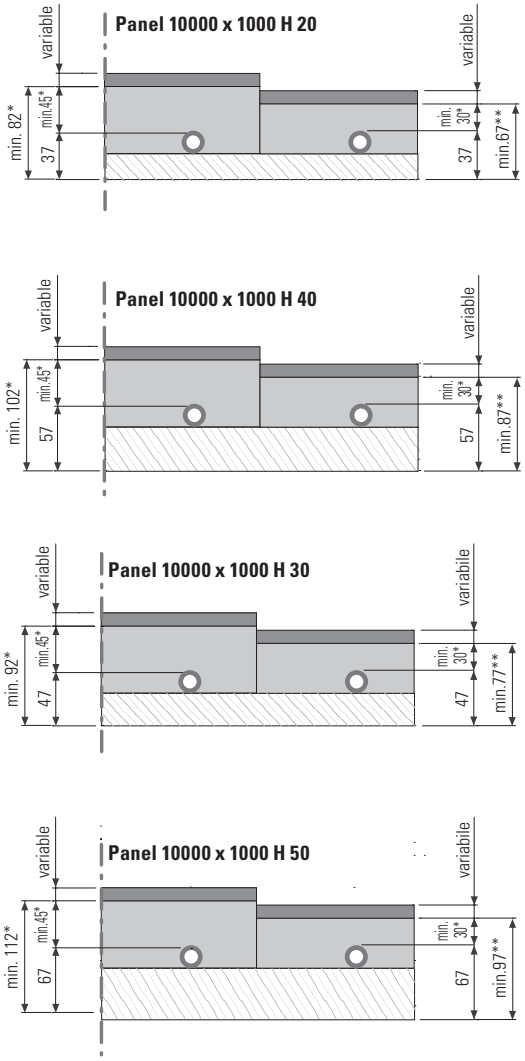


Fig. 7

Minimum system clearance for civilian buildings (mm)

* Traditional cement screed
** Self-levelling screed

* In the event of combination between Emmeti Floor system with Mirai SMI heat pump + Febos HP, it is recommended to increase the screed thickness of about 1 cm with respect to the minimum values.

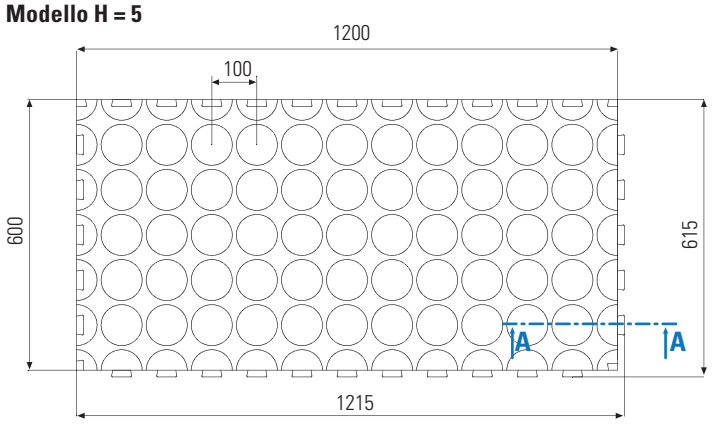
Nota: Screeds **are not** provided by Emmeti

Fig. 7

Thin Floor

Insulation panel

Modello H = 5

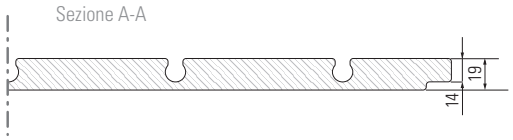


Minimum dimensions of the system for civil buildings (mm)
(1) traditional cement screed*
(2) self-levelling screed*
(3) fluid screed at low thickness Knauf Autolivellina NE 425
(4) fluid screed at low thickness Knauf Superlivellina NE 499

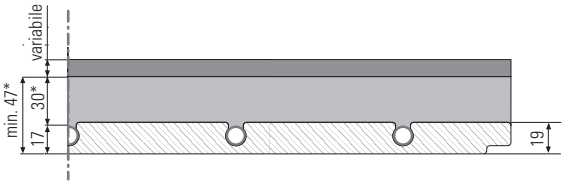
The actual thickness of the slab and the methods used the same are to be determined by the manufacturer / supplier of the same according to his specifications, depending on the installation conditions (size and type of the laying surface, floor type, etc.) and the type of substrate chosen.*

Nota: Screeds **are not** provided by Emmeti

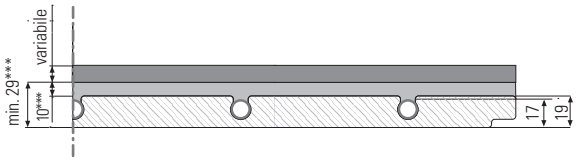
Panel 1200 x 600 H 5



Panel 1200 x 600 H 5



Panel 1200 x 600 H 5
with cement screed Knauf NE 499



Panel 1200 x 600 H 5
with cement screed Knauf NE 425

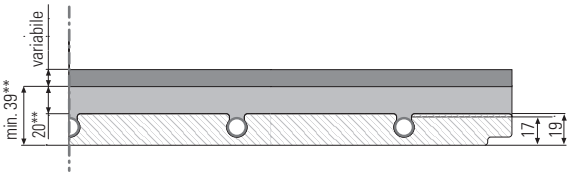
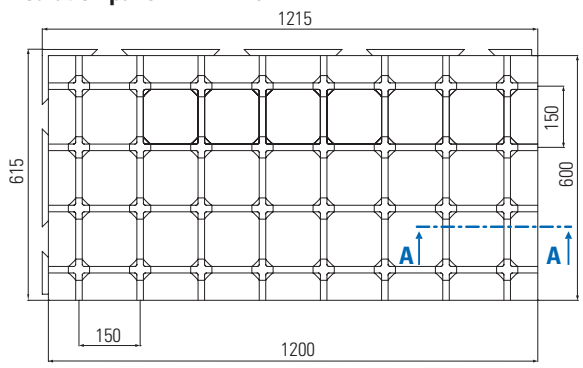


Fig. 8

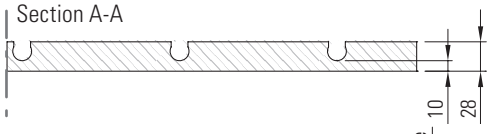
Dry Alu Floor

Insulation panel H = 10

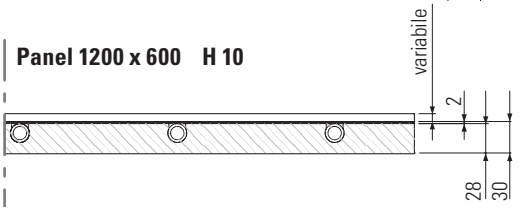


Panel 1200 x 600 H 10

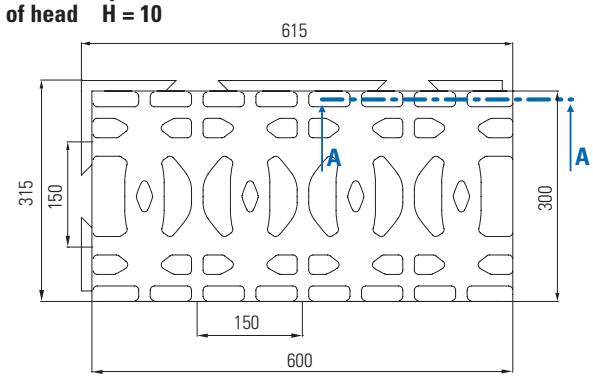
Section A-A



Panel 1200 x 600 H 10

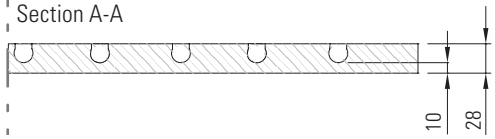


Insulation panel
of head H = 10



Panel 600 x 300 H 10

Section A-A



Panel 600 x 300 H 10

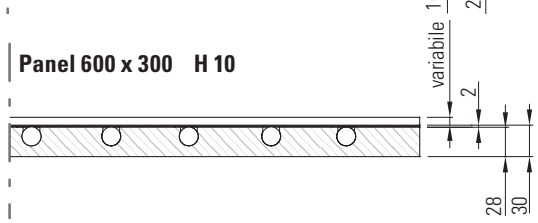
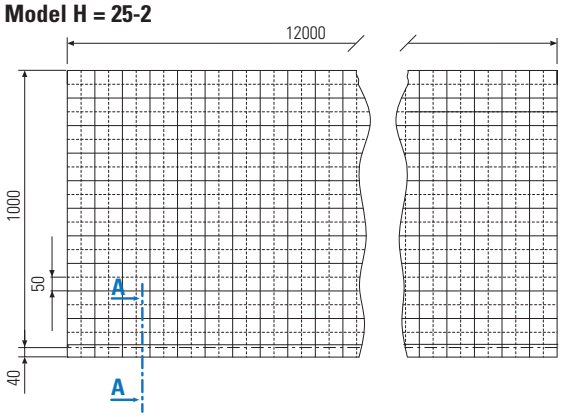


Fig. 9

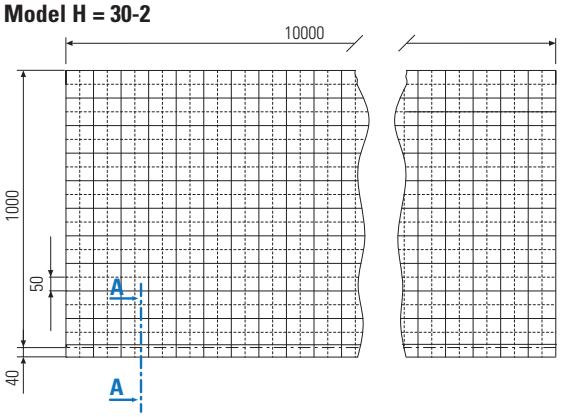
Klettjet

Insulation panel

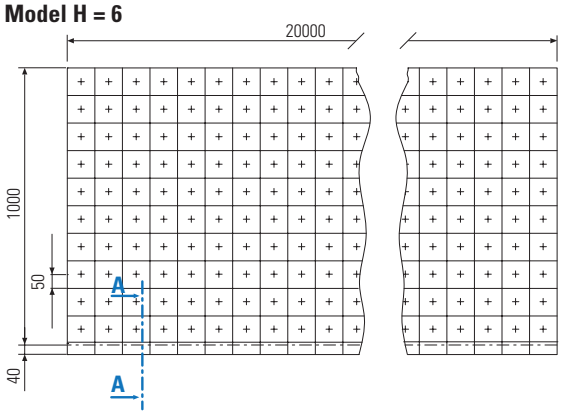
Model H = 25-2



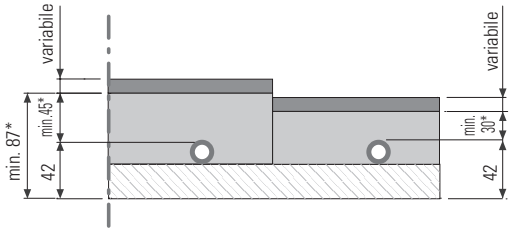
Model H = 30-2



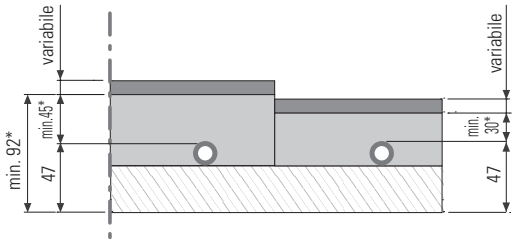
Model H = 6



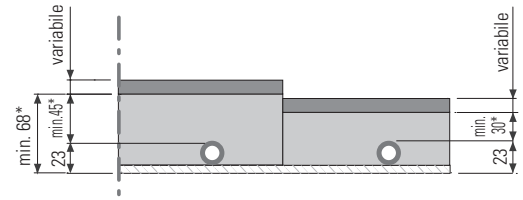
Panel 12000 x 1000 H 25-2



Panel 12000 x 1000 H 30-2

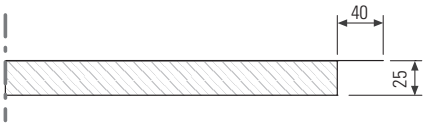


Panel 20000 x 1000 H 6



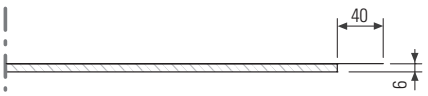
Panel 12000 x 1000 H 25-2

Section A-A



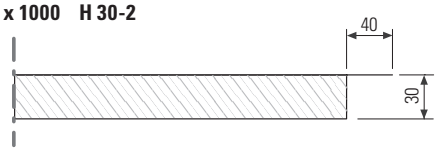
Panel 20000 x 1000 H 6

Section A-A

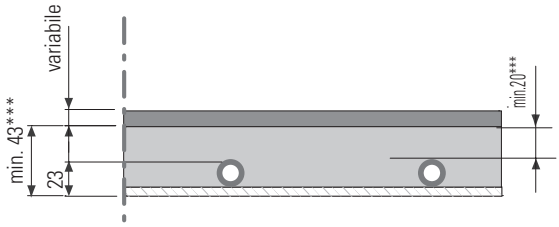


Panel 10000 x 1000 H 30-2

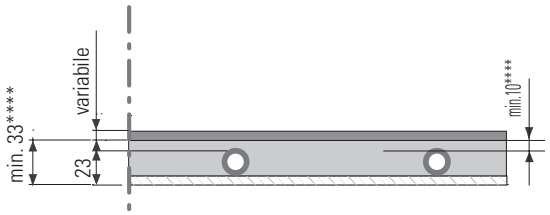
Section A-A



Panel 20000 x 1000 H6 - Con massetto Knauf NE425



Panel 20000 x 1000 H6 - Con massetto Knauf NE499



Minimum dimensions of the system for civil buildings (mm)
* Traditional cement screed
** Self-leveling screed
*** Fluid screed with low thickness Knauf Autolivellina NE 425
**** Fluid thin screed Knauf Superlivellina NE 499

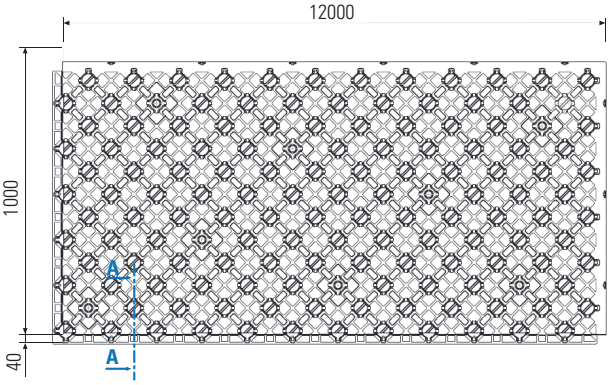
In the event of combination between Emmeti Floor system with Mirai SMI heat pump + Febos HP, it is recommended to increase the screed thickness of about 1 cm with respect to the minimum values.

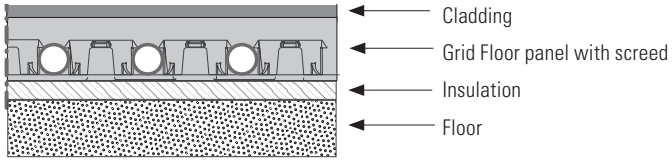
Nota: Screeds **are not** provided by Emmeti

Grid floor

Insulating Panel

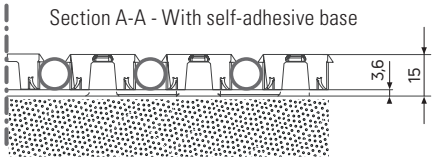
Model H = 0/10 dn12





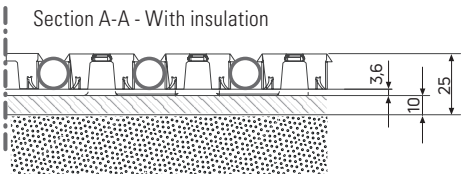
Panel 1200 x 600 H 0

Section A-A - With self-adhesive base



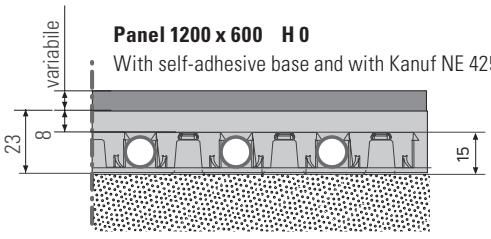
Panello 1200 x 600 H 10

Section A-A - With insulation



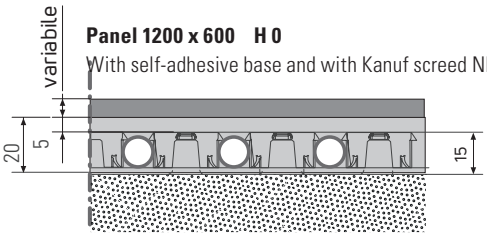
Panel 1200 x 600 H 0

With self-adhesive base and with Kanuf NE 425 screed



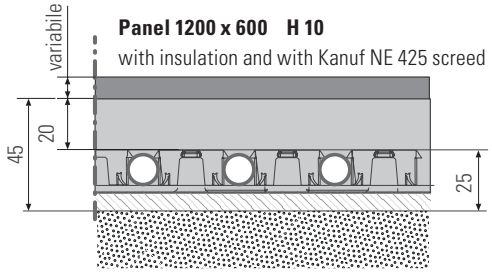
Panel 1200 x 600 H 0

With self-adhesive base and with Kanuf screed NE 499



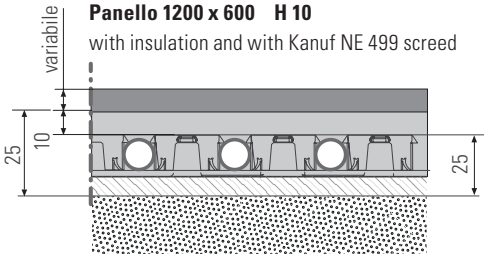
Panel 1200 x 600 H 10

with insulation and with Kanuf NE 425 screed



Panello 1200 x 600 H 10

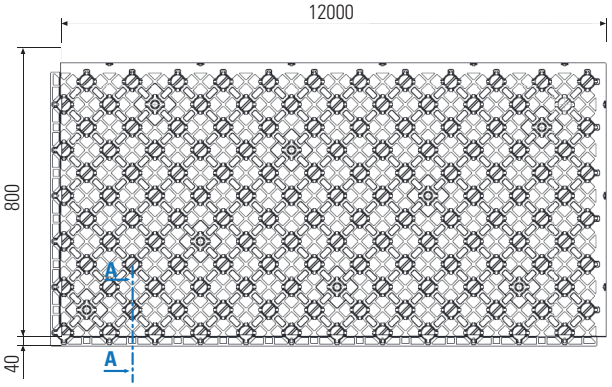
with insulation and with Kanuf NE 499 screed

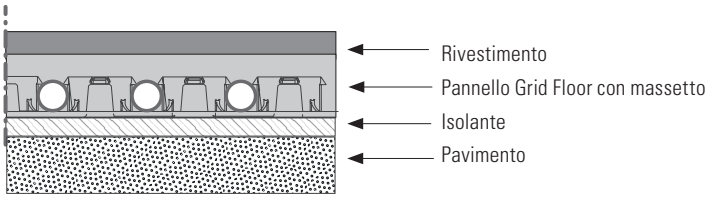


Note: The actual thickness of the screed and how it is made are to be defined with the screed manufacturer/supplier according to its specifications, depending on the installation conditions (size and type of laying surface, type of slab, etc.) and the type of trim chosen.

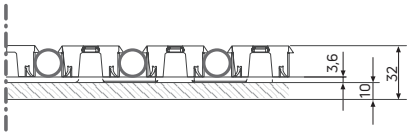
Grid floor
Insulating Panel

Model H = 10 / 25 / 42 DN16/17

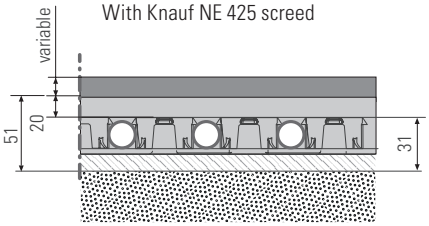




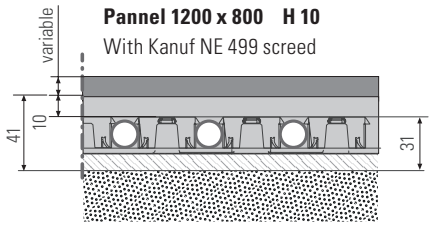
Pannel 1200 x 800 H 10
Section A-A



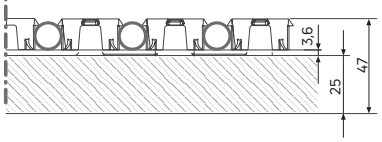
Pannel 1200 x 800 H 10
With Knauf NE 425 screed



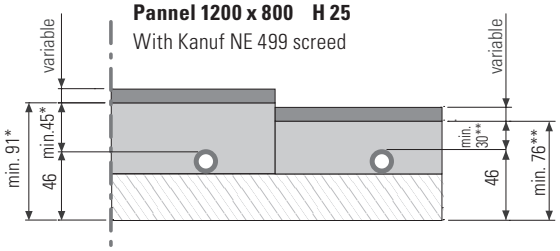
Pannel 1200 x 800 H 10
With Kanuf NE 499 screed



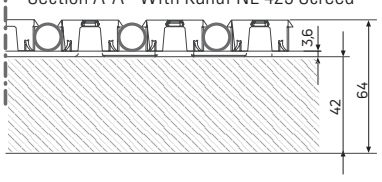
Pannel 1200 x 800 H 25
Section A-A - With Kanuf NE 425 Screed



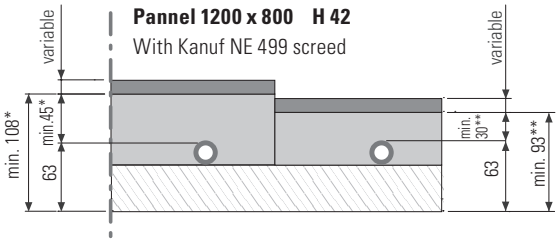
Pannel 1200 x 800 H 25
With Kanuf NE 499 screed



Pannel 1200 x 800 H 42
Section A-A - With Kanuf NE 425 Screed



Pannel 1200 x 800 H 42
With Kanuf NE 499 screed



* Traditional cementitious screed
** Self-levelling screed

Note: The actual thickness of the screed and how it is made are to be defined with the screed manufacturer/supplier according to its specifications, depending on the installation conditions (size and type of laying surface, type of slab, etc.) and the type of trim chosen.

Warning
The foundation must be clean, have no mortar residues and be sufficiently flat to allow the insulating panels to rest uniformly.

To install the radiant floor heating system, the interior plaster and the hydrothermal and electrical systems must already be complete; the latter, in particular, must be covered by a level screed with adequate mechanical strength.
Any layers of bituminous materials must be separated from the panels using polyethylene sheets (minimum thickness 0.2 mm), overlapping by at least 20 cm on the sides and joined using appropriate adhesive. (Fig. 11).

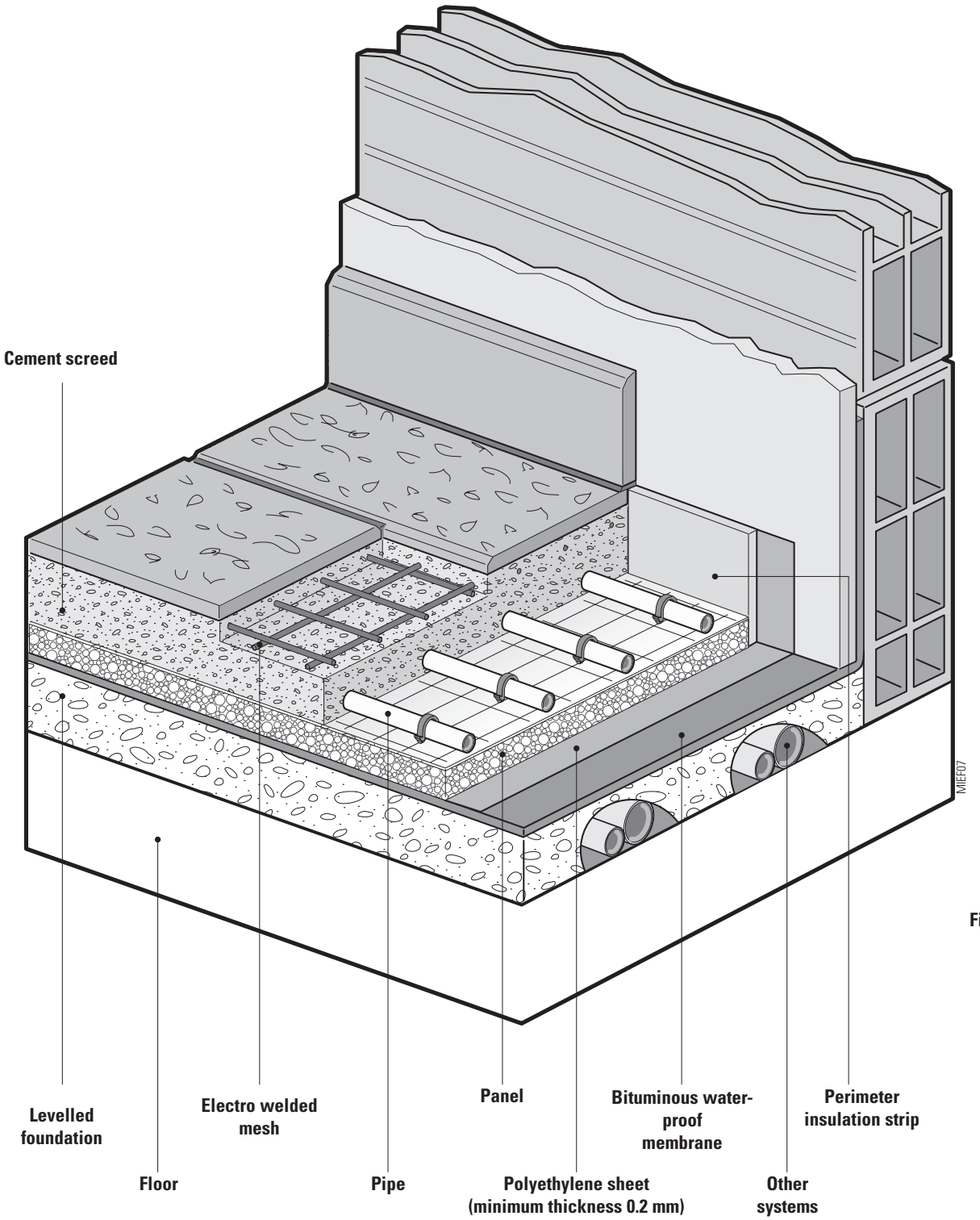


Fig. 11

If, for structural reasons or insufficient height available it was not possible to realise adequate coverage of the hydrothermal and electrical systems, the pipes can be placed behind the walls (Fig. 12), making sure that the screed covering reaches a thickness of at least 30 mm.

It is important for the panels to rest on the floor slab to prevent the screed from sagging and the flooring from cracking.

Warning!
Should a floating floor be installed, reduce the transmission of noise from footsteps with STEP COMBI FLOOR acoustic panels. An area where other systems pass will create an acoustic bridge and therefore must be avoided! Such systems must preferably be enclosed in the floor slab or coated with suitable certified acoustic insulating material.

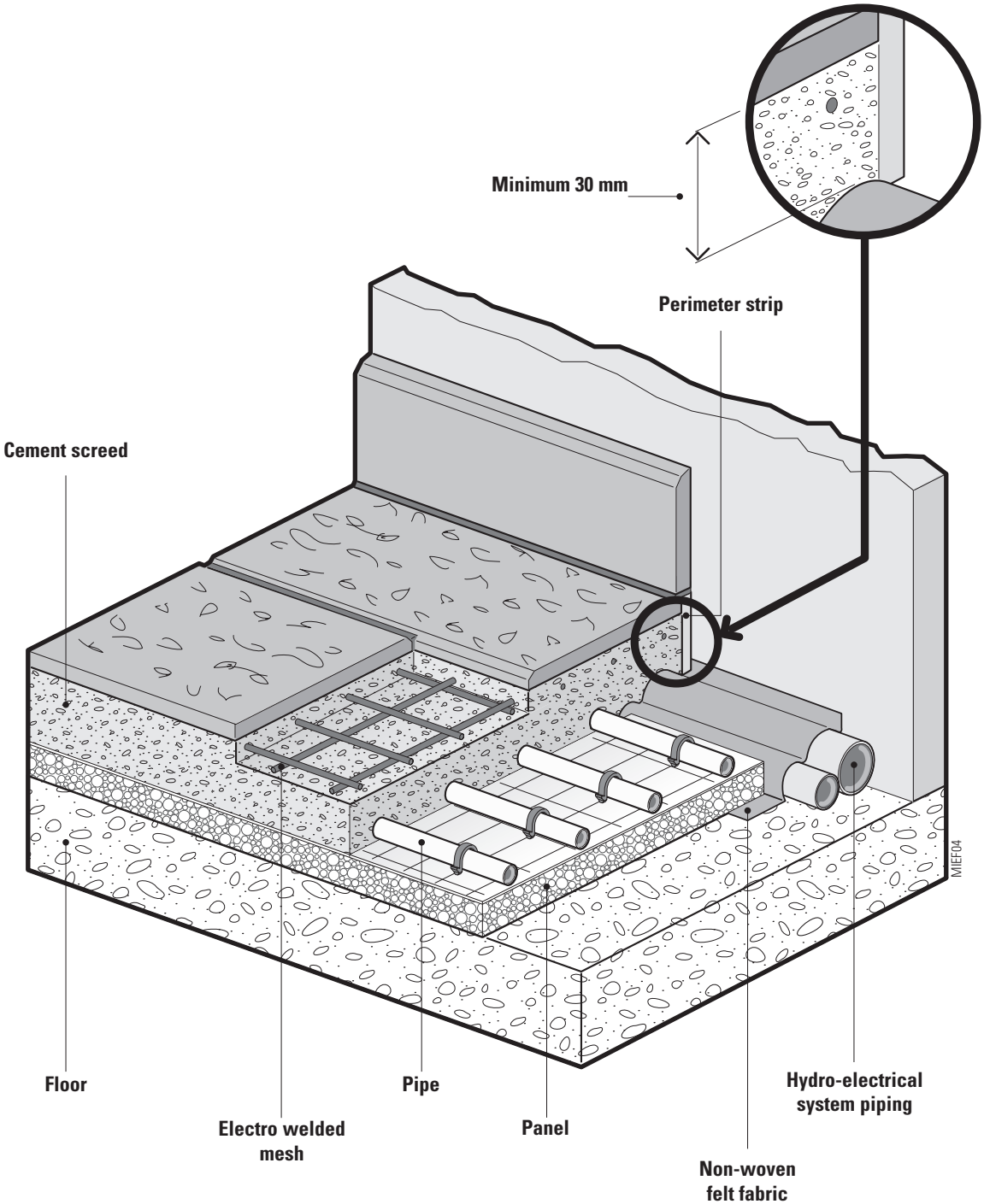


Fig. 12

In systems with hydrothermal and electrical piping running along the walls, it is important that the panels rest fully on the floor slab.
This is why we recommend creating a 90° "step" on top of this piping onto which the panels can be placed laterally (Fig. 13 e 14).

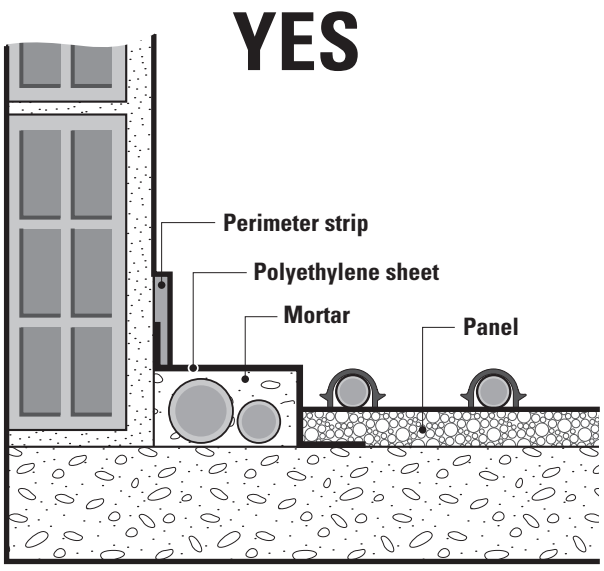


Fig. 13

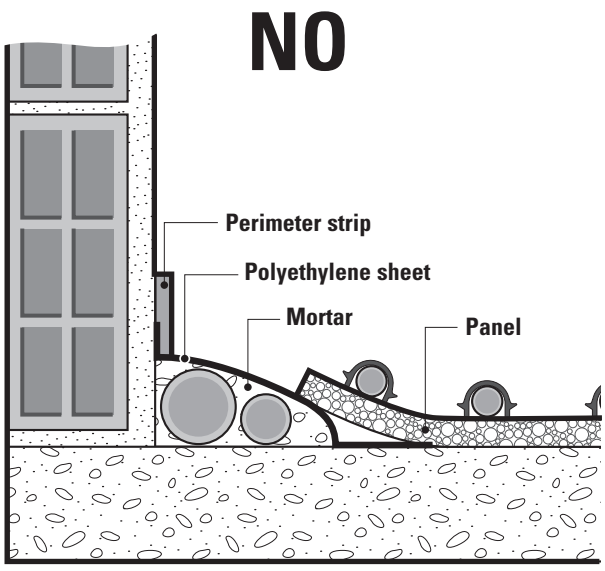


Fig. 14

The height of this step should not be over that of the floor system (panel + pipe), and must ensure a minimum thickness greater than a 30 mm screed (Fig. 12).
To prevent adhesion of the radiant screed (which must be free to "float" with respect to the surrounding structure) to this step, it is important to place a separating layer (polyethylene sheet, “non-woven felt”, etc).
Level compensation cannot be made using loose (sand) or low-density materials.

The distribution manifolds must be installed at least 30 cm from the raw floor slab.
Emmeti Topway distribution manifolds allow for the connection between the delivery piping and the lower bar equipped with simple adjustment lockshields (red cap) or flowmeters, and between the return piping and the upper bar where the shut-off valves (blue cap) are located and where electrothermic heads can be installed. (Fig. 15).

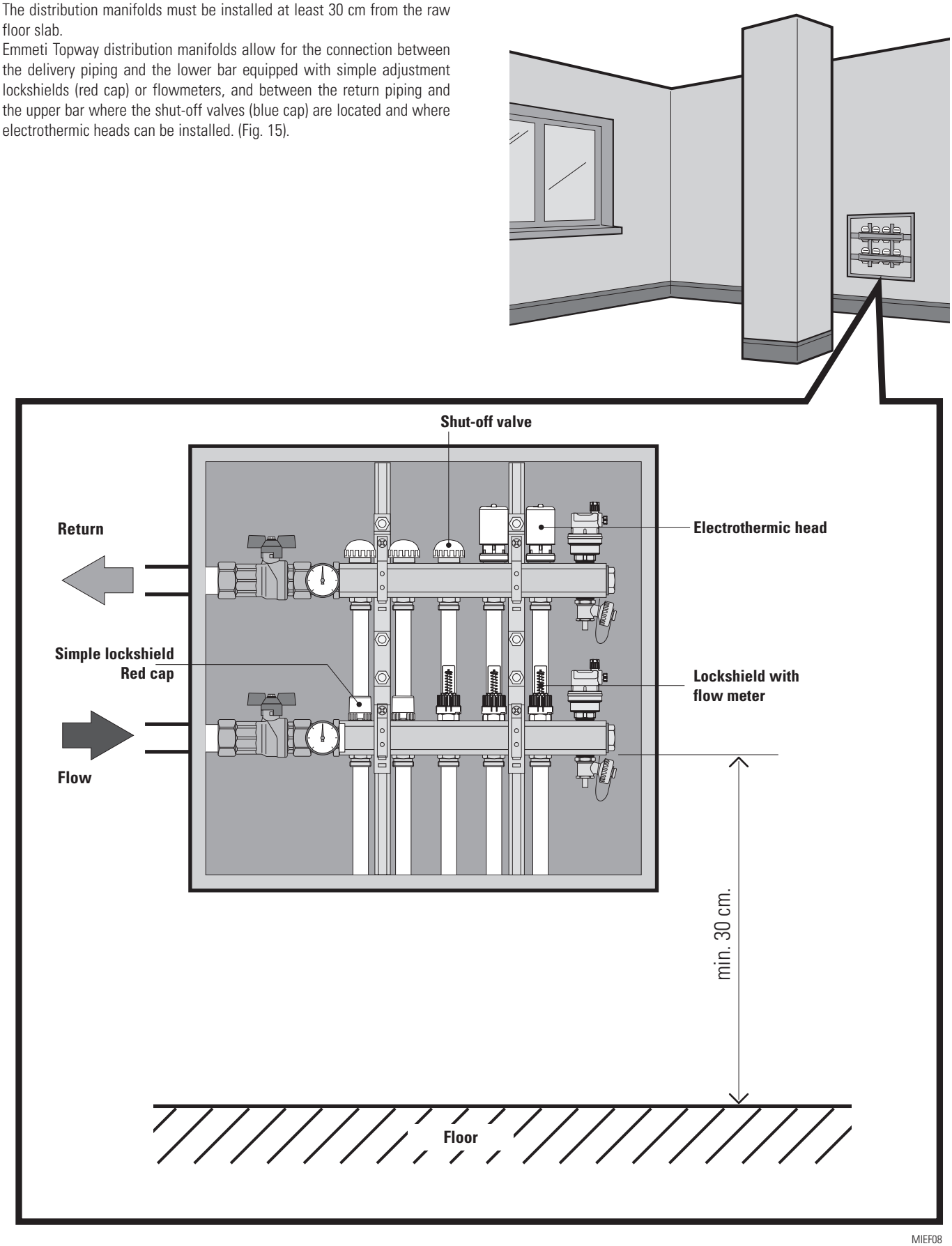
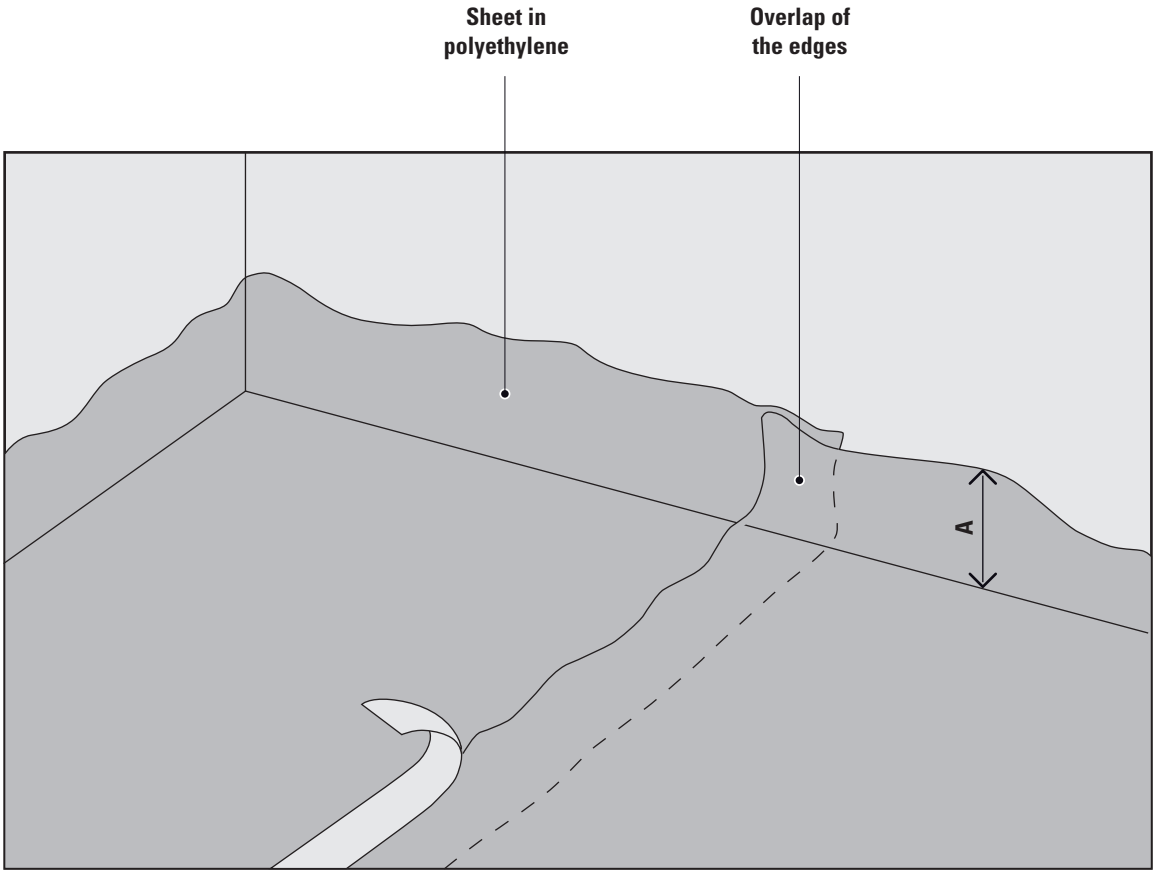


Fig. 15

In the event that moisture moves upwards from the substrate to the insulation panels, a polyethylene sheet must be laid over all the floor slabs, lifting the edges along the walls. The sheets must overlap and be joined using adhesive tape. This method must also be used in the event of systems resting on substrates in contact with the ground (ground floors, basements) or when the flooring is used for summer cooling.



A = about 5 cm

Fig. 16

The perimeter strip is an essential element, both for compensating thermal expansion and for thermally and acoustically insulating the radiant screed from the walls of the building.
The height of the perimeter strip (150/250 mm) must cover the overall dimensions of the system (insulation + screed + flooring).
It must be laid along the entire perimeter of every vertical structural element (walls, stairs, pillars, columns, etc.) and fastened on the adhesive side (if necessary with nails, clips or adhesives to prevent it from moving while pouring the radiant screed) (Fig. 17).
The perimeter strip must also be placed in correspondence of the doorsills to the stairwells and to terraces (Fig. 18).
The polyethylene band applied to the strip must be folded towards the panels and overlaid onto them to prevent screed penetration under the isolating layer.
In correspondence of wall edges and corners, use a cutter to make an incision of half the thickness of the strip to allow proper contact with the walls (Fig. 19).

Fig. 17

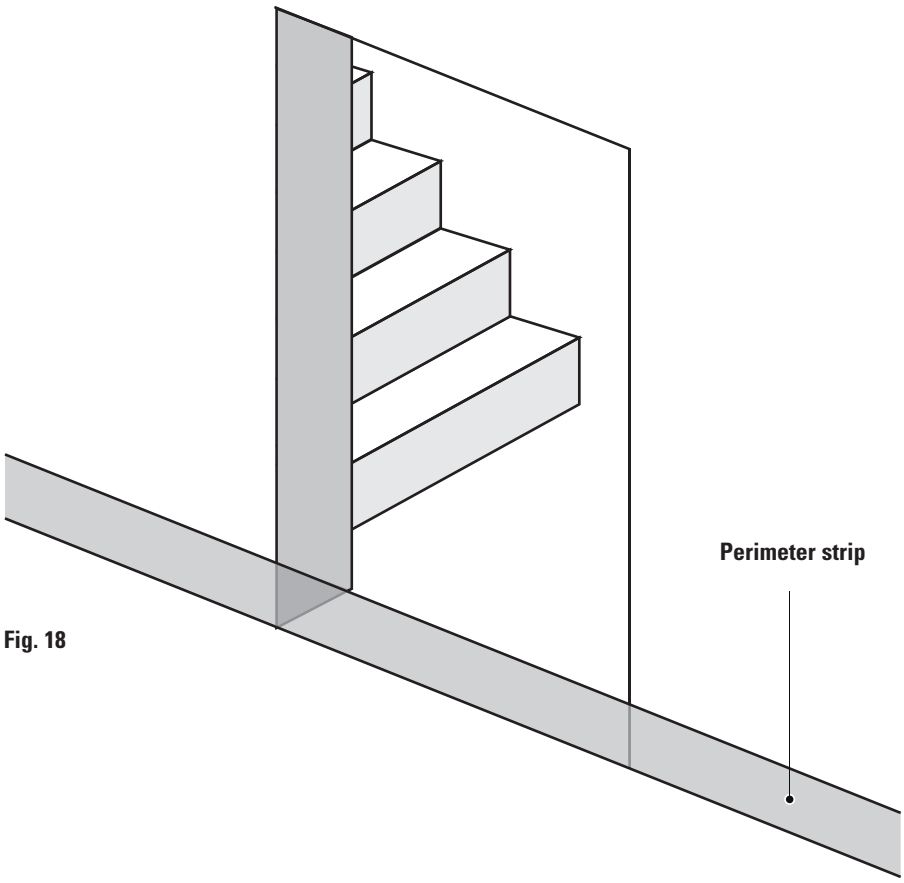


Fig. 18

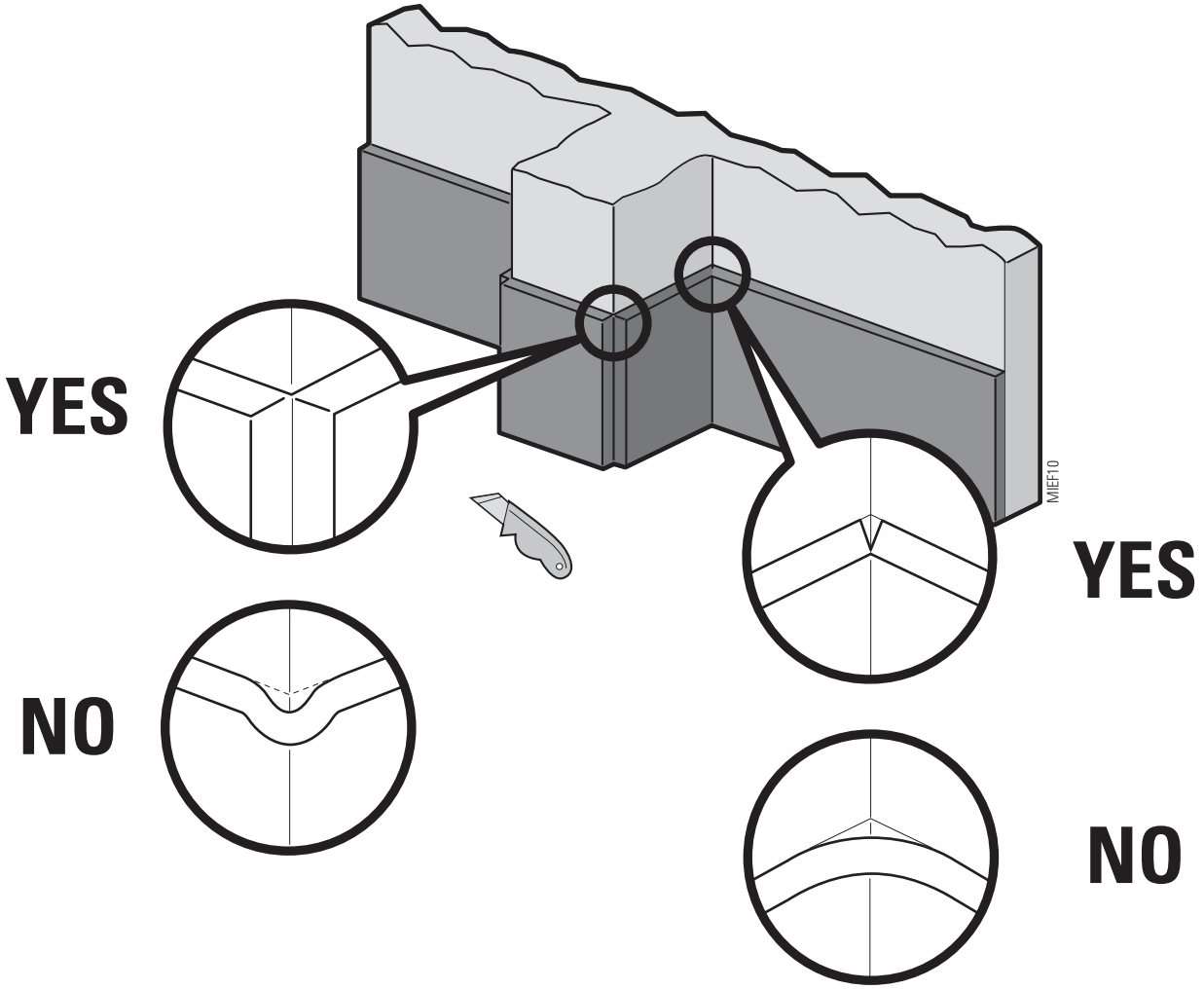


Fig. 19

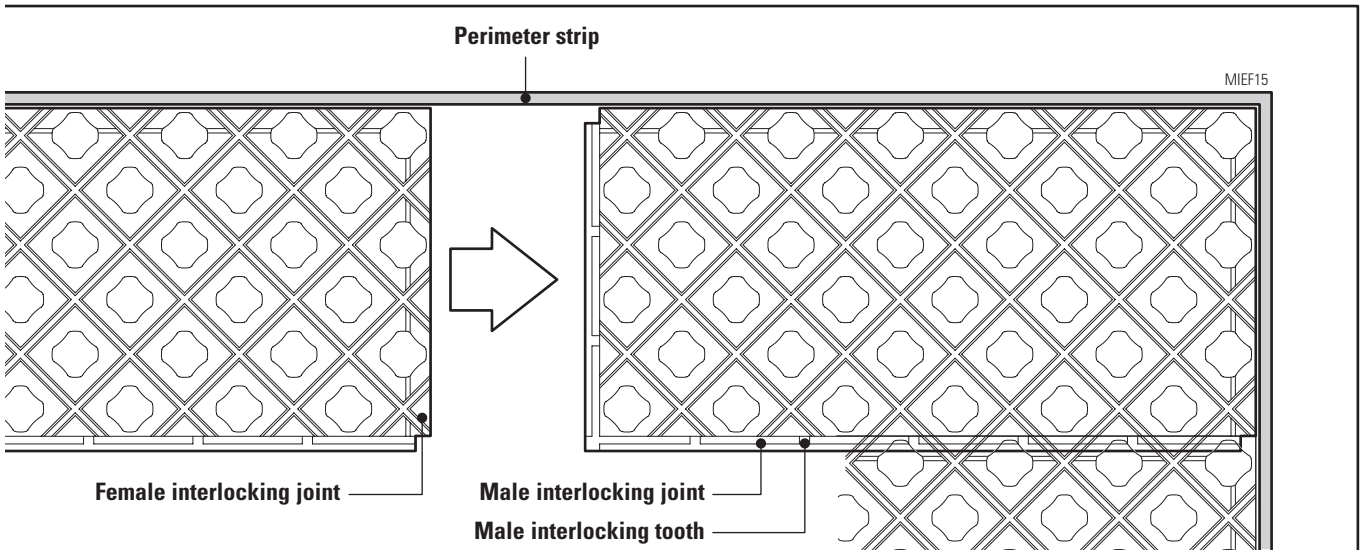
6. LAYING THE INSULATION PANELS

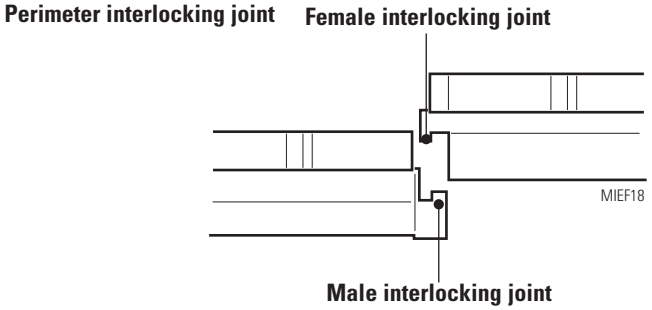
Standard Floor, Standard Combi Floor, Classic Floor, Step Floor and Step Combi Floor Panels

We recommend laying the panels starting from a corner of the room in the direction of the longest wall (Fig. 20).
Lay the panels with the female side of the interlocking joint towards the perimeter expansion joint.
Keep joining the panels through the interlocking joints, cutting them with a cutter and using the parts in excess for the subsequent rows whilst ensuring that the bosses between the rows are aligned (Fig. 21) and that the male teeth interlock correctly with the grooves in the female joints.

Fig. 20

Classic Floor and Step Floor Panels





Standard Floor, Standard Combi Floor, Step Combi Floor Panels

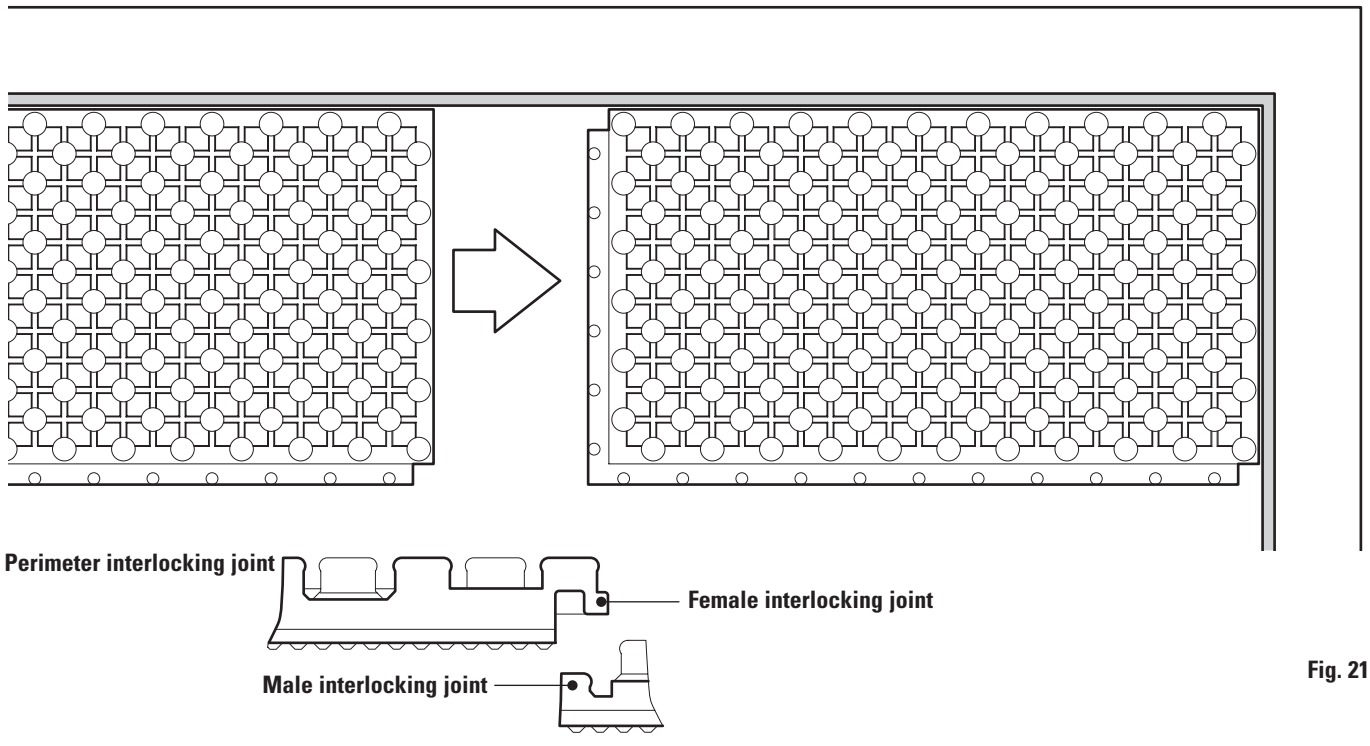


Fig. 21

Plan Floor Panel

We recommend laying the panels starting from a corner of the room in the direction of the longest wall (Fig. 22).
Lay the panels with the female side of the interlocking joint towards the perimeter expansion joint.
Keep joining the panels through the interlocking joints, cutting them with a cutter and using the parts in excess for the subsequent rows and ensuring that the alignment marks between the rows match up (Fig. 20).

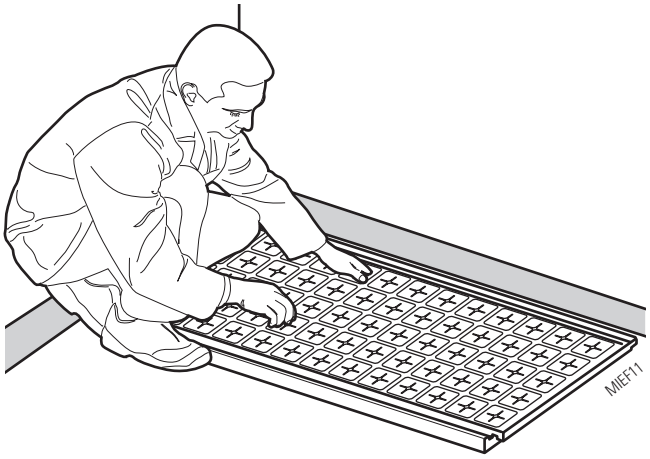


Fig. 22

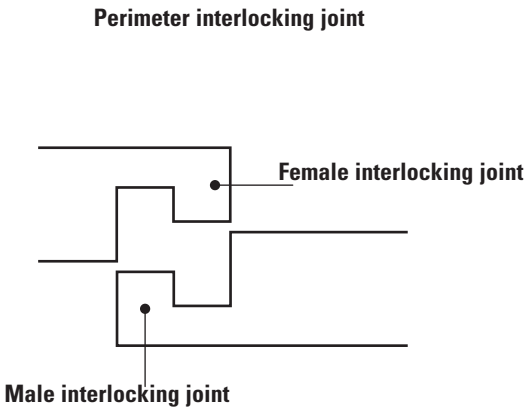


Fig. 23

Example of laying and recovering the cut part of the insulation panels of the Emmeti Floor system (Standard, Classic, Plan, Step).

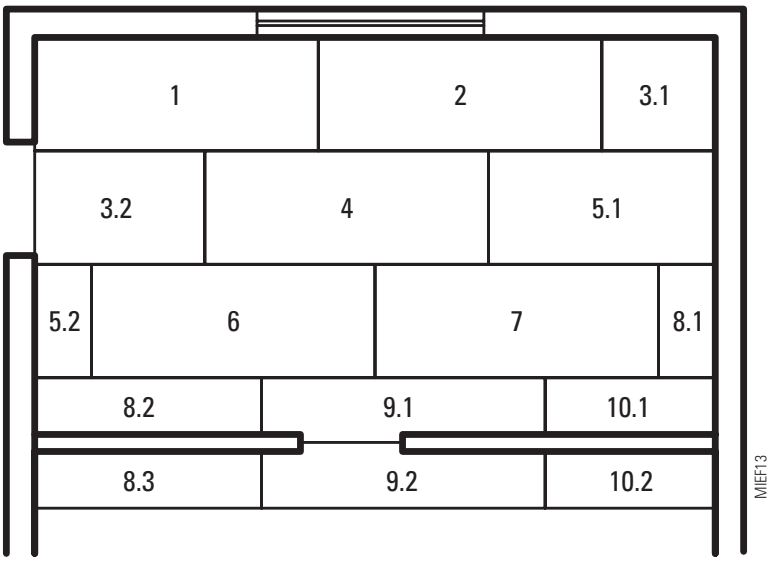


Fig. 24

Panel Roll Floor

It is advisable to start laying the roll starting from one corner of the room in the direction of the longest wall of the same, making sure that the adhesive edge is approached to the strip perimeter (Fig. 25).
Once the first row of the panel, continuing the laying of the subsequent joining by overlapping of the adhesive edge (Fig. 26).
The cut parts are reused in excess of the next row, respecting where possible alignment grid printed on the film surface, to minimize material waste (Fig. 27); sealing panels (short side), will be carried out with adhesive tape Emmeti.

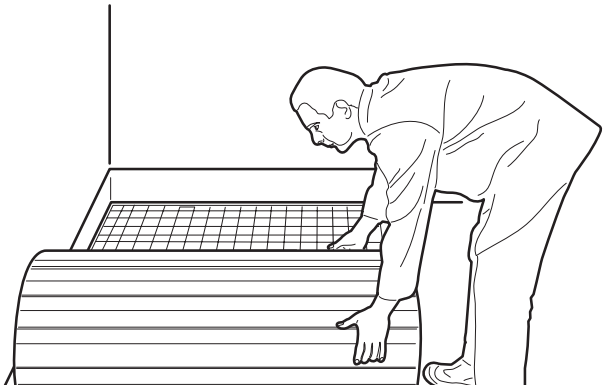


Fig. 25

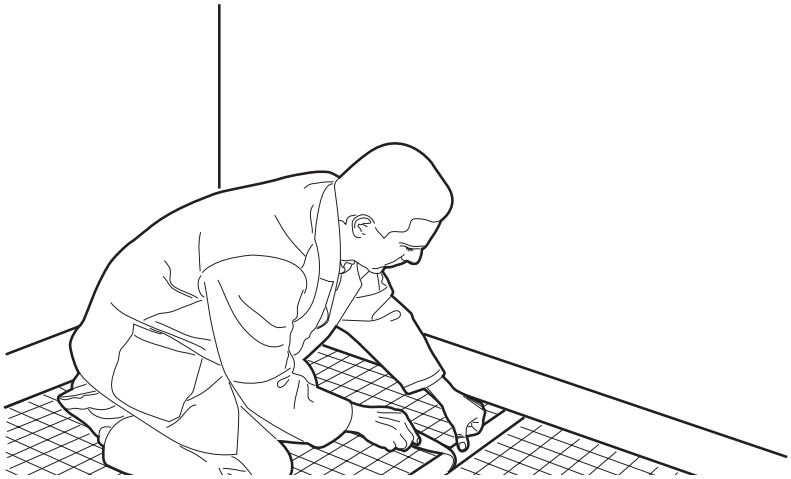


Fig. 26

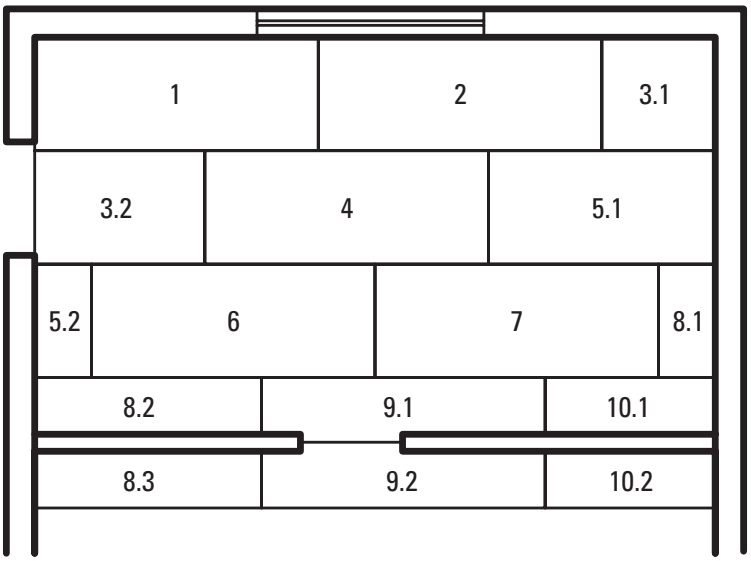


Fig. 27

Panel Grid floor

The new range of Grid Floor panels for underfloor radiant systems is characterized by the special conformation of the grid made of recycled plastic material (polypropylene), which combines the simplicity of laying the pipes of embossed systems with the advantages of flat systems in terms of heat exchange.
In fact, the pipes firmly attach to the panels and are completely in contact with the screed, which fills the perforated ashlars, improving the heat exchange of the system.
In the version without insulation, a screed above the reduced thickness of the ashlar is sufficient, thanks to the anchoring of the screed to the underlying layer. It is therefore particularly suitable for renovations as it allows for reduced total thicknesses.
The system also turns out to have lower thermal inertia.
The Grid Floor panel should be well fixed to the support layer. To this end, we recommend the use of glue, polyurethane foam or mechanical fasteners (dowels) in case this does not go to compromise the continuity of lower insulations in order to optimize adhesion, so as to avoid detachment of the panel when laying the piping and screed.
Substrates made of expanded clay or other aggregate material are not allowed.

With adhesive bottom
The bottom must be:

- Load-bearing
- Stable (no cracks, crevices, etc.)
- Perfectly flat surfaces
- Clean of dust, debris, etc.
- Treated with primer for cementitious surfaces
- If necessary, use dowels (code 28130037) taking care not to puncture pre-existing installations

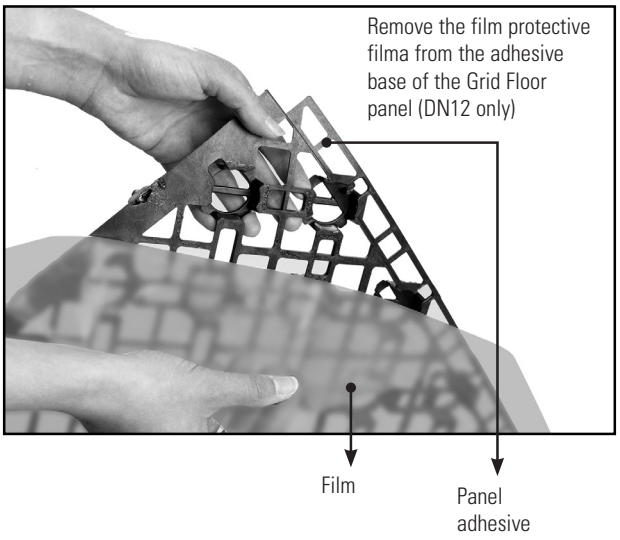
Cut panels: sheet metal shears or drywall cutter.

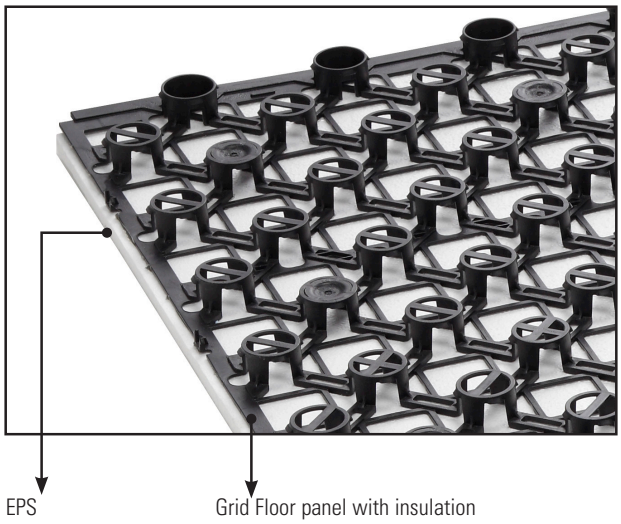
With insulation

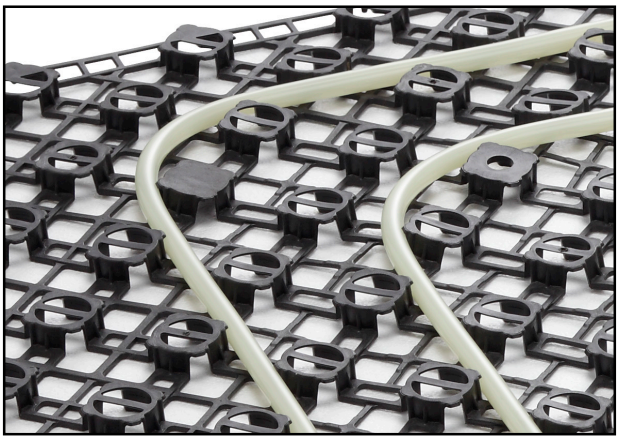
- Must be glued with coat-type glue (Recommended product: fischer FASTGRIP 800)

Panel cutting: angle grinder (flex)

Detail of perimeter joints







Klettjet system

Before laying, make sure that the substrate, on which the panel is to be laid, is as flat, smooth and clean as possible.
It is advisable to start laying the roll, both for the Klettjet EPS-T panel and the Klettjet R PE panel, starting from a corner of the room in the direction of the longest wall in the room, so that the edge is close to the perimeter strip (Fig. 28). Excess cut parts should be reused in the next row, respecting if possible the alignments of the grid printed on the surface film, to minimize material waste (Fig. 30).

In the case of EPS-T panels (thickness 25 or 30 mm) splice the panels using the appropriate 50 mm adhesive tape (Fig. 29). In the case of PE panel (6 mm thick), the film on the back of the panel should be removed before installation so as to expose the adhesive surface. In case the substrate is rough, it is advisable to check that the surface ensures perfect bonding of the panels. If necessary, evaluate the application of specific primers.

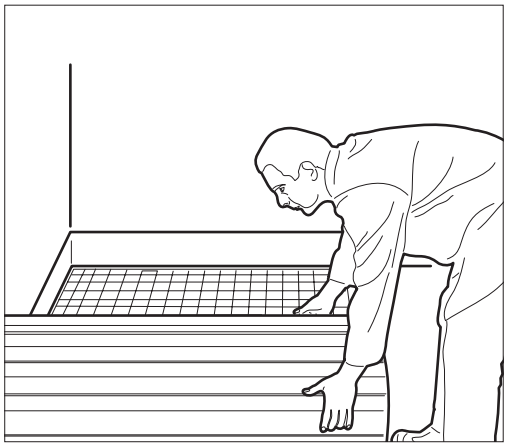


Fig. 28

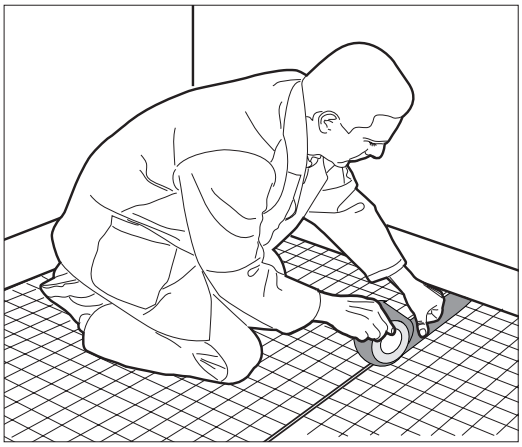


Fig. 29

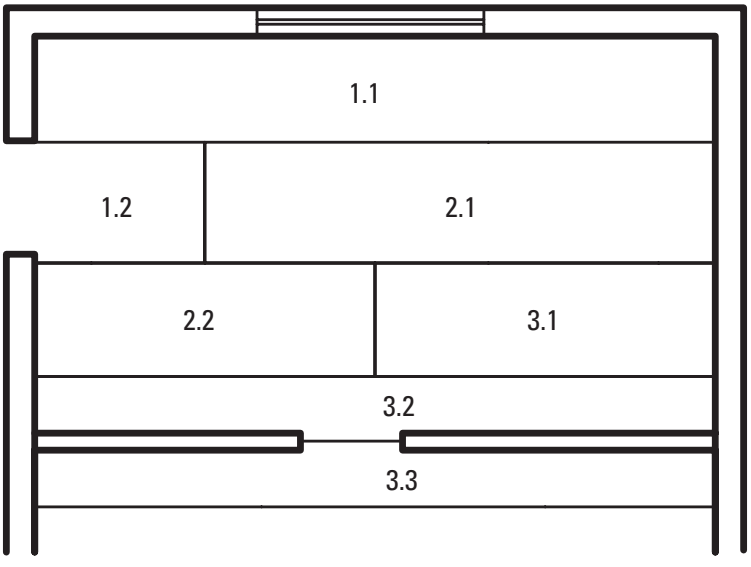
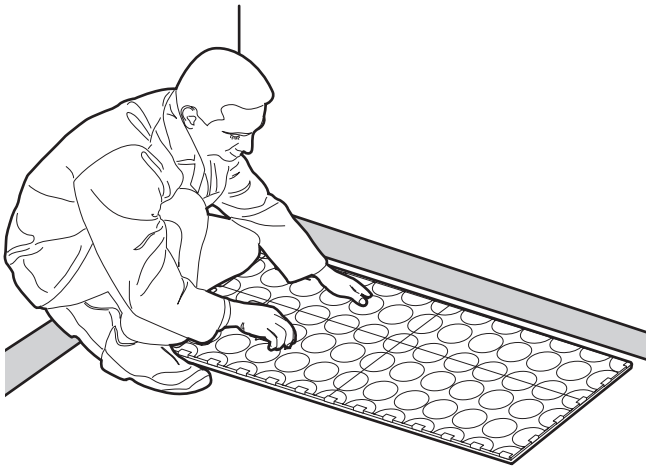


Fig. 27

Panel Thin Floor

We recommend starting the installation of the panels from one corner of the room in the direction of the longest wall of the same (Fig. 28).

Fig. 28



After removing the protective film of the self-adhesive base, place the panels with the side dovetail towards the expansion joint perimeter (the tongue and on the side resting on the perimeter expansion joint must first be removed with a large knife blade).
Ensure that the installation surface is cleaned properly to avoid difficulties of accession.
Continue joining the panels with special joints, cutting them with a cutter blade large and reusing the excess parts for subsequent rows, checking the alignment of the ashlars between a row and the other (Fig. 29) and the correct superposition of the joints male with the corresponding female joints.

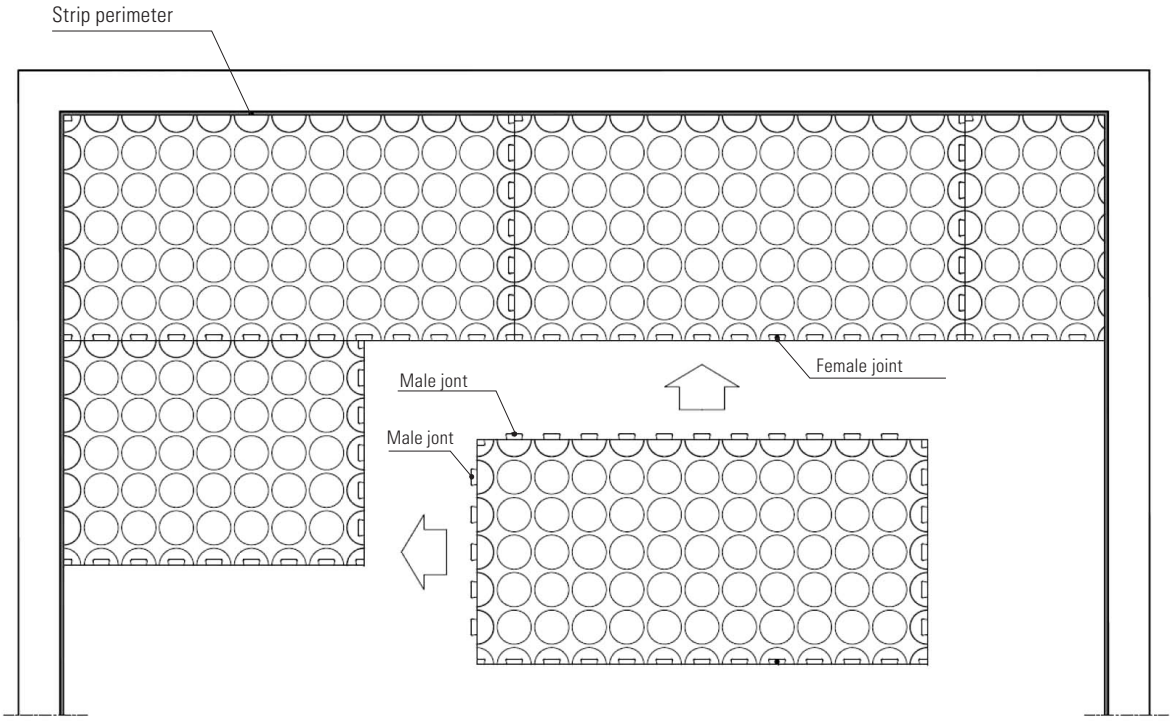
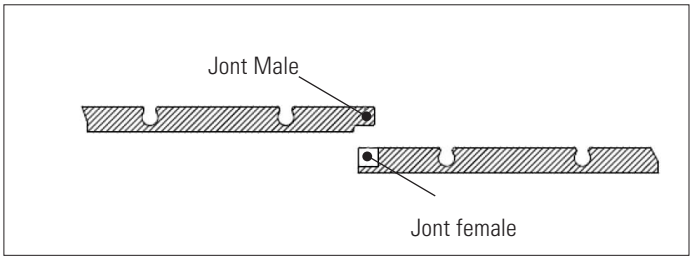


Fig. 29

Strip perimeter



Dry Alu Floor Panel

Warning

The Emmeti "Dry" system must be laid in accordance with UNI EN 1264. The surface on which the panels are to be laid must be perfectly flat and clean. If necessary, pre-emptively apply a layer of self-levelling screed. Position the panels (starting with the end panels) according to the heating engineer's layout plan (which will include the position of the panels and end panels, as well as the direction in which to lay the piping). We recommend that you attach the panels, in particular the end panels, to the underlying surface with a suitable adhesive. The end panels will be adjacent to the shorter length wall of the room in which they are being placed. In this way the circuit will require fewer curves in the piping and therefore less load loss.

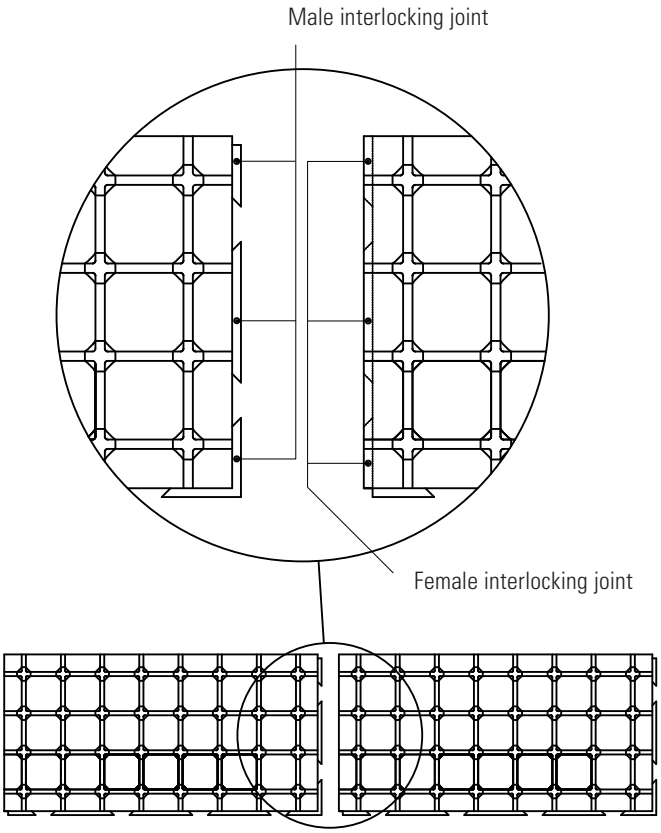
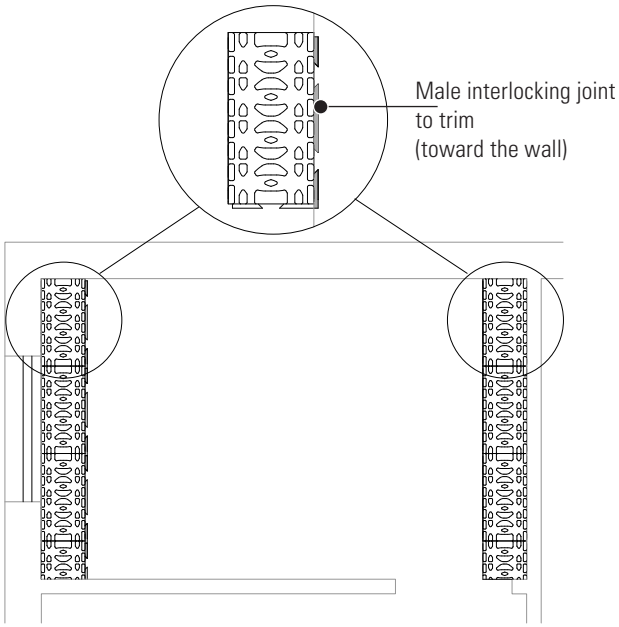
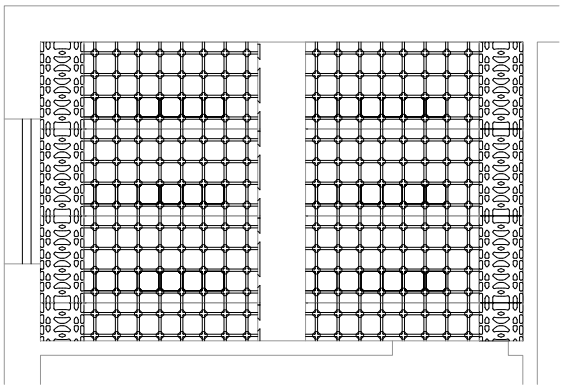


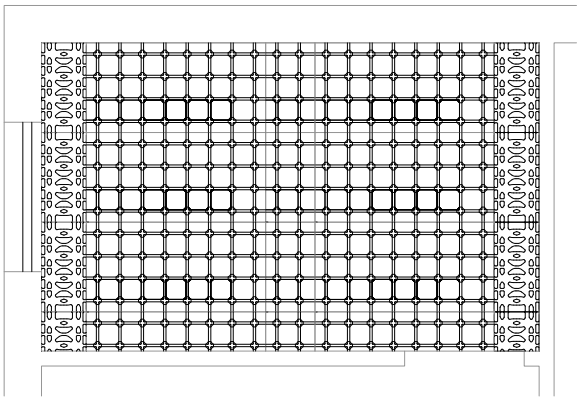
Fig. 30



Phase 1:
Lay the end panels



Phase 2:
Lay the side panels, joining them to the end panel



Phase 3:
Lay the central panels (cutting them to size if necessary)

Fig. 31

If necessary, on the basis of the layout plan, cut the panels using appropriate equipment that allows a linear and regular cut (without imperfections). It is recommended that you cut on the male interlocking side. The next panel must be placed adjacent to the cut panel given that it is impossible to lock the two panels together.
Example: the layout plan requires that one of the panels is 750 mm long (panel B). Cutting the panel on the male edge means the male interlocking joint is no longer present (panel B) so the adjacent panel (panel C) must be placed right up against the other panel.

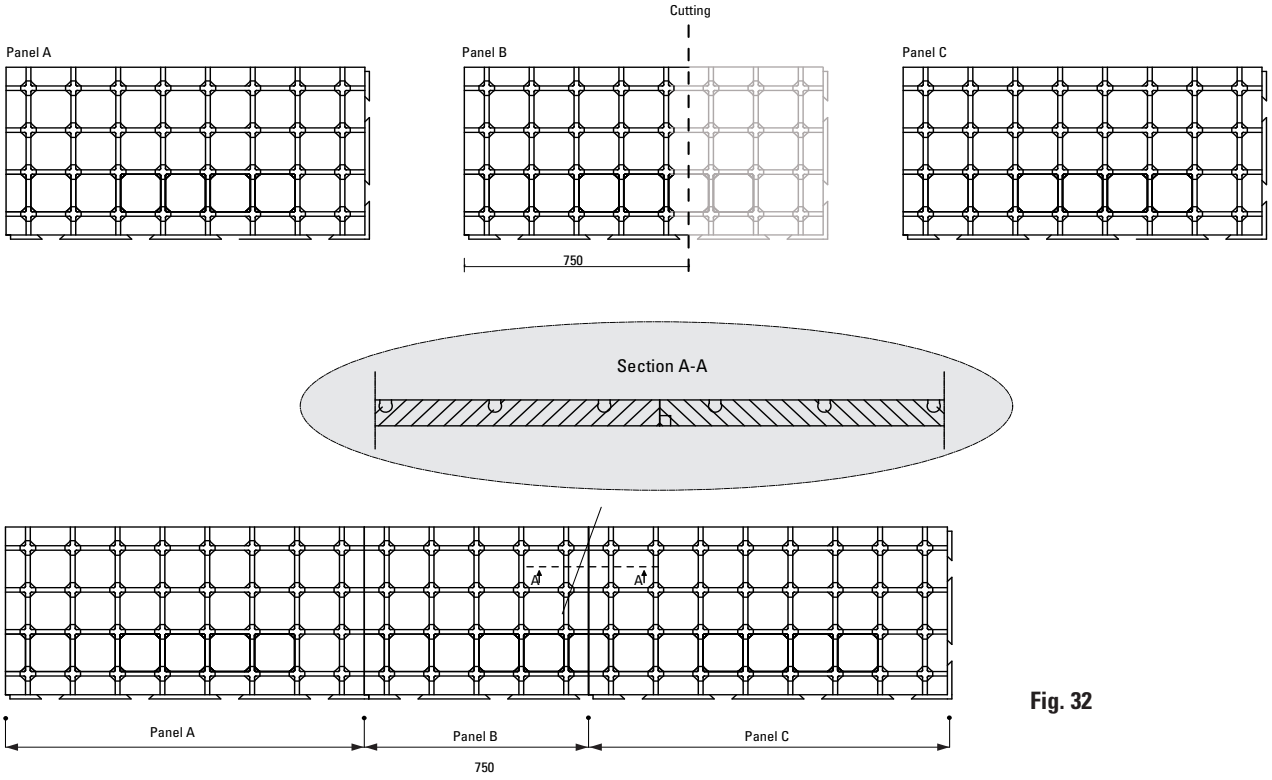


Fig. 32

At manifold distribution points or other particular points (such as doors, border spaces, etc.) it becomes difficult to lay a panel so it is advisable to instead use a filling material (of cement-based type) to fill the gap up to the same height level as the panels.

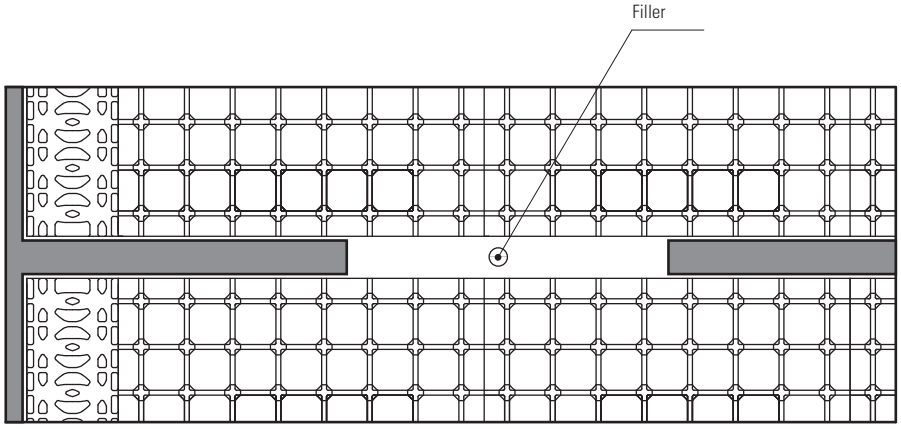


Fig. 33

Preliminary operations

Join the pipes to the flow collector (using the appropriate curve supports for PE-X piping, Fig. 34) using Emmeti single pipe unions (tightening unions) and insulate the initial part of the circuits (from the collectors up to about 25 cm into the screed) with soft insulating sheaths.

The most popular laying system is the “spiral” one, which, compared to the “serpentine” system, allows alternating the warmer pipes with the “colder” ones, thereby obtaining a uniform surface temperature and also allows laying with 90° curves that limit piping stress and pressure drops in water circulation.
The circuit design of a floor heating system can provide for different distances (or “steps”) between the pipes inside the same room.
This leads to dividing the room into "living" areas and "marginal" (or perimeter) areas.
The marginal area (Fig. 35) is the band, max. 1 m wide, along the external walls. In this area, the distance between the pipes can be smaller than the internal living area.
If the circuit develops within an area that includes both the living and the marginal area, it is called a "mixed" circuit (Fig. 36 e 37).
On the other hand, the “separate” type is used to develop circuits that are used only in the marginal living room areas (Fig. 38).

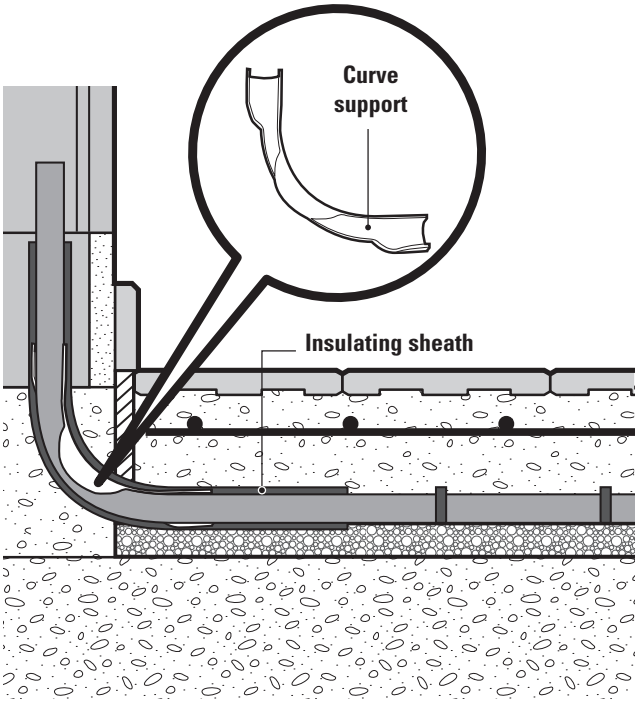


Fig. 34

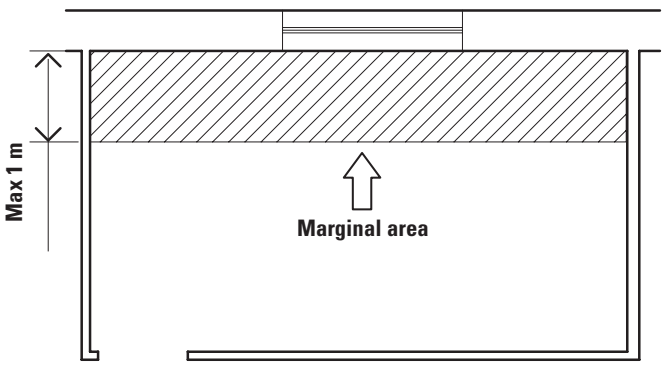


Fig. 35

Verify that the diameter of the tubes that you intend to install is compatible with the selected panel:	
Panel	**Pipe diameters that can be installed (mm)**
Standard, Standard Combi	16 - 17
Classic, Plan, Roll	16 - 17 - 20
Step Combi	16 - 17
Dry Alu	17
Thin Floor	12

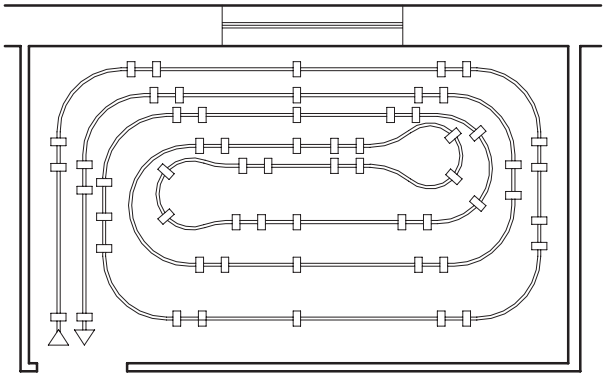


Fig. 36

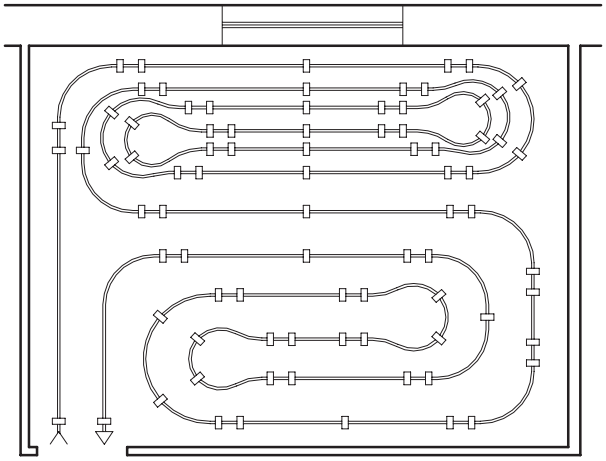


Fig. 37

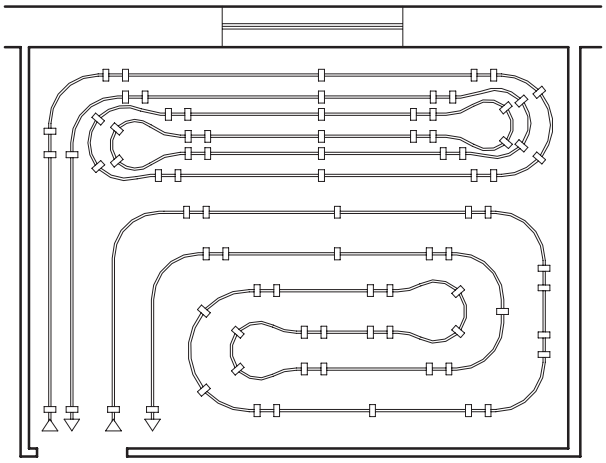


Fig. 38

Curves

The minimum bending radius of Emmeti system pipes is 5 times the external diameter of the pipe, (only in the case of PE-Xc pipe 12x2, combined with the panel Thin Floor, this value is lower).
Always observe this limit to prevent "frapping" the pipes.

Distance from vertical structures

The pipes must have a minimum 50 mm distance from vertical structures.
Before installing the pipe, we recommend marking the areas involved in each circuit on the panels to facilitate installation without any errors.
Based on the working drawings of the system, ensure that the roll has enough length to create various circuits in order to minimise swarf.
Bear in mind that it is essential to cut about 10 cm off the ends of the new rolls as this gets damaged during inspection operations.

Roll unwinder

The practical Emmeti roll unwinder (for rolls up to 600 m), allows for quick and easy pipe installation (Fig. 39).

Plan Floor System

Start laying the pipe by unwinding the roll in the opposite direction from which it is wound and then fasten it to the panels with the Tacker clip fixing tool (Fig. 40).
It is recommended to position the clips approximately 30-40 cm from each other, taking care never to place them in the middle of the pipe bend. Figure 41 shows the correct positioning of the clips along 90° and 180° bends.

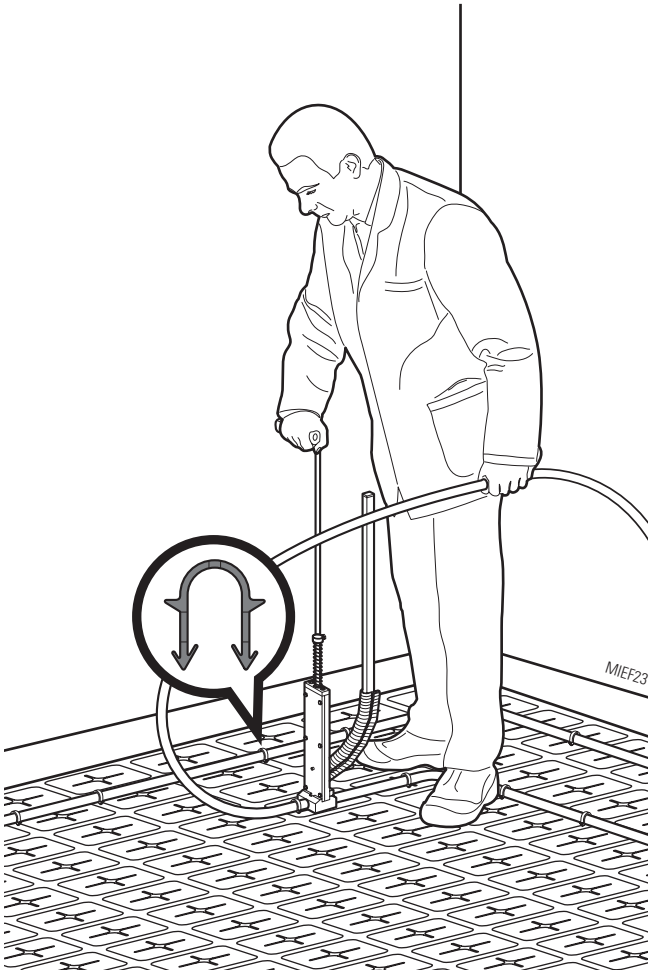


Fig. 40

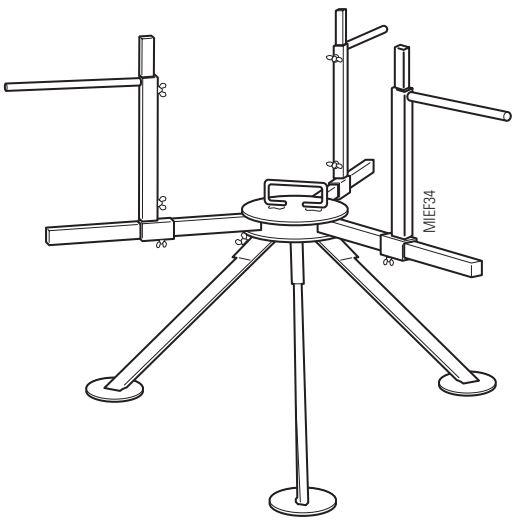


Fig. 39

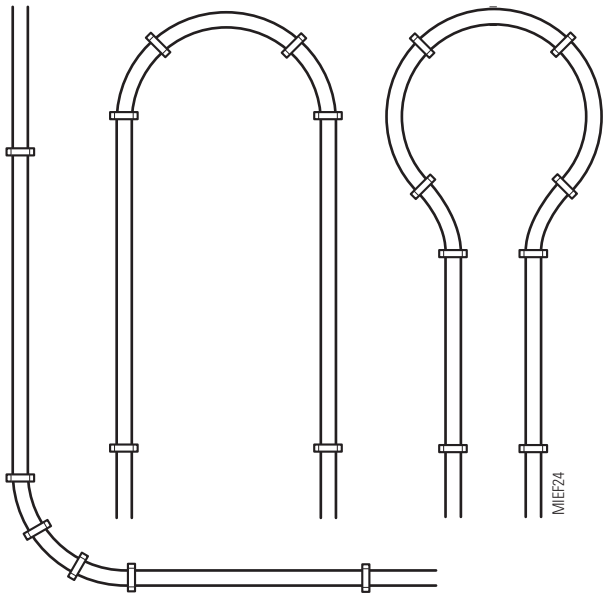


Fig. 41

Standard Floor, Standard Combi Floor, Grid Floor, Classic Floor and Step Combi Floor Systems

For Standard Floor and Standard Combi Floor (*), Classic Floor and Step Combi Floor panels, correct piping installation does not require the use of tools; this is made possible by the particular surface shape of the panels characterised by surface bosses that allow inserting the pipes into the interlocking joints with simple foot pressure (Fig. 42), checking that the pipes have been secured and keeping them under the walking surface to prevent any accidental scratches.
If necessary, use plug or manual clips (Fig. 43) to anchor the pipe to the panel.

(*) With the lower Standard Floor and Standard Combi Floor panel (H = 10mm), we recommend using the Alpert multilayer pipe and plug clip.
(**) On Grid Floor, it is recommended to use the fixing dowel to improve the anchorage of pipe and panel.

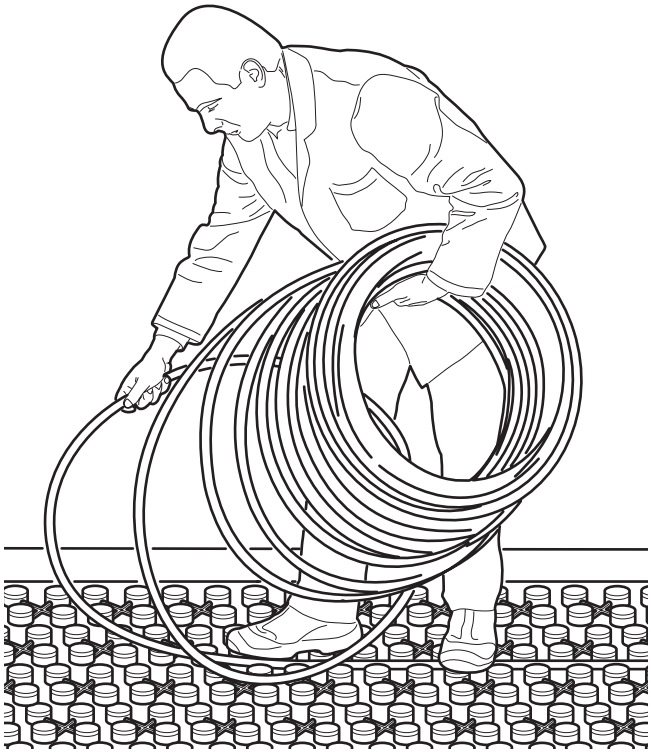


Fig. 42

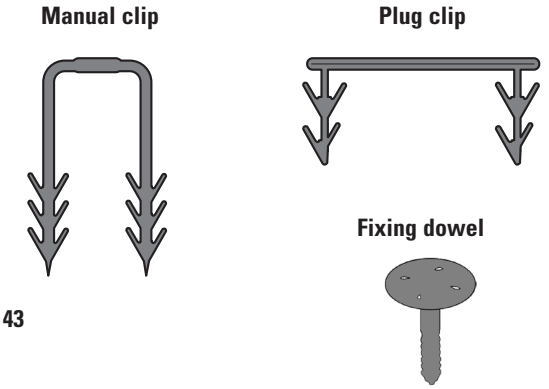


Fig. 43

Standard Floor, Standard Combi Floor, Grid Floor, Step Floor and Step Combi Floor panels over 50 mm

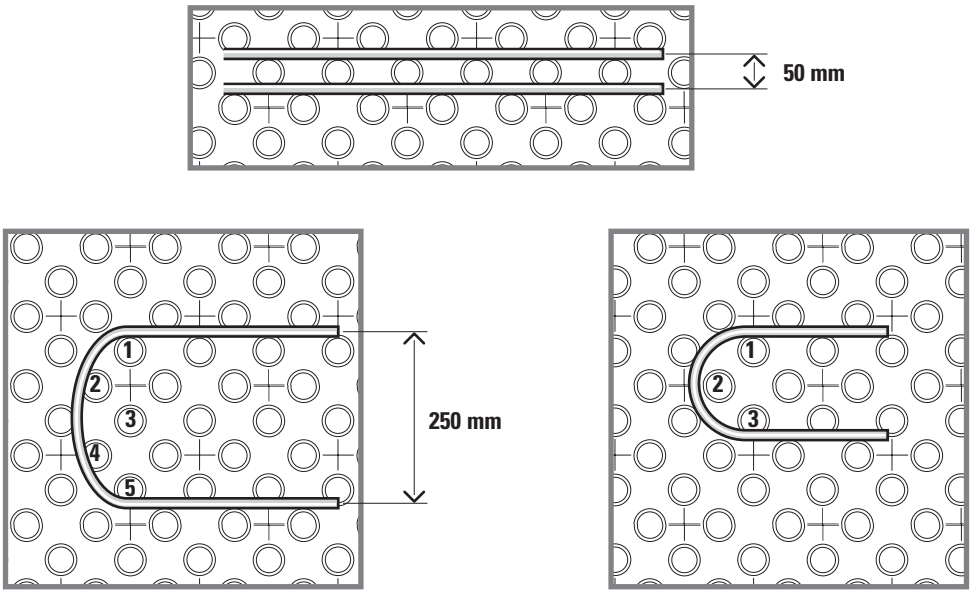


Fig. 44

Classic Floor panel over 75 mm

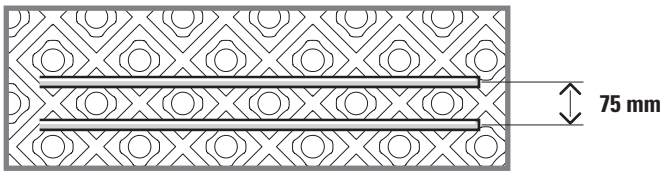
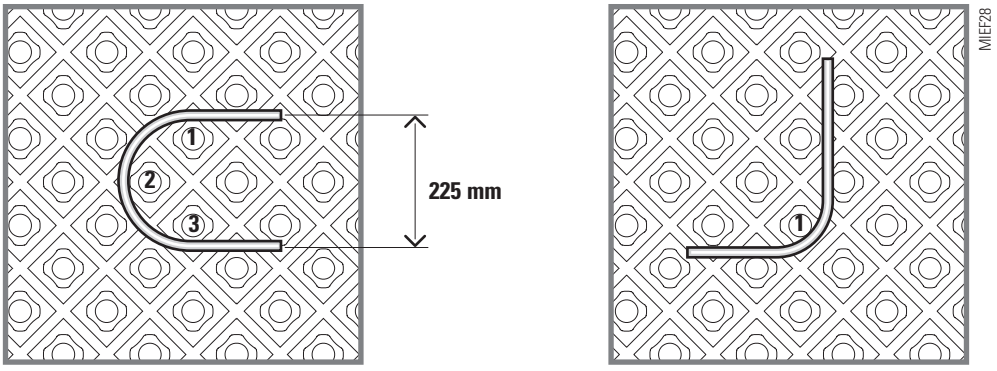


Fig. 45



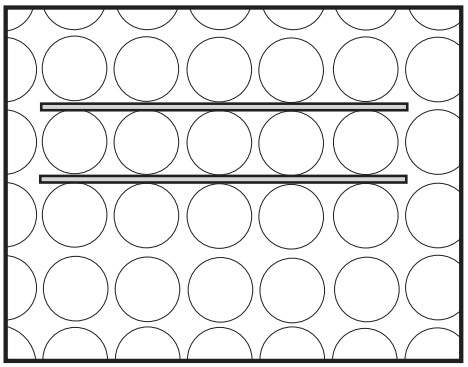
YES

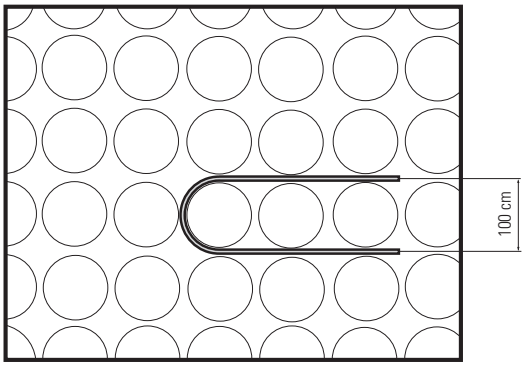
180° curve on 3 bosses

NO

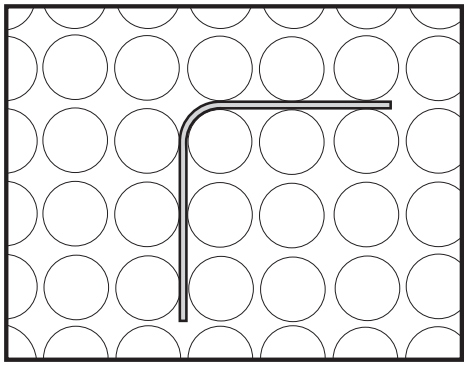
90° curve on 1 boss

Panel Thin Floor - step 100 mm





SI - Curve on 180° su 1 bugna



SI - Curve on 90° su 1 bugna

Fig. 46

Dry Alu Floor Panel

Use 17x2 piping for the circuits (PE-Xa is recommended).
With this type of panel the laying system can only be "serpentine" (Fig. 31).

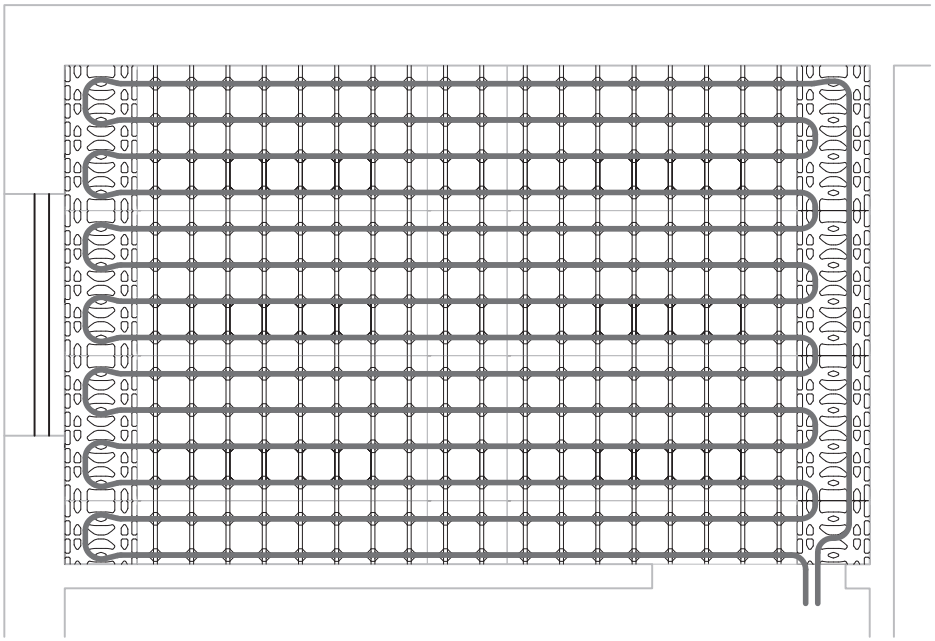
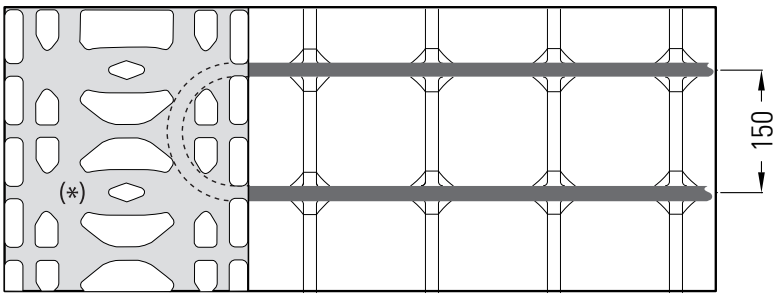
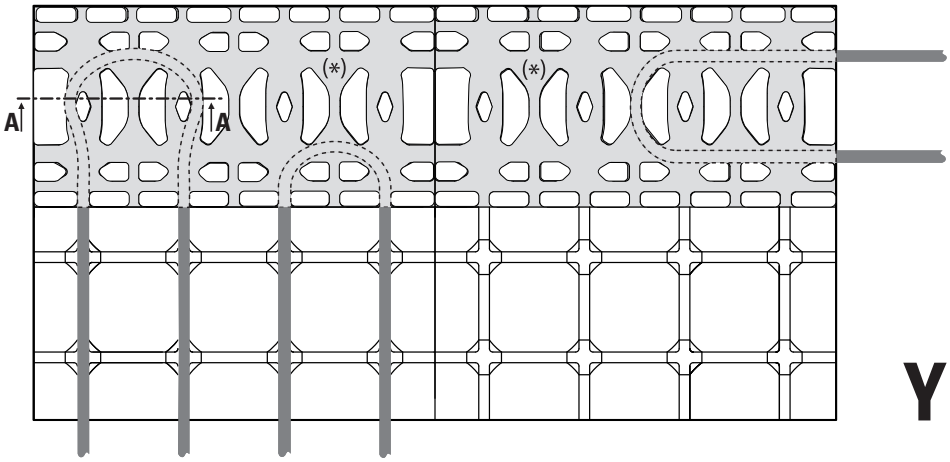


Fig. 47



It is recommended to cover the piping at the end panels (*) with grout or self-levelling screed, taking care to fill any empty space between the bosses by skimming and smoothing flush with the top of the panel.



YES

Section A-A

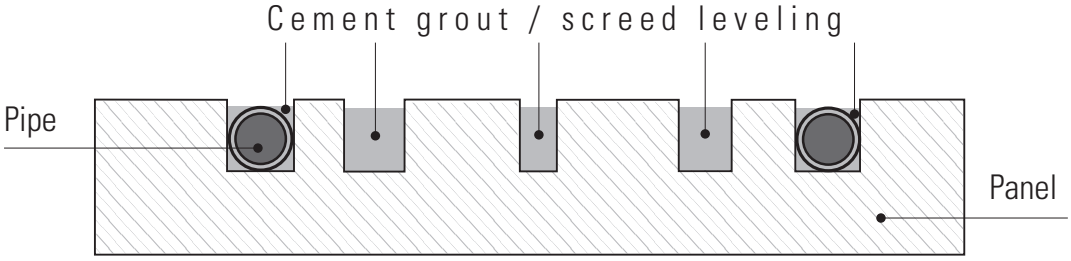
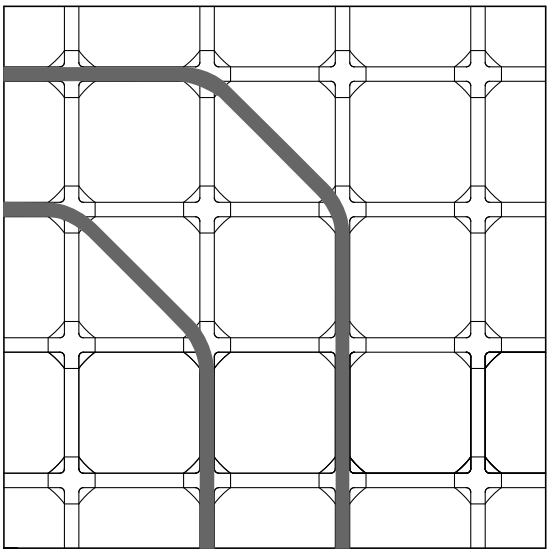


Fig. 48



The Dry panel is predisposed for the laying of pipes at 45° by cutting the aluminium laminate.

Final operations

Once the laying of the circuit is finished, connect the pipes to the return collector using the same system described for the flow collector. We recommend taking note of the length of the single circuits and their location (pipes are marked numerically every metre) and write it on the collector to simplify the checks between the design lengths and actual lengths. This data is very useful for carrying out the correct hydraulic balancing at a later stage.

Once the system is installed, in the event of any modification with respect to the working drawings, the distribution of the circuits starting from the manifold must be indicated in the building plan. A copy of this documentation must be handed to the owner of the building.

Warning

The floor heating system is not visible and time confuses the memory.

Fig. 49

Klettjet system

For the installation of the Pex Penta Klett pipe it is recommended to use the appropriate gloves.
Fasten the support for the pipe (Fig. 53) between the shoulders of an access door according to the following indications.

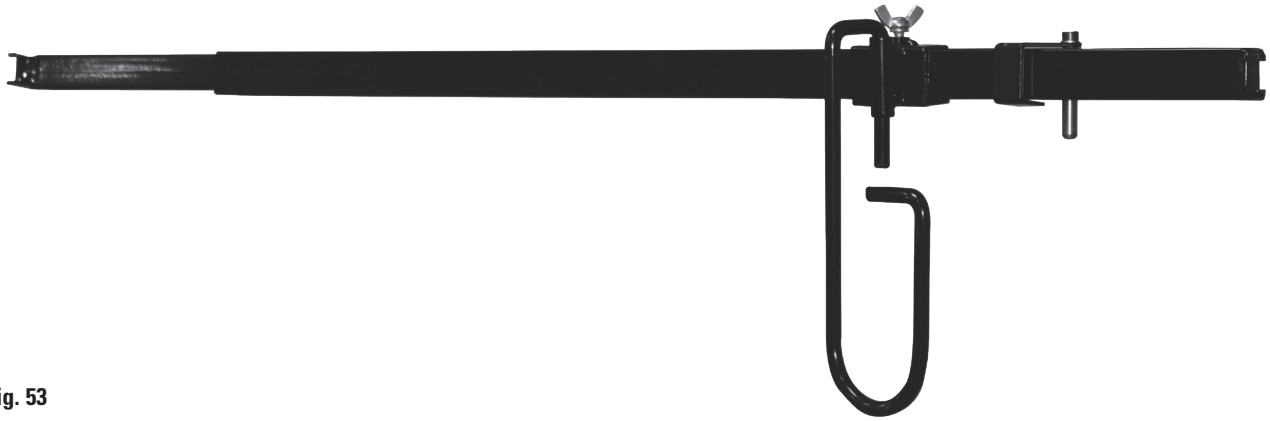
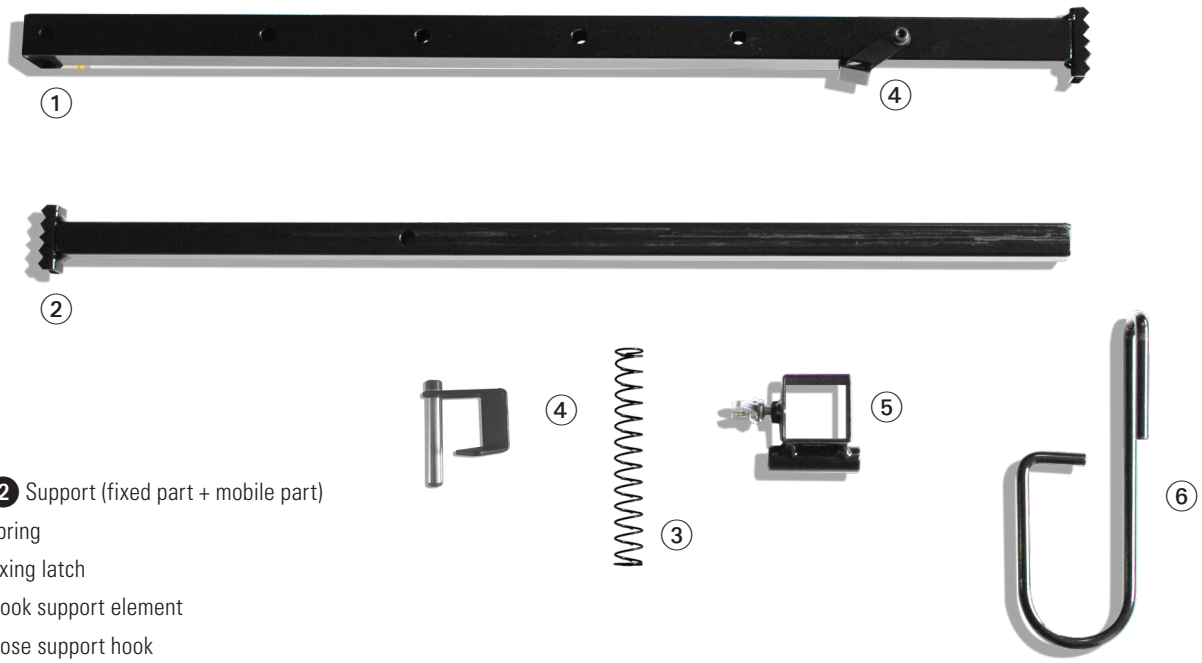


Fig. 53



1 + 2 Support (fixed part + mobile part)
3 - Spring
4 - Fixing latch
5 - Hook support element
6 - Hose support hook

- Remove the fixing bolt (4)
- Remove the mobile part of the support (2) and the spring (3) from the fixed part (1)
- Insert the bolt into one of the holes on the fixed part of the support according to the width of the door (for a 90 cm wide door place it on the second hole as shown in figure 53-1)
- Reinsert the spring first, then the mobile part of the support
- Position the hook support element (5) in correspondence with one of the remaining holes and lock it by tightening the wing nut
- Compress the mobile part of the support on the fixed one and release it after positioning it in correspondence with the door at a height of 140 cm from the floor. Insert the hook (6) into its support.
- Pass the pipe inside the hook and lay it over the panels installed according to the project diagram following the grid drawn on the panels (see figure 54) with the simple pressure of the foot (figure 55). The tube will be fixed to the panel due to the presence of the velcro on both. In case of changes to the installation, the pipe can be easily removed and then reattached.

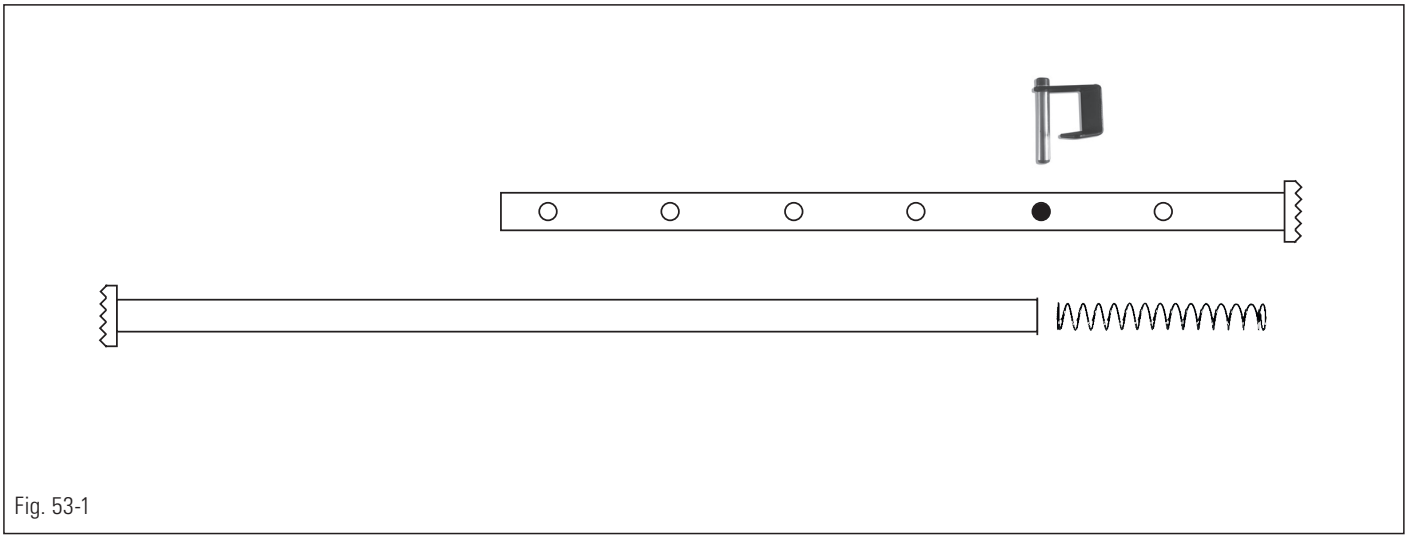
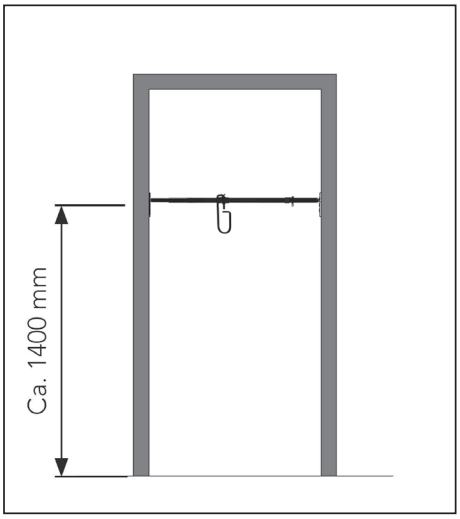


Fig. 53-1

Bolt insertion hole for 90 cm wide doors



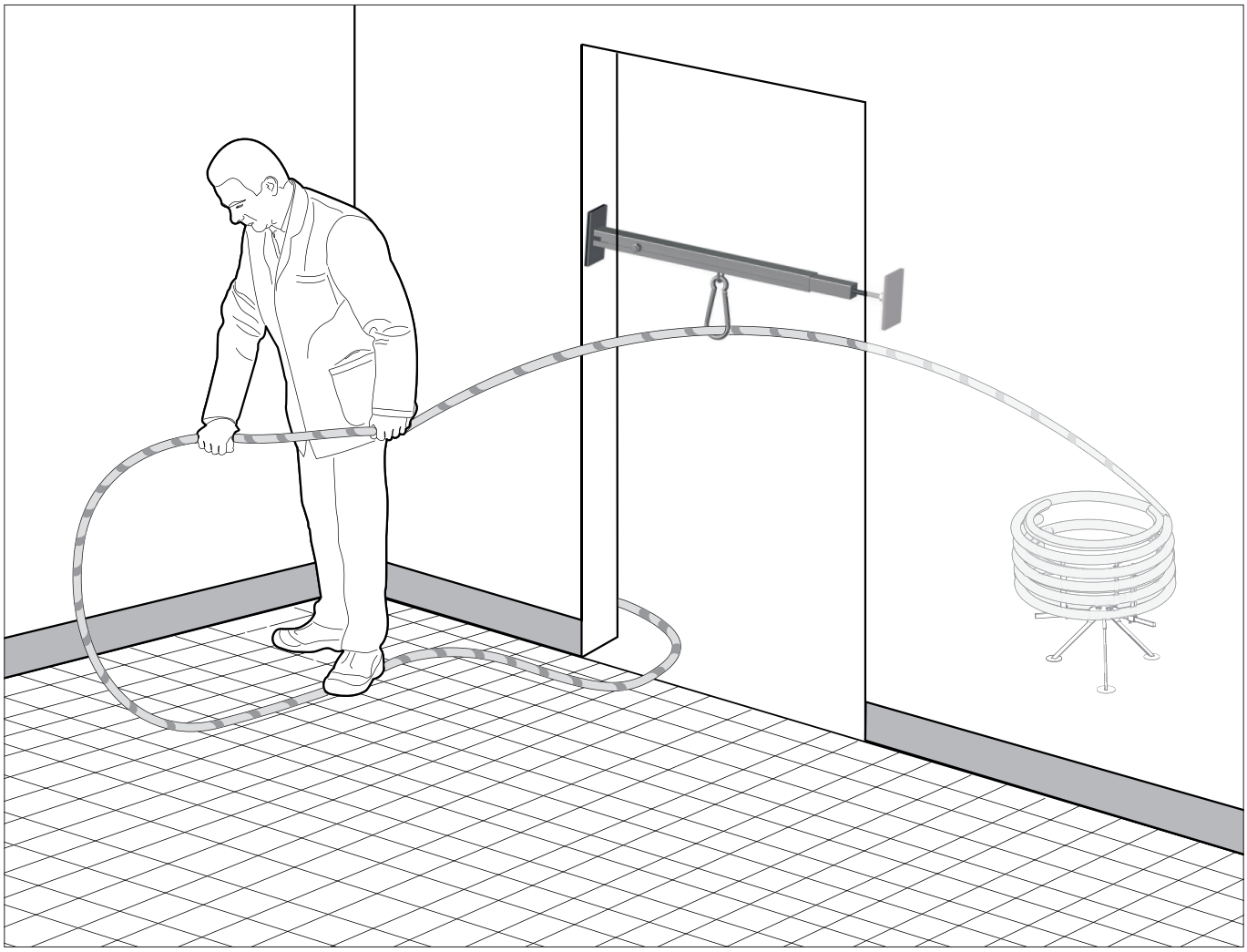


Fig. 54

Route PexPenta Klett pipe through the snap hook and place it above the panels installed according to the project and following the grid drawn on the panels (see figure 54) with the simple pressure of the foot (Fig. 55).
The pipe will be fixed to the panel for the velcro presence on both.
In the event of laying changes, pipe can be easily removed and refitted.

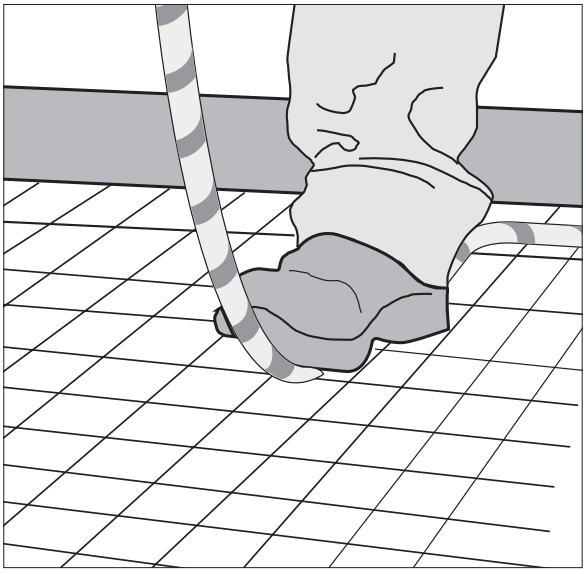


Fig. 55

8. INSPECTION AND PROTECTION OF THE PLANT

Once the circuits have been laid, the plant must be loaded using drinking water with a hardness less than 15° fr and operating gradually, one circuit at a time, to allow a rapid expulsion of the air.
Subsequently, inspect the system with water at a pressure of at least 6 bar.
In the event of freezing risks, use anti-freeze products; once the risk is over, these products must be removed by emptying the system before rinsing it.
In any case, the operating pressure must be maintained even while pouring the radiant screed.

The treatment of the water in the heating plants (UNI 8065) envisions chemical conditioning to prevent microbiological formations such as algae, mould, bacteria, which develop in the circuits in the presence or not of oxygen.
These problems are exacerbated in periods when there is no circulation (plant standstill) and low operating temperatures of the underfloor plant.
It is therefore advisable to treat the water using the relevant Emmeti anti-mildew and anti-limescale liquid.
To eliminate the air efficiently and continuously, it is recommended to install a deaerator (air microbubble separator) and to close all points of possible absorption of air into the plant, including automatic air vent valve caps.

The testing of the system can be run with potable water, clean and filtered, or oil-free or or inert gas compressed air.
Testing with water:
The **hydraulic test** for **heating systems** is carried out according to what is provided by UNI EN 14366 and UNI EN 1264-4, with a testing pressure al least equal to (1.3 x operating pressure), and in any case ranging between 4 and 6 bar, to retain for at least 120 minutes. For details, refer to what is indicated in the standards.
Testing with air:
Testing is carried out in two phases, leak test and load test, using pressure gauges with a resolution of 1 mbar and an adequate detection method (for example soapy water). The loading test follows the leaking test, if the latter has a positive outcome.
Leak test is carried out by filling the system with compressed air at a pressure ranging between 110 and 150 mbar, to maintain for at least 30 minutes, for volumes up to 100 liters. For higher volumes, the duration of the test shall be increased by 10 minutes per 100 additional liters.
The load test is carried out by filling the system with compressed air at a pressure of 3 bar (up to size 50x4) or 1 bar (for sizes ≥ 63x4.5), to maintain for at least 30 minutes for volumes up to 100 liters. For higher volumes, the duration of the test shall be increased by 10 minutes per 100 additional liters.
At the end of the testing, the installer must compile and release to the customer the appropriate report, downloadable via the following link:

9. LAYING A SCREED COVERING

The screed covering is an essential structural element that must be made with extreme care by specialised personnel shortly after laying the pipes (to prevent their excessive exposure to light) in a single monolithic layer according to the indications of the construction designer.
It must have good mechanical strength, thermal conductivity (I≥1,2 W/mK, in compliance with UNI 10351 and UNI EN 1264) and adequate fluidity, which can be improved by using the specific Emmeti fluxing additive (*).

A radiant cement screed is normally obtained by appropriately mixing the following components:

- certified quality low-shrinkage cement
- Clean aggregates; composition: 50% sand (0-4 mm) and 50% gravel (4-8 mm).
- clean drinking water
- chloride-free additives that have no negative effects on the screed and on the system components.

(*) Dosage: 1 litre x 100 Kg of cement

The use of a radiant screed containing special binders or inert gas must be approved by the construction designer and the composition of such a substrate must be guaranteed and certified by the manufacturer.
The mechanical strength class of the heating screed must be suited to the loads provided for by the design of the structure (flooring) and must meet construction standard requirements.

Warning!
All products which may cause a worsening of the screed conductivity are prohibited (e.g. aerating additives).
The use of other additives together with the Emmeti fluidifier need to be agreed with our technical office.
Avoid premixed screeds or binders sensitive to moisture in the event of systems for summer cooling.
The electrowelded meshes must be preferably arranged toward the bottom screed surface (at about 15 - 20 mm from the pipe) and in any case they have not to be in contact with the pipes (see Fig. 56).
We recommend galvanized iron meshes, for screeds (anti-shrinkage type), Ø 1.75 - 2 mm.

Attention!
In the case of anhydrite screeds laying (self-levelling), the use of electrowelded meshes must be verified by the works management, together with their manufacturer **.**

The electro welded meshes should be arranged towards the lower surface of the screed (approximately 15 - 20 mm from the pipe) and never in contact with the piping (see Fig. 50).
We recommend using galvanised iron meshes Ø 1,75-2 mm for screeds (anti-shrink).

Warning!
In the event of anhydrite screeds (self-levelling), the use of electro welded meshes must be verified from construction management, with manufacturer of the same.

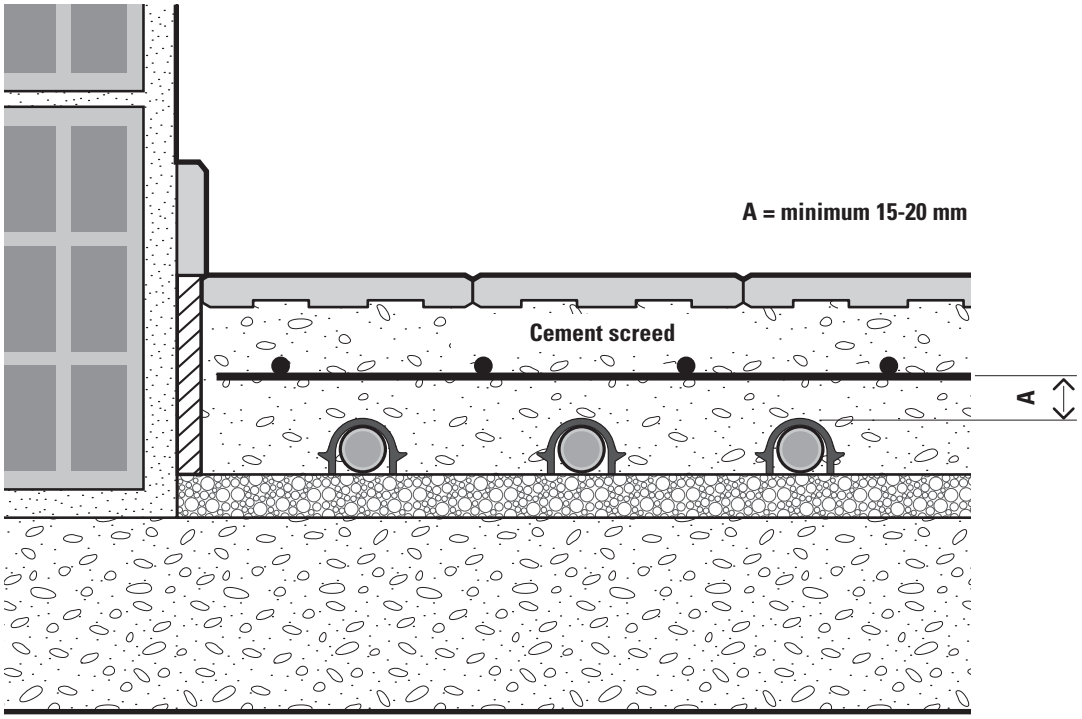


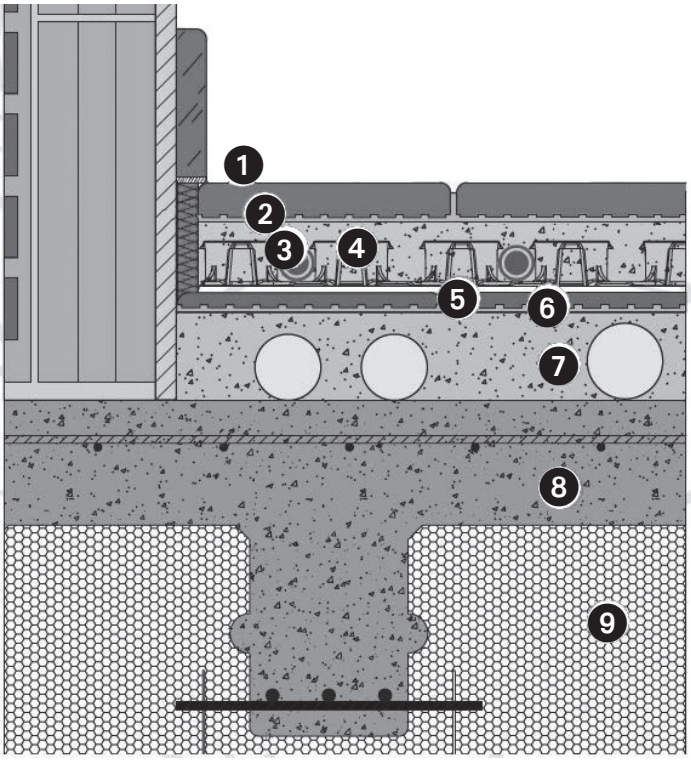
Fig. 50

The insulation panels and the piping must be protected against damage before and during the laying of the screed; if necessary, place some boards or other such items to prevent the passage of wheelbarrows and operators from deteriorating them.
Prevent excessive stress on the panels so as not to compromise their insulating effects.
The creation of a radiant screed on an insulating layer requires special precautions even during the setting and curing phase; in particular, once laid, it must be protected against drying, direct sunlight and negative effects of heat and drafts to prevent the formation of cracks or anomalous shrinkage ("sail" effect).
When laying the screed, its temperature and room temperature must not go below 5 °C.
Subsequently, a temperature of at least 5°C must be maintained for at least 3 days.
Therefore, the door and window fittings must already be installed and closed otherwise the openings must be closed off with polyethylene sheets.
However, once the concrete has been cast, it is advisable to protect it by wetting the surface with damp cloths or nebulised water, or by covering it with polyethylene tarpaulins to reduce plastic shrinkage.

Screeds fluids generation.
In case of laying of screeds fluids generation, particularly suitable for the realization of installations with low thickness (for example in conjunction with panels lowered as the THIN FLOOR), thickness and effective method of laying
They must be defined with the manufacturer of these screeds, depending on the installation conditions (size and type laying surface, type floor, etc.) and the type of substrate chosen. The choice of surface finish should take into account the type and thickness of screed used.

Panel in anchorage

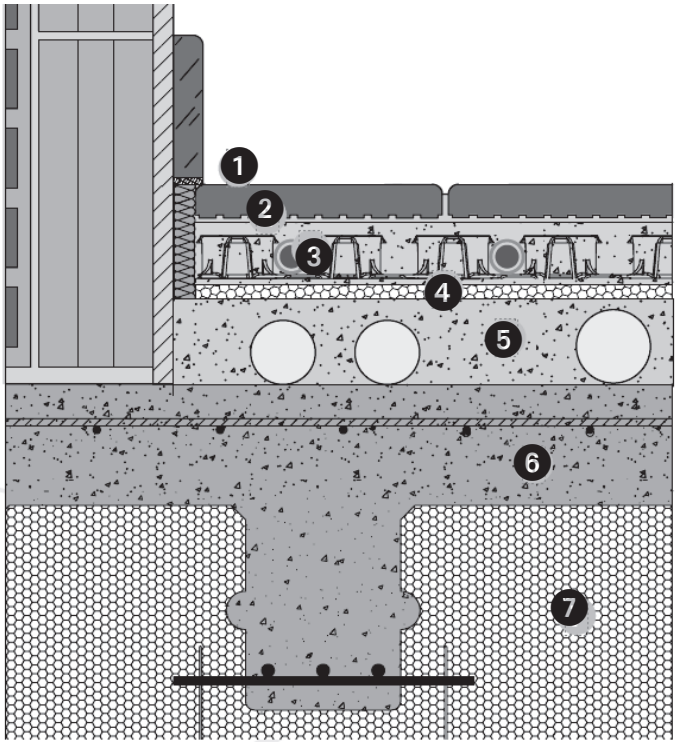
Using a state-of-the-art fluid screed and using a pump system for installation, it is necessary to achieve a minimum thickness of 8 mm above the ashlar. To ensure at all points of the installation the minimum thickness of screed it is essential that the panel/pipe system is well anchored to the substrate, for this purpose it is recommended to ensure that the substrate is perfectly flat clean and free of cracks. It is also recommended to use a primer and where necessary use mechanical fasteners (dowels) to ensure perfect adhesion.



1. Ceramic finish
2. Cementitious screed
3. Piping
4. Panel
5. Existing finish
6. Primer
7. Lightened screed for plant cover
8. Concrete slab
9. Thermal insulating slab

Panel in anchorage

Using a state-of-the-art fluid screed and using a pump system for installation, it is necessary to achieve a minimum thickness of 8 mm above the ashlar. To ensure at all points of the installation the minimum thickness of screed it is essential that the panel/pipe system is well anchored to the substrate, for this purpose it is recommended to ensure that the substrate is perfectly flat clean and free of cracks. It is also recommended to use a primer and where necessary use mechanical fasteners (dowels) to ensure perfect adhesion.



1. Ceramic finish
2. Cementitious screed
3. Piping
4. Panel
5. Lightened screed for plant coverage
6. Concrete slab
7. Thermal insulating slab

Method

The load and heat distribution layer for this system is formed of a double layer of galvanised steel plates.

Once the circuits have been completed and before proceeding with the installation of the double layer of plates, it is necessary to establish a separation layer consisting of polyethylene sheet.

On top of this must be placed the first layer of galvanized sheeting. Plates without an adhesive side should be used in this first layer. Instead, the plates with an adhesive side should be used for the second layer and should be laid with the adhesive side towards the first layer (face down). In this way the two layers will stick together. The two layers of plates must be offset from each other (meaning that the joins of the first layer should never coincide with the joins of the second layer).

It is important to avoid overlaps between plates of the same layer.

It is also necessary to leave a gap of 1 or 2 mm between one plate and another.

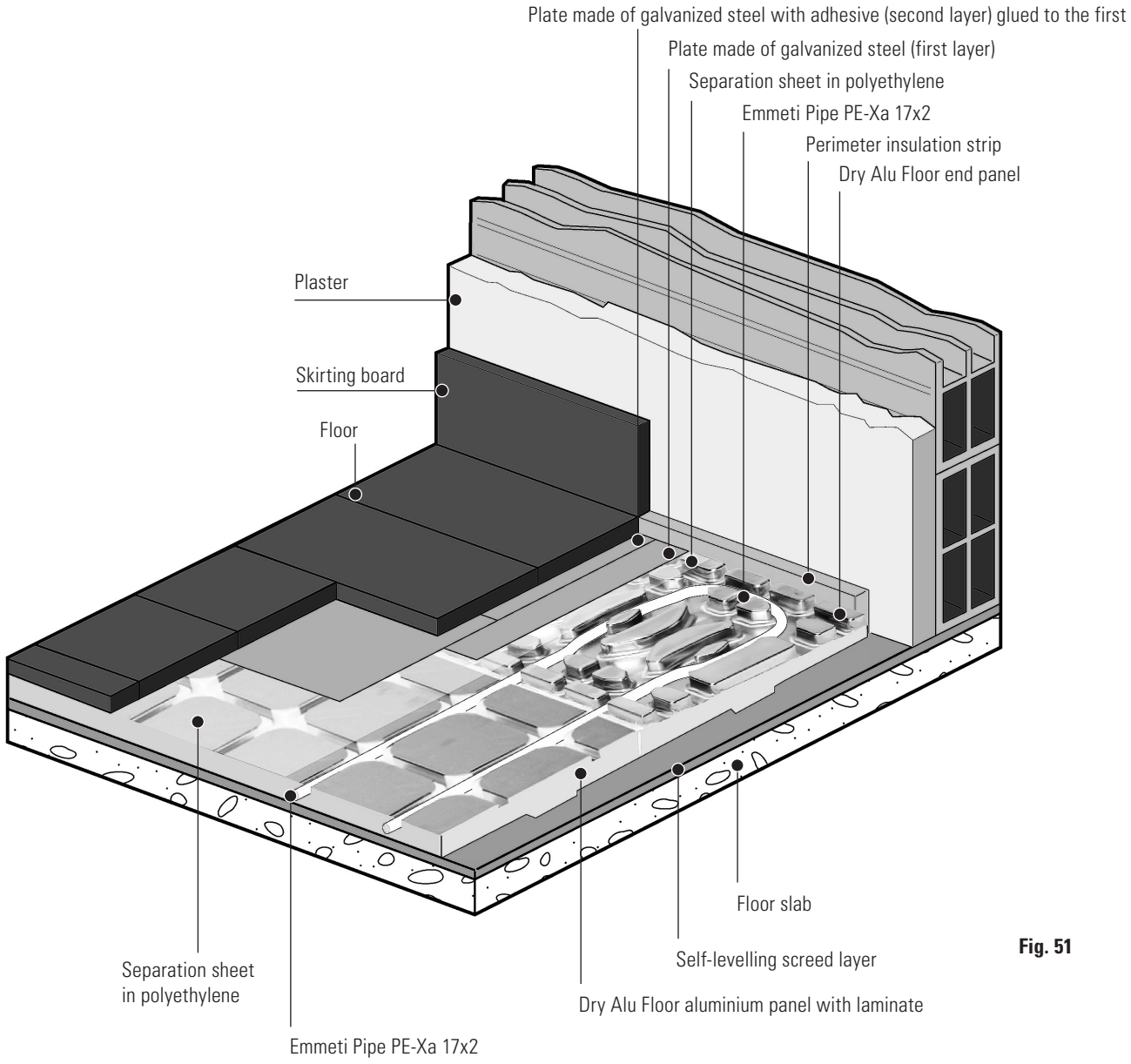
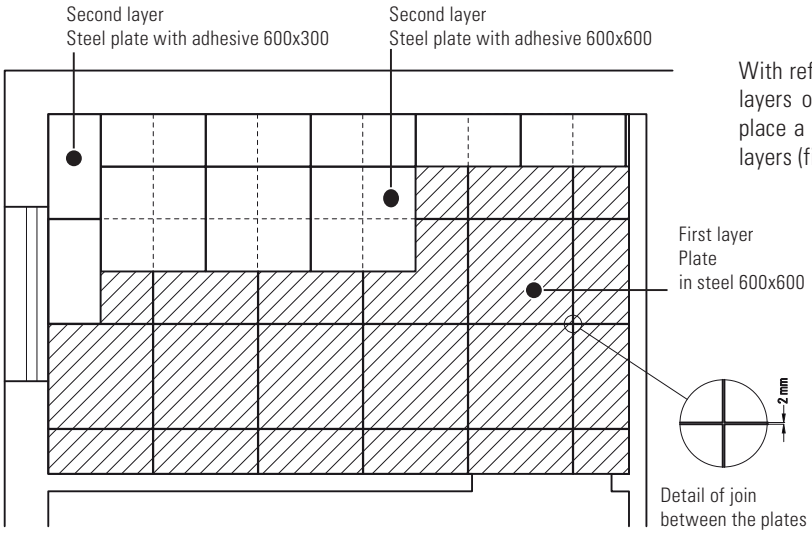


Fig. 51



With reference to an elastic joint (see chapter 11. Partial cuts), the two layers of sheets should not be glued together. It is recommended to place a sheet of polyethylene between the two galvanised steel plate layers (fig. 53)

Fig. 52

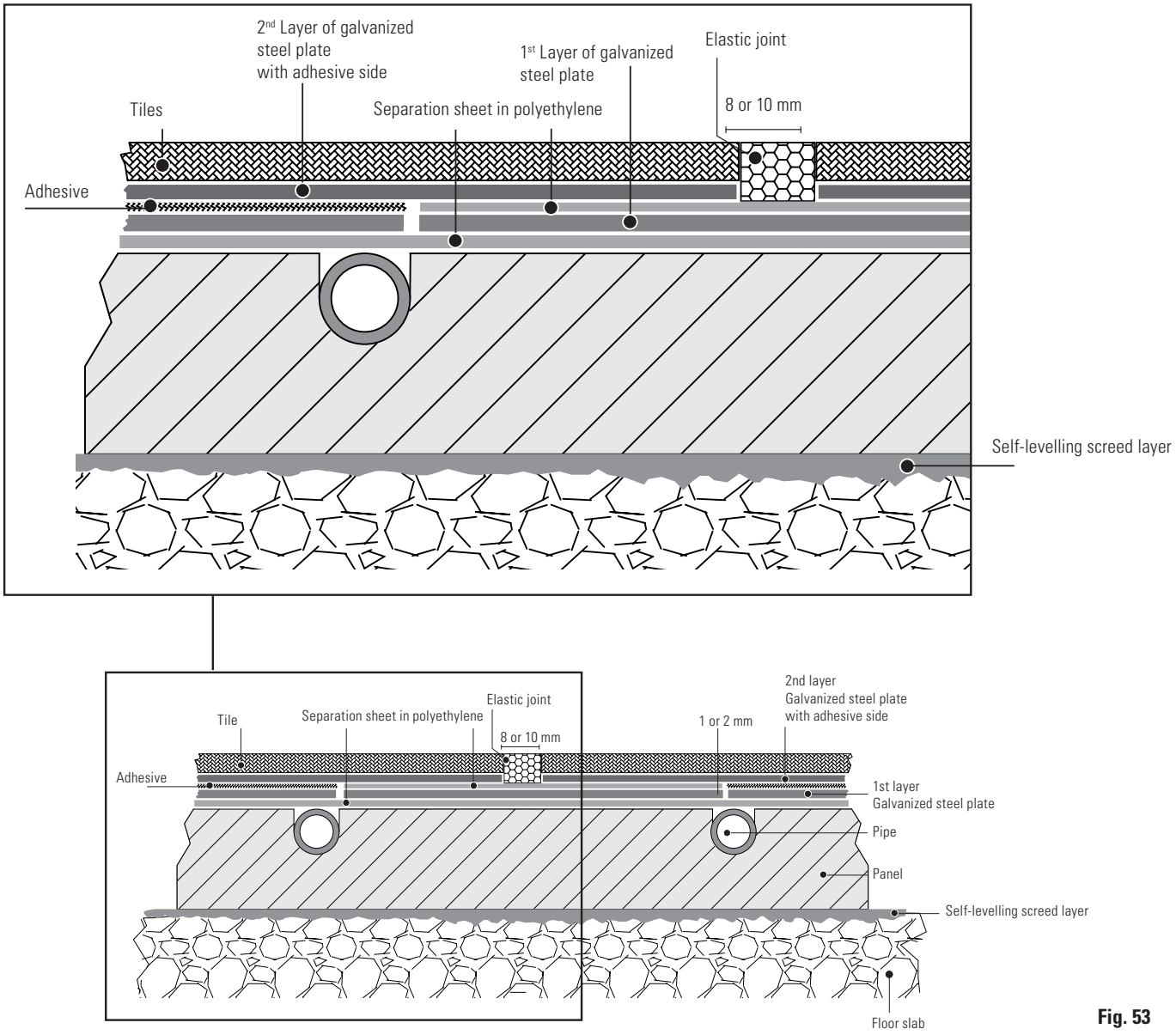


Fig. 53

Coverage of the dry system can be done with the installation of two layers of gypsum fibreboard (also known as plasterboard), whose characteristics and use are the responsibility of the manufacturer.

In correspondence with doors and surface areas larger than 40 m² or with sides longer than 8 metres (as indicated in the working drawings) partial cuts must be made equal to one third of the screed thickness, and left until the flooring is complete when they need to be filled in with an appropriate elastomeric material (Fig. 54). For the dry system, the cut should only be to the upper plate layer (see fig. 53).
In the event of wooden or linoleum flooring, or fitted carpets, these cuts can be avoided.

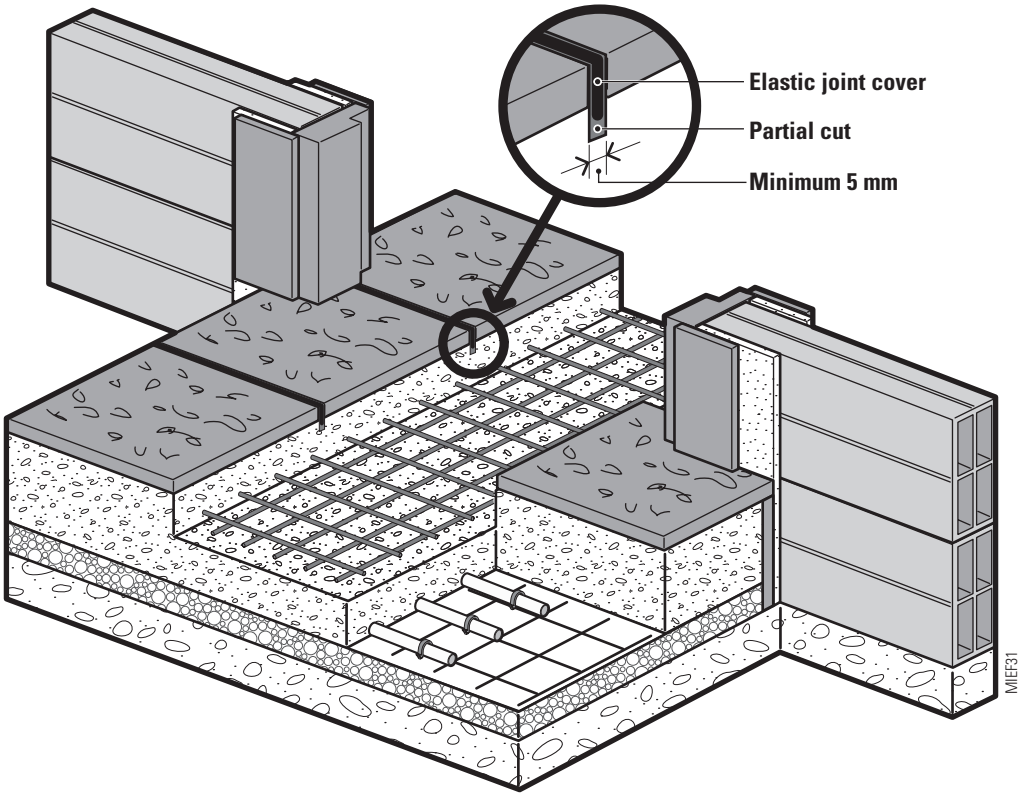


Fig. 54

Examples of partial cuts

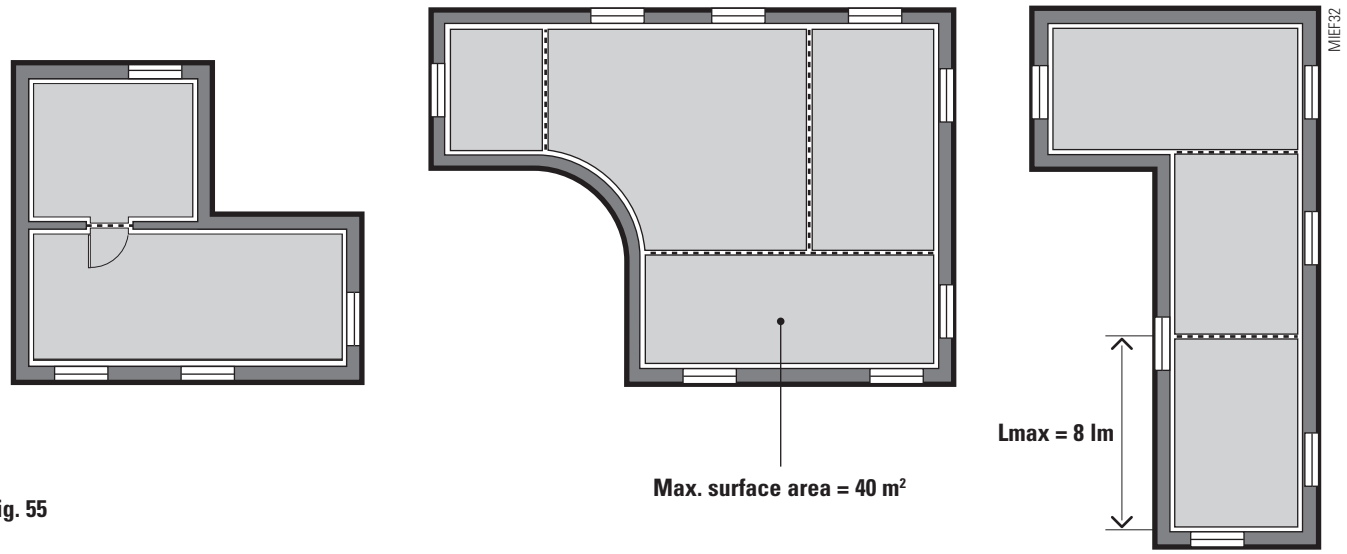


Fig. 55

In the event that the piping crosses screed expansion joints or structural joints, cover the pipes with an insulating sheath at least 20 cm on each side in correspondence with the crossing sections (Fig. 56).
The expansion joint must be copied on the flooring with appropriate joint cover profiles (by the flooring installer).

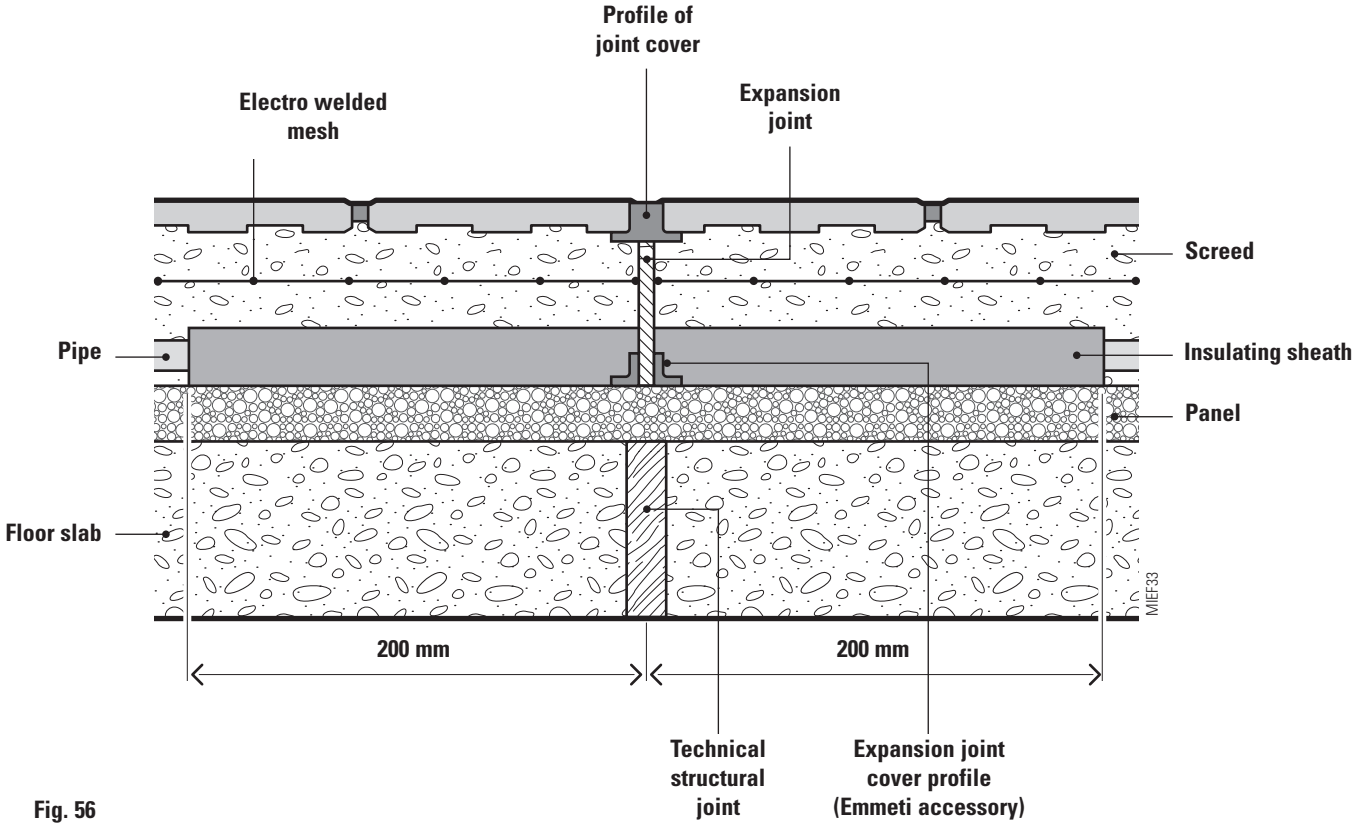


Fig. 56

Detail of profile joint cover (example)

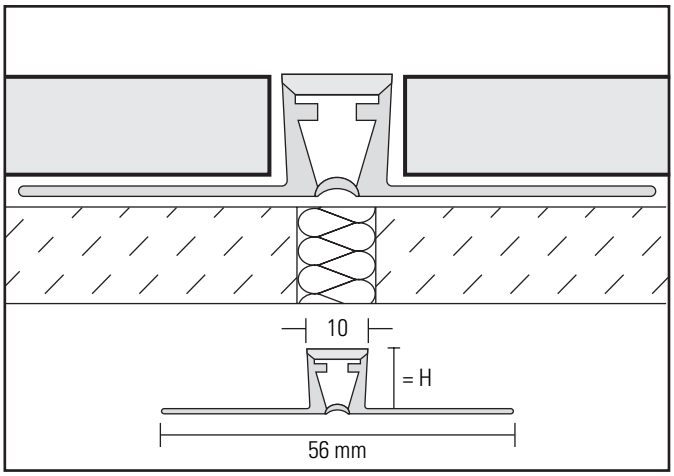


Fig. 57

Note: Not required for GRID FLOOR

13. FIRST START-UP OF THE SYSTEM

This operation must be carried out at least 21 days after laying the cement screed in compliance with the manufacturer's instructions and at least 7 days after in the event of anhydrite screeds.
The initial heating starts at a supply temperature ranging between 20 °C and 25 °C, which must be maintained for at least 3 days. Subsequently, the maximum design temperature must be set and maintained for at least 4 days.
Should the screed heating be started with the flooring already installed (e.g. wet bed stone or cotto tile flooring installation, etc.), the heating procedure must be gradual. Start by keeping the delivery water temperature of the system between 20 ° C and 25 °C for three days and then increase it by 5 °C every three days until reaching the maximum design temperature, which must be maintained for a minimum of four days. The heating start-up process must be documented. The report can be downloaded via the following link:

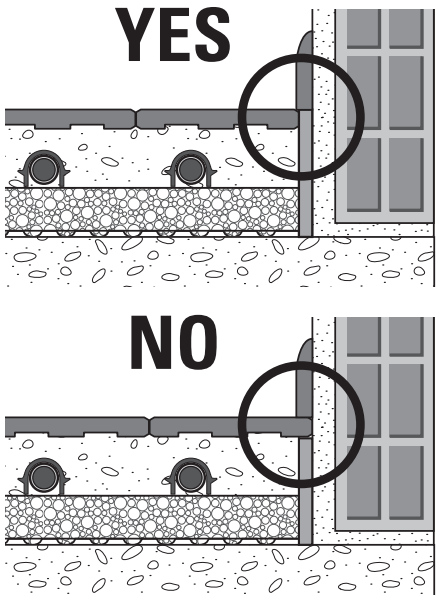
14. INSTALLATION OF FLOORING AND SKIRTING BOARD

There are no limitations to the choice of covering for a radiant floor heating system provided that it has a thermal resistance below 0.15 m^2K/W (UNI EN 1264). Ceramic, cotto, natural stone, marble or "Venetian" are the best suited floorings for this type of system; in the event of wooden ones, on the other hand, it is important to accurately verify the thickness to prevent excessive insulation phenomena resulting in a poorer thermal efficiency. It is also essential to prevent air bubbles from forming between the screed and the floor covering. Before installing any type of flooring, the radiant screed must be heated for it to be completely dried and its behaviour in terms of thermal expansion must be verified.
Floor coverings must be laid only with the system off and sufficiently cold. As for wooden flooring, we recommend leaving the planks/parquet for at least one week inside the room before installing them in order to allow them to adapt to the new thermohygrometric conditions.

Warning
The flooring must be installed by laying it close to the insulation strip before cutting any excess off the strip to leave it flush with the floor covering (Fig. 58).
The absence of this expansion space will cause the flooring to break and a noise bridge will form!
Use an adequate elastic material to seal the joint between the flooring and the skirting board (or tile).

Dry System
In the case of the Dry Alu Floor system, the laying of finished surfaces will require the use of special adhesives designed for metal surfaces (usually polyurethane type glues).
In the case of laying floor tiles, allow at least 4/5 mm between the tiles and use suitable elastic fillers. It is advantageous to use tiles that do not exceed a size of 40 cm per side.

Installing the skirting boards
The contact between the skirting boards and flooring creates noise bridges. This is why we recommend using a spacer (of approx. 0.5 mm) when installing the skirting boards.
For cotto or marble skirting boards, or for a wall/flooring joint in the event of tiles or stone/marble coverings, use elastic sealants (silicone-based) to fill the joint between the flooring and the skirting board.



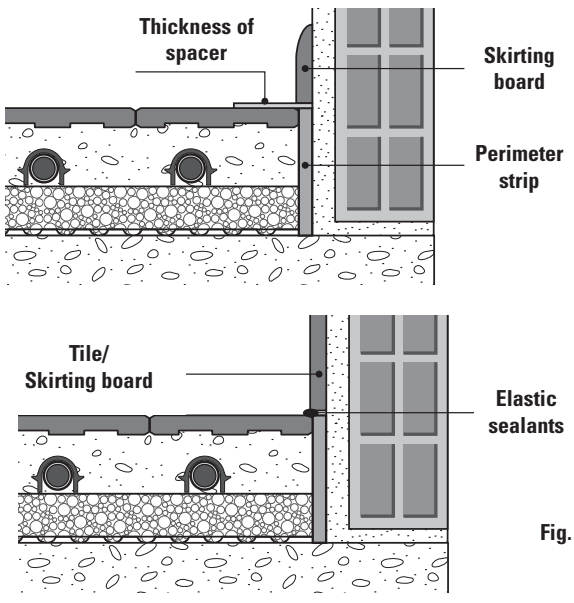


Fig. 58

Efectuar un control preliminar, verificado que en cada local la altura disponible para la instalación sea aquella prevista en función del tipo de soporte (hormigón fino o una placa de doble capa de galvanizado), del sistema utilizado (tubo y paneles) y de la altura habitable de proyecto ([1]).

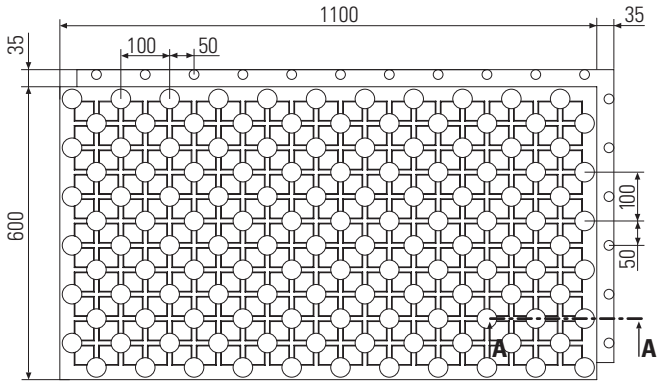
Los sistemas de calefacción por suelo radiante Emmeti requieren espesores minimos variables desde 30 a 119 mm ([2]), revestimiento del suelo excluido, en función del tipo de panel y del soporte usad (Fig. 2-10).

([1]) El espesor de la capa de soporte tiene que ser calculado en función de la capacidad de carga del material utilizado.

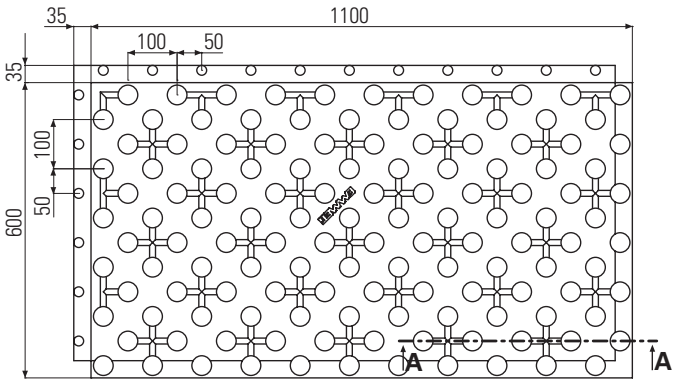
([2]) Para instalaciones en edificios de uso civil-terciario.
Para aplicaciones de ambito industrial, la estructura del suelo tendrá que ser dimensionada por el proyectista.

Panel aislante Standard Floor

Modelo H = 10



Modelos H = 20/30



Modelos H = 40/50/60

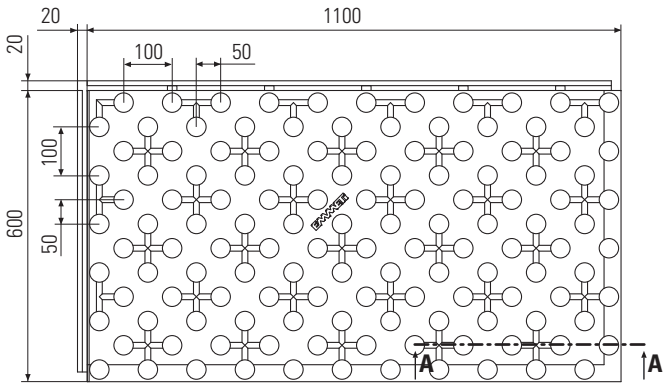
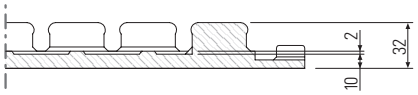


Fig. 1

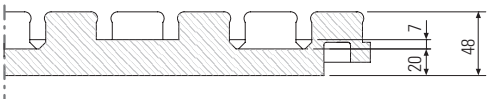
Panelo 1100 x 600 H 10

Sección A-A



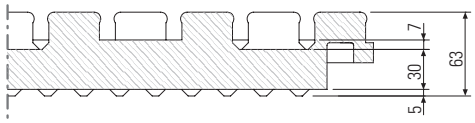
Panelo 1100 x 600 H 20

Sección A-A



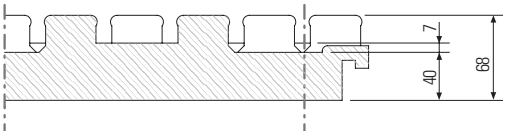
Panelo 1100 x 600 H 30

Sección A-A



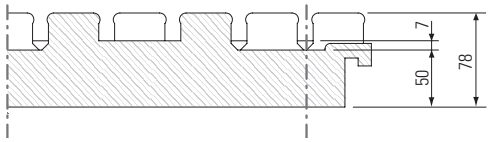
Panelo 1100 x 600 H 40

Sección A-A



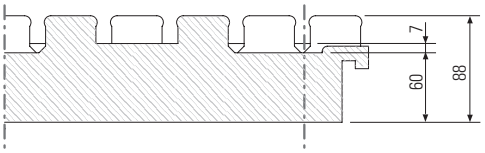
Panelo 1100 x 600 H 50

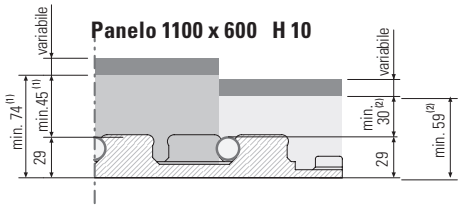
Sección A-A

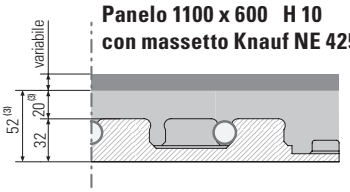


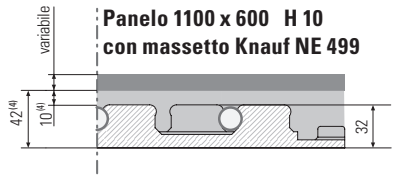
Panelo 1100 x 600 H 60

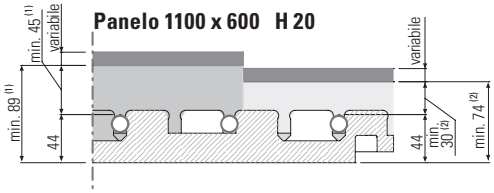
Sección A-A

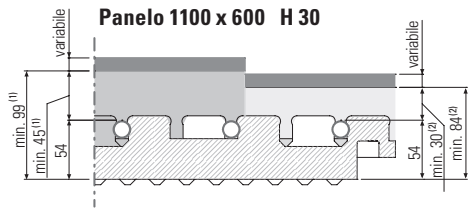


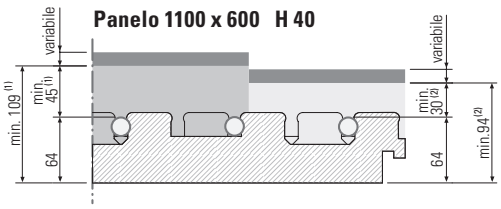


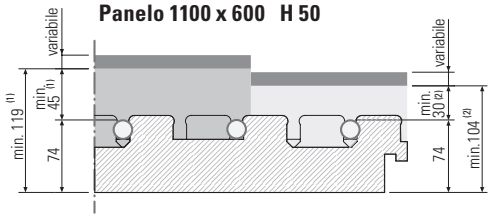


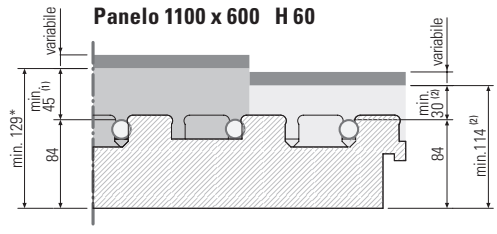












Medidas mínimas del sistema para edificios civíles (mm)

(1) Solera de cemento tradicional*

(2) Regla autonivelante*

(3) Pavimento fluido de bajo espesor Knauf Autolivellina NE 425

(4) Pavimento fluido de bajo espesor Knauf Superlivellina NE 499

Nota: Emmeti **no** suministra los hormigones

Fig. 2

El espesor real de la losa y los métodos utilizados la misma han de ser determinado por el fabricante / proveedor del mismo de acuerdo con sus especificaciones, dependiendo de las condiciones de instalación (El tamaño y tipo de la superficie de colocación, tipo de suelo, etc.) y la tipo de sustrato elegido.

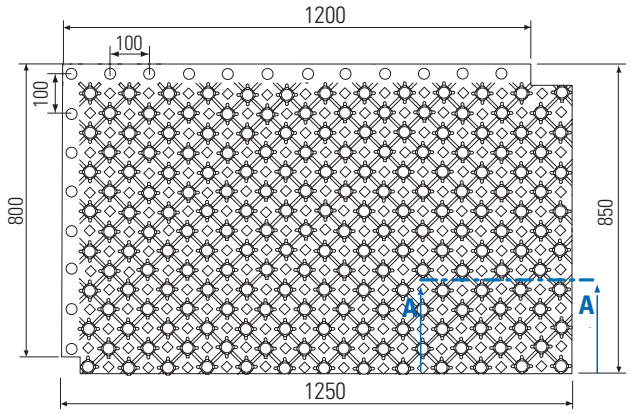
* En el caso de combinar el sistema Emmeti Floor con la bomba de calor Mirai SMI + Febos HP, se recomienda aumentar el grosor de la regla en aproximadamente 1 cm en comparación con los valores mínimos.

Fig. 2

Standard Combi Floor

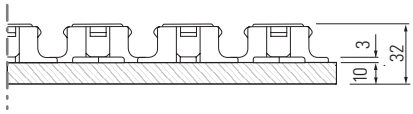
Panelo aislante

Modelos H = 10/20/30



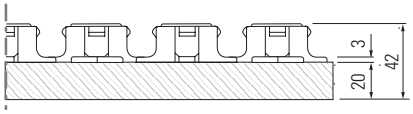
Panelo 1200 x 800 H 10

Sección A-A



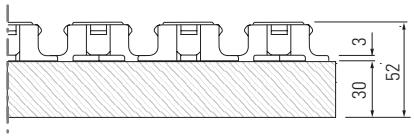
Panelo 1200 x 800 H 20

Sección A-A

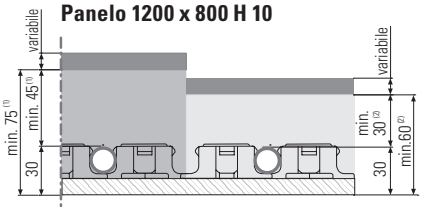


Panelo 1200 x 800 H 30

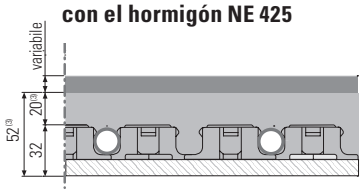
Sección A-A



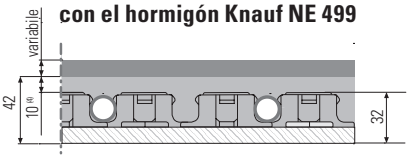
Panelo 1200 x 800 H 10



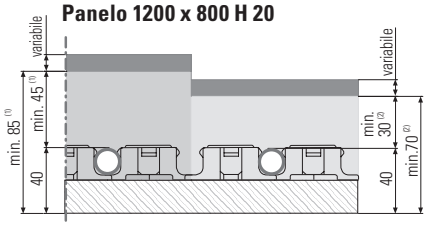
Panelo 1200 x 800 H 10
con el hormigón NE 425



Panelo 1200 x 800 H 10
con el hormigón Knauf NE 499



Panelo 1200 x 800 H 20



Panelo 1200 x 800 H 30

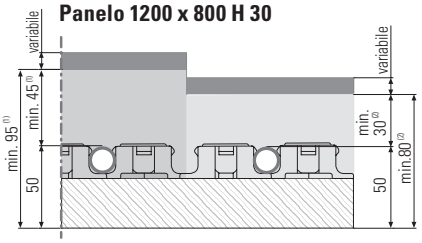


Fig. 3

Medidas mínimas del sistema para edificios civíles (mm)

(1) Regla de cemento tradicional *
(2) Regla autonivelante *
(3) Regla de fluido con bajo espesor Knauf Autolivellina NE 425
(4) Reglón de fluido de bajo espesor Knauf Superlivellina NE 499

El espesor real de la losa y los métodos utilizados la misma han de ser determinado por el fabricante / proveedor del mismo de acuerdo con sus especificaciones, dependiendo de las condiciones de instalación (El tamaño y tipo de la superficie de colocación, tipo de suelo, etc.) y la tipo de sustrato elegido.

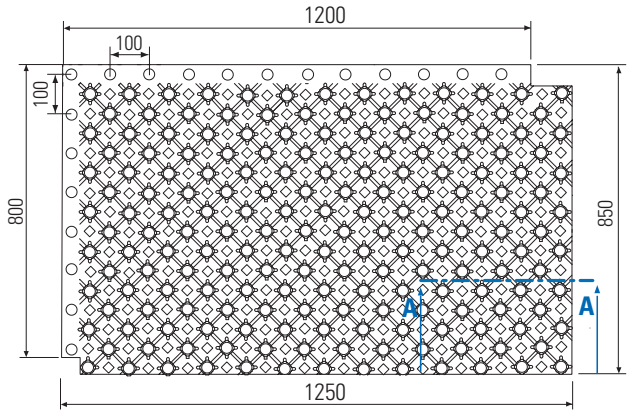
* En el caso de combinar el sistema Emmeti Floor con la bomba de calor Mirai SMI + Febos HP, se recomienda aumentar el grosor de la regla en aproximadamente 1 cm en comparación con los valores mínimos.

Nota I massetti **non** vengono forniti da Emmeti

Standard Combi Floor con grafite

Panelo aislante

Modelli H = 10/18/33/40/50



Medidas mínimas del sistema para edificios civíles (mm)

(1) Regla de cemento tradicional *

(2) Regla autonivelante *

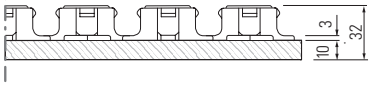
(3) Regla de fluido con bajo espesor Knauf Autolivellina NE 425

(4) Reglón de fluido de bajo espesor Knauf Superlivellina NE 499

El espesor real de la losa y los métodos utilizados
la misma han de ser determinado por el fabricante / proveedor del mismo
de acuerdo con sus especificaciones, dependiendo de las condiciones de instalación
(El tamaño y tipo de la superficie de colocación, tipo de suelo, etc.) y la tipo de sustrato elegido.

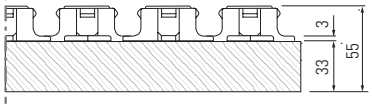
Panelo 1200 x 800 H 10

Sección A-A



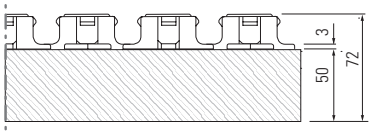
Panelo 1200 x 800 H 33

Sección A-A



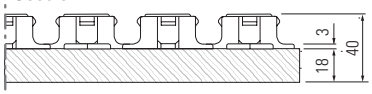
Panelo 1200 x 800 H 50

Sección A-A



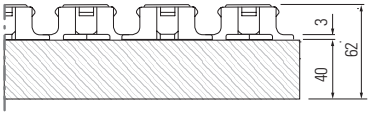
Panelo 1200 x 800 H 18

Sección A-A

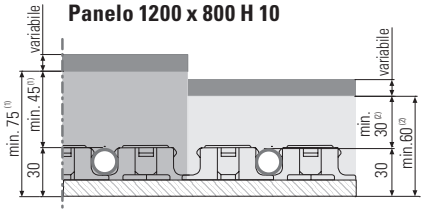


Panelo 1200 x 800 H 40

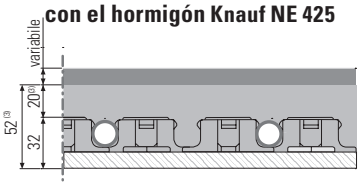
Sección A-A



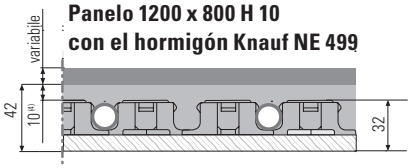
Panelo 1200 x 800 H 10



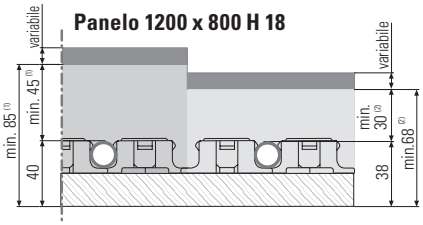
Panelo 1200 x 800 H 10
con el hormigón Knauf NE 425



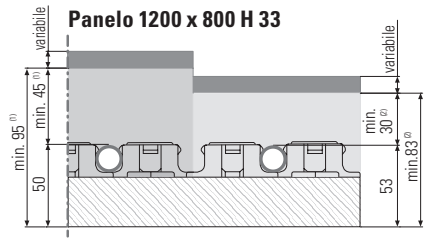
Panelo 1200 x 800 H 10
con el hormigón Knauf NE 499



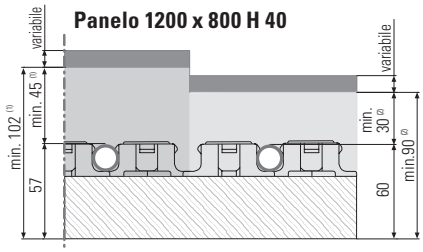
Panelo 1200 x 800 H 18



Panelo 1200 x 800 H 33



Panelo 1200 x 800 H 40



Panelo 1200 x 800 H 50

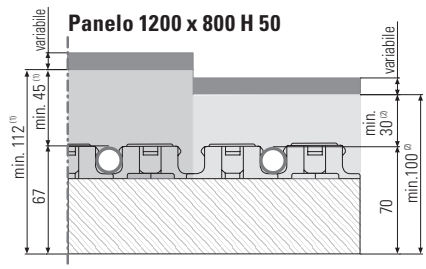


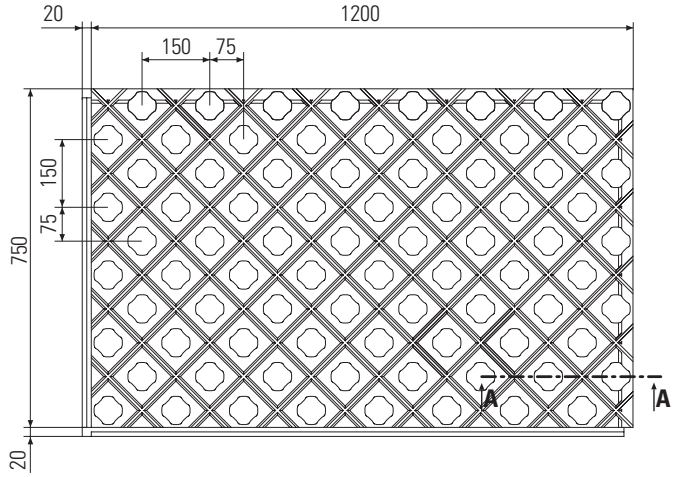
Fig. 3a

* En el caso de combinar el sistema Emmeti Floor con la bomba de calor Mirai SMI + Febos HP, se recomienda aumentar el grosor de la regla en aproximadamente 1 cm en comparación con los valores mínimos.

Nota I massetti **non** vengono forniti da Emmeti

Classic Floor
Panelo aislante

Modelli H = 20/30

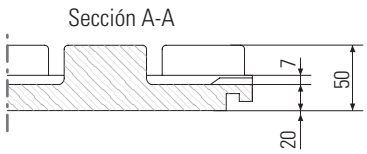


Medidas mínimas del sistema para edificios civíles (mm)

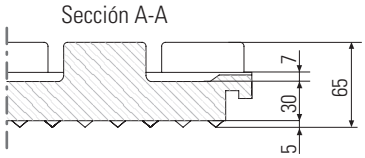
* Hormigón tradicional

** Hormigón de nivelado automático

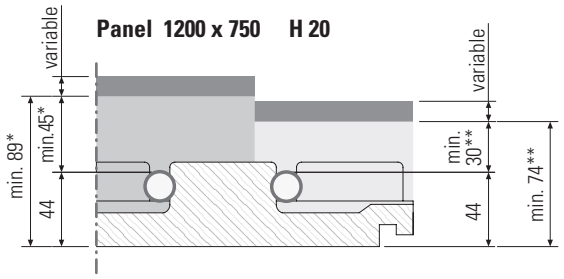
Panel 1200 x 750 H 20



Panel 1200 x 750 H 30



Panel 1200 x 750 H 20



Panel 1200 x 750 H 30

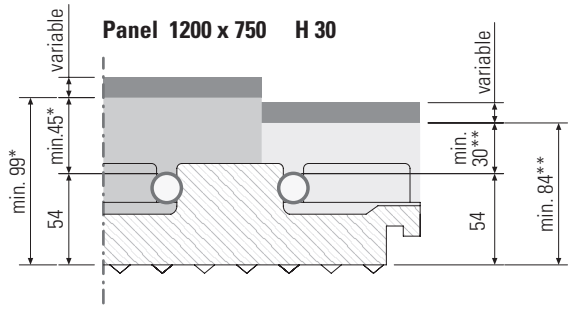


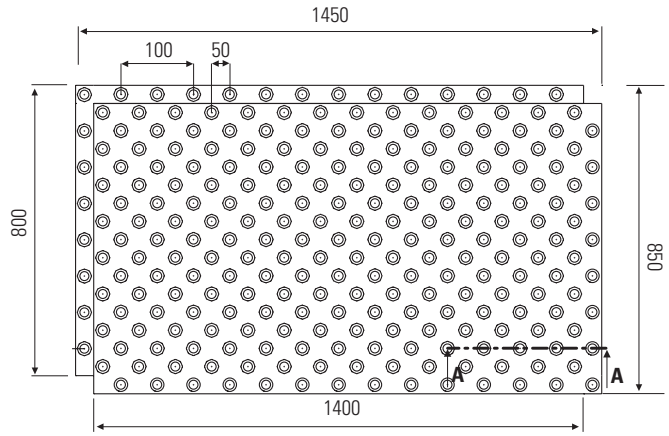
Fig. 4

En el caso de combinar el sistema Emmeti Floor con la bomba de calor Mirai SMI + Febos HP, se recomienda aumentar el grosor de la regla en aproximadamente 1 cm en comparación con los valores mínimos.

Nota: Emmeti **no** suministra los hormigones

Step Combi Floor
Panel fono-aislante

Modelo H = 30-2



Medidas mínimas del sistema para edificios civíles (mm)

* Hormigón tradicional

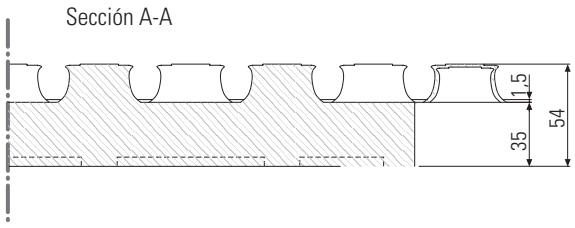
** Hormigón de nivelado automático

Nota: Emmeti no suministra los hormigones

En el caso de combinar el sistema Emmeti Floor con la bomba de calor Mirai SMI + Febos HP, se recomienda aumentar el grosor de la regla en aproximadamente 1 cm en comparación con los valores mínimos.

Nota: Emmeti **no** suministra los hormigones

Panel 1400 x 800 H 30 - 2



Panel 1400 x 800 H 30 - 2

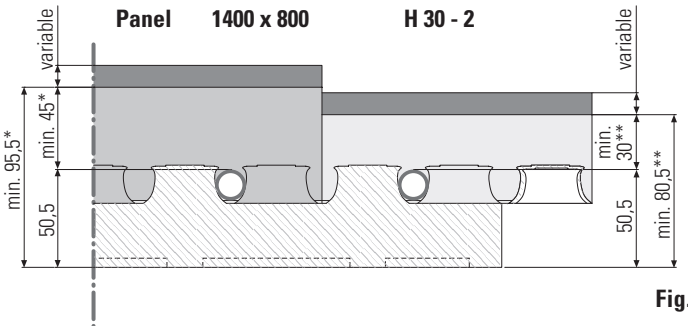
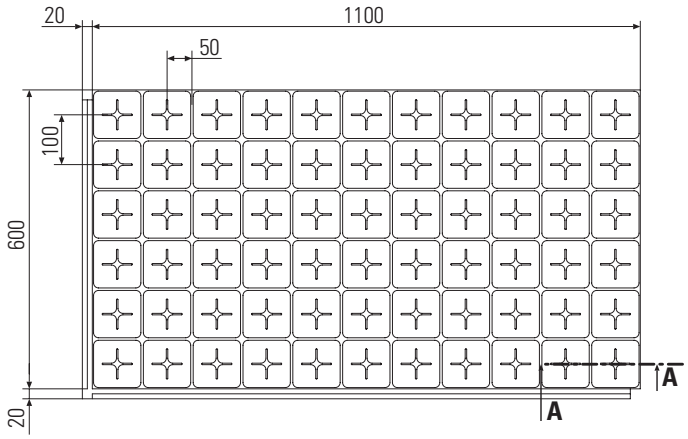


Fig. 5

Plan Floor
Panel aislante



Modelo H = 30

* Hormigón tradicional

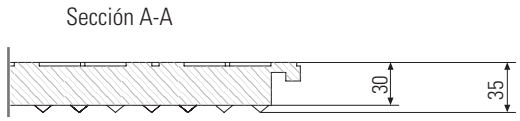
** Hormigón de nivelado automático

Nota: Emmeti no suministra los hormigones

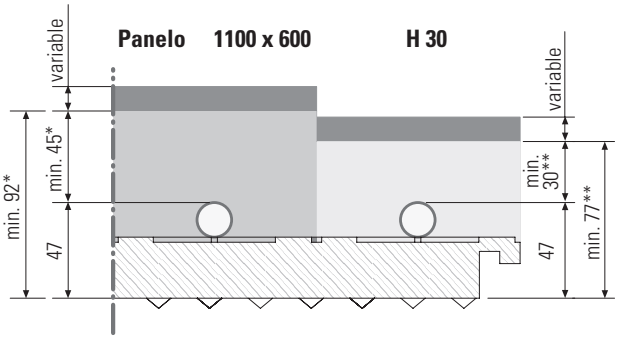
Medidas mínimas del sistema para edificios civíles (mm)

Fig. 6

Panelo 1100 x 600 H 30



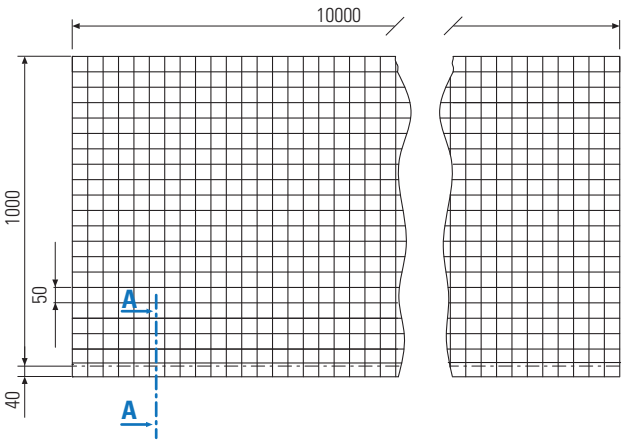
Panelo 1100 x 600 H 30

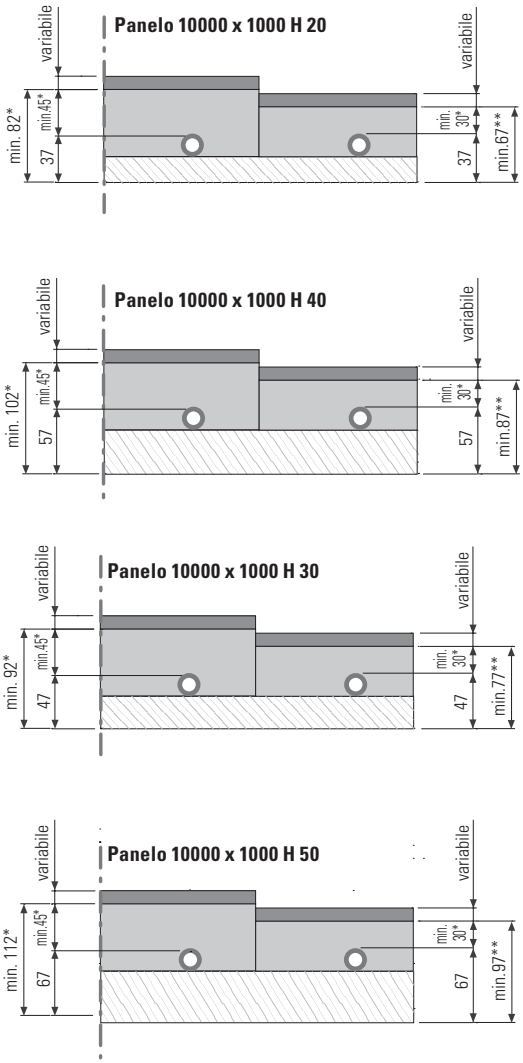


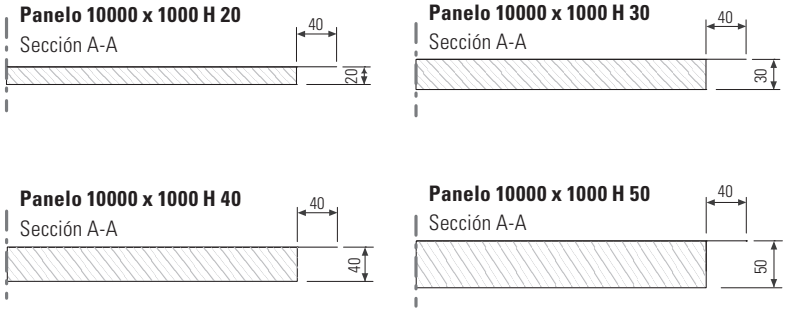
Roll Floor

Panelo Aislante

Modelo H 20/30/40/50







Medidas mínimas del sistema para edificios civíles (mm)

Fig. 7

* Hormigón tradicional

** Hormigón de nivelado automático

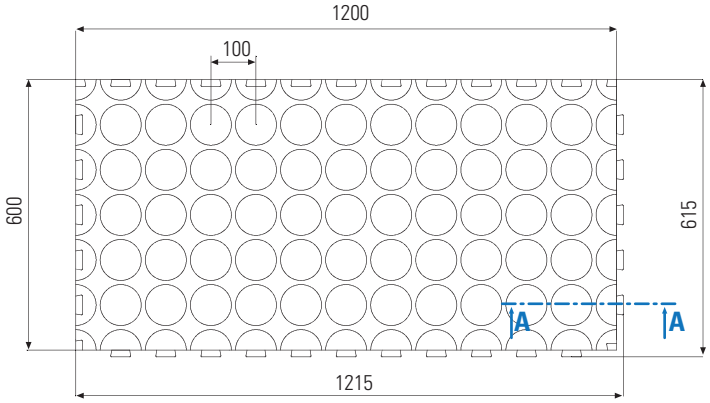
En el caso de combinar el sistema Emmeti Floor con la bomba de calor Mirai SMI + Febos HP, se recomienda aumentar el grosor de la regla en aproximadamente 1 cm en comparación con los valores mínimos.

Nota: Emmeti **no** suministra los hormigones

Thin Floor

Panelo Aislante

Modelo H = 5



Medidas mínimas del sistema para edificios civíles (mm)

* Hormigón tradicional

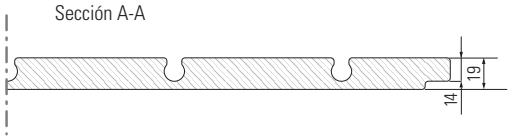
** Hormigón de nivelado automático

Nota: Emmeti no suministra los hormigones

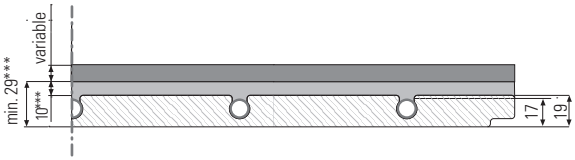
En el caso de combinar el sistema Emmeti Floor con la bomba de calor Mirai SMI + Febos HP, se recomienda aumentar el grosor de la regla en aproximadamente 1 cm en comparación con los valores mínimos.

Nota: Emmeti **no** suministra los hormigones

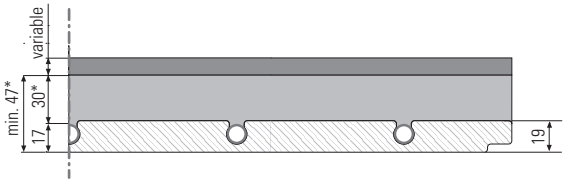
Panelo 1200 x 600 H 5



Panelo 1200 x 600 H 5
con hormigón Knauf NE 499



Panelo 1200 x 600 H 5



Panelo 1200 x 600 H 5
con hormigón Knauf NE 425

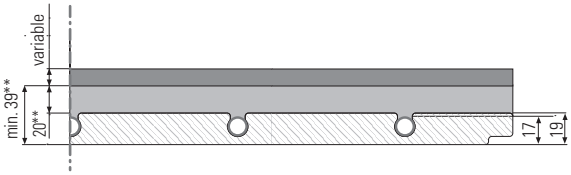
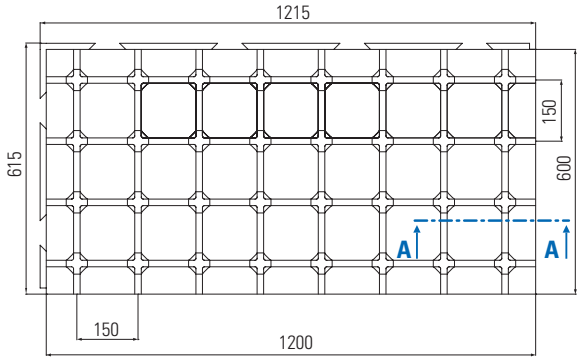


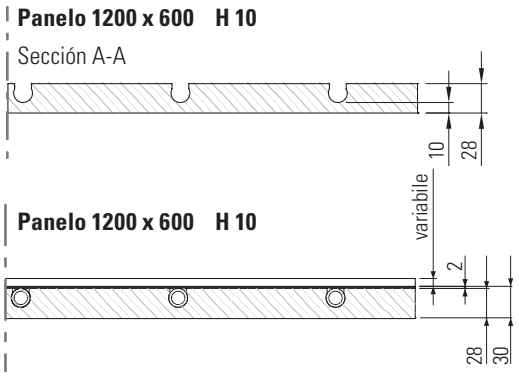
Fig. 8

Dry Alu Floor

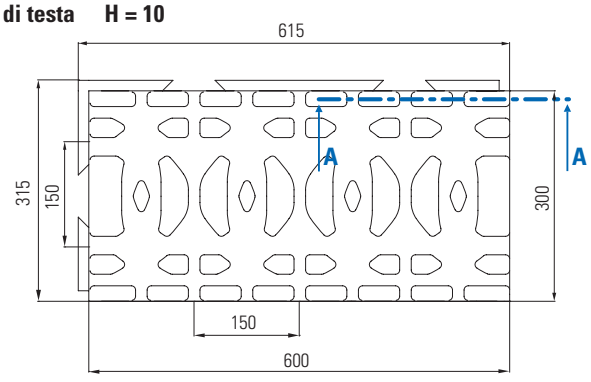
Panelo aislante H = 10



Panelo 1200 x 600 H 10



Panelo aislante
di testa H = 10



Panelo 600 x 300 H 10

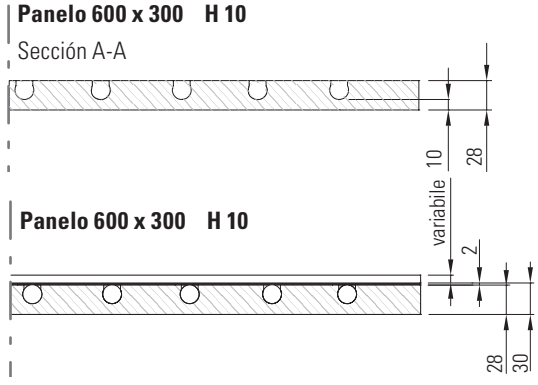
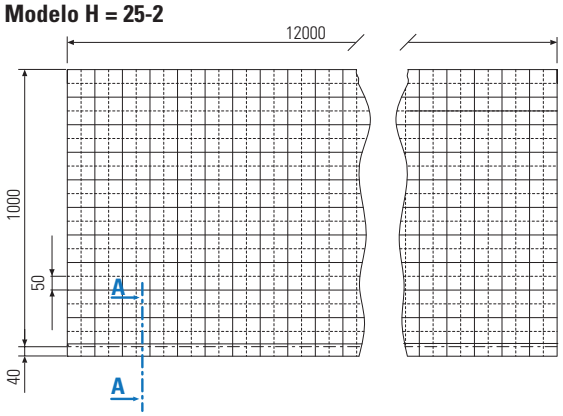


Fig. 9

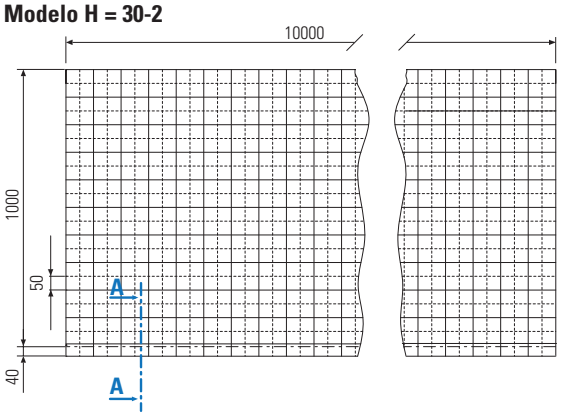
Klettjet

Panelo aislante

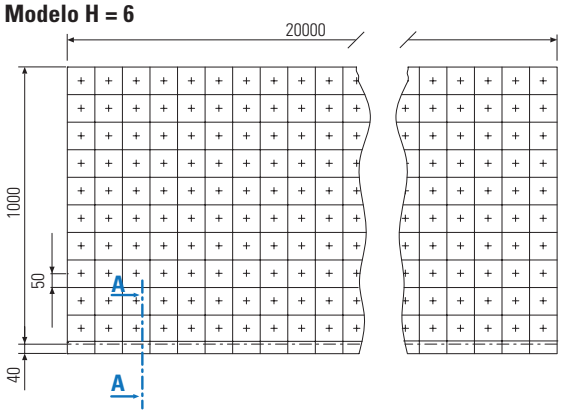
Modelo H = 25-2



Modelo H = 30-2

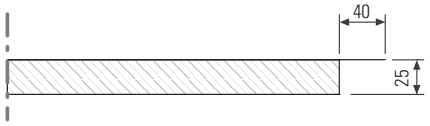


Modelo H = 6



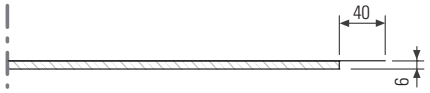
Panelo 12000 x 1000 H 25-2

Sección A-A



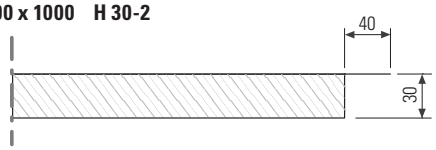
Panelo 20000 x 1000 H 6

Sección A-A

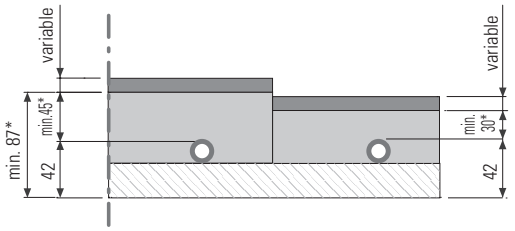


Panelo 10000 x 1000 H 30-2

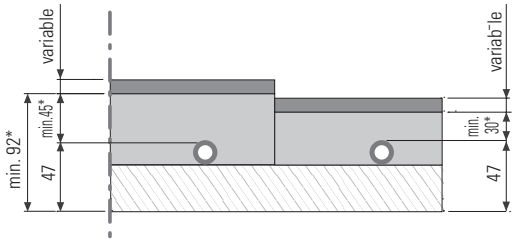
Sección A-A



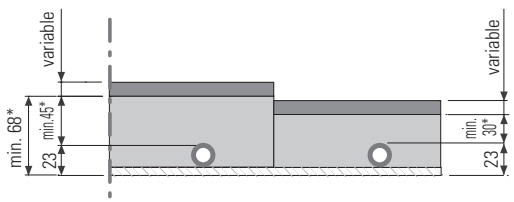
Panelo 12000 x 1000 H 25-2



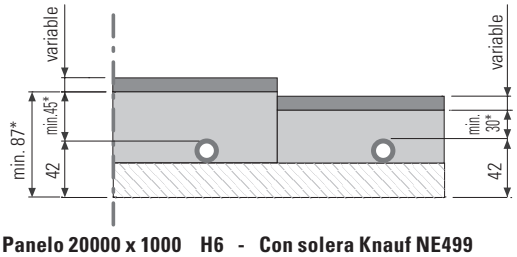
Panelo 12000 x 1000 H 30-2



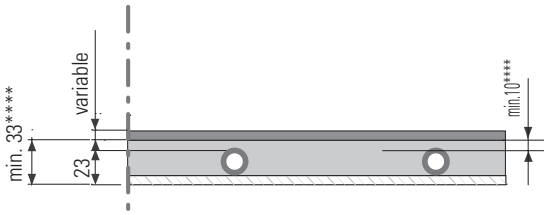
Panelo 20000 x 1000 H 6



Panelo 20000 x 1000 H6 - Con solera Knauf NE425



Panelo 20000 x 1000 H6 - Con solera Knauf NE499



Medidas mínimas del sistema para edificios civíles (mm)

* Hormigón tradicional

** Hormigón de nivelado automático

*** Reglón fluido con bajo espesor Knauf Autolivellina NE 425

**** Reglón fino fluido Knauf Superlivellina NE 499

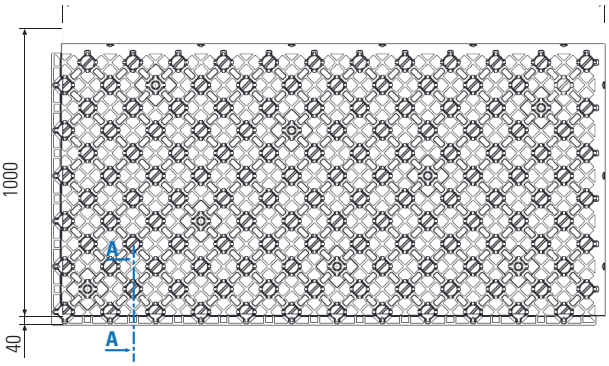
En el caso de combinar el sistema Emmeti Floor con la bomba de calor Mirai SMI + Febos HP, se recomienda aumentar el grosor de la regla en aproximadamente 1 cm en comparación con los valores mínimos.

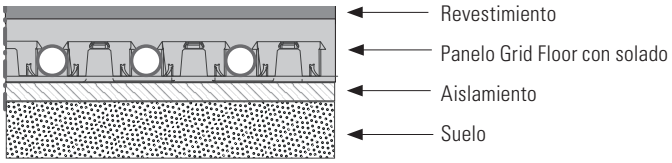
Nota: Emmeti **no** suministra los hormigones

Grid floor

Panelo aislante

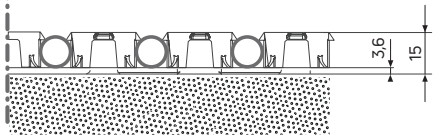
Modelo H = 0/10 dn12





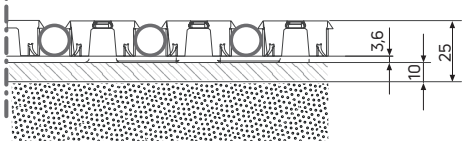
Panelo 1200 x 600 H 0

Sección A-A - Con base autoadhesiva



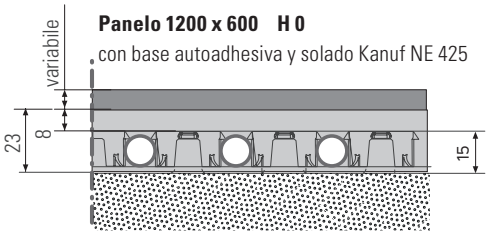
Panelo 1200 x 600 H 10

Sección A-A - Con aislamiento



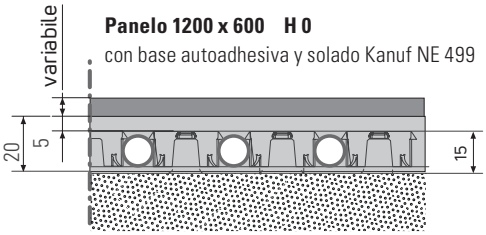
Panelo 1200 x 600 H 0

con base autoadhesiva y solado Kanuf NE 425



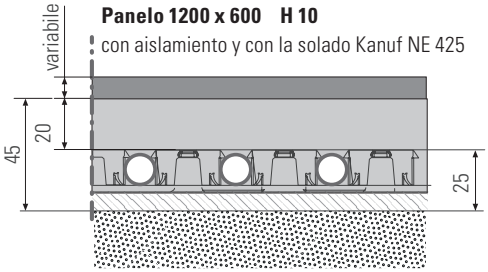
Panelo 1200 x 600 H 0

con base autoadhesiva y solado Kanuf NE 499



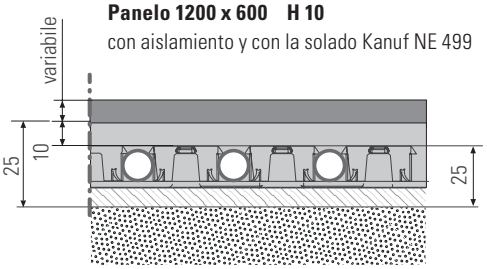
Panelo 1200 x 600 H 10

con aislamiento y con la solado Kanuf NE 425



Panelo 1200 x 600 H 10

con aislamiento y con la solado Kanuf NE 499

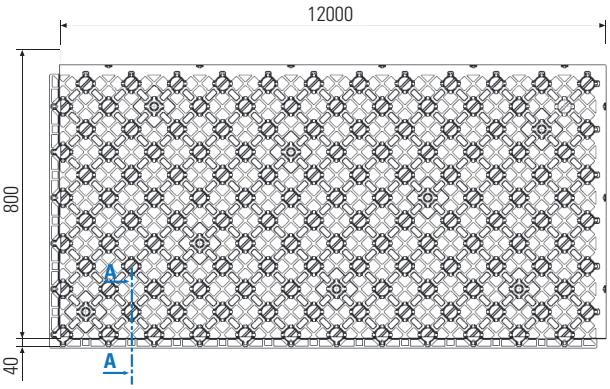


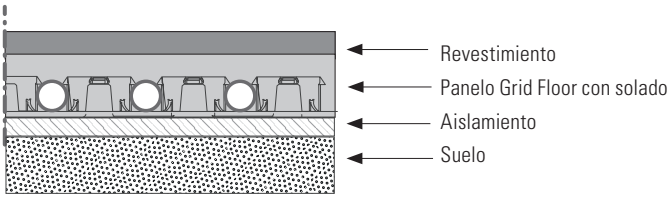
Nota: El grosor real de la solera y la forma de realizarla deben definirse con el fabricante/proveedor de la misma según sus especificaciones, en función de las condiciones de instalación (tamaño y tipo de superficie de colocación, tipo de losa, etc.) y del tipo de trazado elegido.

Grid floor

Panelo Aislante

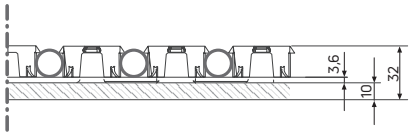
Modello H = 10 / 25 / 42 DN16/17





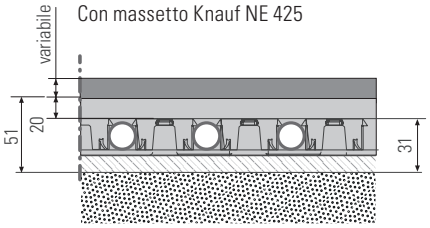
Panelo 1200 x 800 H 10

Sezione A-A



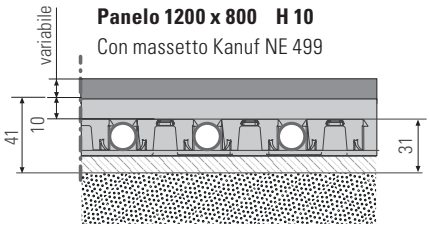
Panelo 1200 x 800 H 10

Con massetto Knauf NE 425



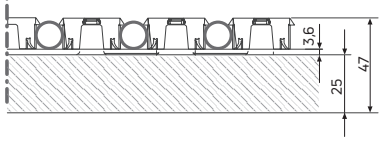
Panelo 1200 x 800 H 10

Con massetto Kanuf NE 499



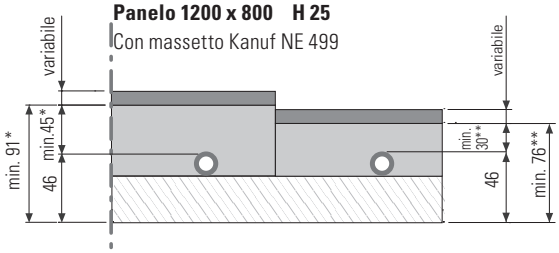
Panelo 1200 x 800 H 25

Sezione A-A - Con massetto Kanuf NE 425



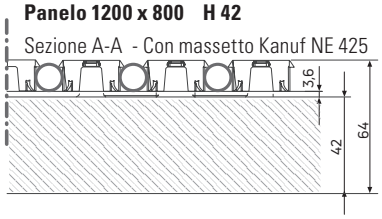
Panelo 1200 x 800 H 25

Con massetto Kanuf NE 499



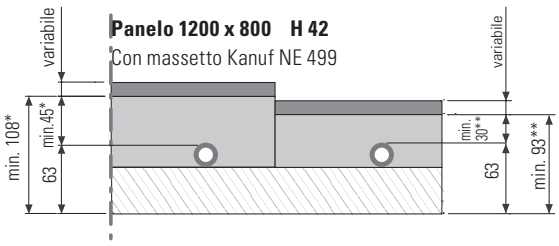
Panelo 1200 x 800 H 42

Sezione A-A - Con massetto Kanuf NE 425



Panelo 1200 x 800 H 42

Con massetto Kanuf NE 499



* Massetto cementizio tradizionale

** Massetto autolivellante

Nota: Lo spessore effettivo del massetto e la modalità di realizzazione dello stesso sono da definire con il produttore / fornitore dello stesso secondo le sue specifiche, in funzione delle condizioni di installazione (dimensione e tipologia superficie di posa, tipologia solaio, ecc) e del tipo di assetto scelto.

Advertencia
El subfondo debe estar bien limpio, sin residuos de cemento, suficientemente plano, para permitir un apoyo uniforme de los paneles aislantes.

Para proceder a la colocación de la instalación de calefacción por suelo radiante, los enlucidos interiores y las instalaciones hidrotérmicas y eléctricas tendrán que estar terminadas; éstas ultimas en particular tendrán que ser cubiertas por un mortero bien nivelado y de adecuada resistencia mecánica. Eventuales capas de material impermeable tendrán que ser aislados de los paneles con laminas de polietileno, espesor mínimo 0.2 mm, subiendo por los lados al menos 20 cm y unidos en los puntos de conexión con adhesivo apropiado (Fig. 11).

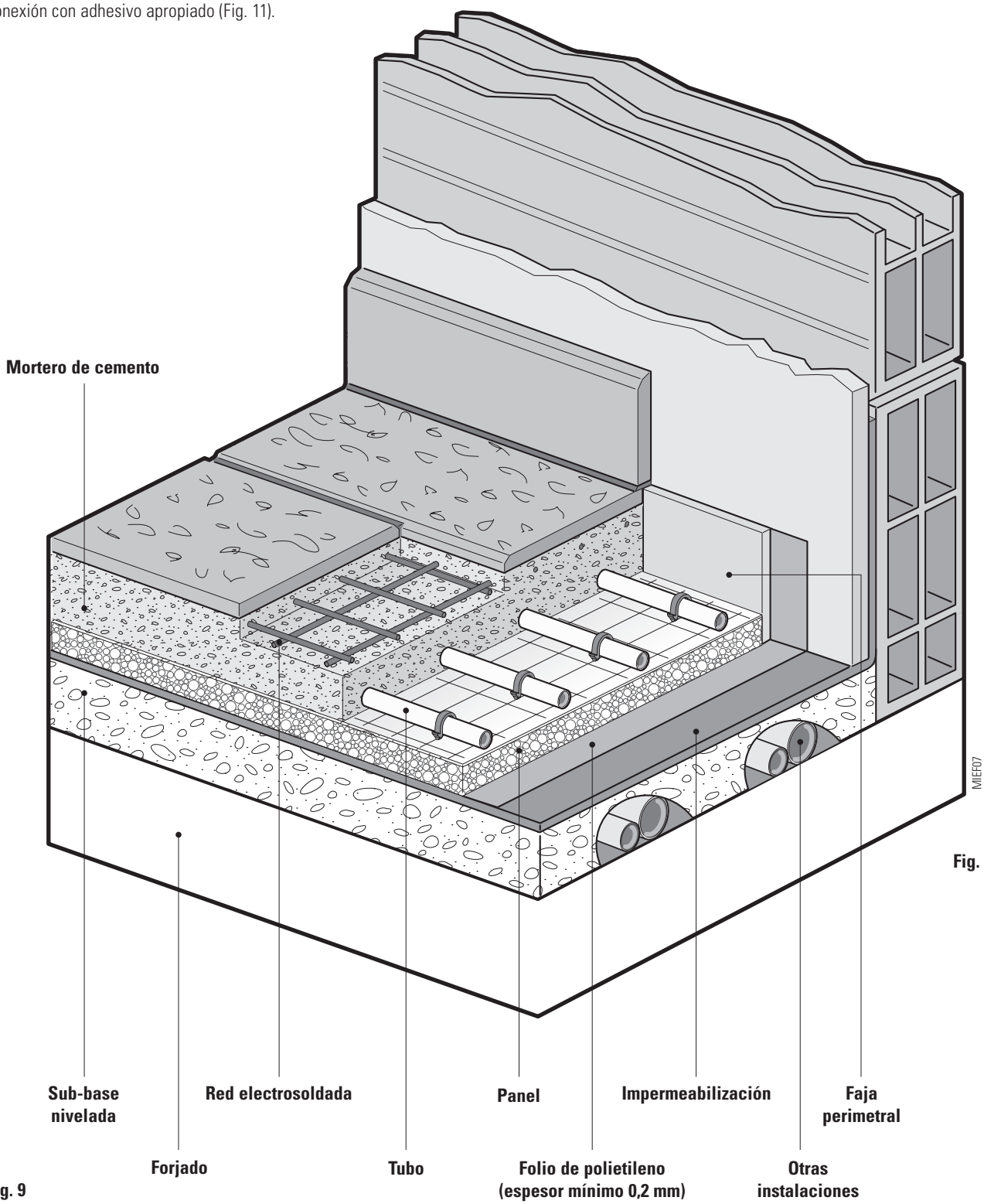


Fig. 11

Fig. 9

Si por razones estructurales o de altura útil disponible insuficiente, no fuera posible realizar una adecuada cobertura de las instalaciones hidrotérmicas y eléctricas, se podrían instalar tales tuberías pegadas a las paredes (Fig. 10), comprobando que la cubierta de la cama llega a un espesor de al menos 30 mm.

Es importante garantizar un perfecto apoyo de los paneles sobre el encofrado para evitar deformaciones (Hundimientos) del mortero y crujidos en los suelos.

¡Atención!
En caso de realización de un suelo flotante para reducir la transmisión de ruido de pisadas, empleando los paneles aislantes STEP COMBI FLOOR, las zonas de paso de otras instalaciones constituyen un puente acústico y, por lo tanto, es necesario evitarlas. Estas instalaciones deberán encajarse, preferiblemente, en la estructura, o bien revestirse con un material aislante adecuado y certificado.

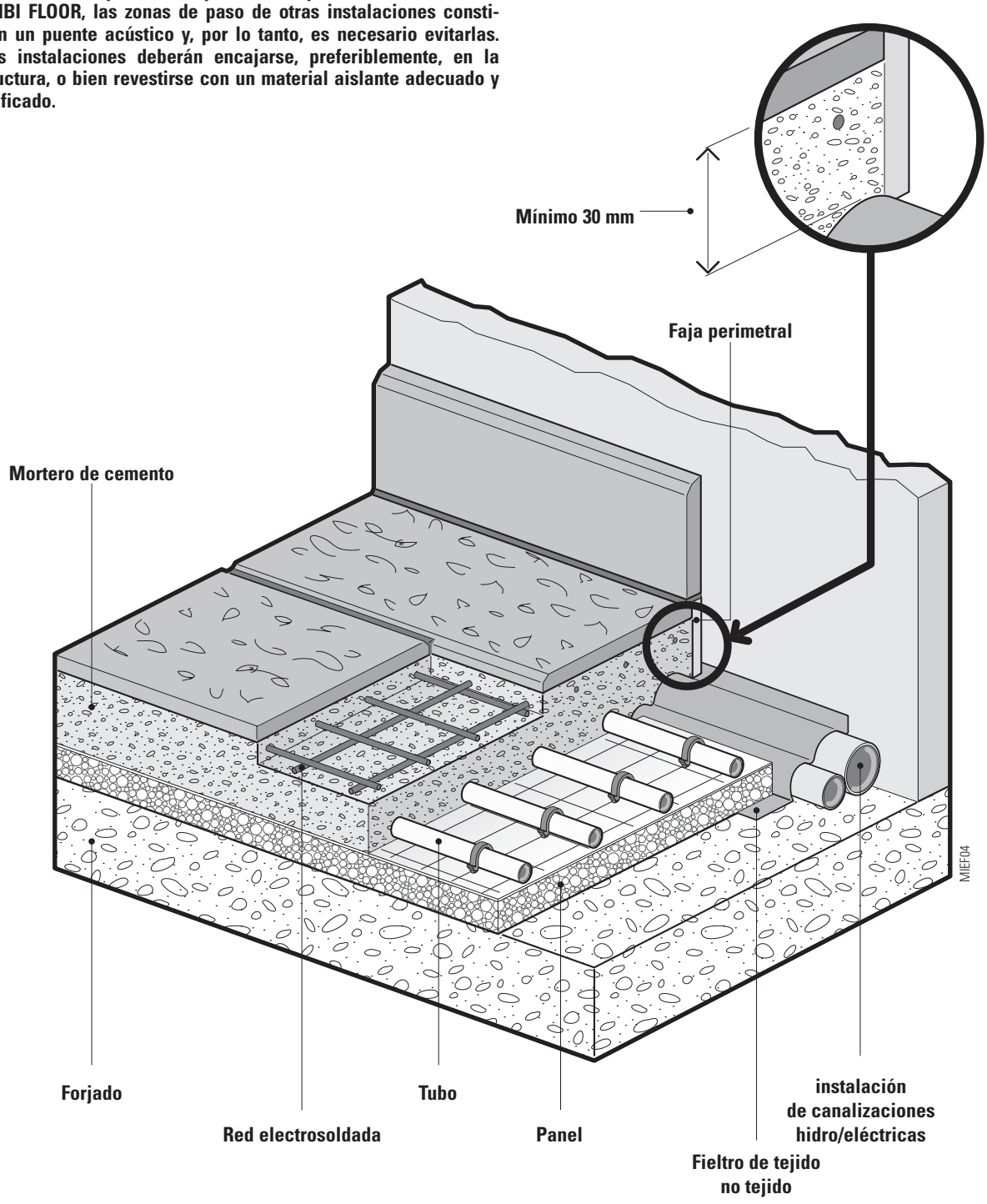


Fig. 12

En las instalaciones que presentan tuberías hidrotermicas y eléctricas dispuestas a lo largo de las paredes, se a de realizar de modo que los paneles resulten apoyados completamente al forjado.
Por este motivo es aconsejable la realización de un "peldaño" en ángulo recto sobre tales tuberías, sobre el cual apoyar lateralmente los paneles (Fig. 13 y 14).

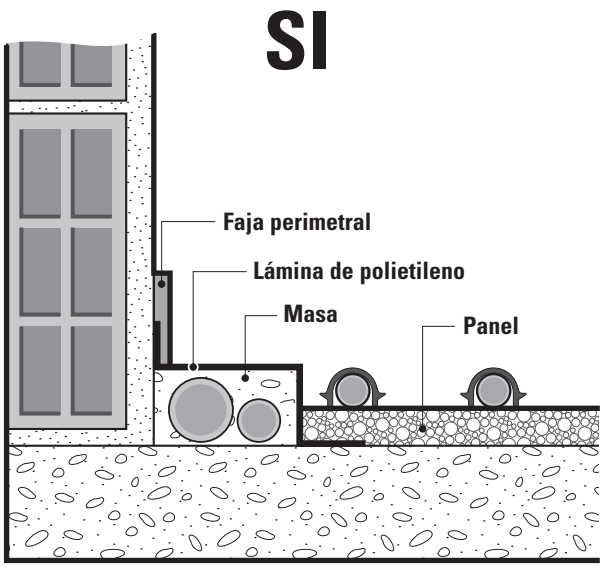


Fig. 13

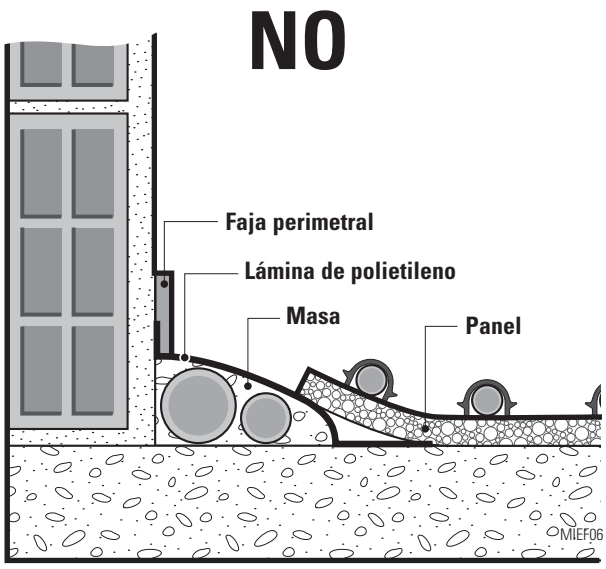
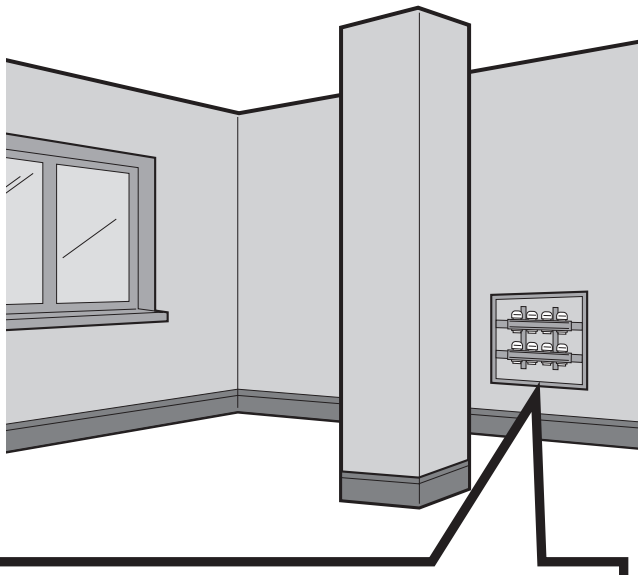


Fig. 14

Necesariamente la altura de tal peldaño no deberá ser superior a la de la instalación del suelo radiante (panel + tubo) y tendrá que garantizar en todo caso un espesor mínimo por encima de 30 mm de mortero (Fig. 12).
Para evitar una eventual adhesión del mortero radiante (que tiene que ser libre de "flotar" con respecto de la estructura circunstante) a tal peldaño, se tiene que posicionar una capa separador (hoja en polietileno, fieltro de tejido no tejido, etc).
La compensación de los niveles no podrá ser realizada con material suelto (arena) o aislantes de baja densidad.

Los colectores de distribución tienen que ser instalados por lo menos a 30 cm del suelo terminado.
Los colectores de distribución Emmeti Top Way prevén el enlace de la tubería de impulsión con el colector inferior dotado de detentores de regulación simple (tapón rojo) o con medidores de flujo y la línea de retorno con la barra superior, donde se encuentran las válvulas de cierre (tapa azul) en el que se puede aplicar a los jefes de electro (Fig. 15).



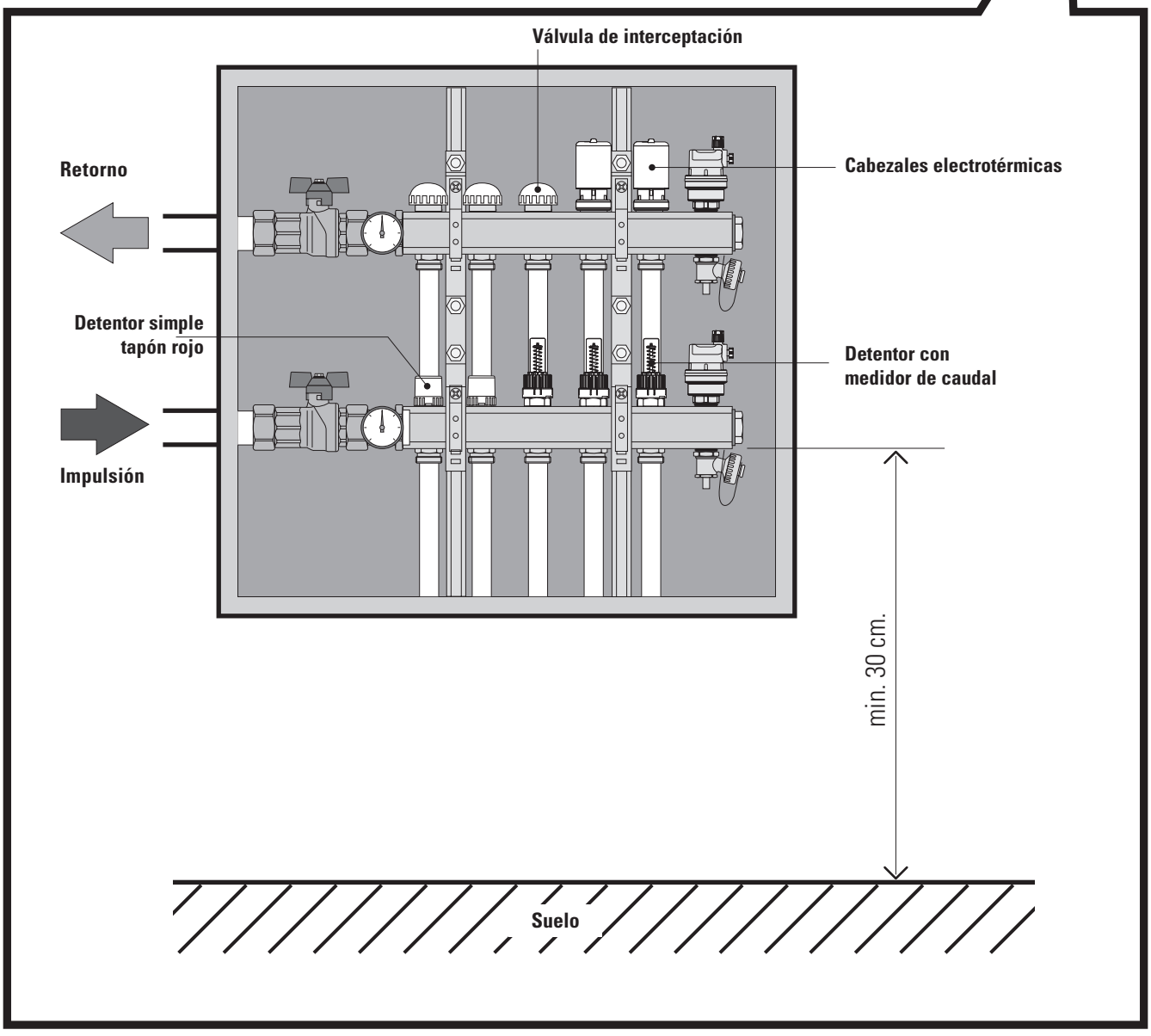
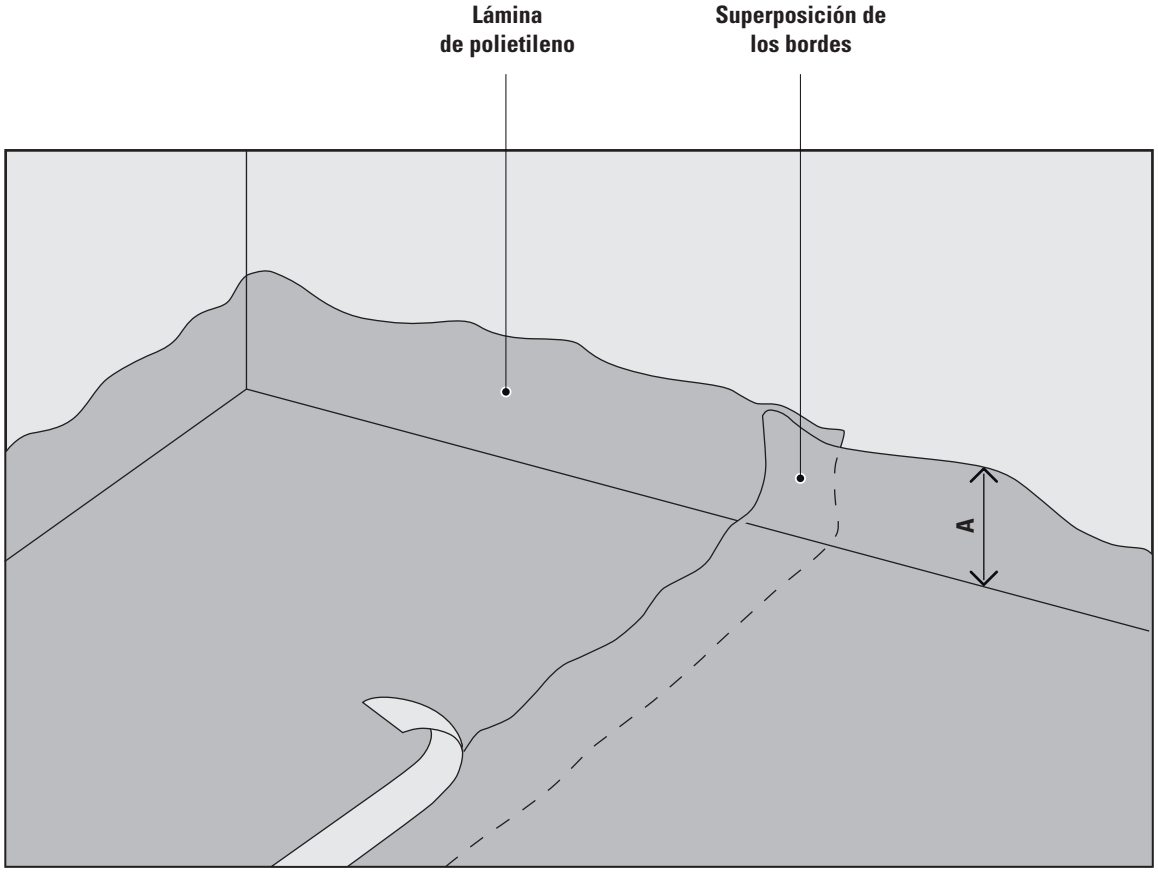


Fig. 15

Si existe la posibilidad de humedad ascendente desde la sub-base hacia los paneles aislantes, debe colocarse la lámina de polietileno por toda la superficie de la losa, realzando sus bordes por las paredes. Las láminas deben superponerse y unirse con cinta adhesiva. Esta medida debe adoptarse en caso de instalaciones apoyadas sobre forjados en contacto con el terreno (plantas bajas, sótanos) o si se utiliza el pavimento para enfriamiento en verano.



A = 5 cm aproximadamente

Fig. 16

La faja perimetral es un elemento absolutamente necesario, tanto para compensar las dilataciones térmicas, como para aislar térmicamente y acústicamente el mortero del suelo radiante de las paredes del edificio.
La altura de la faja perimetral, 150/250 mm, tendra que ser suficiente para cubir el conjunto total de la instalación (aislante + mortero + pavimento).
Esta debe ser colocada a lo largo de todo el perímetro de cada elemento estructural vertical (paredes, escaleras, pilares, columnas, etc.), fijándola del lado del adhesivo (si fuera necesario con clavos, grapas o adhesivo de modo que evite eventuales desplazamientos durante el vertido del mortero al suelo, (Fig. 17).
La faja perimetral también deberá colocarse coincidiendo con los umbrales de entrada hacia las escaleras y con los umbrales de acceso a las terrazas (fig. 18).
La banda en polietileno aplicado a la faja perimetral tiene que ser pegada hacia los paneles, y superpuesta, para impedir la penetración del mortero bajo la capa de aislamiento.
Con respecto a las esquinas y los rincones de las paredes, practicar una incisión en la faja perimetral con un cuter hasta la mitad del espesor de modo tal que favorezca un contacto adecuado a la pared (Fig. 19).

Fig. 17

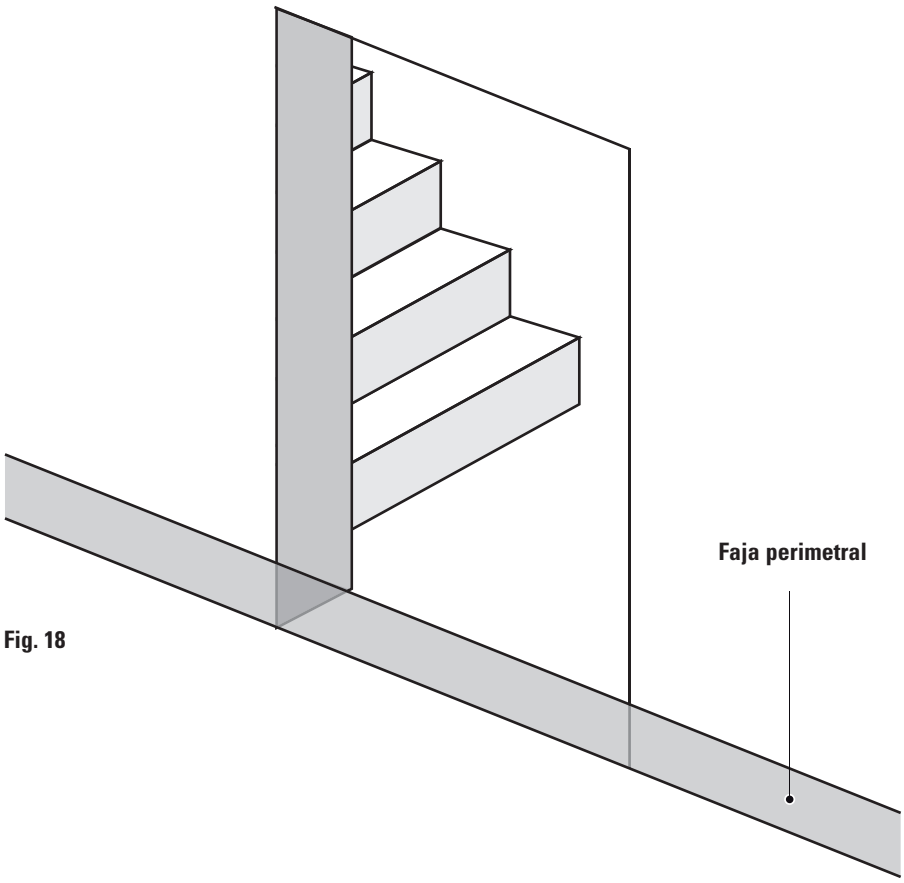


Fig. 18

5. COLOCACIÓN DE FAJA PERIMETRAL AISLANTE

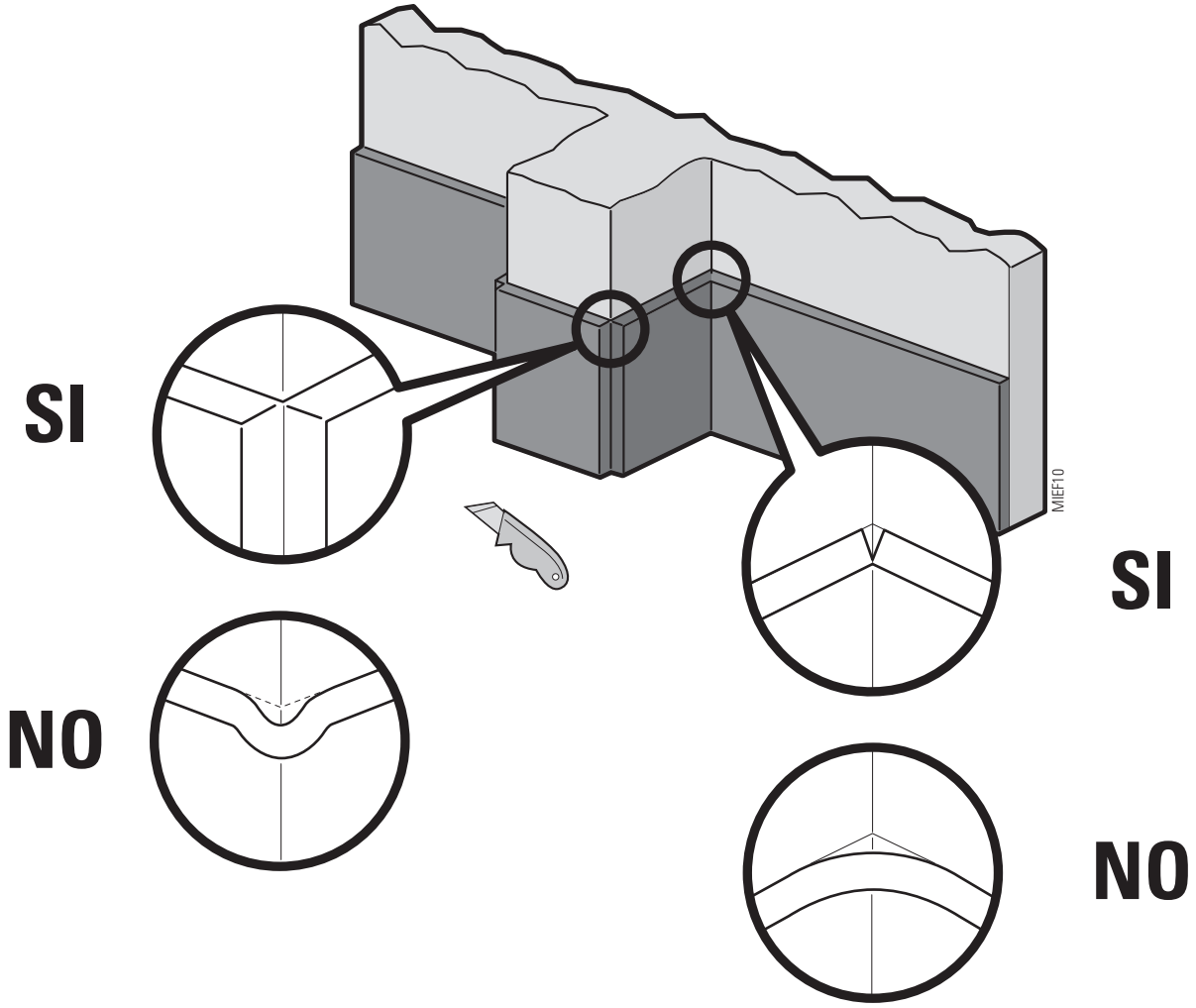


Fig. 19

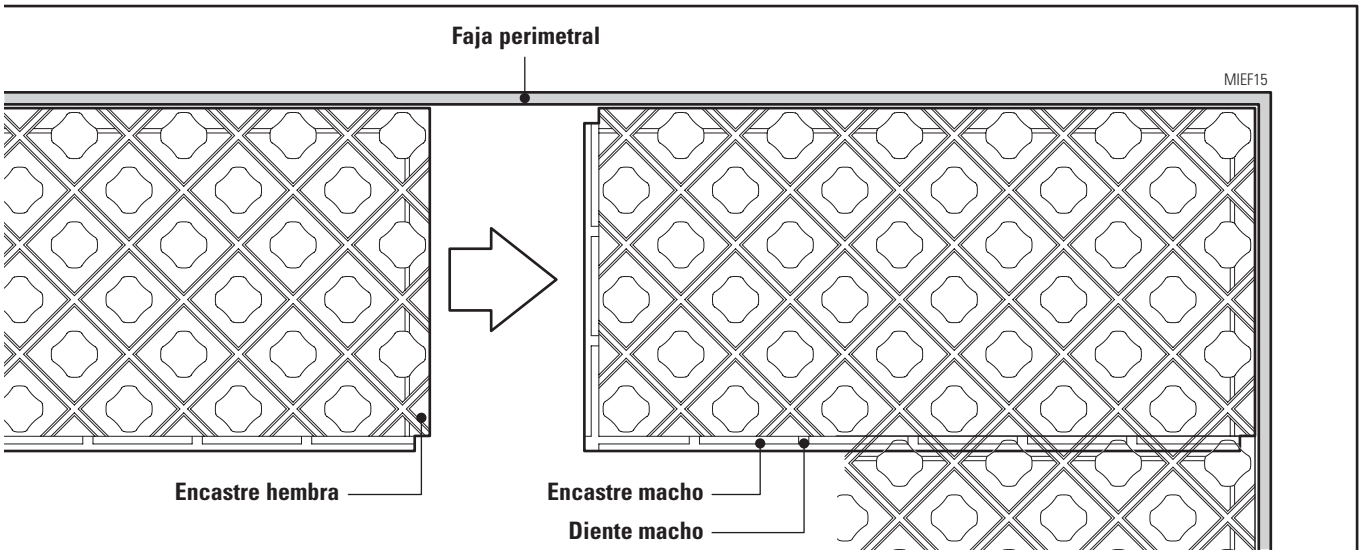
6. COLOCACIÓN DE LOS PANELES AISLANTES

Paneles Standard Floor, Standard Combi Floor, Classic Floor e Step Combi Floor.

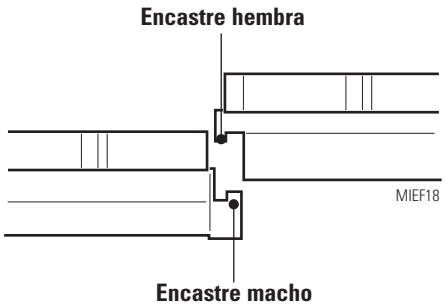
Se aconseja iniciar la colocación de los paneles partiendo de un rincón del local en dirección de la pared más larga del mismo (Fig. 20).
Apoyar los paneles con la junta hembra del encaje hacia la faja de dilatación perimétrica.
Continuar uniendo los paneles mediante sus encastres perimetrales, cortándolos con un cuters y reutilizando las partes excedentes para las filas siguientes, manteniendo la alineación de los tetones entre una fila y la otra (Fig. 21) y la correcta superposición de los dientes machos con las estrías de los encajes hembra.

Fig. 20

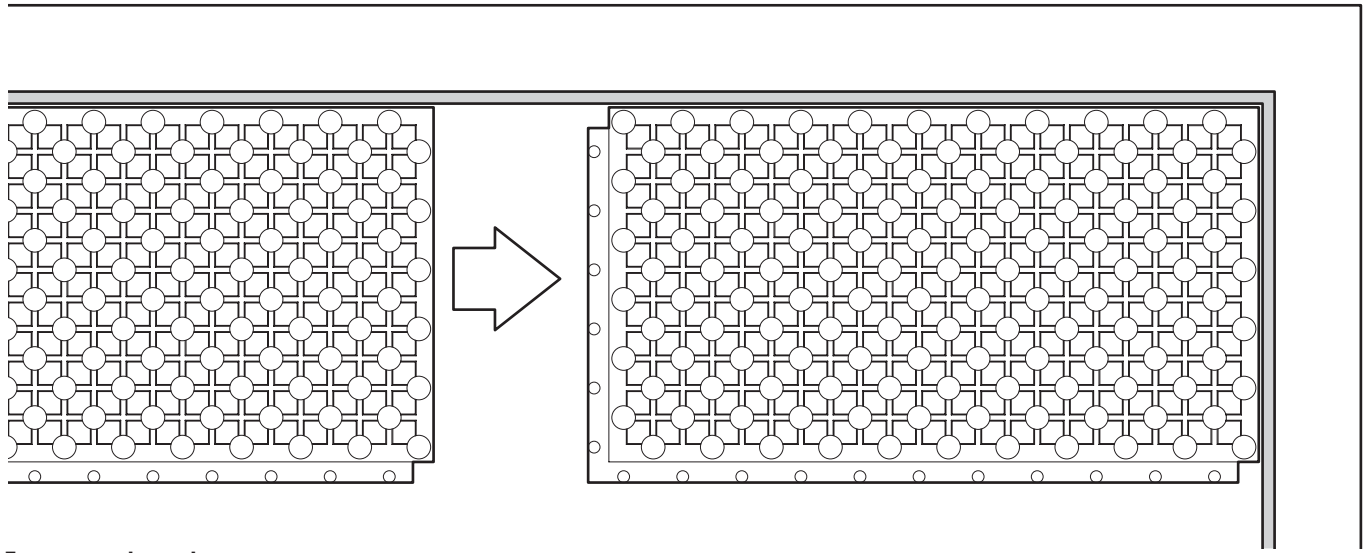
Paneles Classic Floor, Step Floor



Encastre perimetral



Paneles Standard Floor, Standard Combi Floor, Step Combi Floor



Encastre perimetral

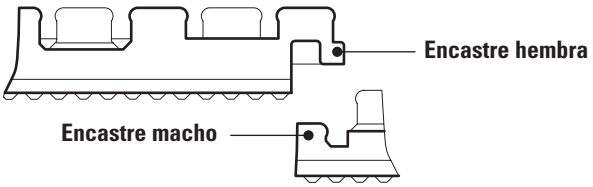


Fig. 21

Panel Plan Floor

Se recomienda iniciar la instalación de los paneles de un rincón de la habitación en dirección a la pared más larga de la misma (Fig. 22).
Coloque los paneles con el lado femenino de la anidación en el perímetro de juntas de expansión.
Continuar unirse a los paneles con las ranuras adecuadas, cortar con un cuchillo y la reutilización de los cabos sueltos de las filas posteriores, el control de la alineación de la superficie de la huella digital y el otro entre una fila.

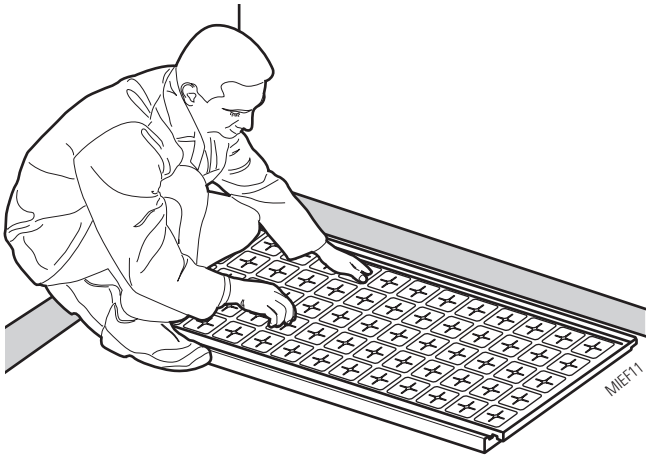


Fig. 22

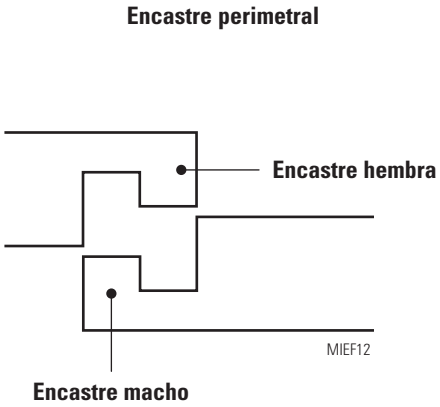


Fig. 23

Ejemplo de colocación con recuperación de la parte cortada de los paneles aislantes del sistema Emmeti Floor (Standard, Classic, Plan, Step)

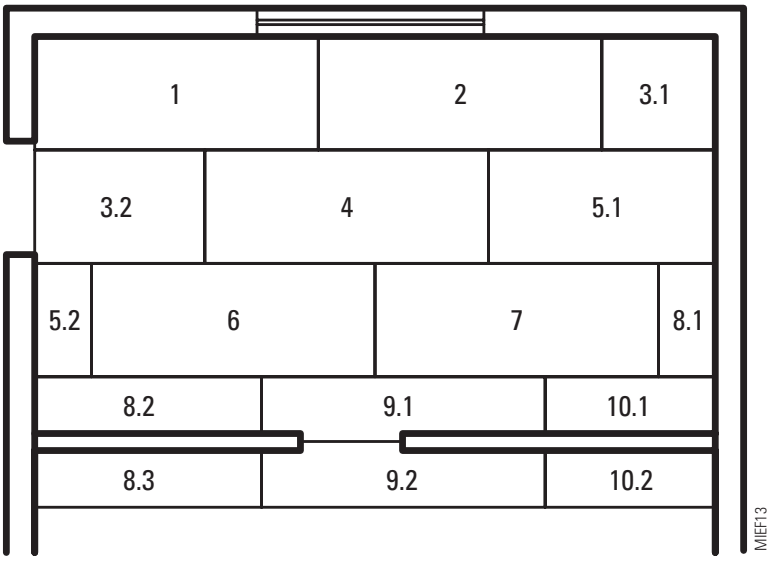


Fig. 24

Panel Roll Floor

Es aconsejable comenzar a poner el rollo a partir de una esquina de la habitación en la dirección de la pared más larga de la misma, asegurándose de que el borde adhesivo se acercó al perímetro tira (Fig. 25).
Una vez que la primera fila del panel, continuando la colocación de la unión posterior por la superposición del borde adhesivo (Fig. 26).
Las piezas cortadas se vuelven a utilizar en exceso de la siguiente fila, respetando siempre que sea posible cuadrícula de alineación impreso en la superficie de la película, para reducir al mínimo el desperdicio de material (Fig. 27); paneles de sellado (lado corto), se llevarán a cabo con cinta adhesiva Emmeti.

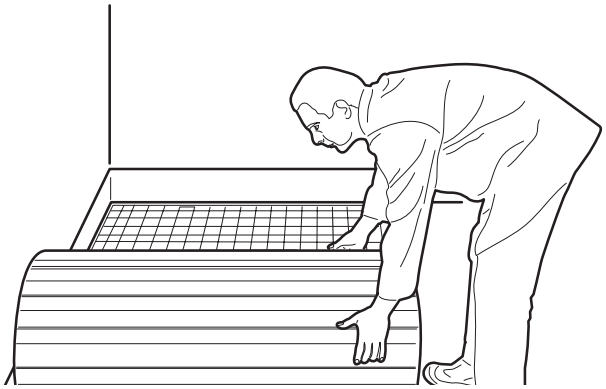


Fig. 25

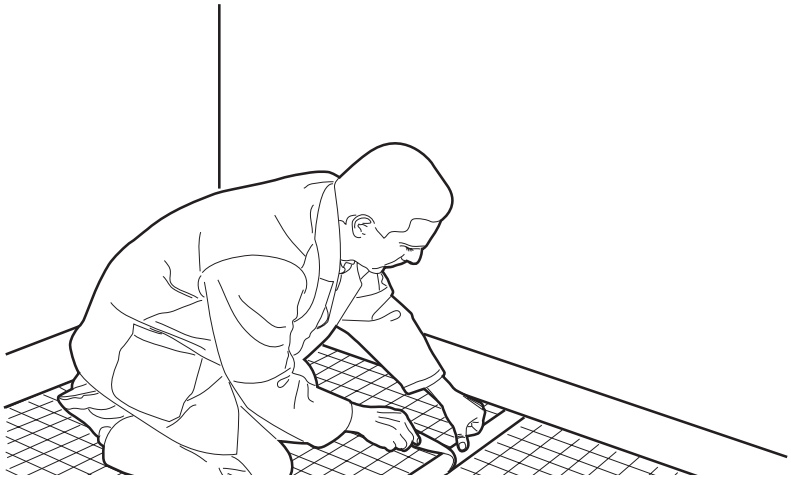


Fig. 26

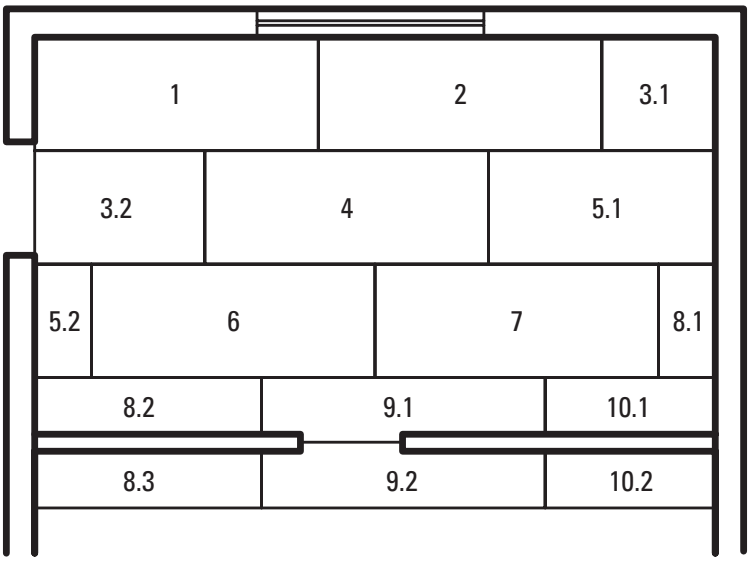


Fig. 27

Panel Grid floor

La nueva gama de paneles Grid Floor para la realización de instalaciones radiantes de suelo, se caracteriza por la particular conformación de la rejilla de material plástico reciclado (polipropileno), que combina la sencillez de instalación de las tuberías de los sistemas con cojinetes, con las ventajas de los sistemas planos en términos de intercambio de calor.
De hecho, los tubos se adhieren firmemente a los paneles y están completamente en contacto con la regla, que llena los agujeros perforados, mejorando el intercambio térmico del sistema.
En la versión sin aislamiento, es suficiente una regla sobre el bastidor de espesor reducido gracias al anclaje de la regla a la capa inferior. Por lo tanto, es especialmente adecuado para las renovaciones, ya que permite obtener espesores totales reducidos.
La planta también tiene una menor inercia térmica.
El panel Grid Floor deberá estar bien sujeto a la capa de soporte. Con este fin, se recomienda el uso de pegamento, espuma de poliuretano o fijaciones mecánicas (tacos) en caso de que esto no comprometa la continuidad de los aislamientos inferiores para optimizar la adhesión, para evitar desprendimientos del panel durante la instalación de la tubería y la regla.
No se admitirán subfondos de arcilla expandida u otro material agregado.

Con fondo adhesivo

El fondo deberá ser:

- Portante
- Estable (sin grietas, grietas, etc.)
- Superficies perfectamente planas
- Limpio de polvo, residuos, etc.
- Tratadas con imprimación para superficies cementosas
- Si es necesario, utilizar tacos (cod. 28130037) sin perforar las instalaciones existentes

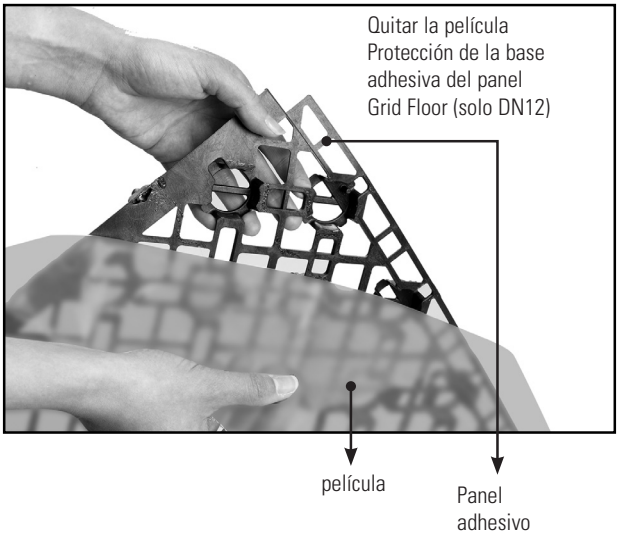
Corte de paneles: cizalla de chapa o cortador de placas de yeso.

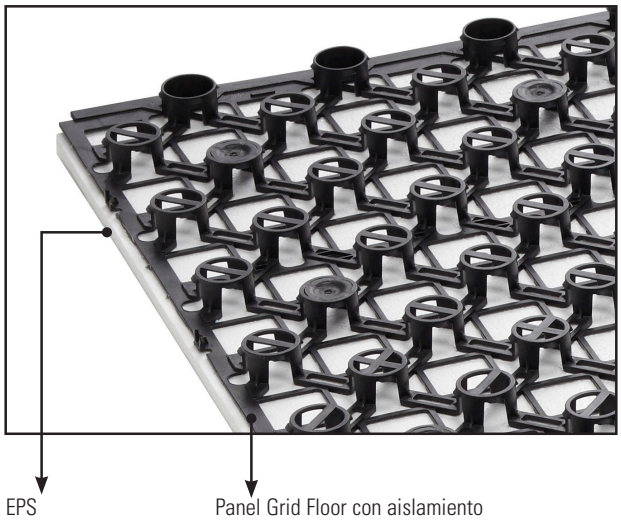
Con aislante

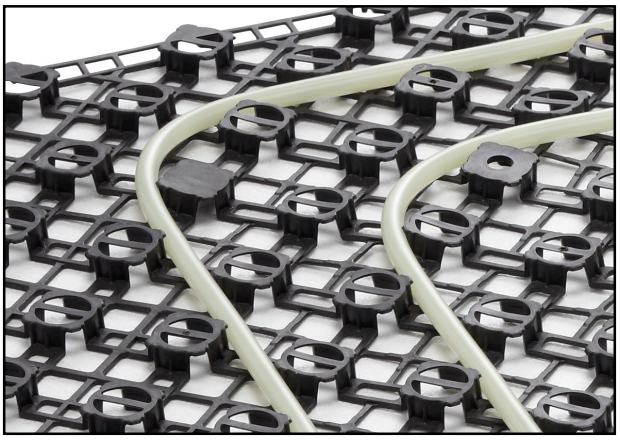
- Debe pegarse con pegamento tipo abrigo (Producto recomendado: fischer FASTGRIP 800)

Corte de paneles: amoladora angular (flex)

Encastres perimetrales especiales







Panel Klettjet

Antes de la colocación, asegúrese de que el soporte en el que debe colocarse el panel sea lo más plano posible, liso y limpio.
Se recomienda iniciar la colocación del rollo, tanto para el panel EPS-T Klettjet como para el panel PE Klettjet R, partiendo de una esquina del local en dirección a la pared más larga del mismo, de modo que el borde esté unido a la franja perimetral (Fig. 28). Las piezas sobrantes cortadas se reutilizarán en la siguiente fila, respetando, si es posible, las alineaciones de la rejilla impresa en la película superficial, para minimizar los residuos de material (Fig. 30).

En el caso de paneles EPS-T (espesor 25 o 30 mm), empalme los paneles con la cinta adhesiva 50 mm (Fig. 29). En el caso del panel PE (espesor 6 mm) antes de la colocación, se retirará la película colocada en la parte posterior del panel para descubrir la superficie adhesiva. Si el soporte es en bruto, se recomienda comprobar que la superficie garantiza el perfecto encolado de los paneles. Considere la posibilidad de aplicar imprimaciones específicas.

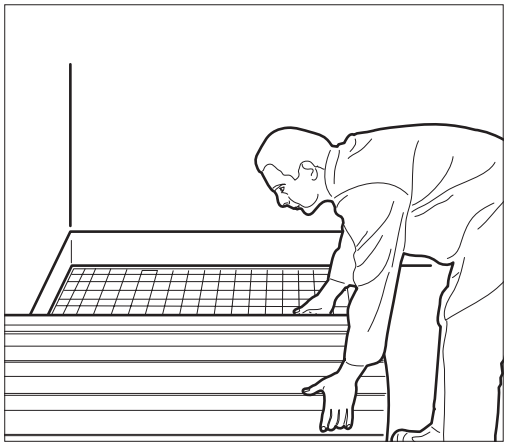


Fig. 28

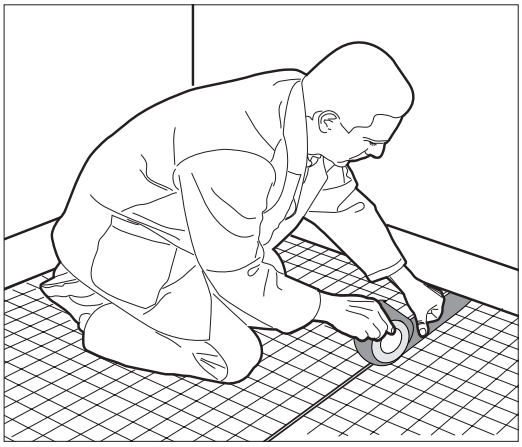


Fig. 29

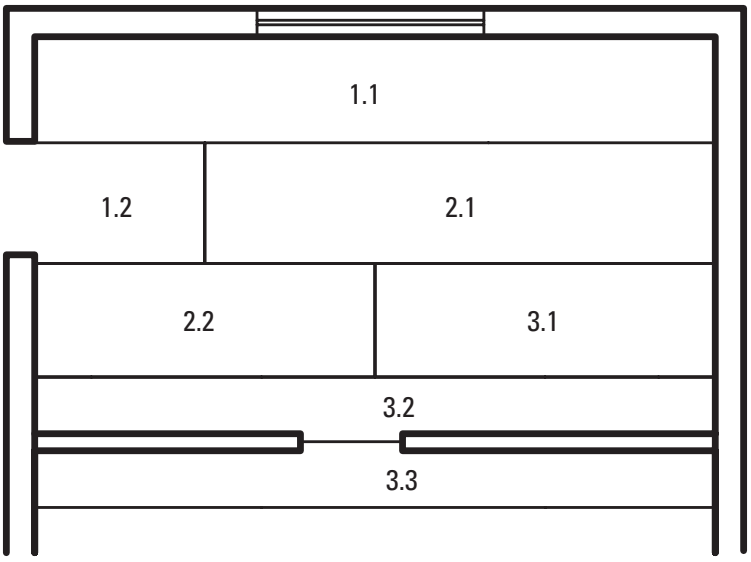


Fig. 27

Panel Thin Floor

Se recomienda iniciar la instalación de los paneles de una esquina de la habitación en dirección a la pared más larga de la misma (Fig. 28).

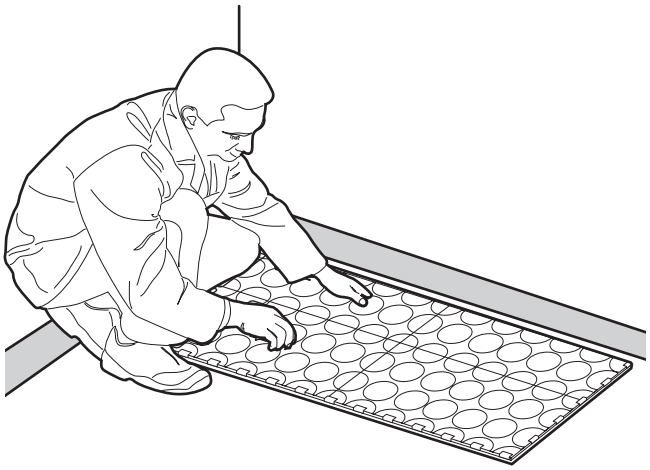
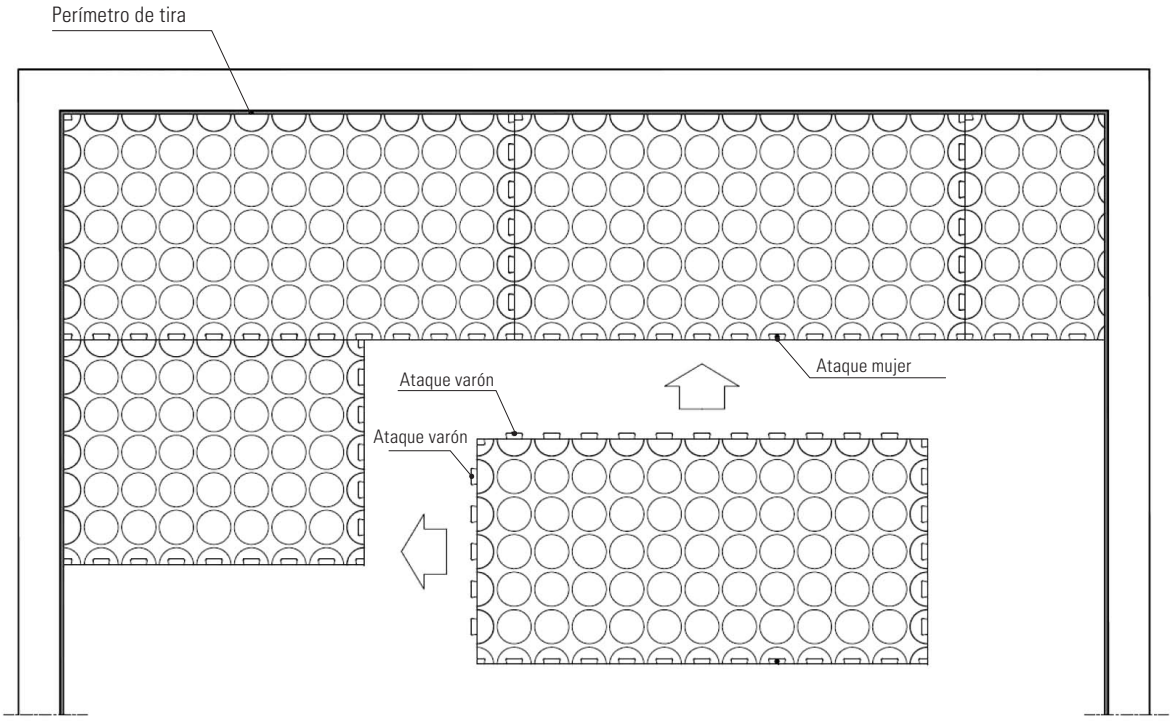


Fig. 28

Después de retirar la película protectora de la base autoadhesiva, colocar los paneles con la cola de milano lado hacia el perímetro junta de expansión (la lengua y en la cara apoyada en la junta de dilatación perimetral primero se debe retirar con una hoja de cuchillo de grandes dimensiones) .
Asegúrese de que la superficie de instalación se limpia correctamente para evitar dificultades de adhesión.
Continuar unirse a los paneles con juntas especiales, cortándolos con una cuchilla de corte grande y la reutilización de las partes sobrantes para las filas posteriores, la comprobación de la alineación de los sillares entre una fila y el otro (Fig. 29) y la superposición correcta de las articulaciones macho con las correspondientes articulaciones femeninos.



Ataque de perímetro

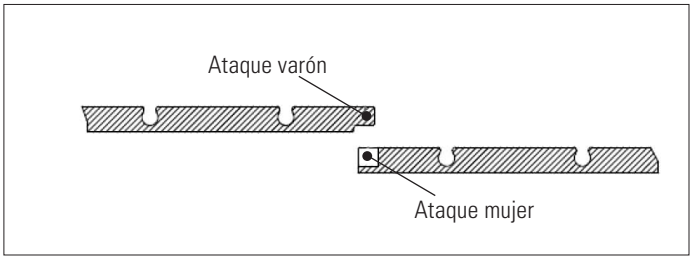


Fig. 29

Panel Dry Alu Floor

Advertencias

Para la instalación del sistema Emmeti en seco, aténgase siempre a lo previsto por la norma UNI EN 1264. La superficie de instalación debe estar plana y limpia. Si es necesario, realice previamente un acabado superficial con hormigón de nivelado automático. Coloque los paneles (empezando por los delanteros) según el diseño de instalación del técnico (que deberá indicar la posición de los paneles delanteros, así como el desarrollo de los serpentines). Se recomienda pegar los paneles, en especial los delanteros, a la superficie inferior, usando colas adecuadas. Los paneles delanteros deberán estar junto a la pared más corta de la habitación en la que se ubiquen; de este modo, el circuito necesitará un número menor de curvas de los tubos y, por lo tanto, habrá menos pérdidas de carga.

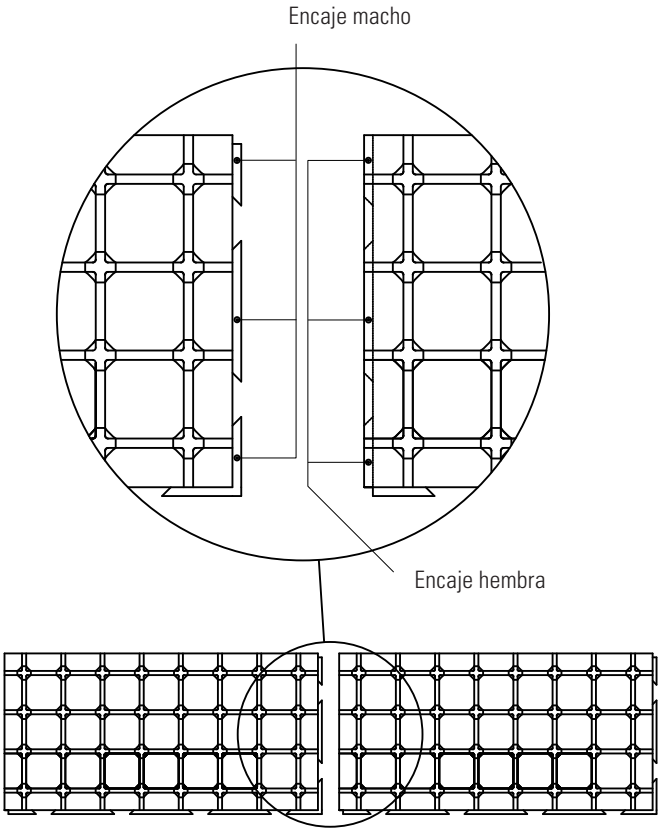
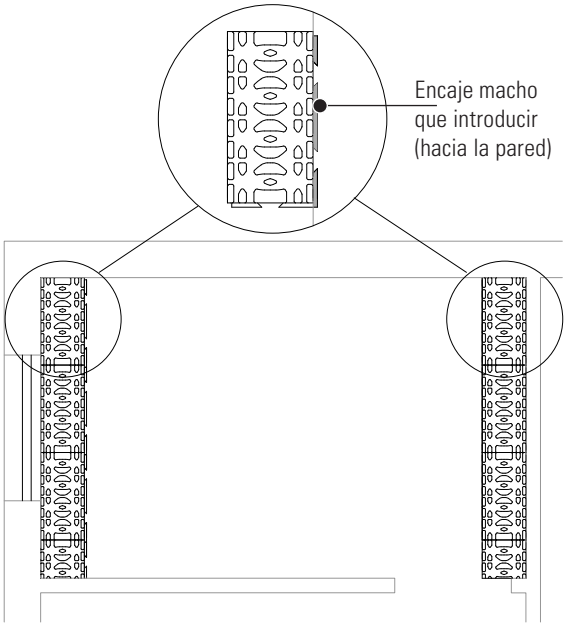
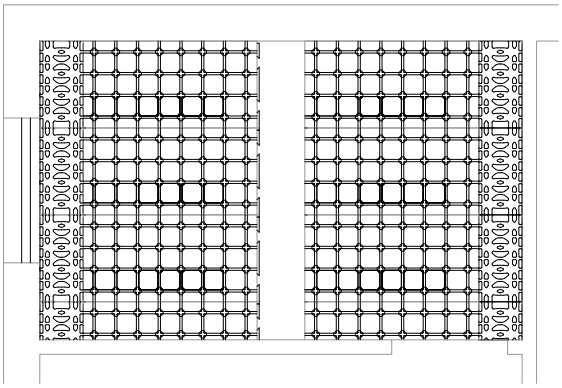


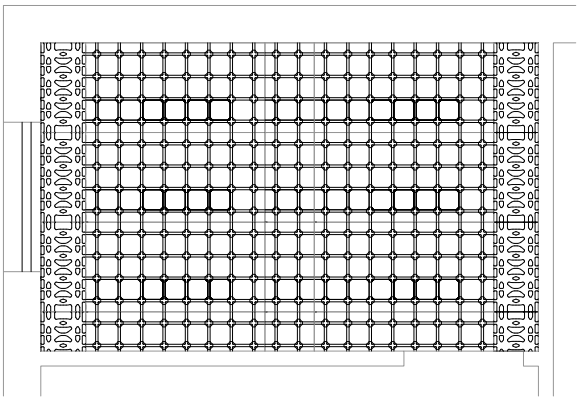
Fig. 30



Fase 1:
Instalación de paneles delanteros



Fase 2:
Instalación de paneles laterales encajados en los delanteros



Fase 3:
Instalación de paneles centrales (cortar si es necesario)

Fig. 31

Si es necesario, dependiendo del esquema de instalación, corte los paneles con un corte realizado con herramientas adecuadas, que permitan un corte lineal y regular (sin rebordes). Se recomienda cortar de un lado un encaje macho. El siguiente panel debe instalarse adyacente al cortado, dada la imposibilidad de encaje.
Ejemplo: en el esquema de instalación se demanda que uno de los paneles tenga una longitud de 750 mm (panel B). Dado que, al cortar el panel, los encajes macho desaparecen, el panel cortado (panel B) y el panel adyacente (panel C) deben apoyarse el uno sobre el otro.

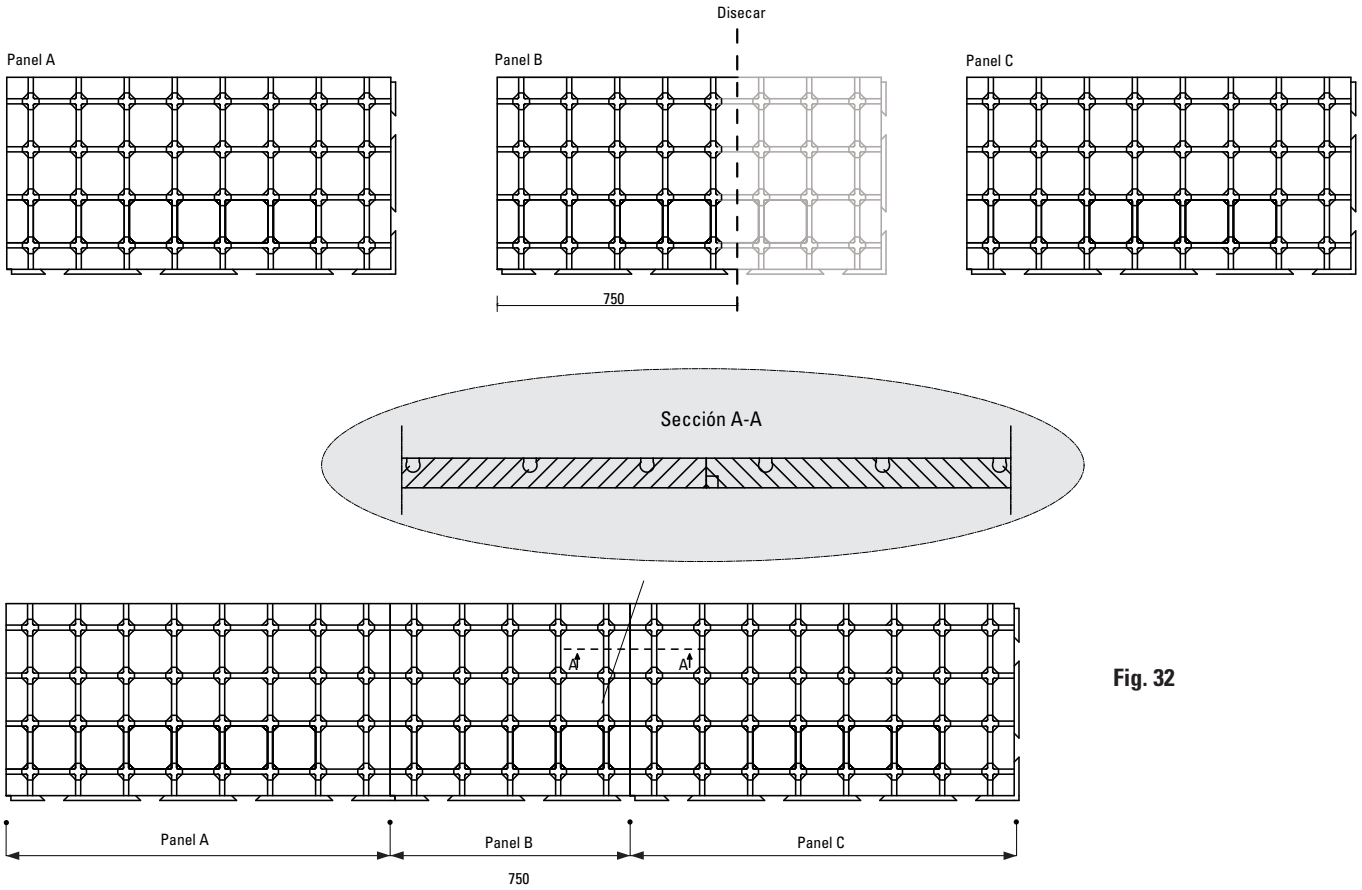


Fig. 32

En correspondencia con los colectores de distribución o con puntos concretos (como puertas, espacios perimetrales, etc.) con un desarrollo superficial limitado y difícil de cubrir con el panel, se recomienda emplear en lugar del material de relleno (como hormigón), a la misma altura que los paneles.

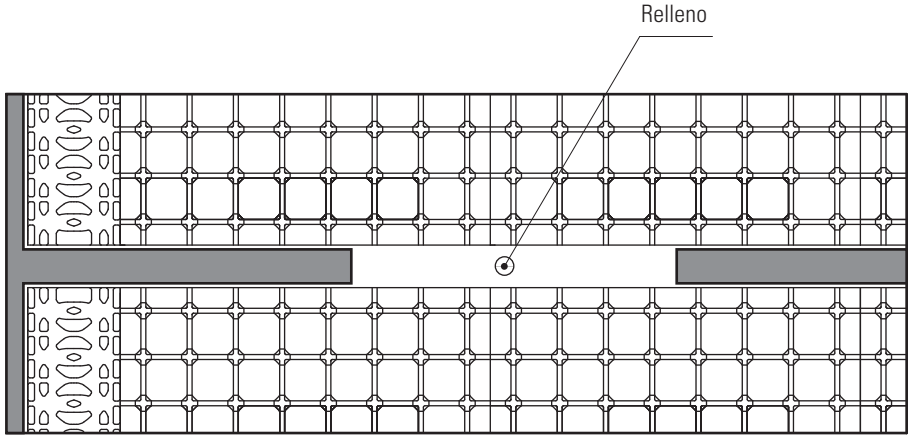


Fig. 33

Operaciones preliminares

Unir los tubos al colector de impulsión (utilizando para el tubo PE-X los adecuados soportes curvos, Fig. 34), con las tuercas monoblocco Emmeti (apretando los empalmes) y aislar los tramos iniciales de los circuitos (del colector hasta cerca de 25 cm dentro del mortero), con vainas blandas aislantes.

Entre los sistemas de colocación el más utilizado es "a caracol", que con respecto del sistema "a serpentina", permite alternar los tubos más calientes con los más "fríos", consiguiendo una temperatura superficial más homogénea, y además de efectuar una colocación con curvas a 90° que limitan los esfuerzos a las tuberías y las pérdidas de carga a la circulación del agua. El proyecto de los circuitos de una calefacción por suelo radiante puede prever distancias o "pasos", diversos entre los tubos dentro de la misma estancia. Esto determina una subdivisión de las zonas en "habitable" y "marginal", o perimétrica.

La zona marginal (Fig. 35) es la franja, de ancho máximo 1 m, a lo largo de las paredes externas. En tal zona, el paso entre los tubos puede ser inferior con respecto de la zona habitable, más interna.

Si el circuito se desarrolla dentro de un área que comprende la zona habitable y marginal, el circuito es definido "mixto" (Fig. 36 y 37).

Se utiliza en cambio la tipología "separada" para desarrollar circuitos qué sirvan exclusivamente sólo áreas marginales o áreas habitables (Fig. 38).

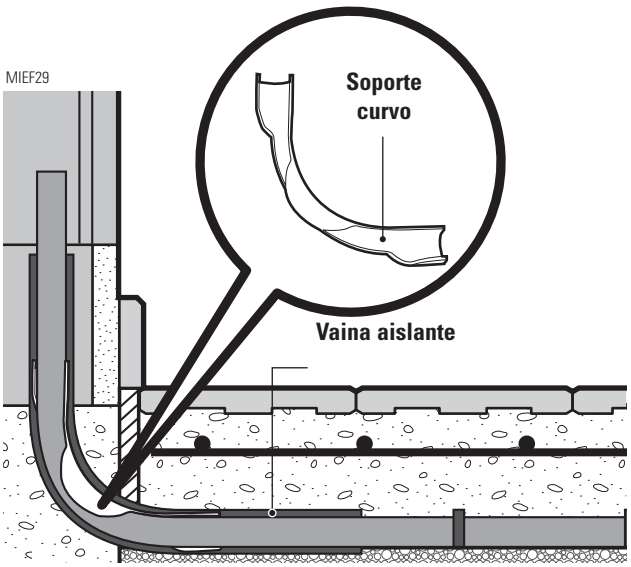


Fig. 34

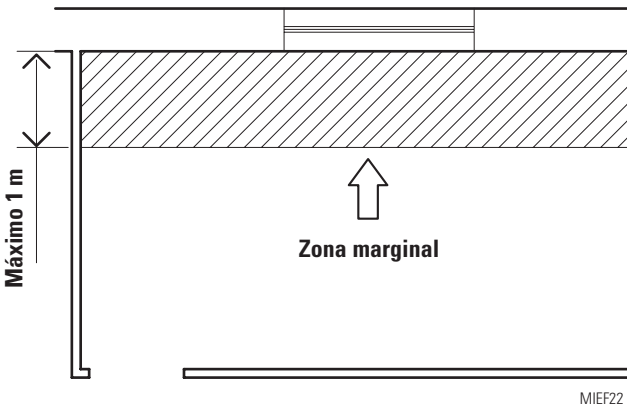


Fig. 35

Compruebe que el diámetro de los tubos que se quieren instalar sea compatible con el panel elegido	
Panel	**Diámetro de tubos instalables (mm)**
Standard, Standard Combi	16 - 17
Classic, Plan, Roll	16 - 17 - 20
Step Combi	16 - 17
Dry Alu	17
Thin Floor	12

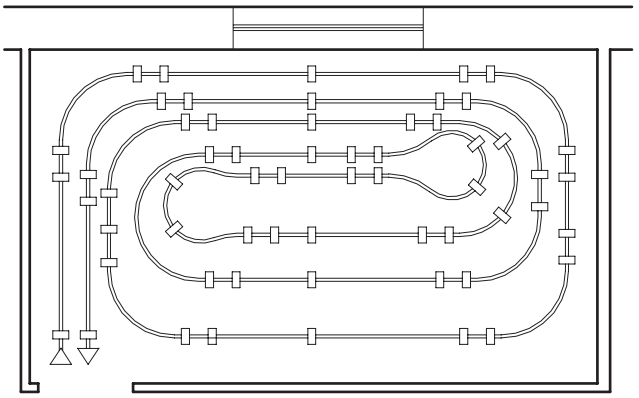


Fig. 36

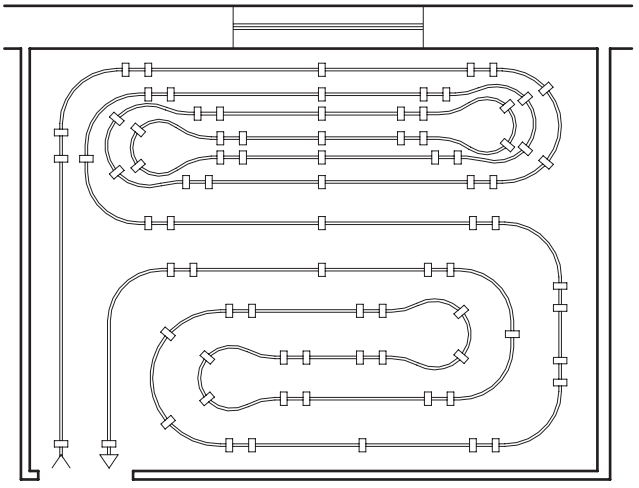


Fig. 37

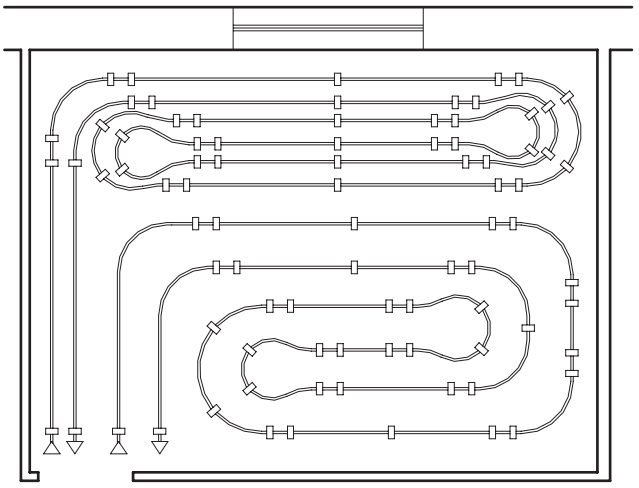


Fig. 38

Curvas

El radio mínimo de curvatura para los tubos del sistema Emmeti es de 5 veces el diámetro externo del tubo (sólo en el caso de PE-Xc tubo de 12x2, en combinación con el panel de Thin Floor, este valor es inferior).
Respetar con atención este límite, para evitar desagradables fenómenos de "estrangulación" de los tubos.

Distancia de las estructuras verticales

Los tubos tienen que respetar una distancia mínima de 50 mm de los estructuras verticales.
Antes de efectuar la colocación del tubo, se aconseja señalar sobre los paneles las áreas interesadas para cada circuito, para facilitar la operación de instalación sin posibilidad de errores.
Con base en el proyecto de la instalación, verificar que el rollo sea de largo idóneo para la realización de los varios circuitos, de modo que se limite lo más posible los sobrantes.
Se recuerda que es indispensable cortar las extremidades de los rollos nuevos unos 10 cm ya que pueden resultar dañados de las operaciones de prueba.

Accesorio para desenrollar tubos

El empleo del práctico accesorio Emmeti (para rollos hasta 600 mts), permite la colocación del tubo de modo simple y rápido (Fig. 39).

Sistema Plan Floor

Iniciar la colocación en la obra del tubo desarrollando el rollo en el sentido contrario al de enrollado y fijarlo sobre los paneles con el adecuado accesorio Tacker fijaclips (Fig. 40).
Se aconseja colocar los clips con una separación de 30 - 40 cm, teniendo cuidado con no colocarlo en correspondencia del centro de curvatura del tubo (en las curvas).
La figura 41 muestra la colocación correcta de los clips a lo largo de las curvas a 90° y 180°.

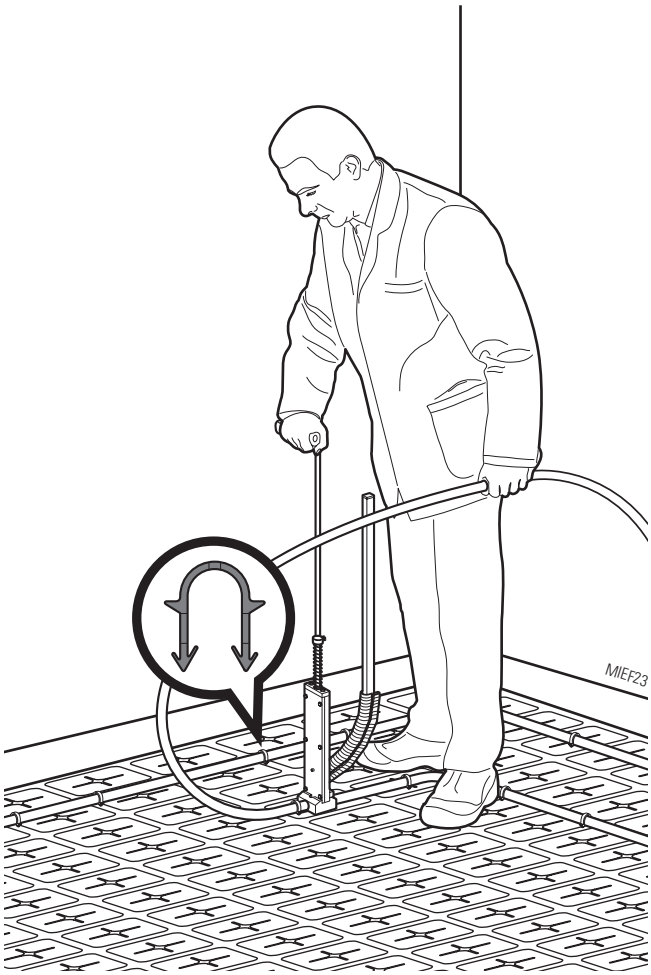


Fig. 40

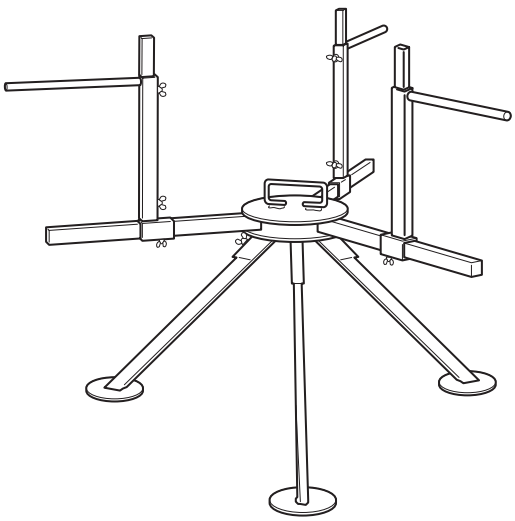


Fig. 39

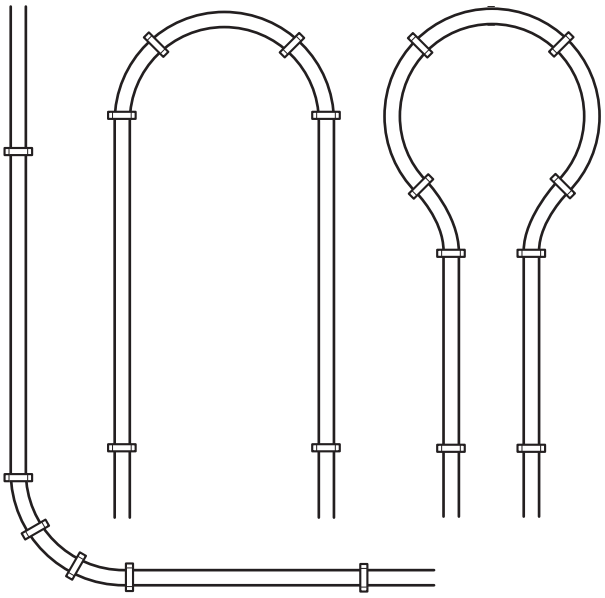


Fig. 41

Standard Floor, Standard Combi Floor, Grid Floor, Classic Floor e Step Combi Floor Systems

Para los paneles Standard e Floor Standard Combi Floor (*), Classic Floor, Step Combi Floor la correcta operación de colocación de las tuberías no requiere el empleo de herramientas; esto es posible gracias a la particular conformación diseño superficial de los paneles caracterizados por los tetones en relieve que permiten insertar los tubos en los encajes con la simple presión del pie (Fig. 42) y aseguran el bloqueo de las tuberías manteniéndolas debajo del plano de pisoteo y previniendo por lo tanto accidentales agresiones.
En caso de necesidad se aconseja utilizar los específicos clips de caballete o manuales (Fig. 43) para anclar el tubo al panel.

(*) Sobre Standard Floor, Standard Combi Floor rebajado H=10 mm, se aconseja utilizar tubo multiestrato Alpert y Clip de caballete.
(**) En Grid Floor se recomienda utilizar el taco de fijación para mejorar el anclaje de tubo y panel.

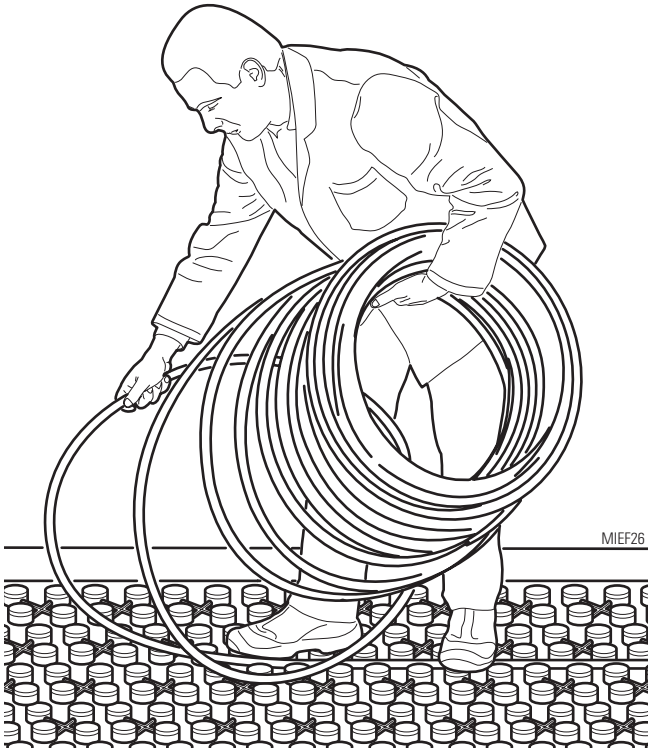


Fig. 42

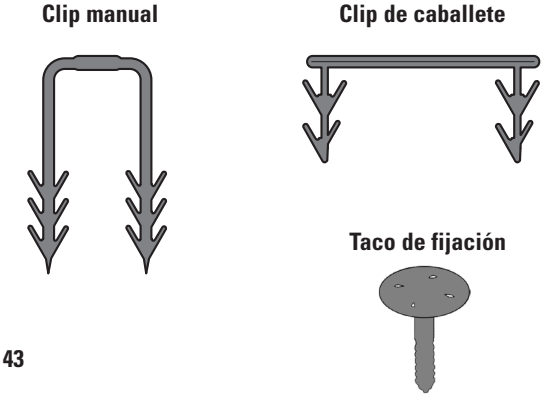


Fig. 43

Standard Floor, Standard Combi Floor, Grid Floor, Step Floor e Step Combi Floor passo 50 mm

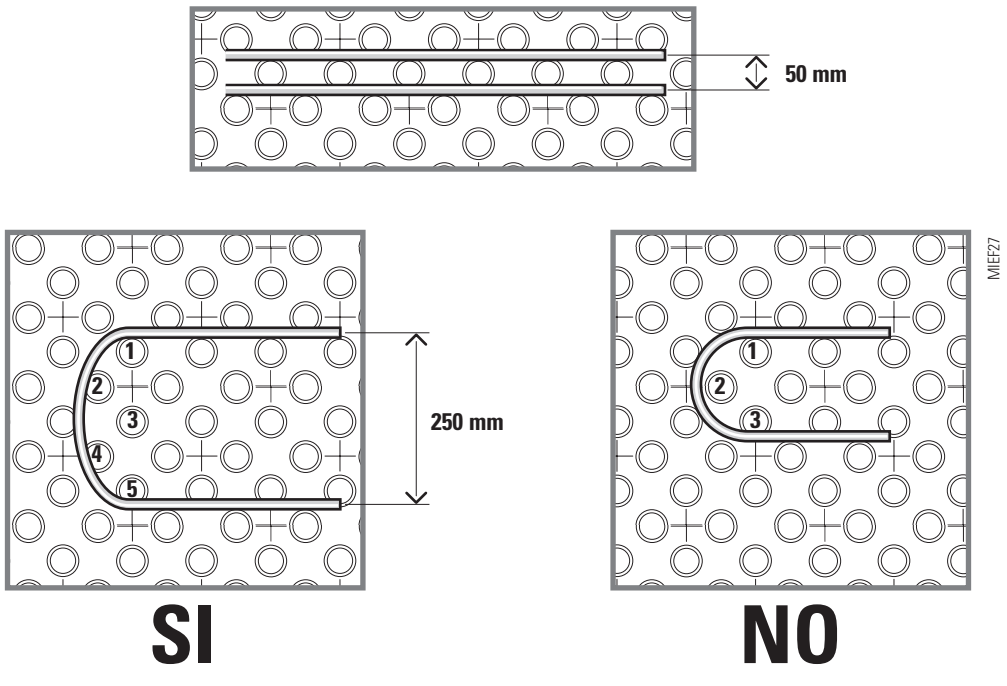
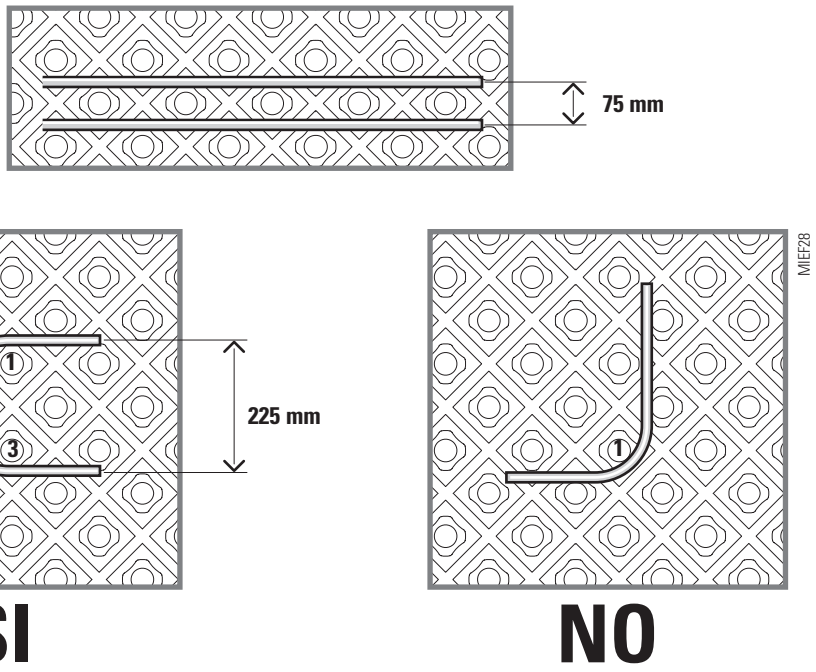


Fig. 44

Panel Classic Floor - paso 75 mm

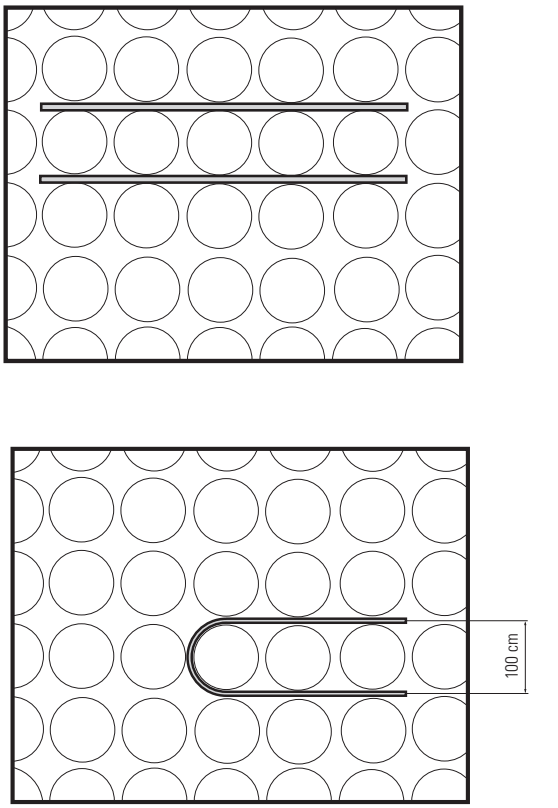


Curva a 180 ° de cada 3 jefes

Curva a 90 ° de cada 1 jefes

Fig. 45

Panel Thin Floor - passo 100 mm



SI - La curva a 180° - 1 bugna

SI - La Curva a 90° - 1 bugna

Fig. 46

Panel Dry Alu Floor

Para la realización de los circuitos, emplee el tubo 17x2 (se recomienda PE-Xa). Con este tipo de panel, el sistema de instalación sólo puede ser de serpentín (Fig. 31).

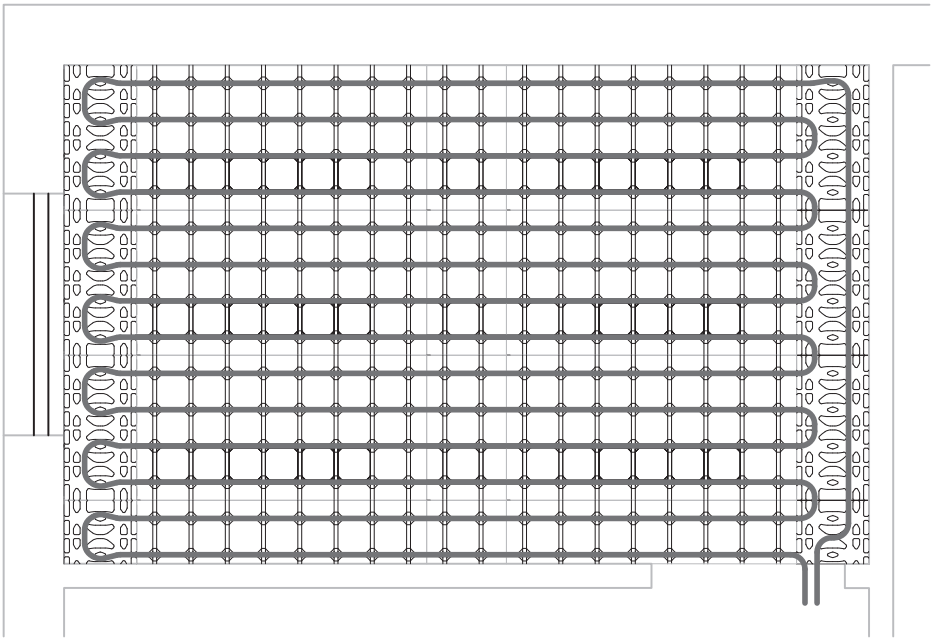
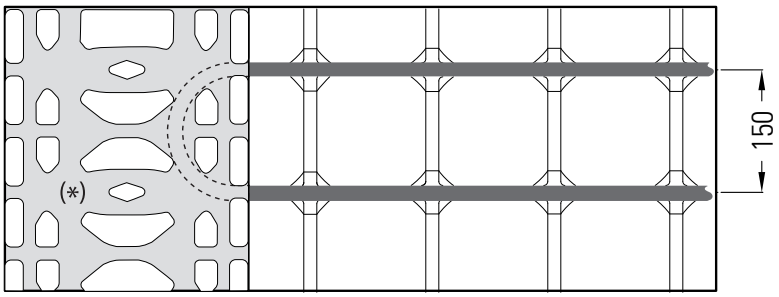
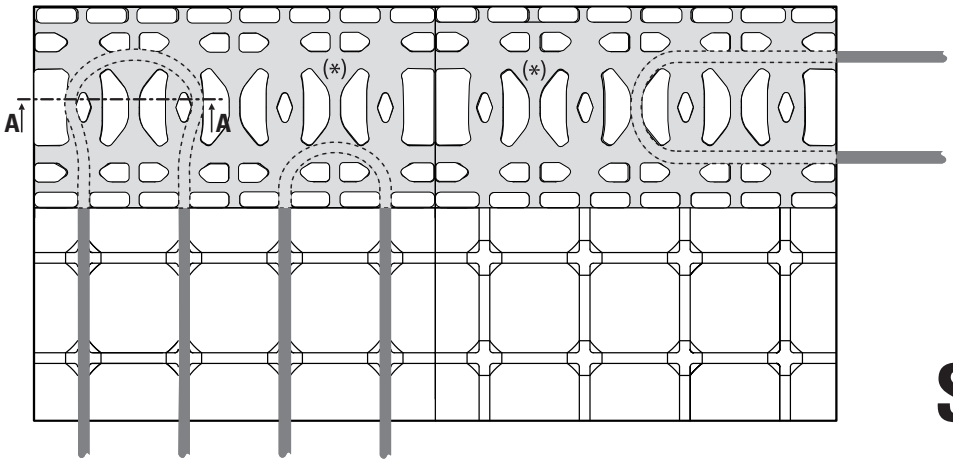


Fig. 47



Se recomienda insertar los tubos en correspondencia con los paneles primarios (*) con masa o mortero autonivelante, teniendo cuidado de rellenar cada espacio vacío entre los tetones nivelando y dejando al ras de la parte superior del panel.



SI

Sección A-A

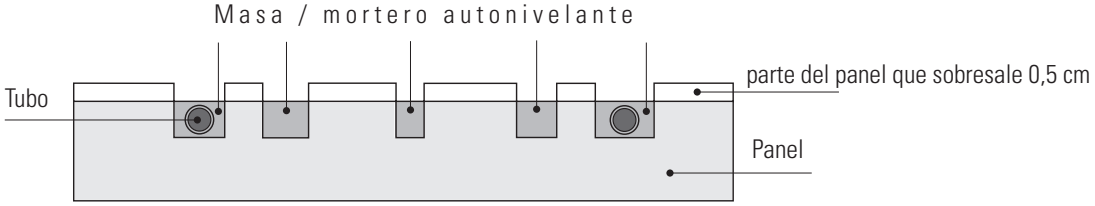
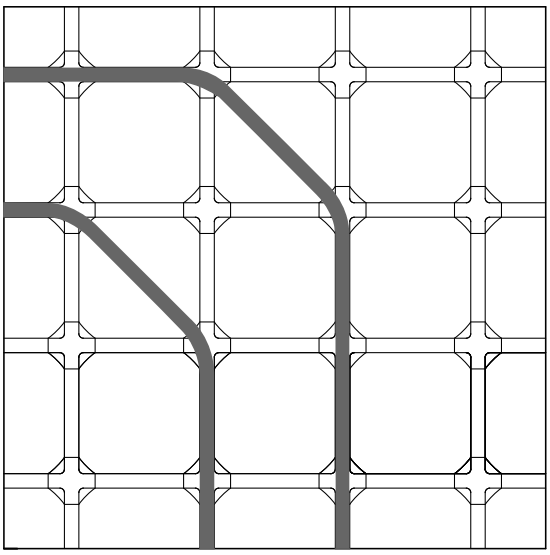


Fig. 48



Seque el panel está diseñado para la instalación de cañerías de 45 °, después de recorte de papel de aluminio.

Operaciones finales

Una vez acabada la instalación del circuito, conecte los tubos con el colector de retorno empleando el mismo sistema descrito para la impulsión. Para acabar, se recomienda tomar nota de la longitud de los circuitos y de los locales a los que pertenecen (los tubos tienen marcas numéricas en cada metro), señalándolo en el colector, para simplificar las comprobaciones entre las longitudes de proyecto y las reales. Este dato es muy útil para poder realizar después el equilibrado hidráulico correcto de la instalación.

Una vez acabada la instalación, en caso de modificaciones con respecto al proyecto ejecutado, se deberá indicar en un plano del inmueble el relieve de la distribución de los circuitos a partir del colector. Se entregará una copia de esta documentación al propietario del inmueble.

Atención

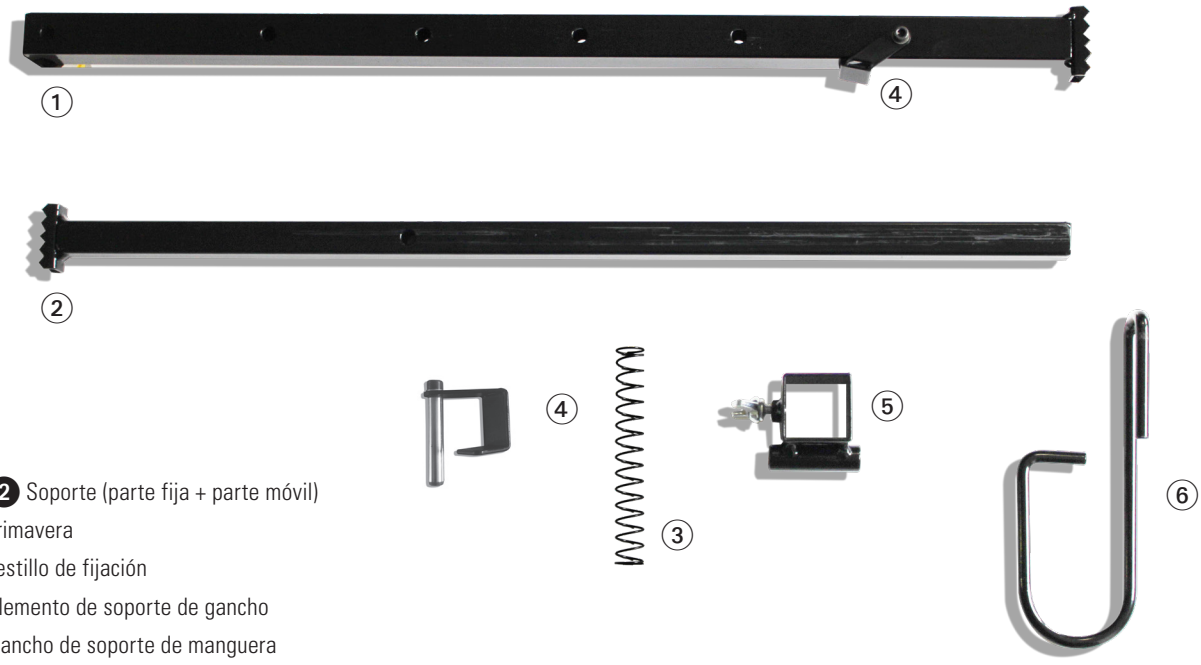
La instalación a suelo no es visible, y el tiempo confunde los recuerdos.

Fig. 49

Sistema Klettjet

Para la instalación del tubo Pex Penta Klett se recomienda usar los guantes adecuados.
Fije el soporte para el tubo (Fig. 53) entre los hombros de una puerta de acceso de acuerdo con las siguientes indicaciones.

Fig. 53



1 + **2** Soporte (parte fija + parte móvil)
3 - Primavera
4 - Pestillo de fijación
5 - Elemento de soporte de gancho
6 - Gancho de soporte de manguera

- Retirar el perno de fijación (4)
- Retirar la parte móvil del soporte (2) y el resorte (3) de la parte fija (1)
- Insertar el cerrojo en uno de los orificios de la parte fija del soporte según el ancho de la puerta (para una puerta de 90 cm de ancho colóquelo en el segundo orificio como se muestra en la figura 53-1)
- Vuelva a insertar primero el resorte, luego la parte móvil del soporte
- Colocar el elemento de soporte del gancho (5) en correspondencia con uno de los orificios restantes y bloquearlo apretando la tuerca de mariposa
- Comprimir la parte móvil del soporte sobre el fijo y soltarlo después de colocarlo en correspondencia con la puerta a una altura de 140 cm. desde el piso. Inserte el gancho (6) en su soporte.
- Pasar la tubería por el interior del gancho y colocarla sobre los paneles instalados según el esquema del proyecto siguiendo la cuadrícula dibujada en los paneles.
  (ver figura 54) con la simple presión del pie (figura 55). El tubo quedará fijado al panel debido a la presencia del velcro en ambos.
  En caso de cambios en la instalación, la tubería se puede quitar fácilmente y luego volver a unir.

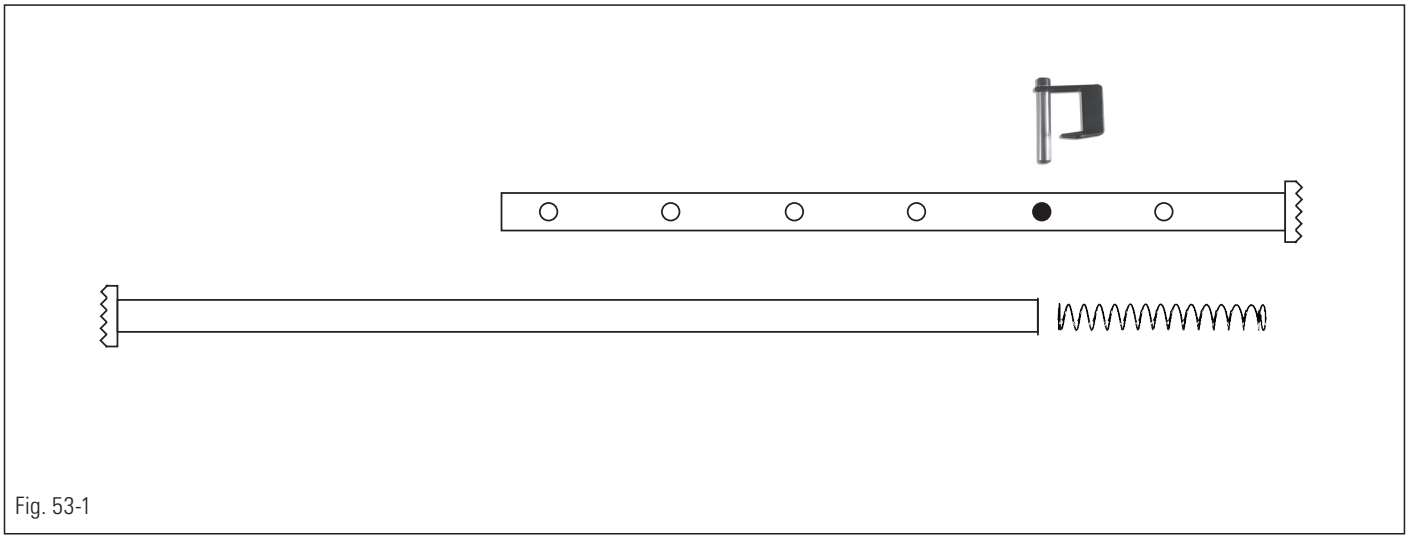
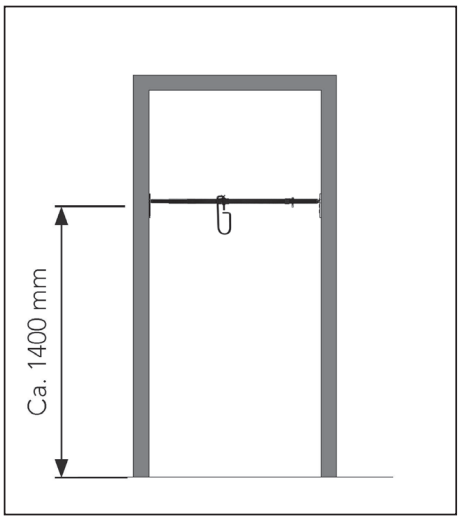


Fig. 53-1

Orificio de inserción de pernos para puertas de 90 cm de ancho



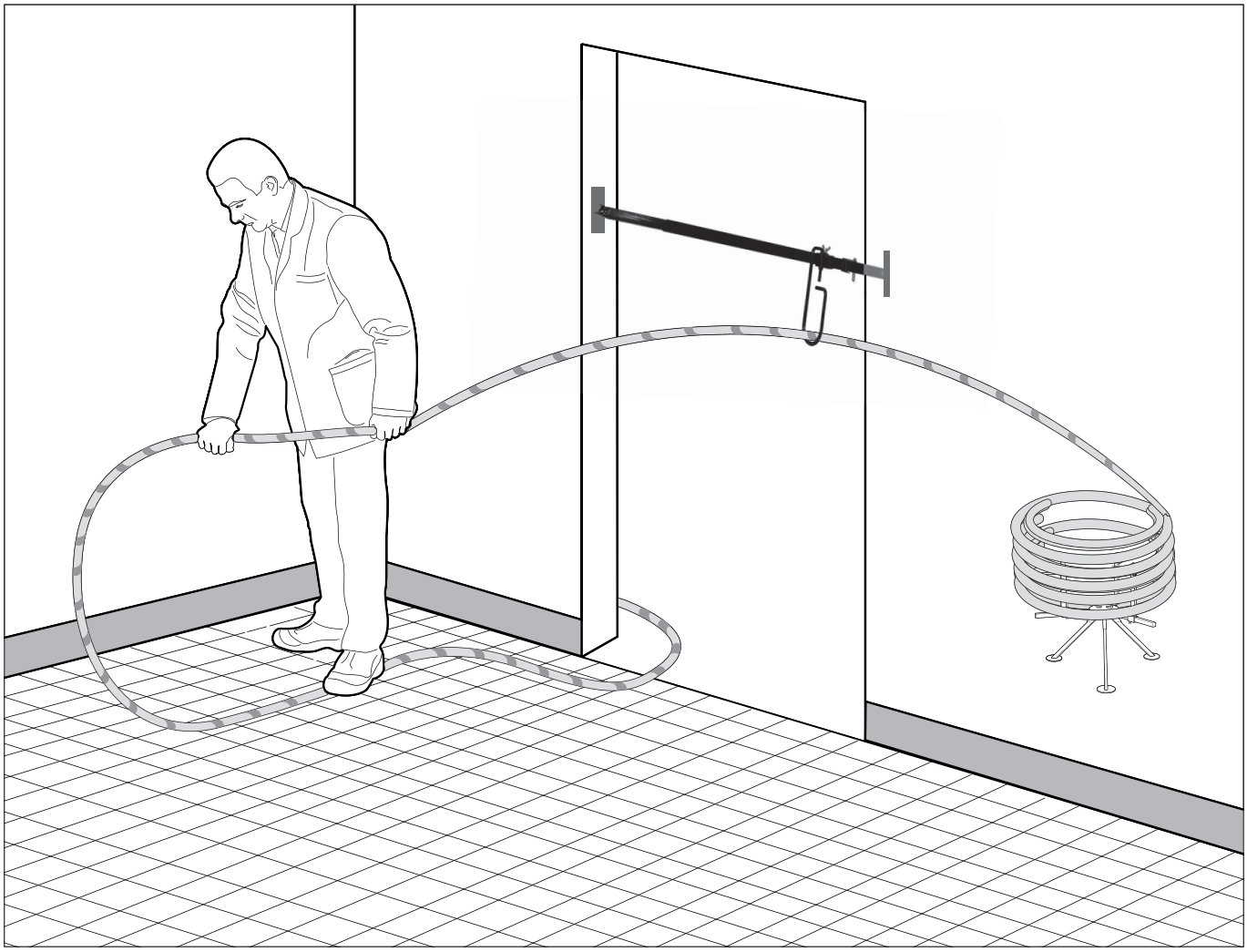


Fig. 54

Pase el tubo PexPenta Klett a través del mosquetón y colóquelo sobre los paneles instalados de acuerdo con el plan del proyecto y siguiendo la cuadrícula dibujada en los paneles (consulte la figura 54) con la simple presión del pie (Fig. 55).
El tubo se fijará al Panelo debido a la presencia del Velcro en ambos. En caso de cambios en la instalación, la tubería puede venir fácilmente retirado y colgado.

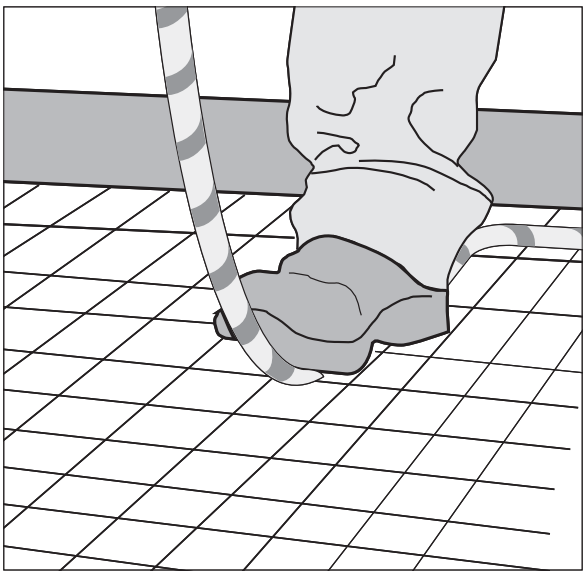


Fig. 55

8. ENSAYO Y PROTECCIÓN DE LA INSTALACIÓN

Una vez acabada la instalación de los circuitos, se debe proceder al llenado de la instalación empleando agua potable con una dureza total inferior a 15%. Se debe proceder gradualmente, llenando un circuito cada vez, para permitir una expulsión rápida del aire.
Después, pruebe la instalación con agua a una presión de, al menos, 6 bar.
Si hay peligro de congelamiento, emplee productos antihielo. Será necesario eliminarlos, una vez acabada su necesidad, mediante el vaciado y aclarado de la instalación.
En cualquier caso, se deberá mantener la presión de funcionamiento, incluso durante el chorro del hormigón radiante.

El tratamiento del agua en las instalaciones térmicas (norma UNI 8065) prevé un acondicionamiento químico para prevenir formaciones microbiológicas como algas, hongos, mohos o bacterias, que se desarrollan en los circuitos con más o menos presencia de oxígeno.
Estos inconvenientes aumentan durante los periodos de ausencia de circulación (de detención de la instalación) y de bajas temperaturas de funcionamiento de la instalación a suelo.
Por lo tanto, se recomienda el tratamiento de las aguas mediante el líquido filtrante antialgas y antical Emmeti.
Para eliminar el aire de manera eficaz y continuada, se recomienda instalar un purgador (separador de microburbujas de aire) y cerrar todos los puntos de posible absorción de aire en la instalación, incluidos los tapones de las válvulas de purga de aire automáticas.

Las pruebas del sistema pueden realizarse con agua potable limpia y filtrada o aire comprimido sin aceite o gas inerte.
Pruebas con agua:
La **prueba hidráulica** para **sistemas de calefacción** se lleva a cabo de acuerdo con las disposiciones de UNI EN 14366 y UNI EN 1264-4, con una presión de prueba major o igual a (1.3 x presión de operación), y en cualquier caso entre 4 y 6 bar, para mantener. Durante al menos 120 minutos. Para más detalles, consulte lo que se indica en las normas.
Pruebas con aire:
La prueba se realiza en dos fases, prueba de fugas y prueba de carga, utilizando manómetros con resolución de 1 mbar y un método de detección adecuado (por ejemplo, agua jabonosa). La prueba de carga sigue la prueba de hermeticidad, si esta última tiene un resultado positivo.
La **prueba de fugas** se realiza llenando el sistema con aire comprimido a una presión entre 110 y 150 mbar, que se mantendrá durante al menos 30 minutos, para volúmenes de hasta 100 litros. Para volúmenes más altos, la duración de la prueba debe aumentarse en 10 minutos por cada 100 litros adicionales.
La **prueba de carga** se realiza llenando el sistema con aire comprimido a una presión de 3 bar (hasta 50x4) o 1 bar (para medidas ≥ 63x4.5), que se mantendrá durante al menos 30 minutos para volúmenes de hasta 100 litros. . Para volúmenes más altos, la duración de la prueba debe aumentarse en 10 minutos por cada 100 litros adicionales.
Al final de la prueba, el instalador debe completar y emitir el informe específico para el cliente / cliente, descargable a través del siguiente enlace:

9. REALIZACIÓN DEL MORTERO DE COBERTURA

El mortero de cobertura es un elemento estructural de fundamental importancia que tiene que ser realizado en breve tiempo después de la colocación de los tubos, para evitar un excesiva exposición a la luz de los tubos, y en un único vertido monolítico, con extremo cuidado por personal especializado y según las indicaciones del proyecto.
Tiene que presentar buenas características de resistencia mecánica, de conductibilidad térmica (λ≥1,2 W/mK, según UNI 10351 y UNI EN 1264) y una adecuada fluidez, que se puede mejorar con la utilización del especifico aditivo fluidificante Emmeti (*).
Un mortero para suelo radiante de tipo cemento es conseguido por lo general mezclando de modo adecuado a los siguientes componentes:
- cemento de calidad certificada y a baja absorción hidrométrica.
- agregados limpios; composición: 50% arena, 0-4 mm y 50% grava (4-8 mm).
- agua potable limpia.
- aditivos faltos de cloruros y sin elementos que afecten negativamente sobre el mortero y sobre los componentes de la instalación.

(*) Dosificación: 1 litro x 100 Kg de cemento

El empleo de un mortero para calefacción que contenga colorantes u inertes especiales tendrá que ser aprobado por el proyectista de la edificación y la composición de tal soporte tendrá que ser garantizada y certificada por el productor.
La clase de resistencia mecánica del mortero para calefacción tendrá que ser adecuada a la entidad de las cargas prevista por el proyecto para la estructura (suelo) y cuanto sea requerido en la normativa de la construcción.

¡Atención!
Se prohíben todos los productos que puedan causar un empeoramiento de la conductividad de la regla (por ejemplo, aditivos de aireación).
El uso de otros aditivos junto con el fluidificador Emmeti debe acordarse con nuestro departamento técnico.
Evite soleras premezcladas o aglutinantes sensibles a la humedad en el caso de sistemas diseñados para enfriamiento en verano.
Las mallas electrosoldadas deben estar dispuestas preferiblemente hacia la superficie inferior de la regla (aproximadamente 15 a 20 mm desde la tubería) y, en cualquier caso, no en contacto con las tuberías (ver Fig. 56).
Recomendamos redes de hierro galvanizado, para soleras (tipo anti-encogimiento), Ø 1.75 - 2 mm.

¡Atención!
En el caso de colocación de soleras anhidras (autonivelantes), el administrador de la construcción debe verificar el uso de mallas electrosoldadas con el fabricante de las mismas.

El emparrillado (mallazo) tienen que ser dispuestas preferiblemente hacia la superficie inferior del mortero, cerca de 15 - 20 mm del tubo, y en todo caso no tiene que estar en contacto con las tuberías (ver Fig. 50).
Se aconsejan redes de hierro galvanizado, (para morteros, de endurecimiento pausado) Ø 1.75 - 2 mm.

Atención
En caso de utilización de mortero anhídrido (autonivelante), el empleo de red electrosodada tendrá que ser verificadodesde la gestión de la construcción, con el mismo productor.

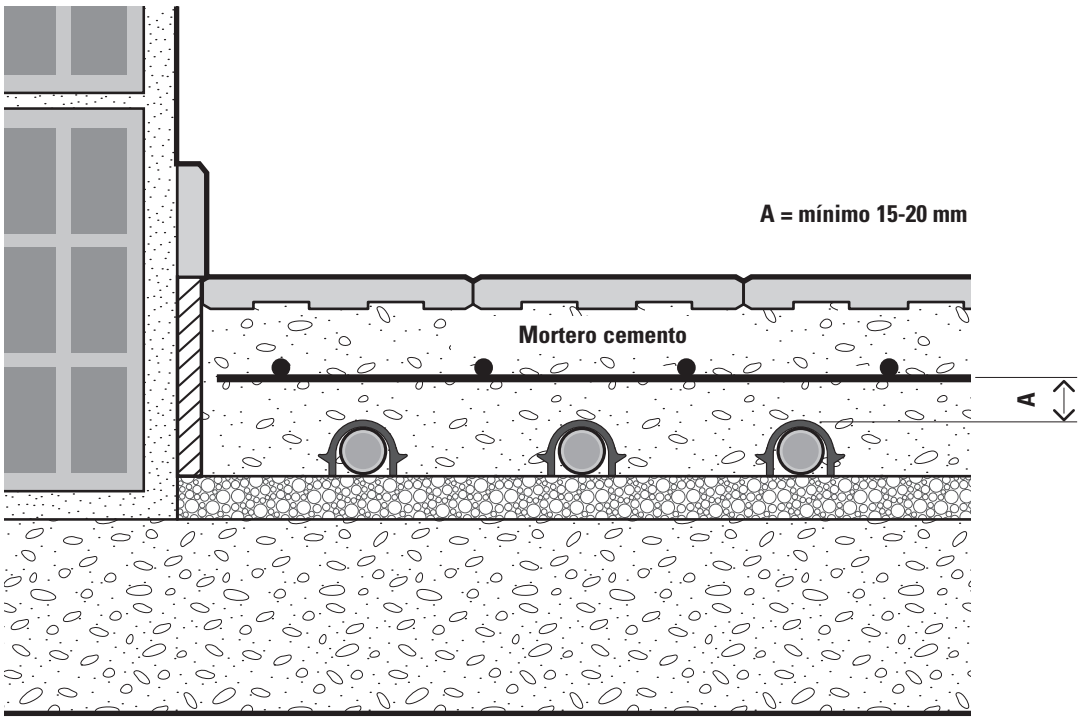


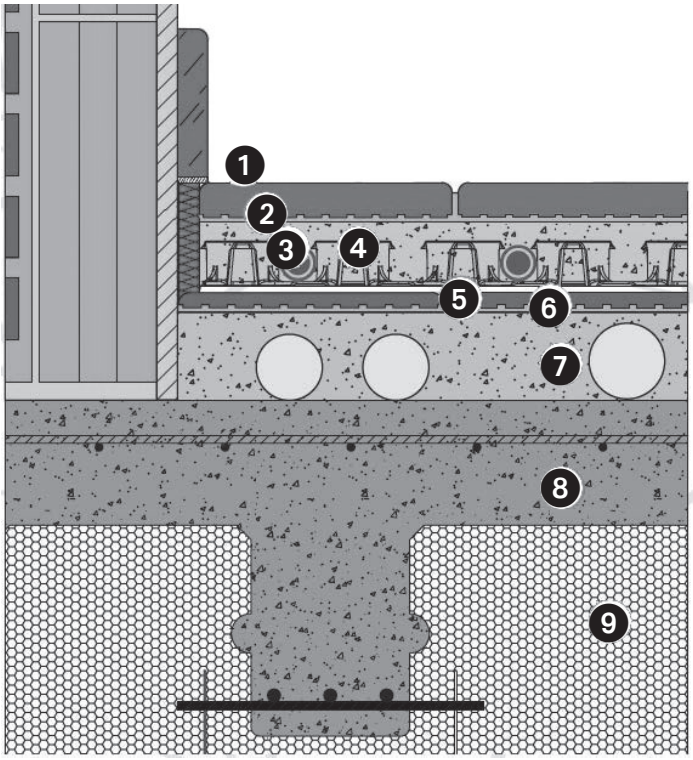
Fig. 50

Los paneles aislantes y las tuberías tendrán que ser preservados antes y durante la ejecución del mortero de eventuales perjuicios; sería recomendable utilizar útiles o aparejos adecuados para evitar que el paso de carretillas y operarios puedan deteriorarlos.
Evitar absolutamente excesos de carga sobre los paneles para que su efecto aislante no sea comprometido.
La realización de un mortero radiante sobre capa aislante también solicita particulares precauciones durante la fase de vertido y maduración; en particular, una vez vertido, el mismo tendrá que ser protegido de la desecación, de la radiación solar directa, del efecto negativo de calor y corrientes de aire para evitar la formación de fisuraciones o contracciones anómalas, (efecto "vela").
Durante la realización del mortero, su temperatura y la temperatura ambiente no deben descender de 5°C.
Después es necesario mantener una temperatura mínima de 5°C durante al menos 3 días.
Los cerramientos deberán por tanto estar montados y cerrados, de otro modo se tendrá que proceder a taponar las aberturas con láminas de polietileno.
Se aconseja en todo caso, una vez efectuado el vertido de hormigón, de protegerlo mojando la superficie con paños húmedos o con agua pulverizada, o bien revistiéndolo con paños de polietileno.

Generación de fluidos Pavimentos
En caso de colocación de solados fluidos generación, especialmente adecuado para la realización de instalaciones con poco espesor (por ejemplo, en conjunción con paneles bajos como el piso THIN), método de espesor y efectiva de colocación debe definirse con el fabricante de estas soleras, dependiendo de la condiciones de instalación (tamaño y tipo que pone la superficie, tipo piso, etc.) y el tipo de sustrato elegido.
La elección del acabado de la superficie debe tener en cuenta el tipo y grosor de solado utilizado.

Panel de anclaje

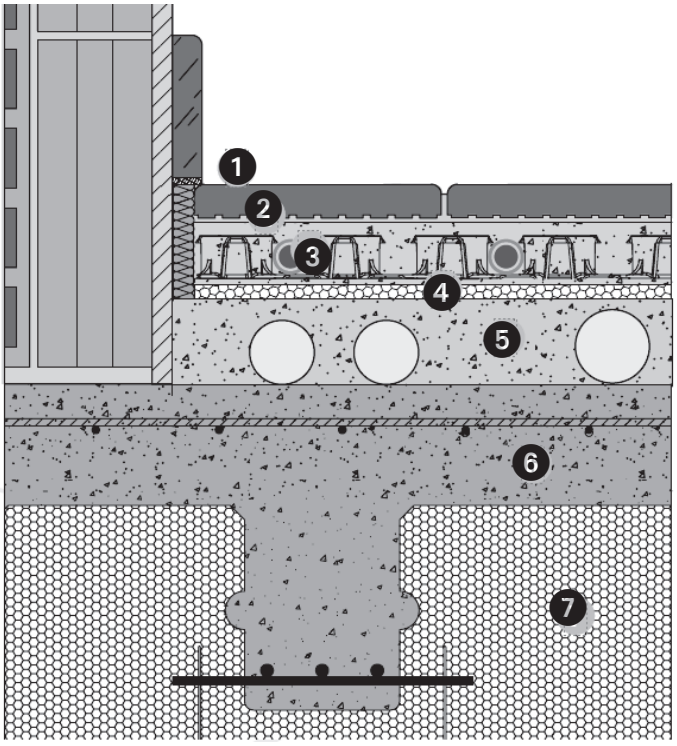
Utilizando una regla fluida de última generación y utilizando un sistema de bomba para la colocación es necesario obtener un espesor de al menos 8 mm por encima de la cuña. Para garantizar en todos los puntos de la instalación el espesor mínimo de solera es fundamental que el sistema panel/tubo esté bien anclado al subsuelo, a tal fin se recomienda asegurarse de que el fondo esté perfectamente plano y libre de grietas. También se recomienda utilizar una imprimación y, cuando sea necesario, utilizar fijaciones mecánicas (tacos) para garantizar una perfecta adherencia.



1. Acabado de cerámica
2. Solera de cemento
3. Tuberías
4. Panel
5. Finitura esistente
6. Primer
7. Solado aligerado para la cobertura de las instalaciones
8. Losa de hormigón
9. Forjado termoaislante

Panel flotante

Para los paneles con aislante, el espesor de la regla recomendada aumenta a 13 mm. Es fundamental que el sistema panel/tubo esté bien anclado al subsuelo para garantizar en todos los puntos de la instalación el espesor mínimo de solapa por encima del bugna. Para ello se recomienda el uso de con pegamento tipo capa.



1. Acabado de cerámica
2. Solera de cemento
3. Tuberías
4. Panel
5. Solado aligerado para la cobertura de las instalaciones
6. Losa de hormigón
7. Forjado termoaislante

Modalidades

La capa de reparto de la carga y de distribución del calor se realiza, para este sistema, a través de una doble cobertura de placas en acero galvanizado.

Una vez completada la instalación de los circuitos, antes de proceder a la instalación de la doble capa de placas, es necesario prever el tendido de una capa de separación, formada por hojas de cobertura en polietileno.

Por encima, es necesario instalar la primera capa de placas galvanizadas. En esta primera capa se usan las placas sin lado adhesivo. Para la instalación de la segunda capa, por su parte, se emplean las placas con lado adhesivo mirando a las de la primera capa (hacia abajo). De esta forma, las dos capas quedarán unidas entre ellas. Las dos capas de placas deberán quedar no coincidentes entre ellas (es decir, las fugas de la primera capa no deben coincidir nunca con las fugas de la segunda).

Es importante evitar la superposición entre las placas de una sola capa. Además, es necesario dejar un espacio de 1 o 2 mm entre una placa y otra.

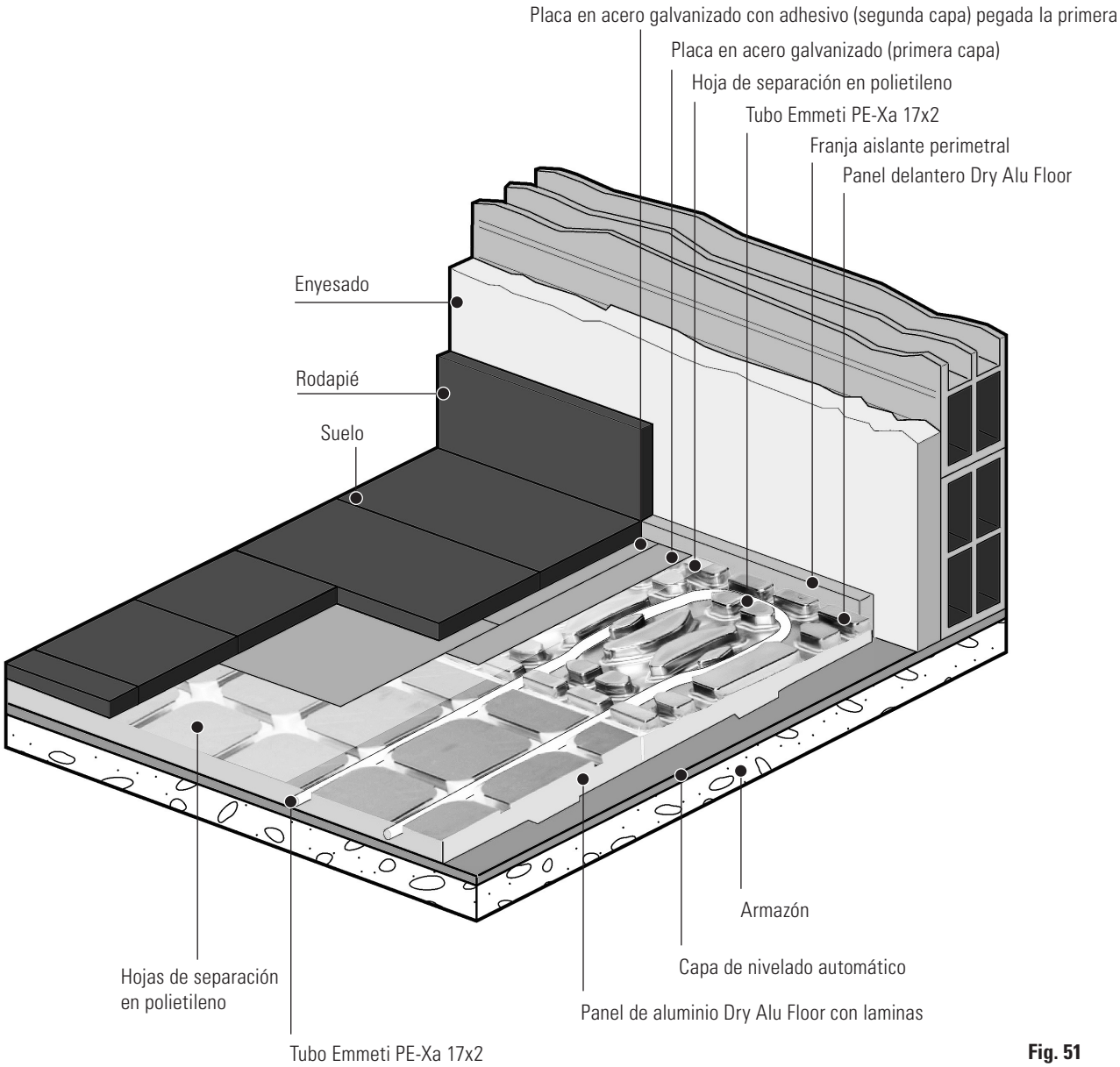
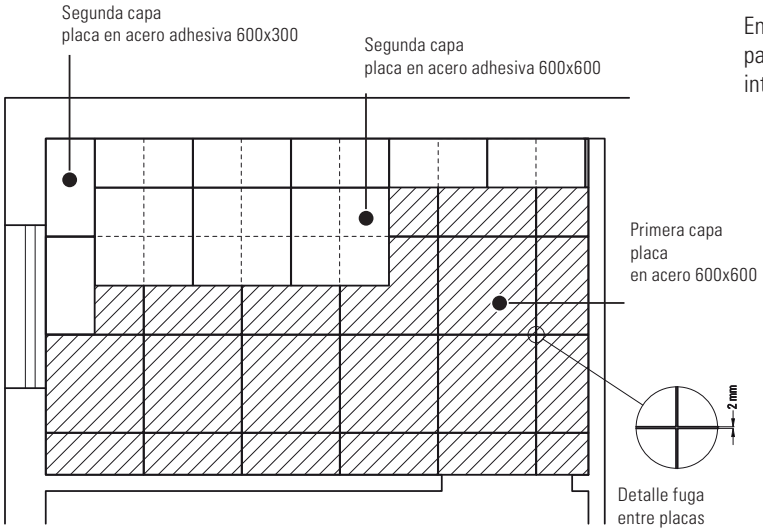
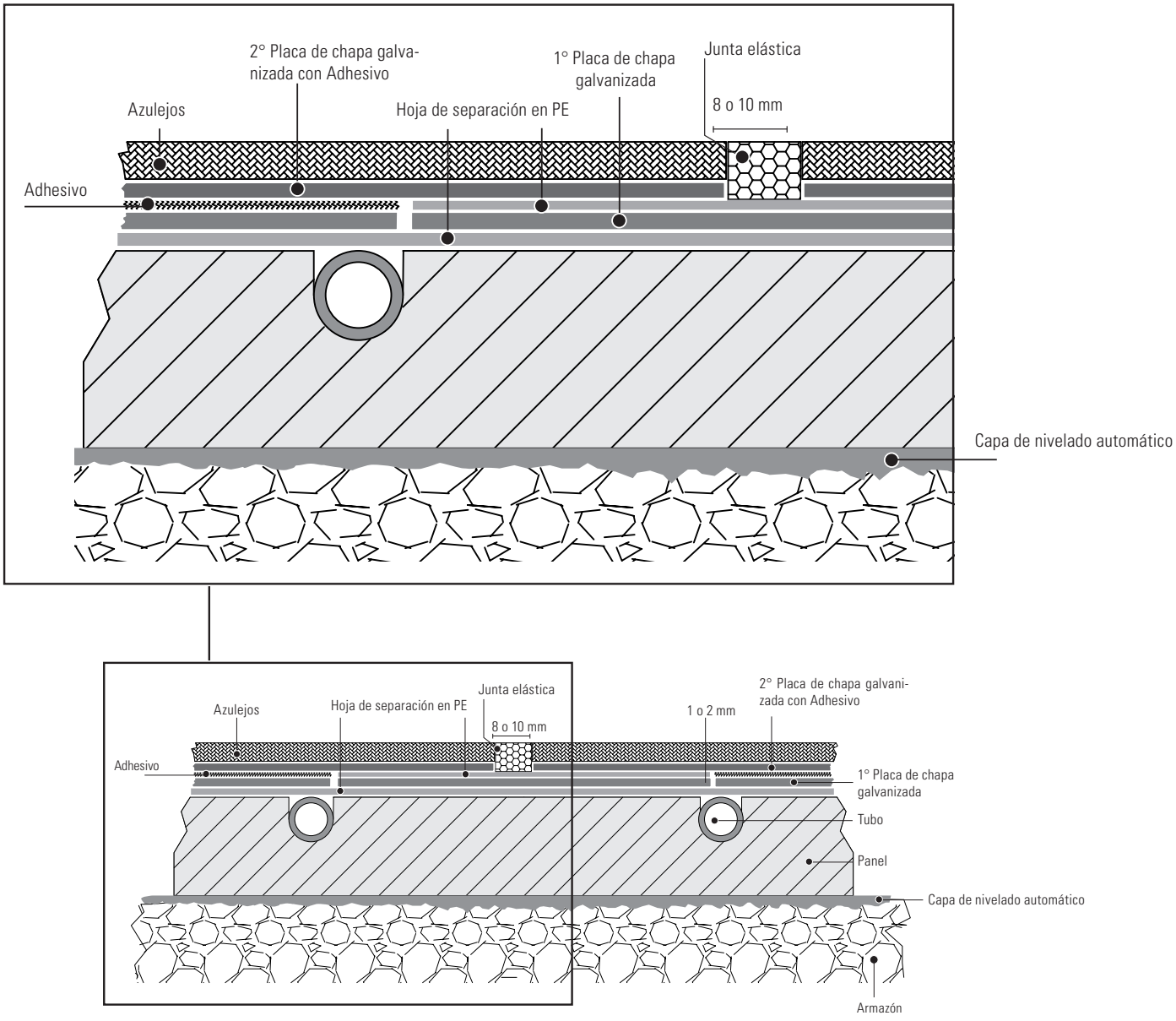


Fig. 51



En correspondencia con una junta elástica (consulte cap. 11, cortes parciales) no es posible pegar dos capas de placas. Se recomienda interponer entre las dos una hoja de separación en polietileno (Fig. 53).



La cobertura de la instalación en seco puede realizarse mediante la instalación de placas dobles en fibra de yeso (llamada también subfondo en seco), cuyas características y modalidades de empleo son competencia del fabricante.

Fig. 52

En correspondencia de puertas y superficies mayores de 40 m^2 o con longitudes superiores a 8 metros (como está también indicado en los proyectos ejecutivos) es necesario prever a menudo de juntas de dilatación que deben realizarse por un tercio del espesor del mortero, que continúan hasta el finaldel pavimento y llenados con idóneo material elastomerico (Fig. 54).
Para el corte sistema seco sólo afecta a la capa de la placa superior (ver fig. 53).
En el caso de los pisos de madera, alfombra o linóleo se puede evitar la presentación de esas cortes en la propia planta.

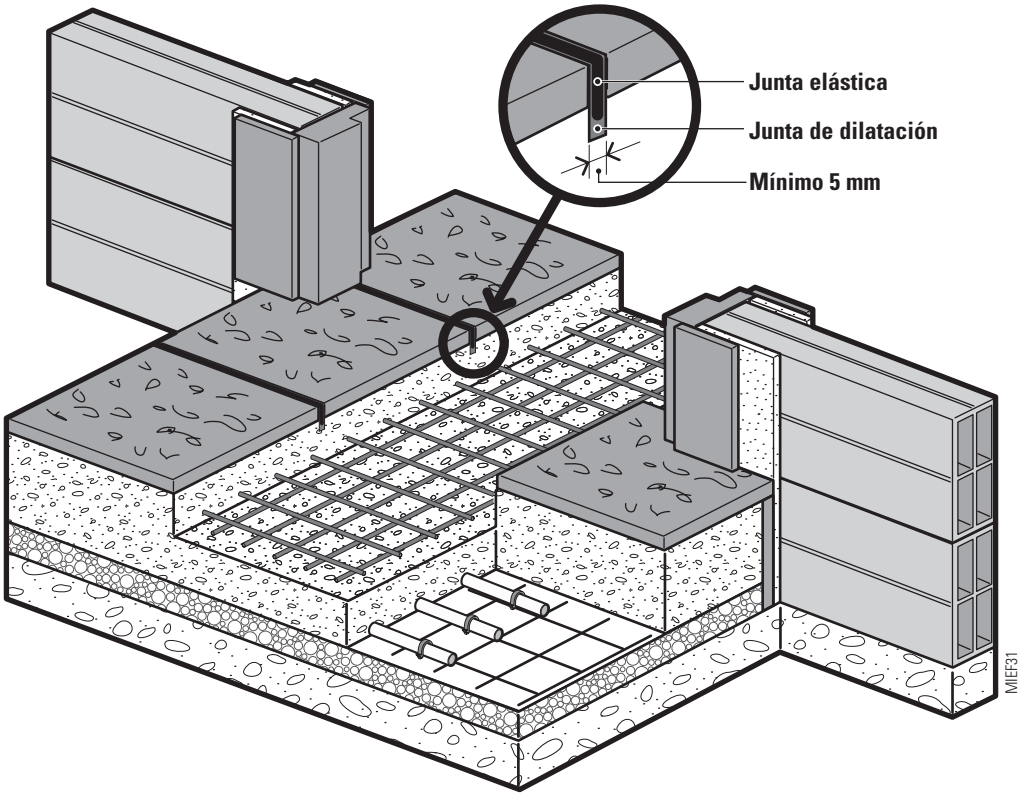


Fig. 54

Ejemplo de cortes parciales

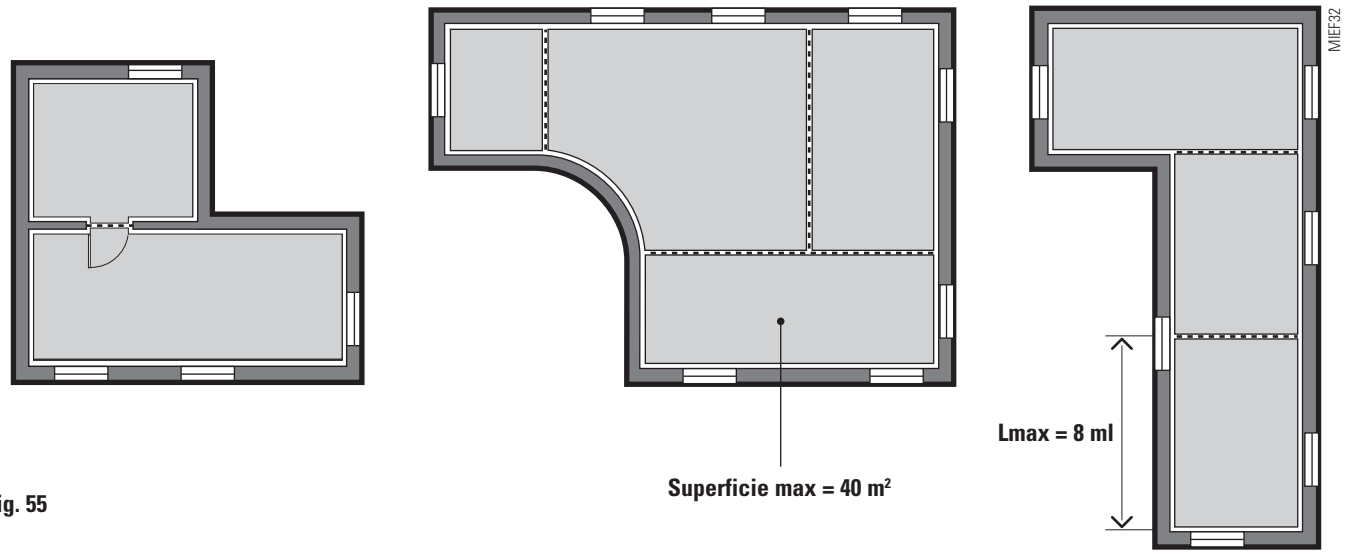


Fig. 55

Si la tuberías pasan a través de juntas de dilatación del mortero o juntas estructurales, revístalas en los tramos de paso con una vaina aislante en al menos 20 cm por cada lado (Fig. 56).
La junta de dilatación deberá cubrirse en el pavimento con los perfiles tapajuntas correspondientes (a cargo del instalador del pavimento).

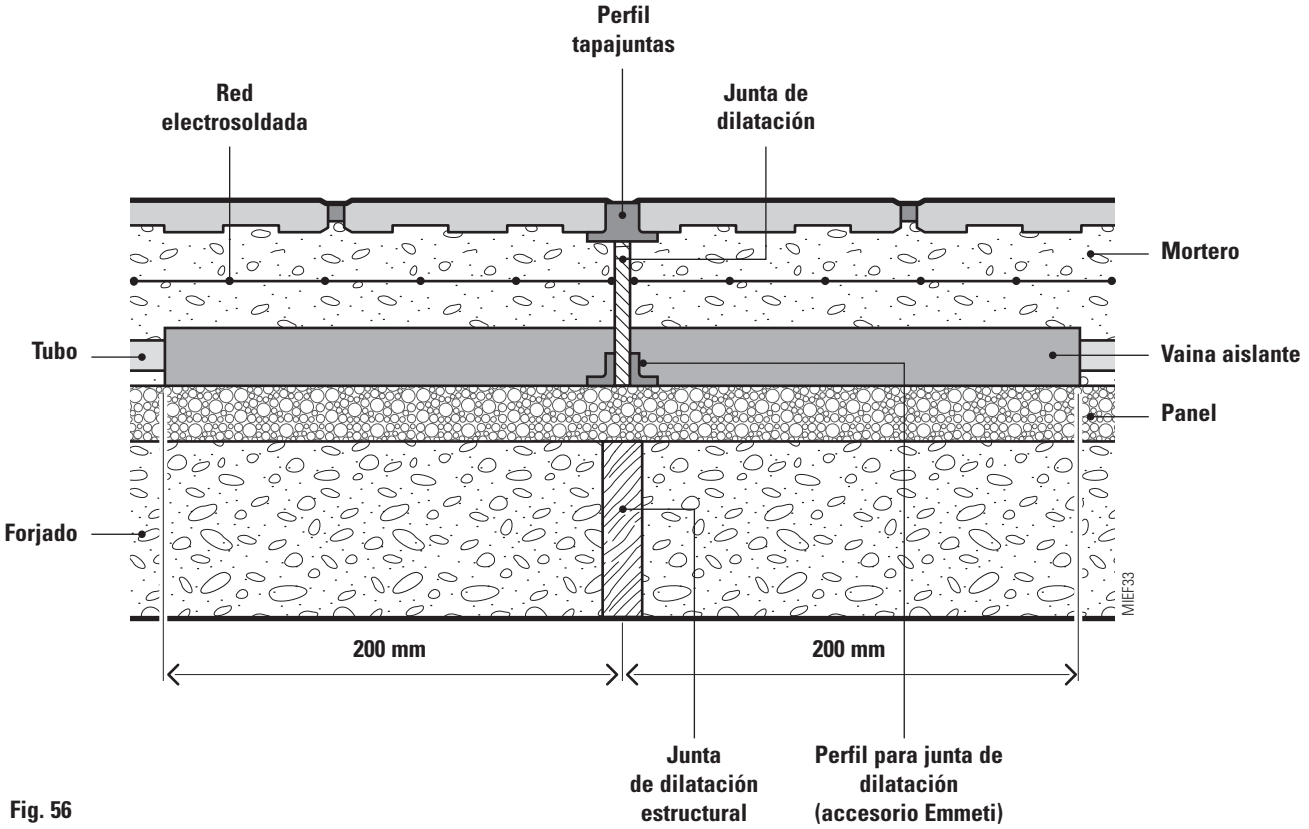


Fig. 56

Detalle del perfil tapajuntas (ejemplo)

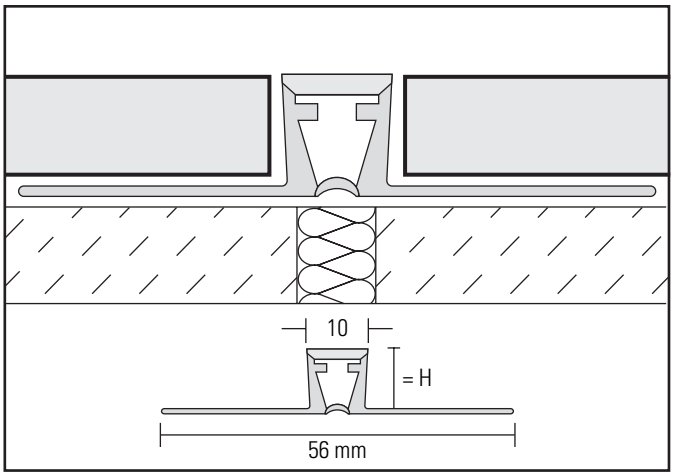


Fig. 57

Nota: no es necesario para GRID FLOOR

13. PUESTA EN MARCHA INICIAL DE LA INSTALACIÓN

Esta operación debe realizarse al menos 21 días después de colocar la regla de concreto o de acuerdo con las instrucciones del fabricante y, en cualquier caso, después de al menos 7 días en el caso de las reglas de anhidrita.
El calentamiento inicial comienza a una temperatura de alimentación entre 20 ° C y 25 ° C, que debe mantenerse durante al menos 3 días. Posteriormente, se debe establecer la temperatura máxima de diseño, que debe mantenerse durante al menos otros 4 días.
En el caso de la puesta en marcha de la calefacción de solera con piso ya tendido (por ejemplo, colocación de piedra, terracota, etc.), el procedimiento de calentamiento debe ser progresivo. Comience por mantener la temperatura del agua de suministro del sistema entre 20 y 25 ° C durante tres días y luego aumentándola en 5 ° C cada tres días hasta alcanzar la temperatura máxima de diseño, que debe mantenerse durante al menos cuatro días. El proceso de arranque de la calefacción debe estar documentado.
Puede descargar el informe a través del siguiente enlace.

14. COLOCACIÓN DE LOS PAVIMENTOS Y DE LOS ZÓCALOS

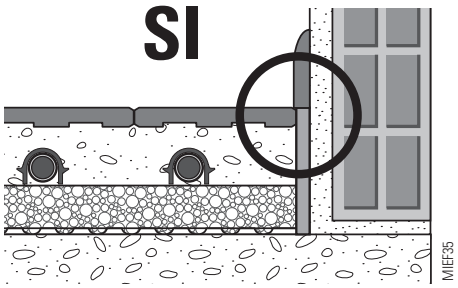
No existen límites en la elección del tipo de revestimiento para los sistemas de calefacción por suelo radiante, por tanto éste presenta una resistencia térmica inferior a 0.15 m^2K/W, (UNE EN 1264).
Pavimentaciones de cerámica, cocidas, piedra natural, mármol o "a la veneciana", son aquéllos que se prestan mejor para realizar este tipo de instalaciones; en el caso de la madera es en cambio necesario averiguar cuidadosamente el espesor para evitar fenómenos de excesivo aislamiento con consiguiente empeoramiento del intercambio térmico.
Es además absolutamente necesario evitar bolsas de aire entre el mortero y el revestimiento. Antes de proceder a la colocación de cualquier tipo de pavimento es necesario calentar el mortero para calefacción para completar de esta forma el secado y verificar el correcto comportamiento que conllevan las dilataciones térmicas.
Los revestimientos podrán ser colocados sólo con instalación apagada y suficientemente fría.
Para suelos de madera es aconsejable dejar los listones/parquets por un período de al menos una semana dentro de los locales antes de su colocación, para que se adecuen a las nuevas condiciones termohigrométricas.

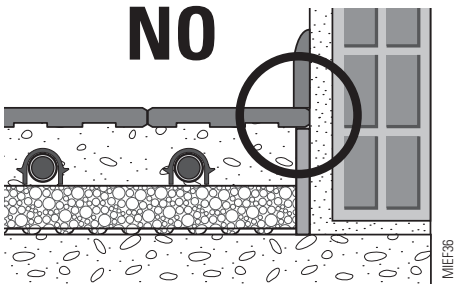
Atención
Los suelos deberán ser colocados apoyandolos a la tira, cuya parte en exceso podrá ser cortada al hilo del revestimiento al final de su colocación (Fig 58).
La ausencia de este espacio de dilatación provocará la rotura de los pavimentos y causará un puente acústico.
El sellado de la fuga entre suelo y zócalo (o baldosa) tendrá que ser efectuada con el idóneo material elástico.

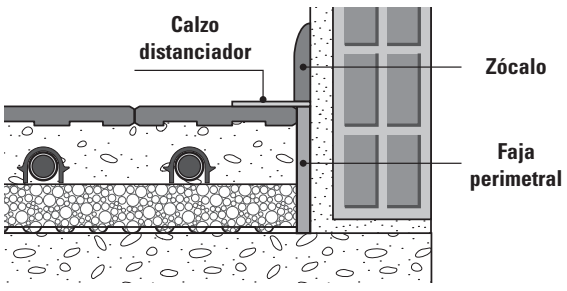
Sistema en seco
En caso de sistema Dry Alu Floor para la instalación de superficies acabadas, es necesario el empleo de colas específicas para superficies metálicas (en general, colas de tipo poliuretánico).
En caso de instalación de placas, prevea fugas de, al menos, 4-5 mm y rellenos elásticos adecuados. Es conveniente que las placas sean de dimensiones no superiores a 40 cm por lado.

Colocación de los zócalos

El contacto de los zócalos con los pavimentos causa puentes acústicos de paso del ruido. Por ello, se recomienda utilizar un calzo distanciador (de aproximadamente 0,5 mm) para la colocación del zócalo.
Para los zócalos de barro cocido o mármol, o para la unión pared/pavimento de ambientes embaldosados o revestidos en piedra/mármol, utilizar sellantes elásticos (base de silicona) para rellenar el intersticio entre el pavimento y el zócalo.







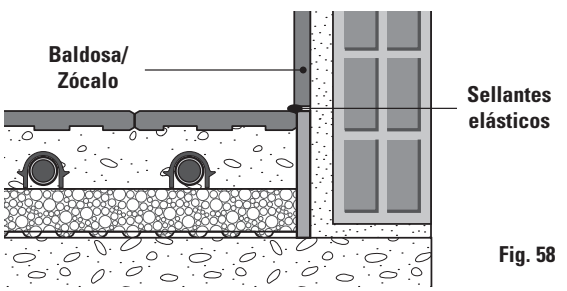


Fig. 58

Note

Rispetta l'ambiente!
Per il corretto smaltimento, i diversi materiali devono essere separati e conferiti secondo la normativa vigente.

Respect the environment!
For a correct disposal, the different materials must be divided and collected according to the regulations in force.

¡Respeta el ambiente!
Para un correcto desecho de los materiales, deben ser separados según la normativa vigente.

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