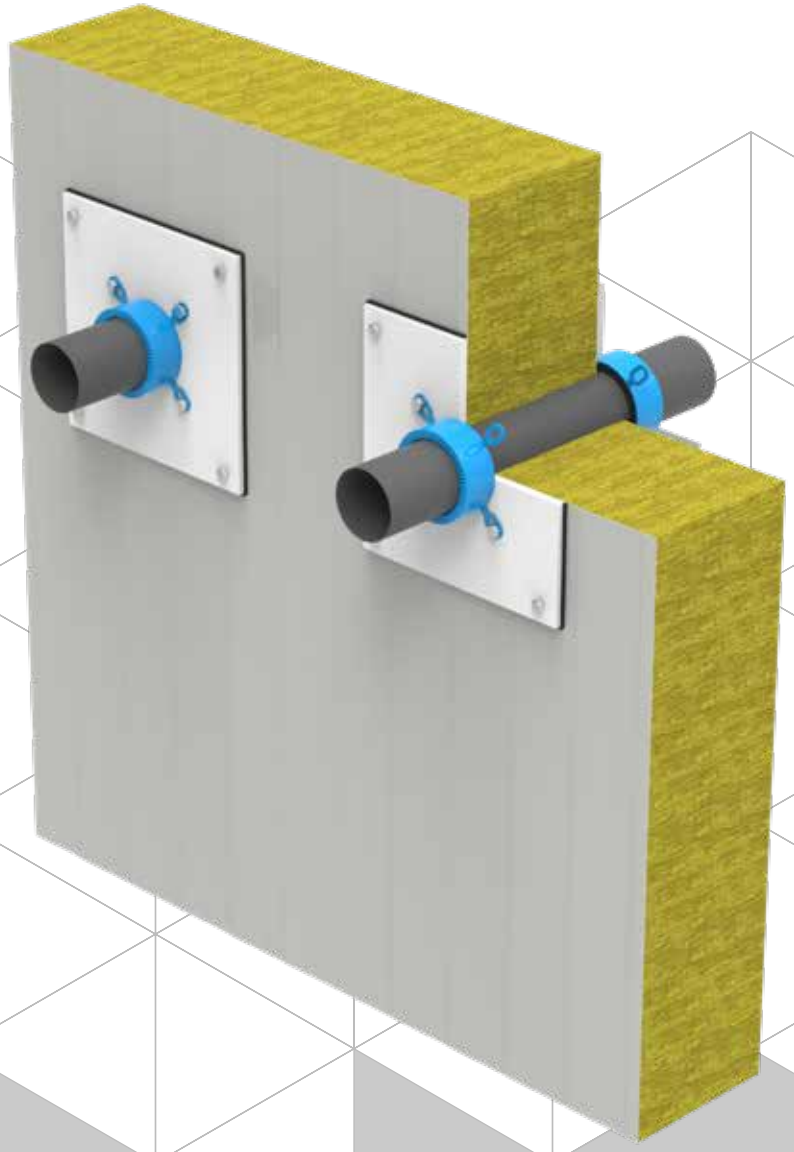
Technical Details and Assembly Drawings

R.E.I. Tech Details



PART OF MANNI GROUP

ISOPAN
BUILDING ENVELOPE SOLUTIONS
by Manni Group

R.E.I. Tech Details

OUR TARGET

The construction of large commercial and industrial buildings requires rapid build times as well as specific fire safety designs.
The fire safety of buildings is attributed ever greater importance, both for residents and to protect the property housed inside.
The main challenge for designers today is the need to satisfy the numerous technical safety regulations that have been developed in different countries, while at the same time serving the interests of owners by minimizing potential tangible and intangible fire damage.

Isopan focus closely on the potential fire protection their products can offer, testing performance levels in line with current standards, and assisting designers in their complex task of successfully integrating regulatory standards with the reality of construction worksites.
Assessing passive fire protection is a basic component of safety and has to be an integral part of building design right from the earliest stages. Everything must be taken into account, from the interplay of major constructional elements right down to the smallest details.
How to maintain the fire resistance of separation barriers when they intersect with structural walls? How to form the junction between wall and ceiling spacer materials without reducing the safety of the building?
Isopan collaborates with Fire Engineering experts to help designers resolve these questions by providing in-depth analyses based on mathematical simulations of the main constructional intersections.
The present text discusses some of the possibilities analysed and assessed. For further details please refer directly to Isopan.

Per la realizzazione di grandi edifici commerciali ed industriali accanto a requisiti di rapidità di installazione viene richiesta una progettazione antincendio specifica.
Sempre più importanza, infatti, viene attribuita alla sicurezza degli edifici in caso di incendio, sia per le persone che lo occupano sia per la salvaguardia dei beni all'interno dello stabile.
La sfida più importante per i progettisti è quindi rappresentata dall'esigenza di ottemperare alle numerose regole tecniche per la sicurezza sviluppate in molte nazioni, minimizzando al contempo, nell'interesse dell'investitore, i danni tangibili e intangibili dopo un incendio.

Isopan si è focalizzata sulla protezione al fuoco che può offrire attraverso i suoi prodotti, caratterizzandoli attraverso il testing delle performance secondo le vigenti normative e supportando i progettisti nel difficile ruolo di coniugare gli standard normativi con la realtà di cantiere.
La valutazione della protezione passiva è alla base della sicurezza; pertanto, deve essere parte integrante della progettazione dell'edificio sin dall'inizio e deve tener conto non solamente delle parti più estese nel loro complesso, ma anche dei dettagli costruttivi specifici.
Come mantenere inalterata la resistenza al fuoco degli elementi di separazione quando si raccordano con pareti esistenti? Come risolvere il nodo tra gli elementi di tamponamento in parete e in copertura, senza indebolire la sicurezza dell'edificio?
Per supportare i progettisti nella risoluzione di questi difficili temi, Isopan ha approfondito il tema in collaborazione con esperti di Fire Engineering attraverso la simulazione numerica dei principali nodi costruttivi.
Il presente documento ha scopo illustrativo delle soluzioni analizzate e valutate, si prega per ulteriori approfondimenti di fare riferimento ad Isopan.

The information set out below derives from tests on Isofire Wall and Isofire Roof panels analysed according to the indications of product standard EN 14509. The study of intersections focuses in particular on establishing whether, in a typical industrial building fire, the sandwich panels are capable of adapting to the movements of the main structure while also maintaining the seal between the panels in a heat deformed configuration.

I dettagli che riportiamo di seguito sono stati analizzati, partendo dai risultati ottenuti durante i test su i pannelli denominati Isofire Wall ed Isofire Roof, in accordo a quanto indicato nella norma di prodotto EN 14509. In particolare, lo studio dei nodi raffigurati di seguito, si è concentrato a stabilire che durante un incendio standard in un edificio industriale, i pannelli sandwich fossero in grado di seguire gli spostamenti della struttura principale mantenendo, anche con questa configurazione deformata, la tenuta nel giunto tra i pannelli.

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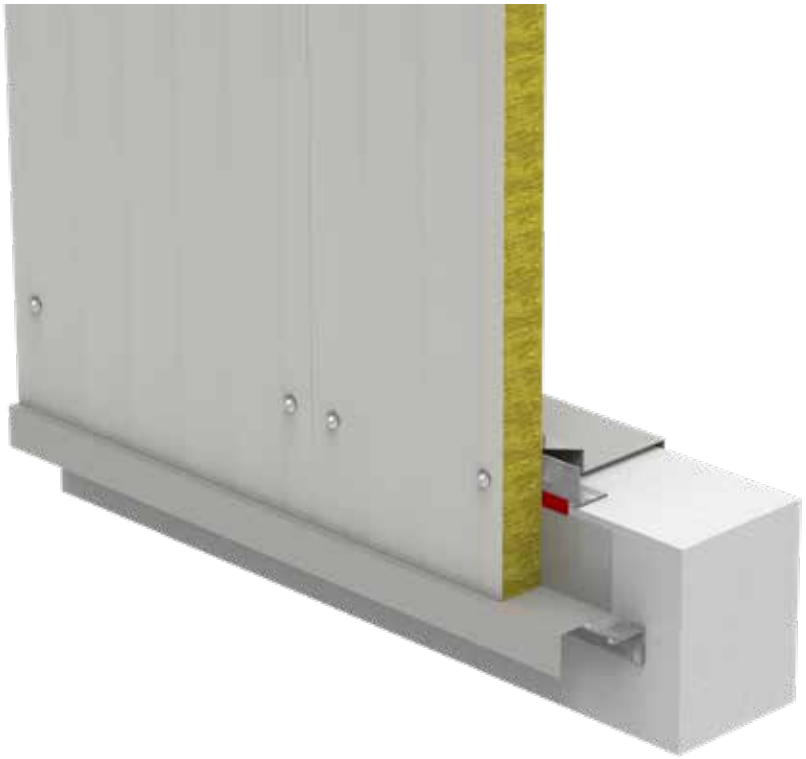
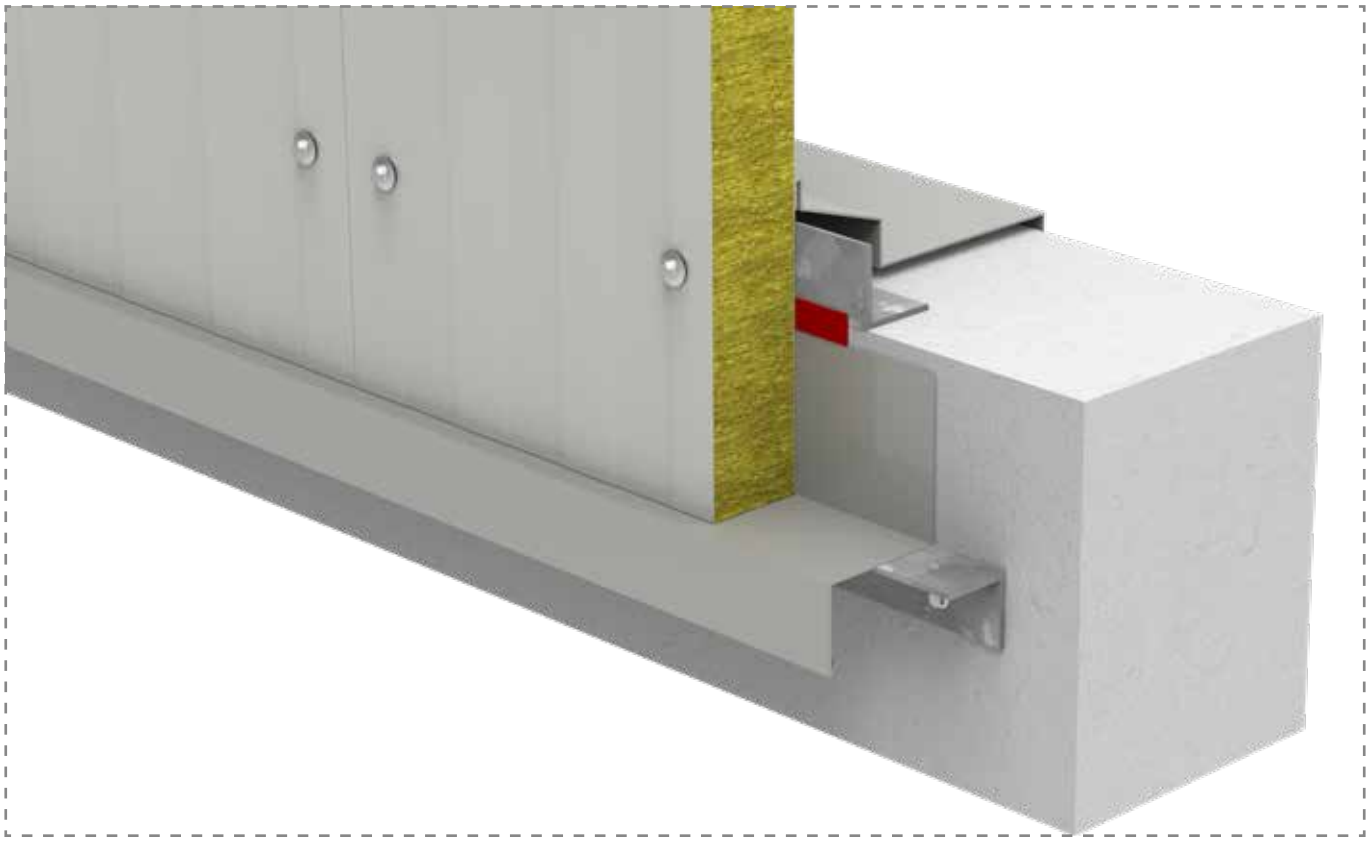
Drawings Index

REI01

Ground detail

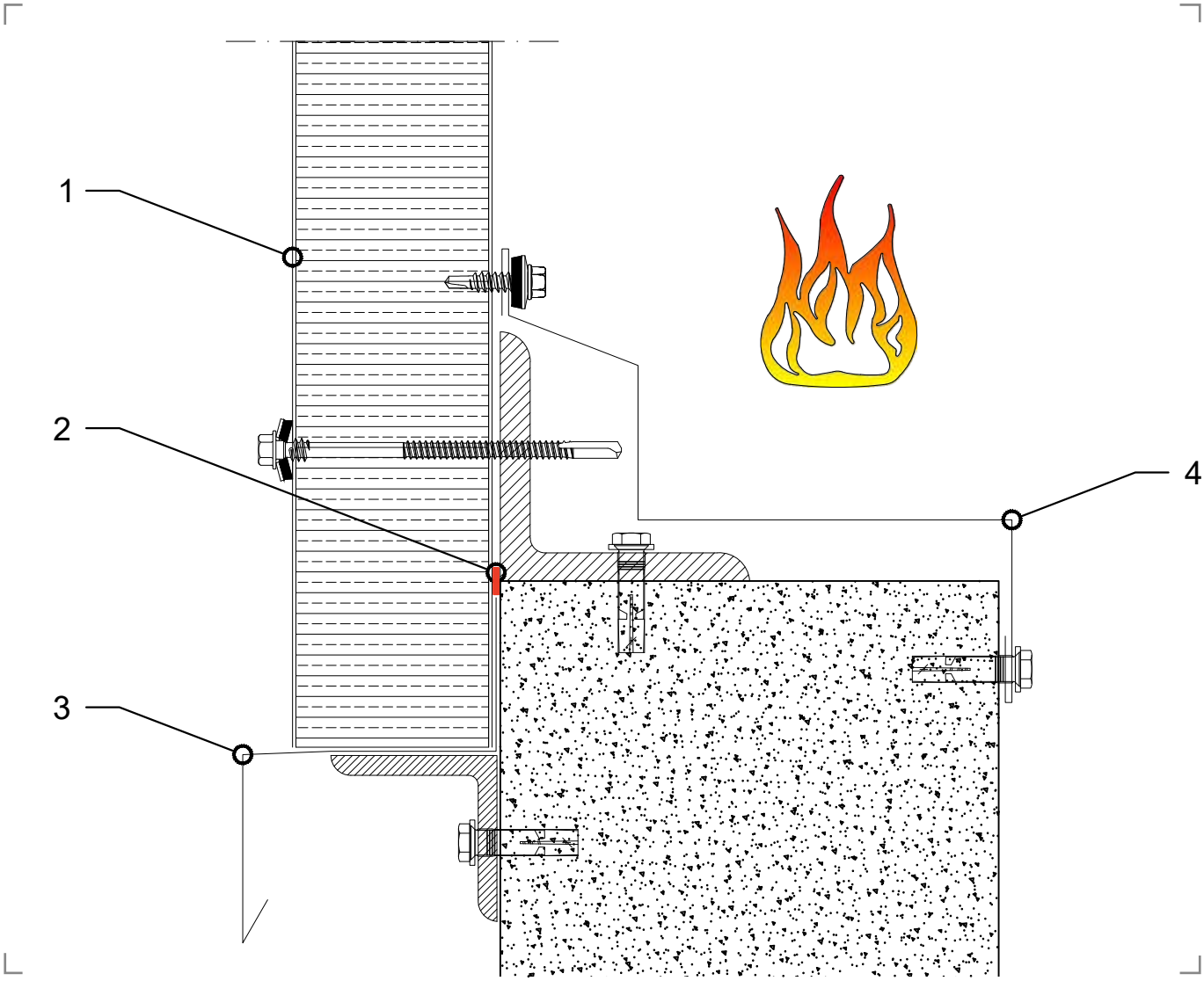




REI01

Ground detail

You can download the .dwg and .pdf files collection at isopan.com.

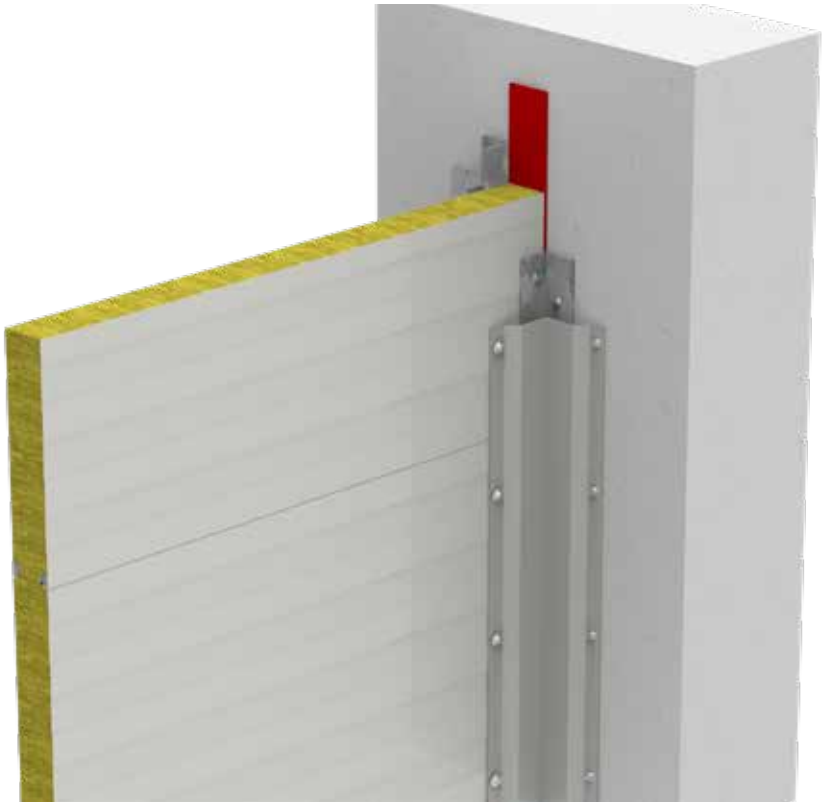


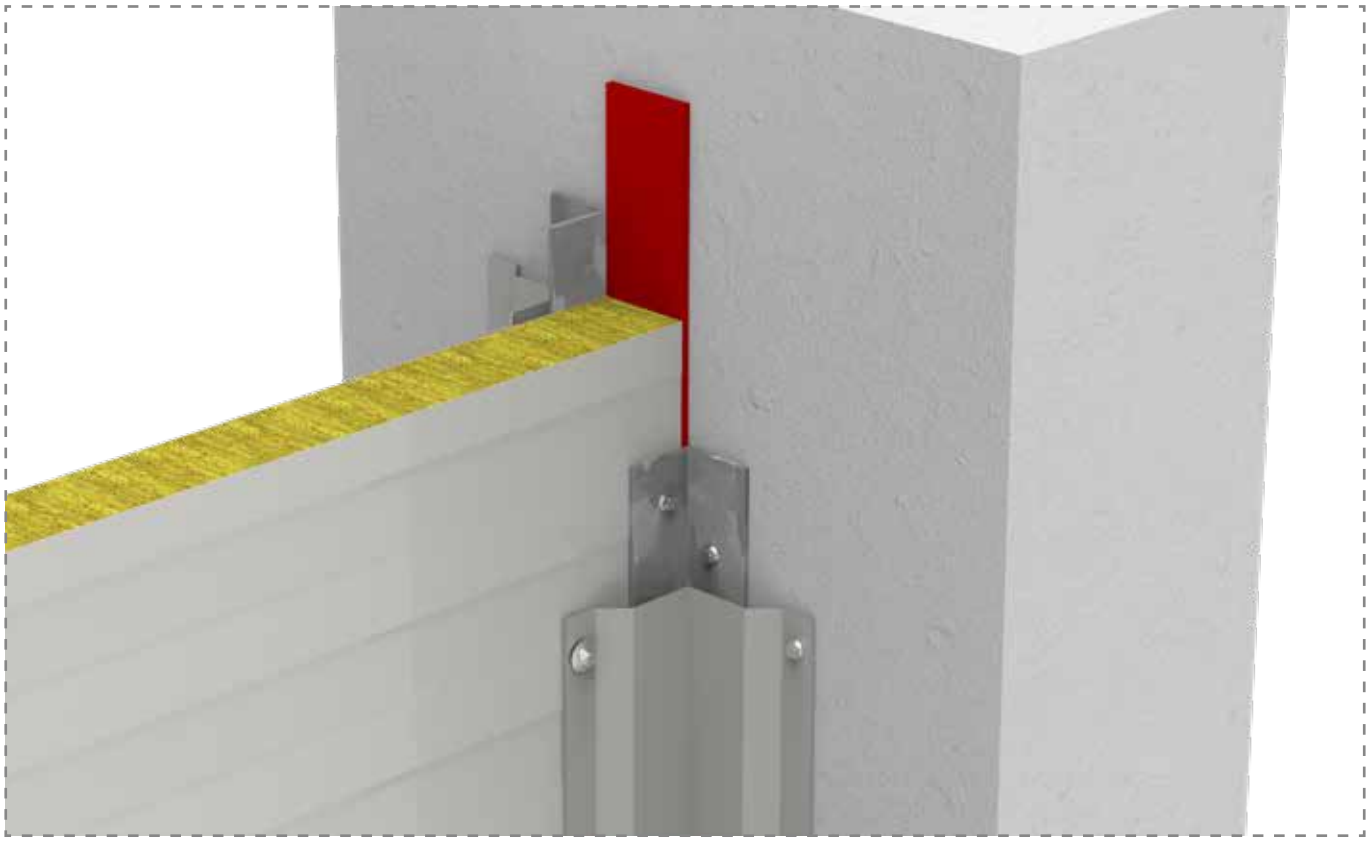
LEGEND

1. ISOPAN Isofire Wall Panel
2. Intumescent sealent
3. Custom cover flashing
4. Internal finishing custom cover flashing

REI02

Wall joint - Horiz. inst.





REI02

Wall joint - Horiz. inst.

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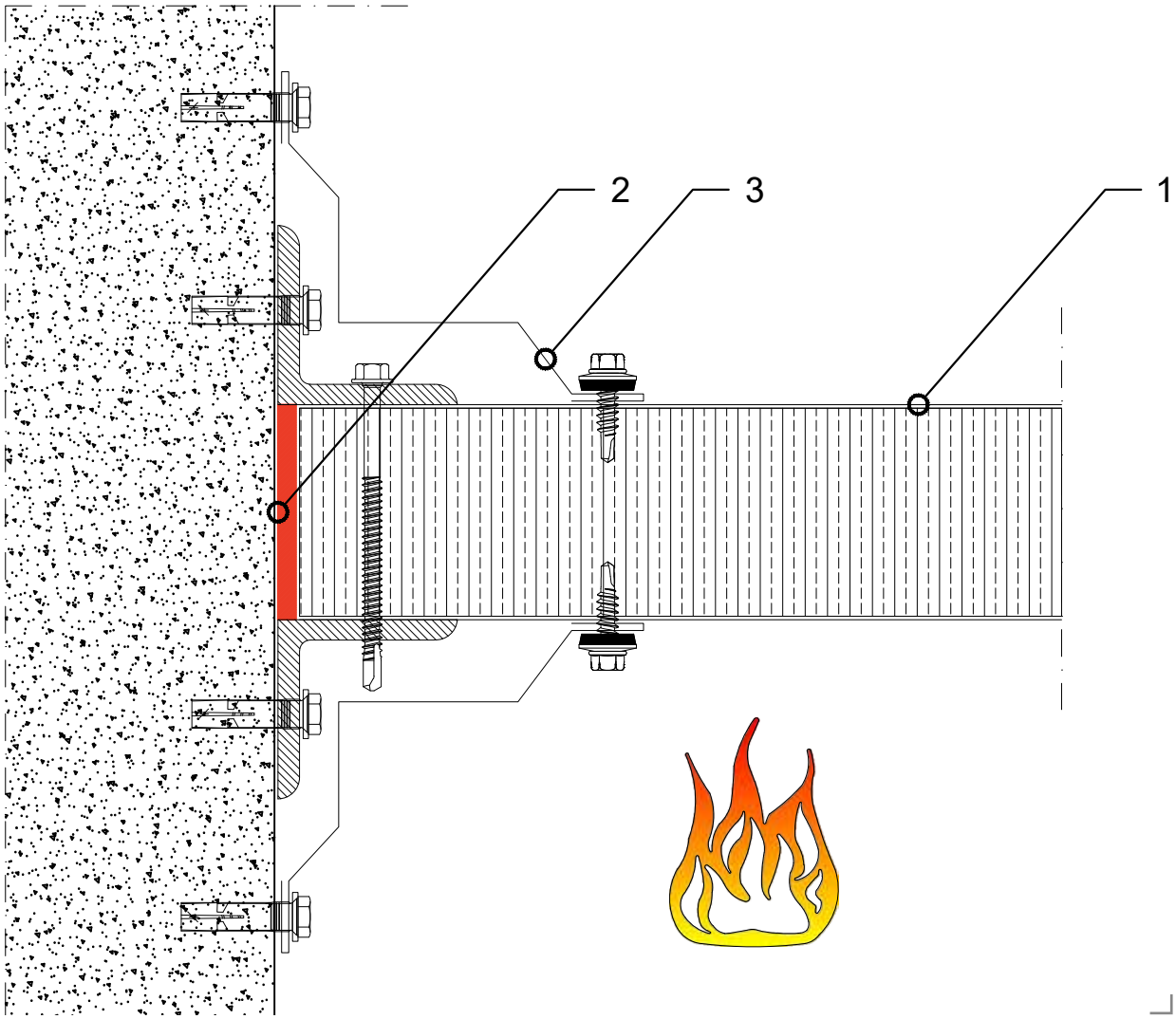
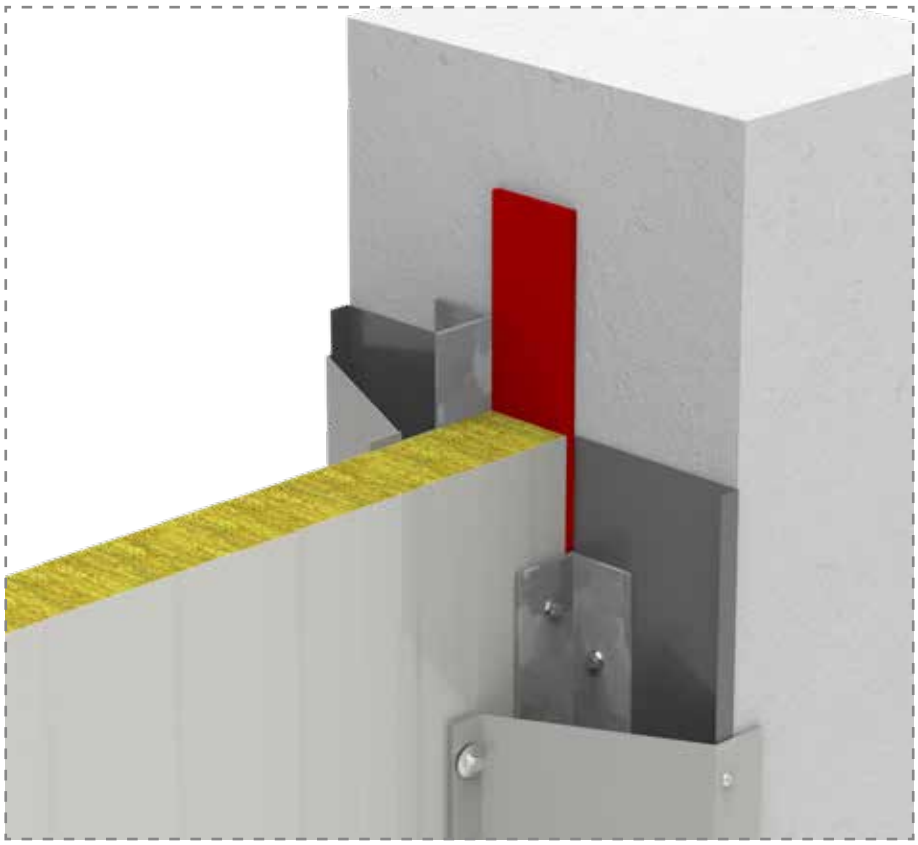


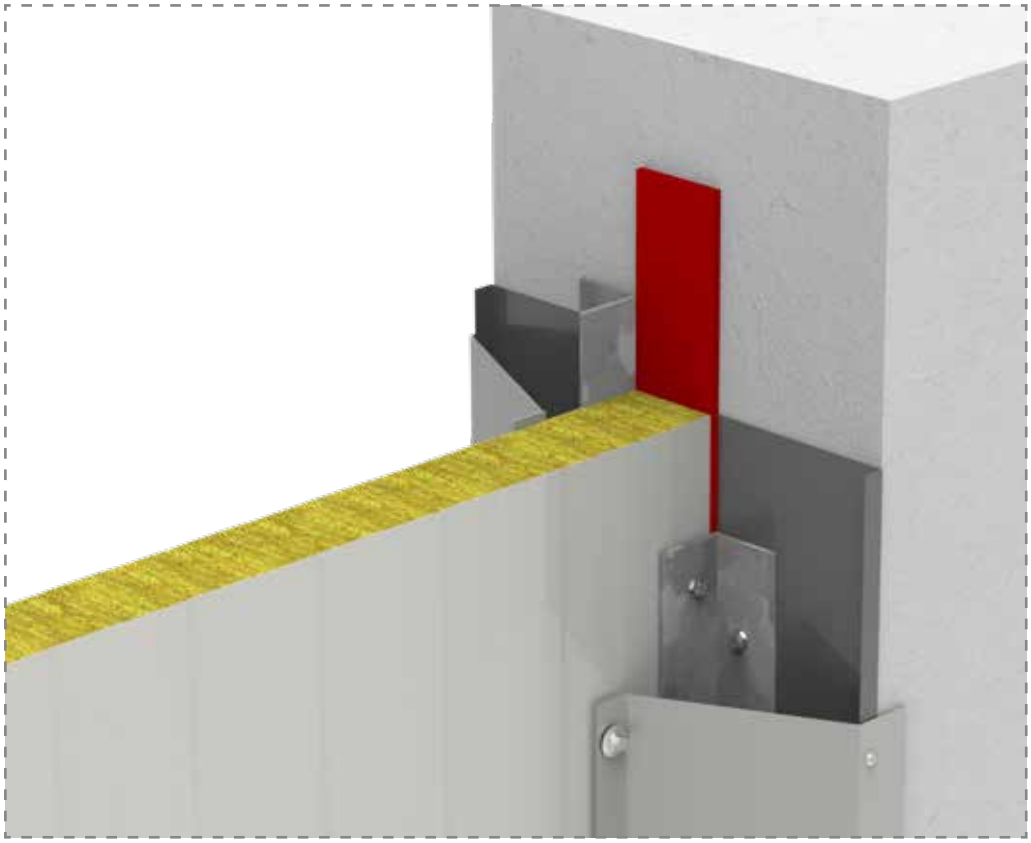
LEGEND

1. ISOPAN Isofire Wall Panel
2. Intumescent sealent
3. Custom cover flashing

REI03

Wall connection - vert. inst.

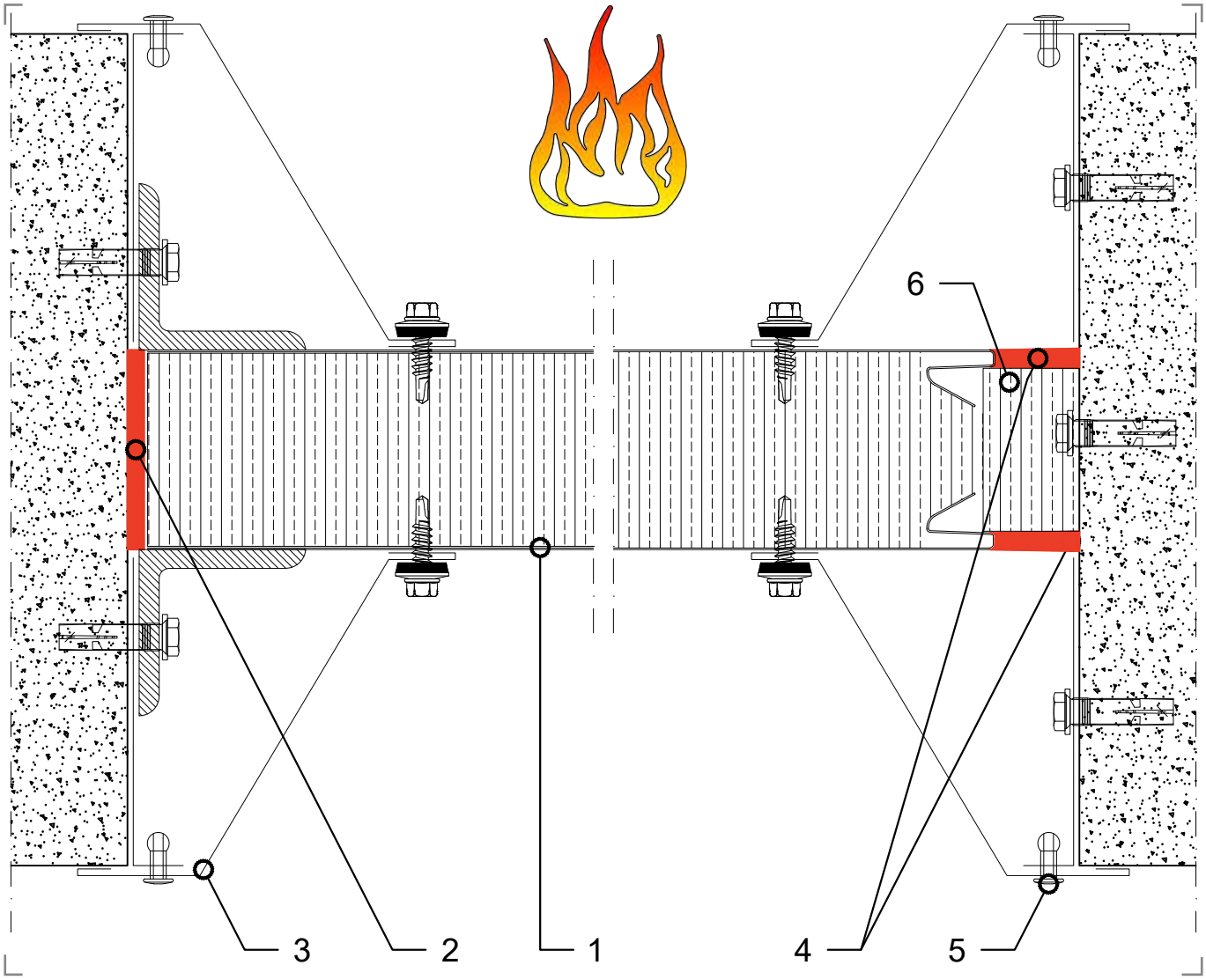




REI03

Wall connection - vert. inst.

You can download the .dwg and .pdf files collection at isopan.com.

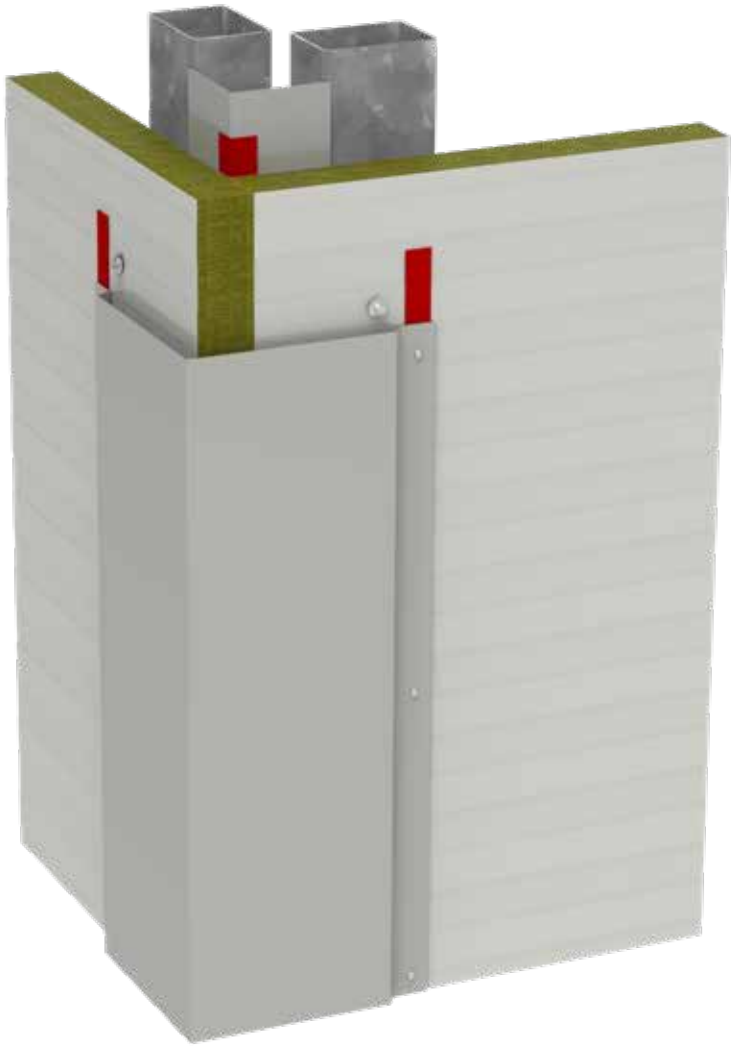


LEGEND

1. ISOPAN Isofire Wall Panel
2. Intumescent sealent
3. Custom cover flashing
4. Intumescent sealent
5. Rivet
6. Mineral Wool

REI04

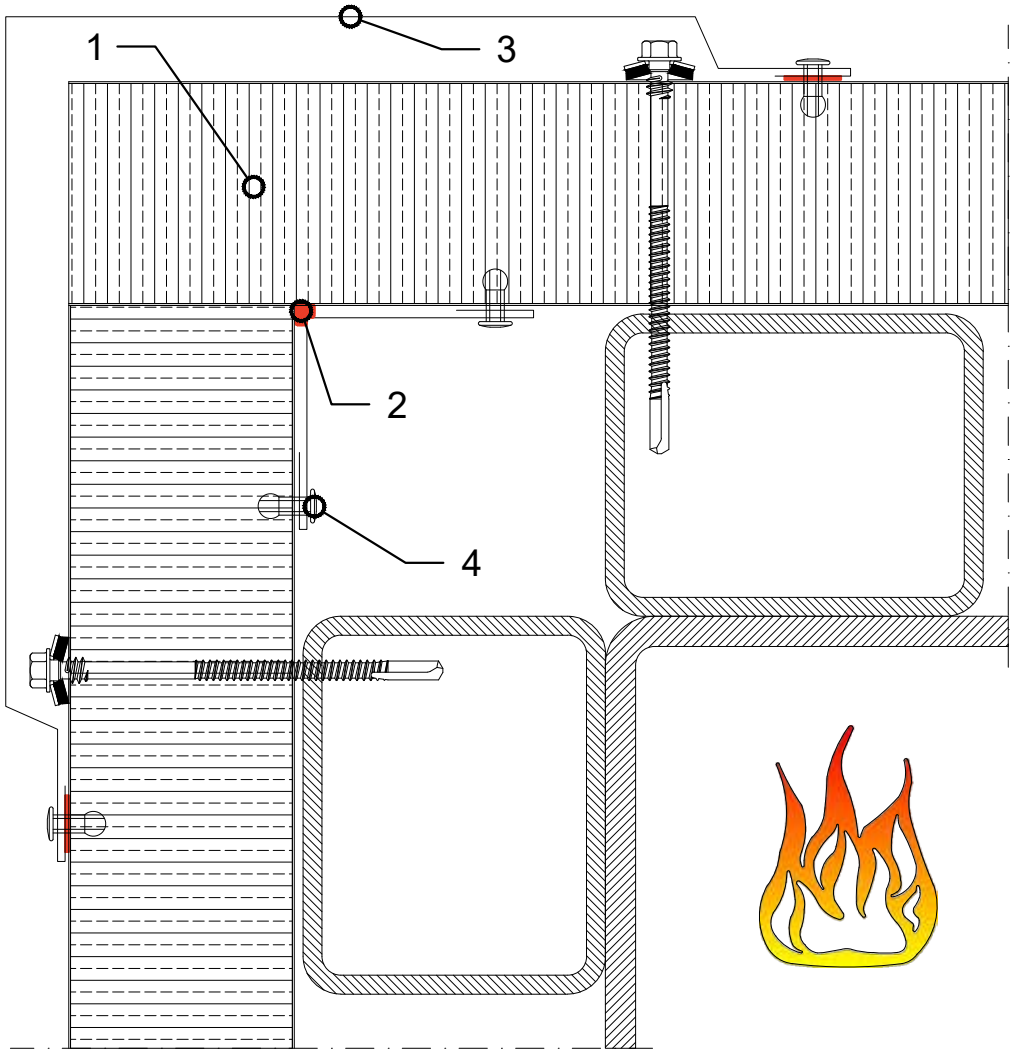
Corner connection



REI04

Corner connection

You can download the .dwg and .pdf files collection at isopan.com.

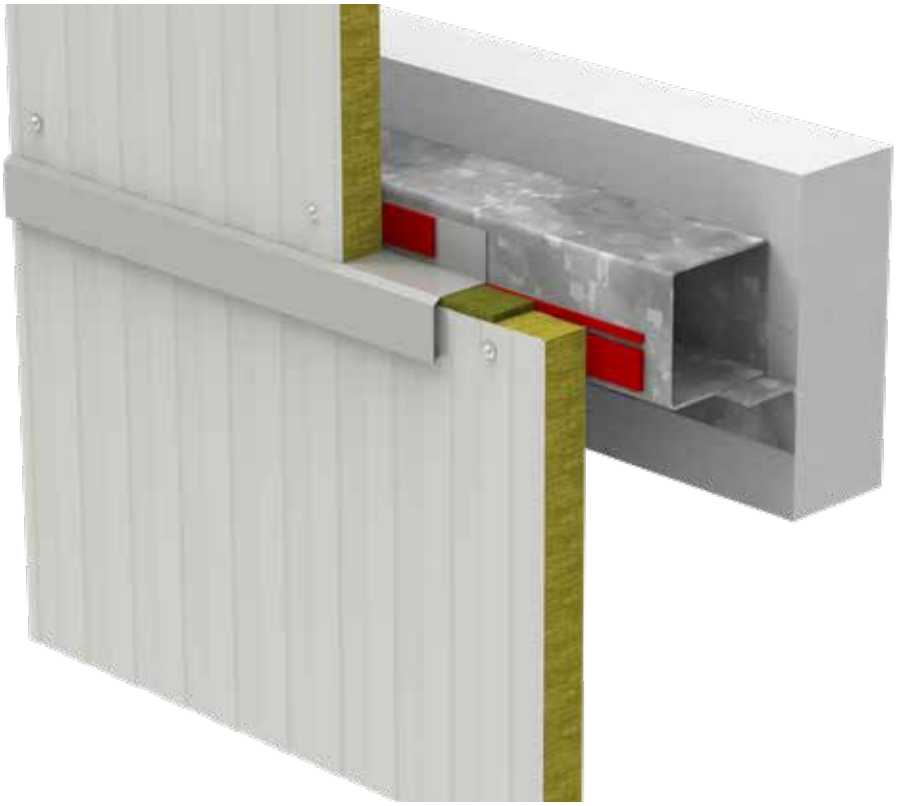


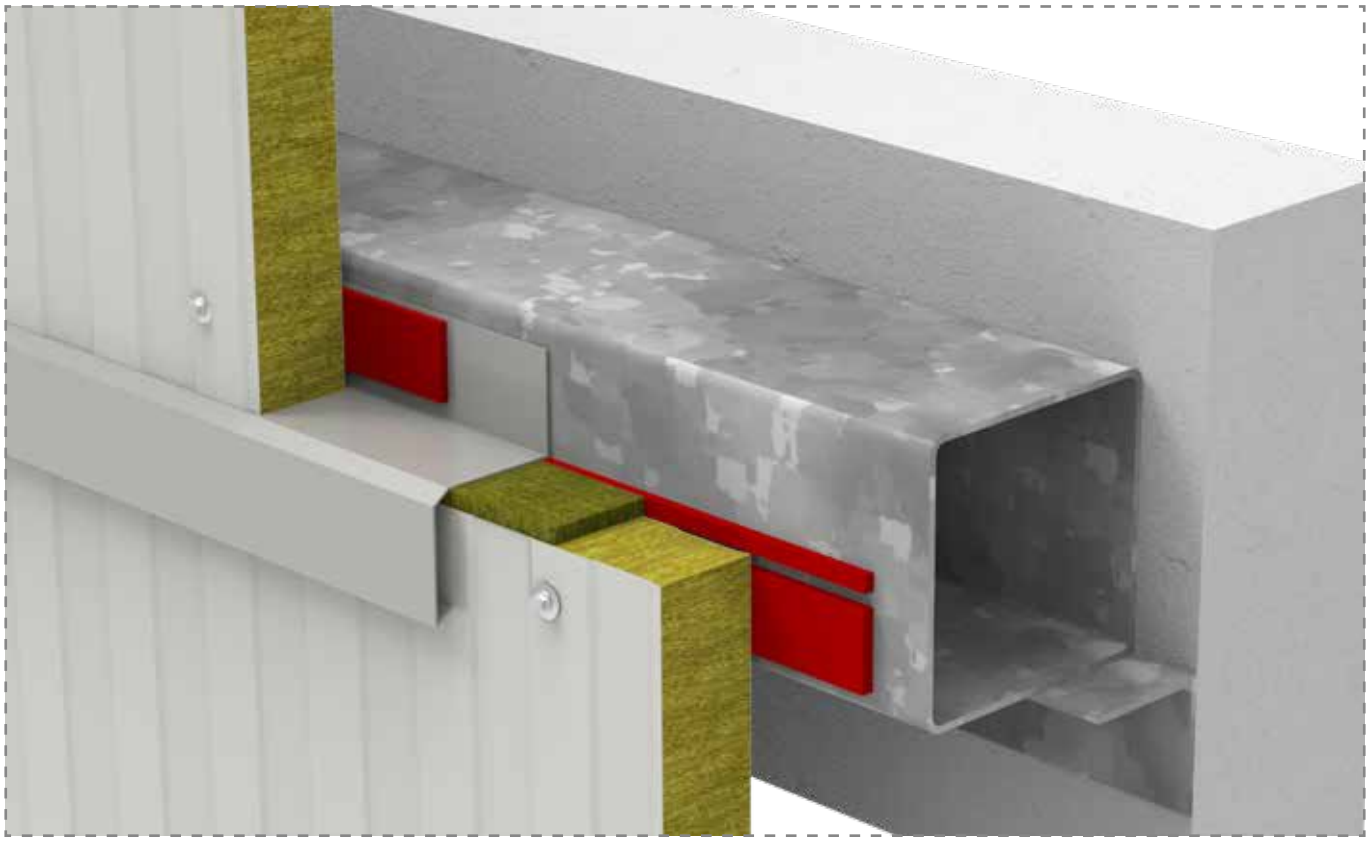
LEGEND

1. ISOPAN Isofire Wall Panel
2. Intumescent sealent
3. Custom cover flashing
4. Rivet

REI05

Panel-to-panel connection





REI05

Panel-to-panel connection

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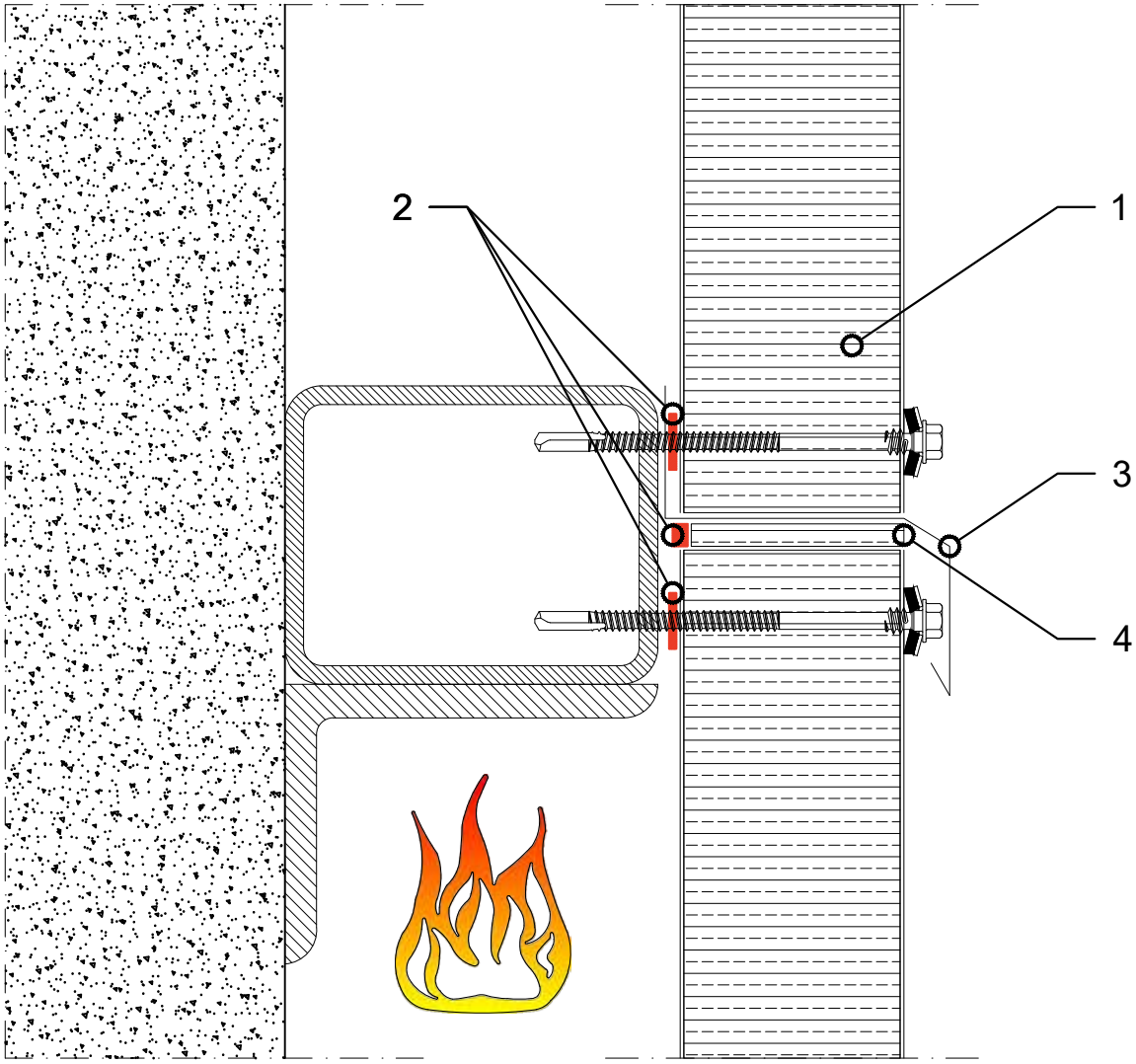

LEGEND

1. ISOPAN Isofire Wall Panel
2. Intumescent sealent
3. Custom cover flashing
4. Insulation (mineral wool)

REI06

Ceiling connection

REI06

Ceiling connection

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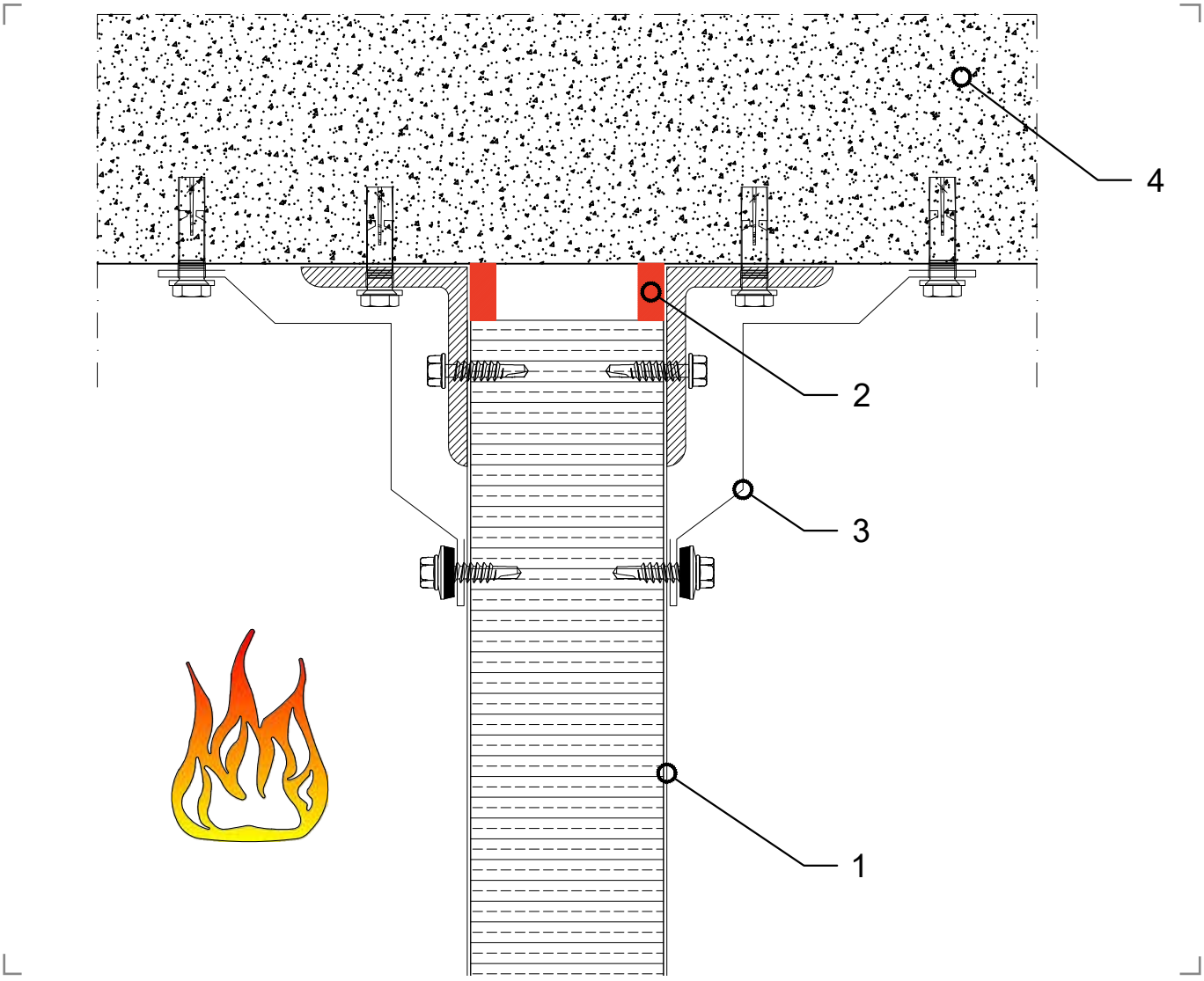
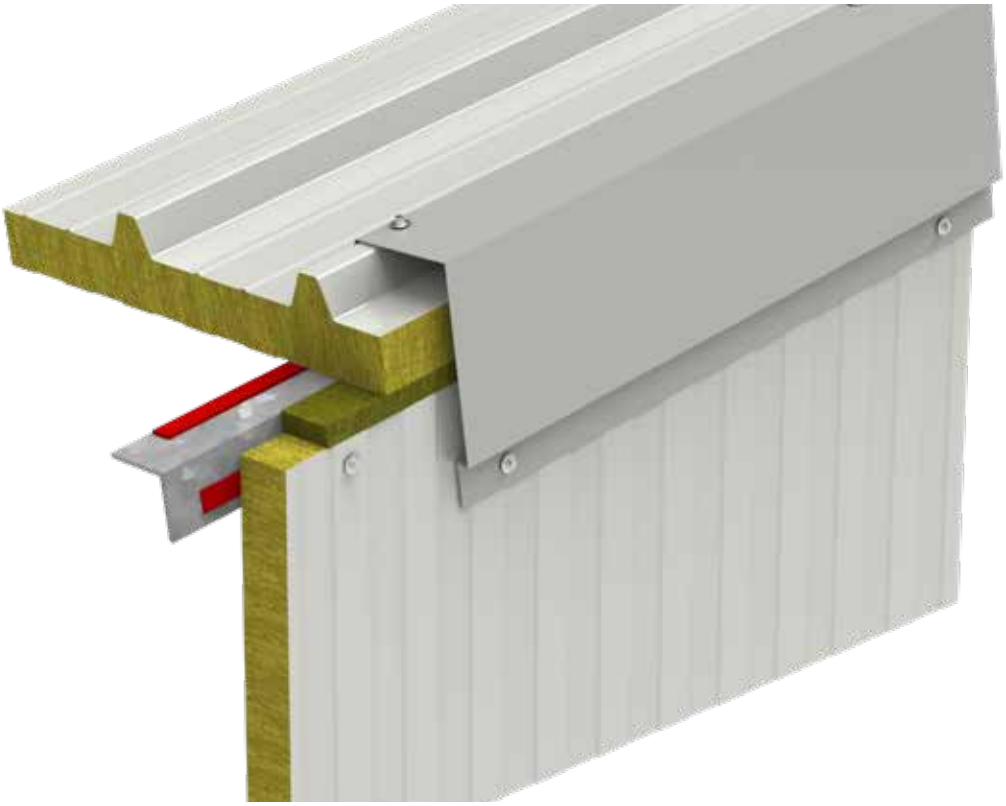


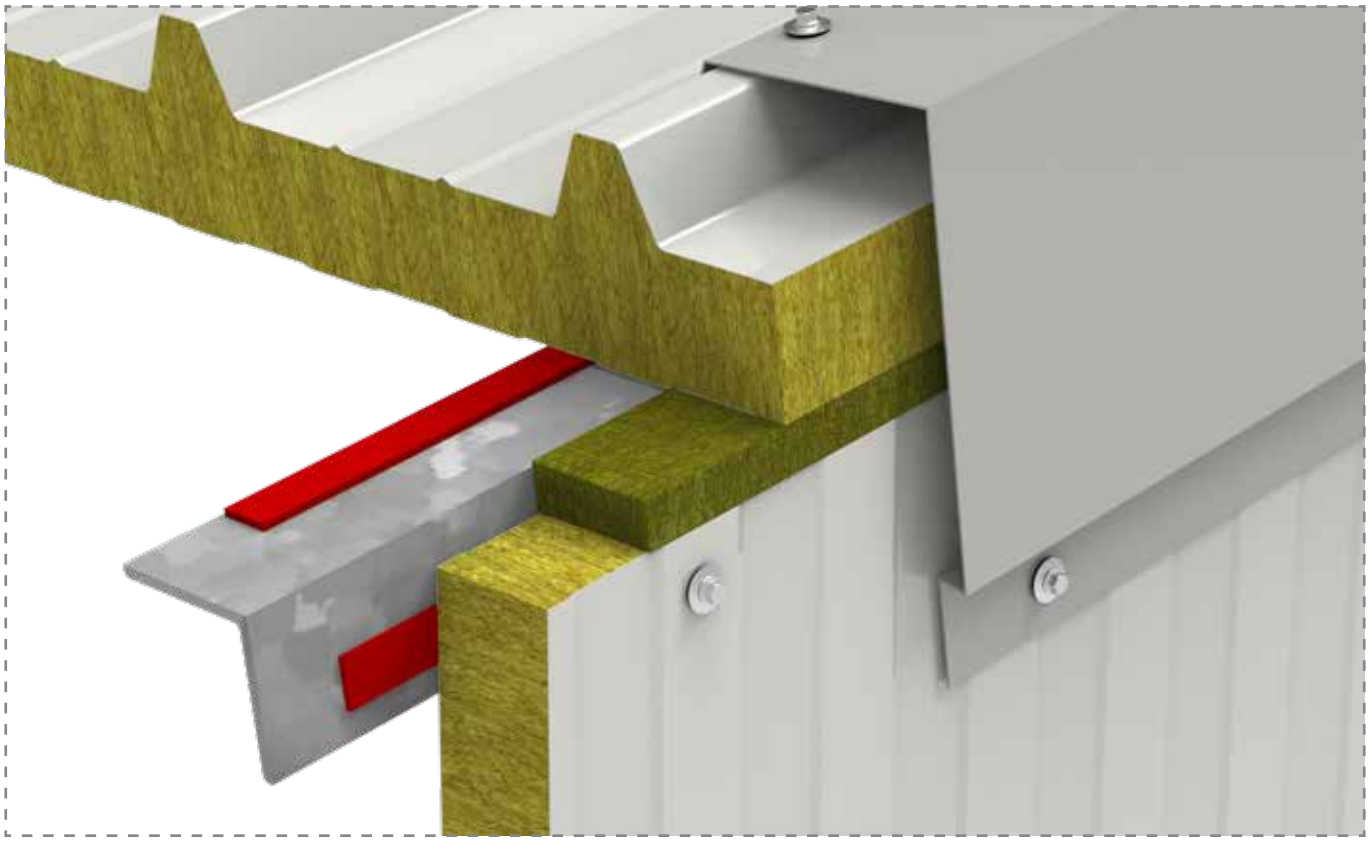
LEGEND

1. ISOPAN Isofire Wall Panel
2. Intumescent sealent
3. Custom cover flashing
4. Concrete ceiling

REI07

Wall-roof connection





REI07

Wall-roof connection

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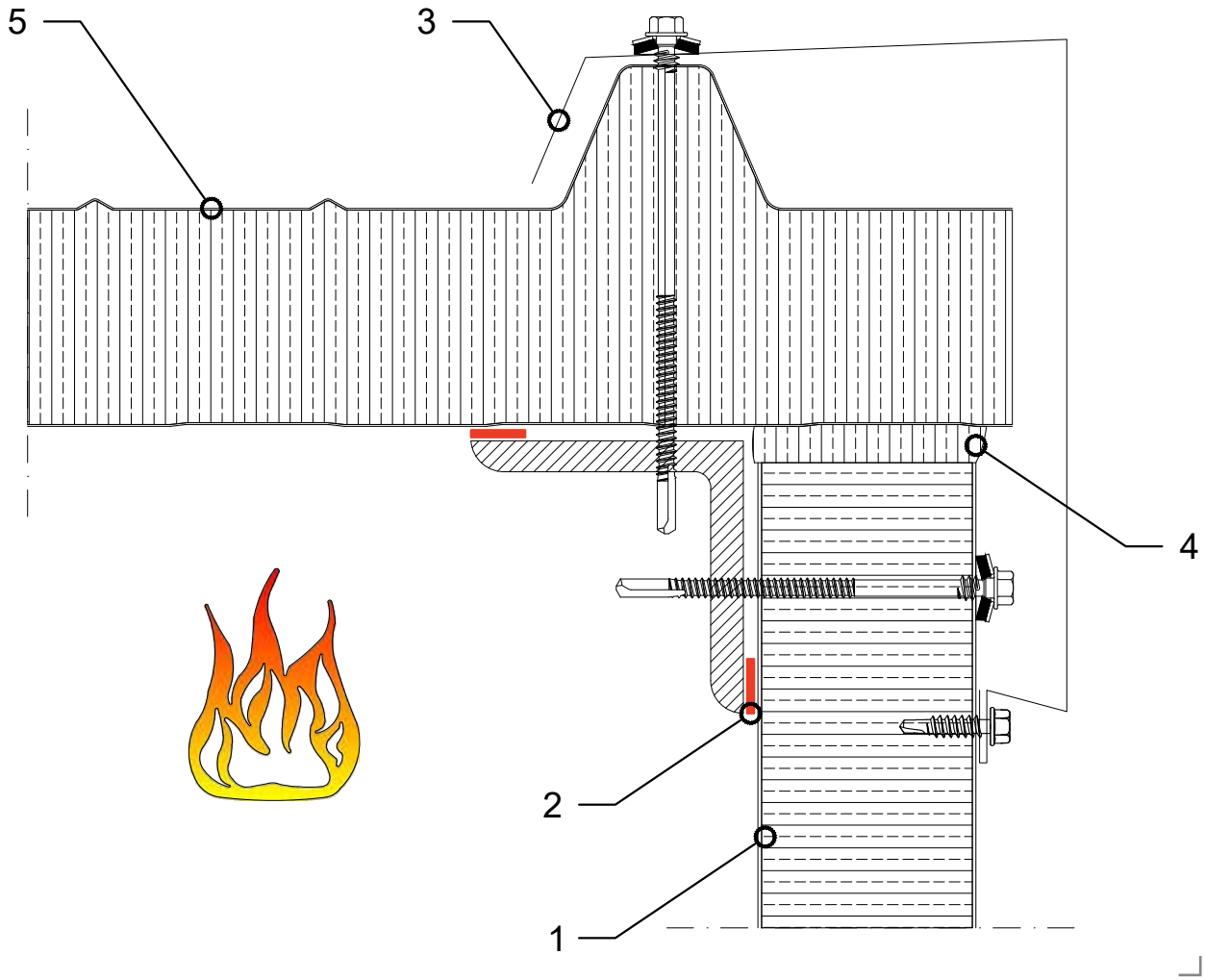
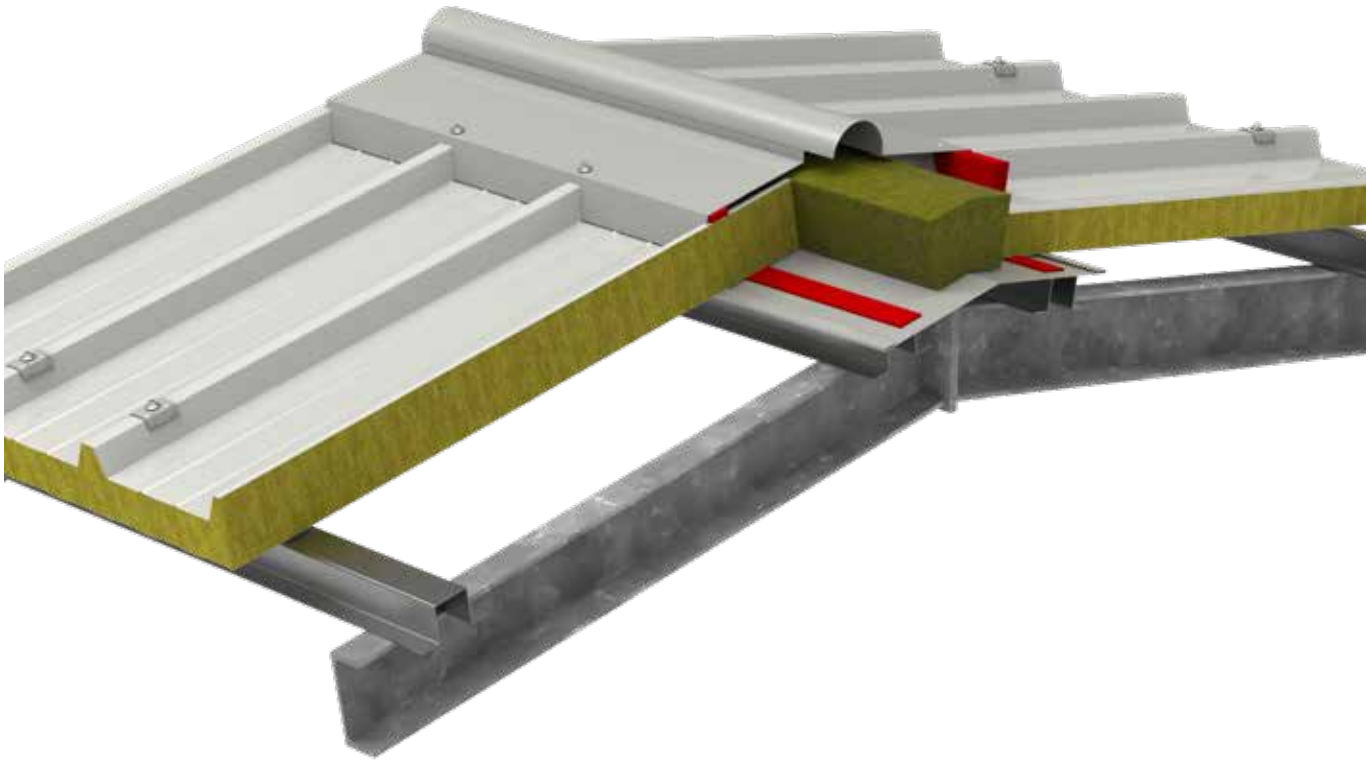


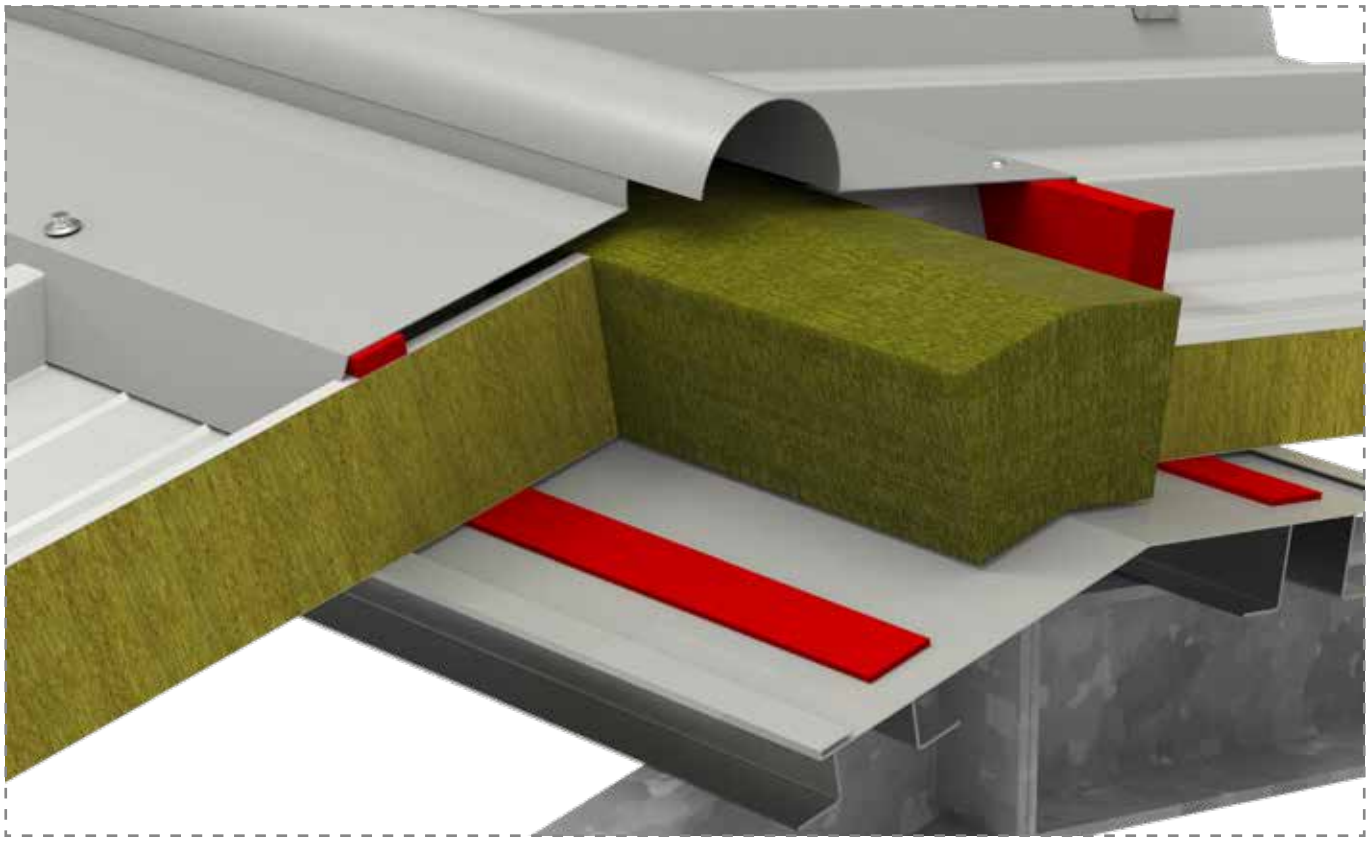
LEGEND

1. ISOPAN Isofire Wall Panel
2. Intumescent sealent
3. Custom cover flashing
4. Insulation (mineral wool)
5. ISOPAN Isofire Roof Panel

RE108

Ridge connection





REI08

Ridge connection

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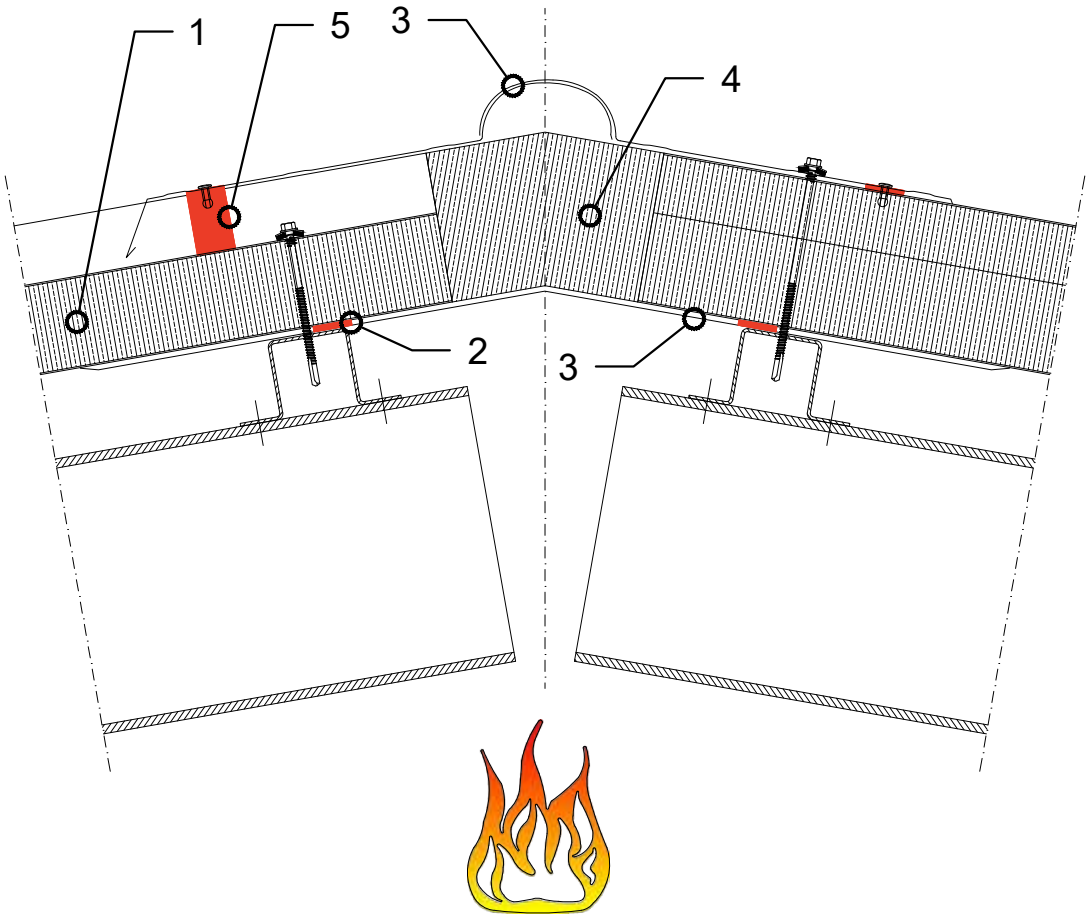
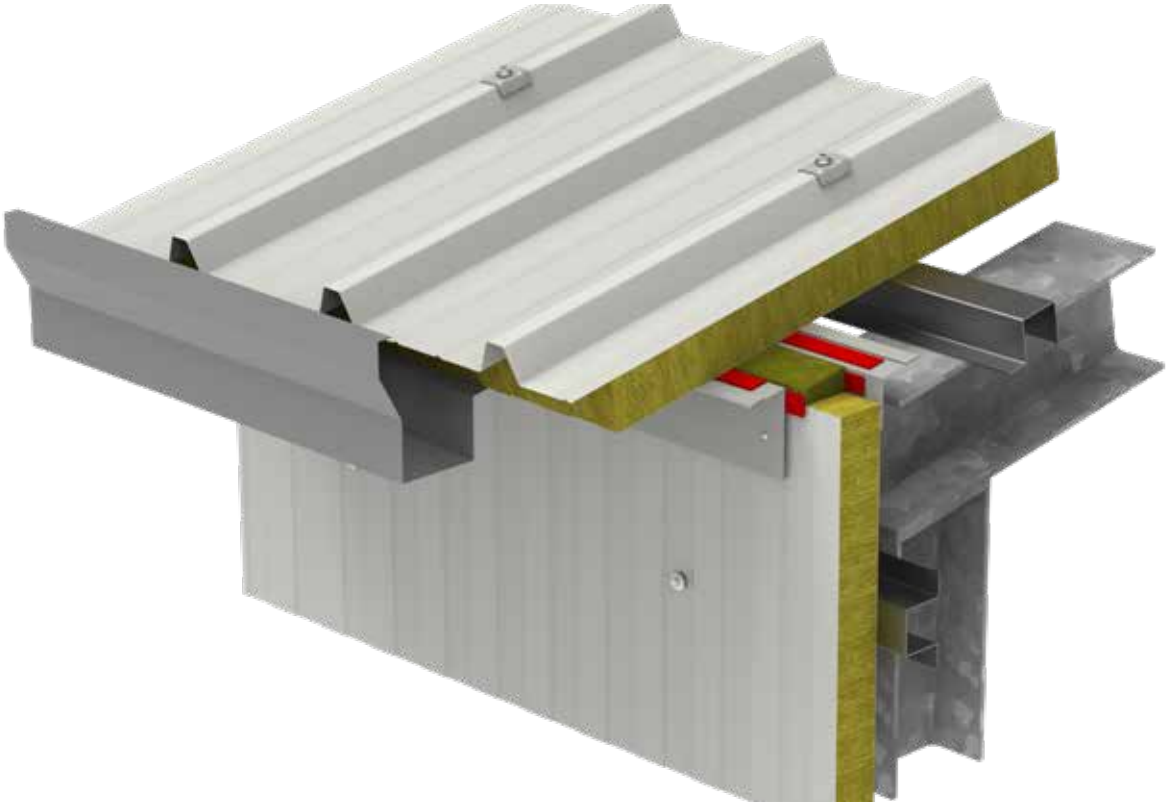


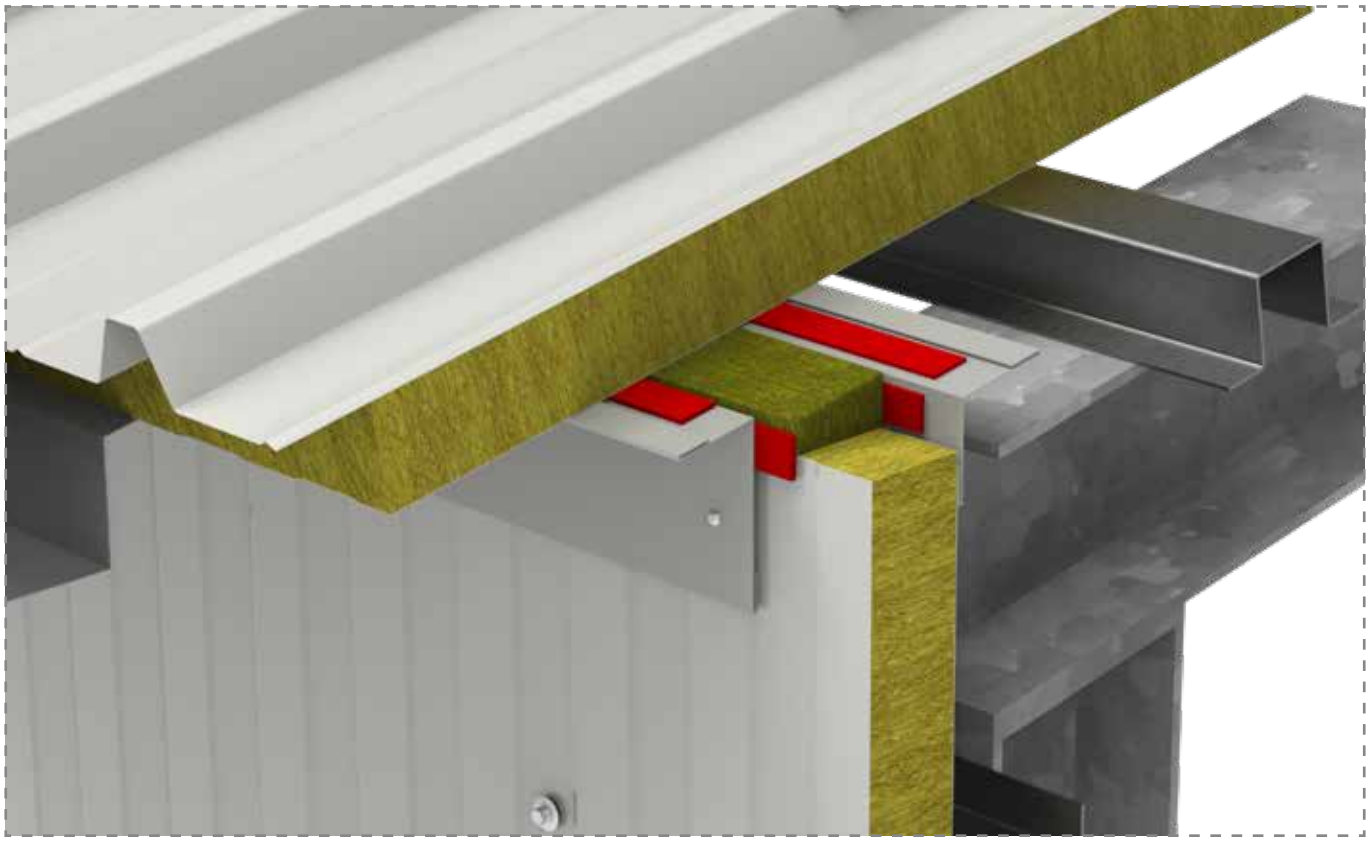
LEGEND

1. ISOPAN Isofire Roof Panel
2. Intumescent sealent
3. Custom cover flashing
4. Insulation (mineral wool)
5. Rib shaped gasket

REI10

Gutter connection





REI10

Gutter connection

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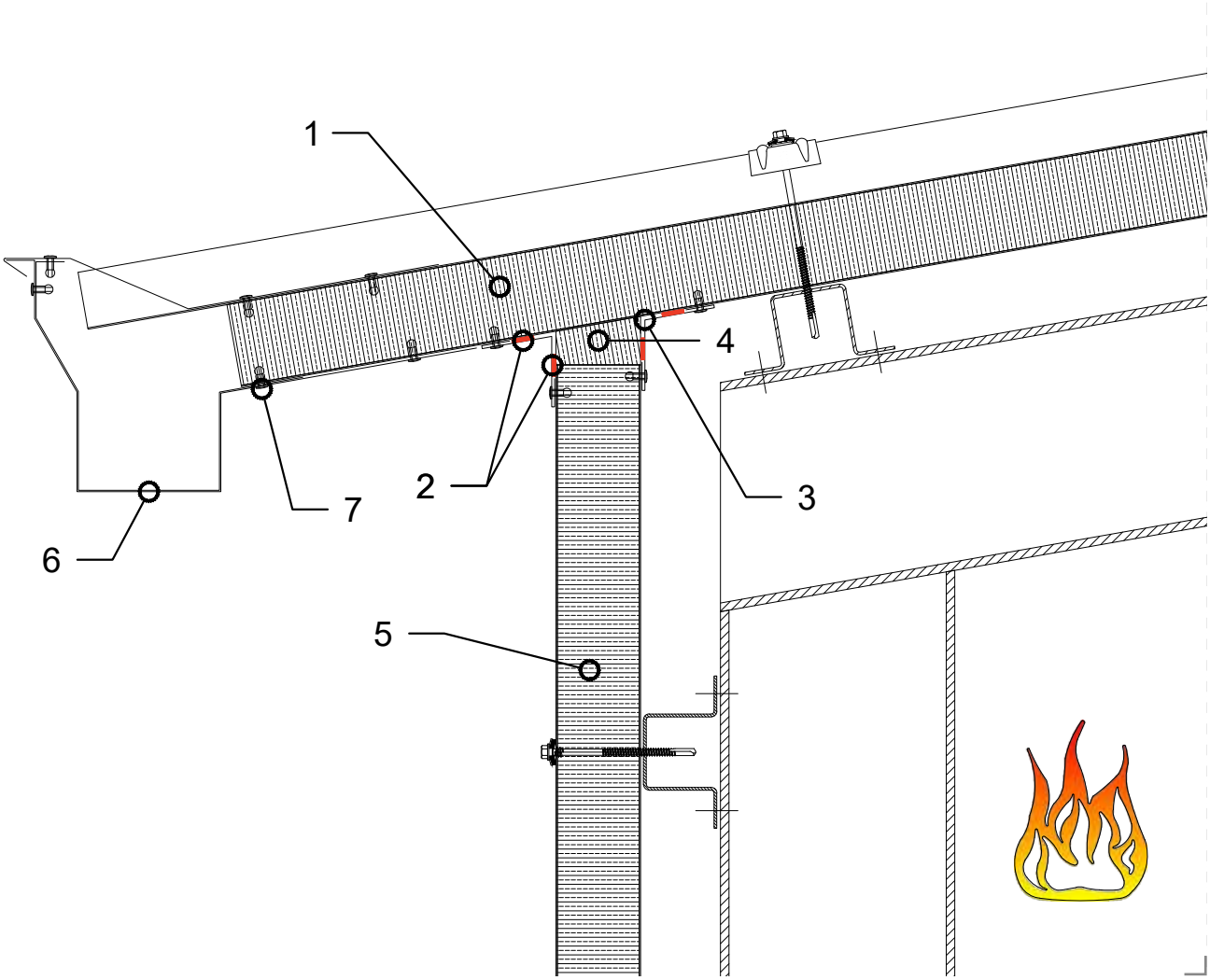


LEGEND

1. ISOPAN Isofire Roof Panel
2. Intumescent sealent
3. Custom cover flashing
4. Insulation (mineral wool)
5. ISOPAN Isofire Roof Panel
6. Gutter
7. Rivet

Focus

PERFORATIONS

One of the main aims of passive fire protection is the capacity to compartmentalize the constructional elements, thus limiting the propagation of fire and confining it to specific areas. In construction this compartmentalization is often compromised by transiting elements like electrical or water systems.
When assessing the fire performance of panels perforated for transit of cables or pipes, intervention is normally required in order to restore the continuity of insulation and compartmentalization. Performance in proximity to perforations is assessed under a specific standard, the EN 1366-3 "Fire resistance tests for service installations - Part 3 Penetration seals".
This standard foresees testing of solid walls (in masonry or concrete) and flexible walls (in plasterboard). Isopan helps designers by carrying out fire resistance tests according to EN 13501-2 and EN 1366-3 with different types of perforations through rock wool sandwich "Isofire Wall" panels.
An assessment is also made of the loads acting on the panels in order to establish the loss of mechanical strength in relation to the size of perforations and cutting actions. It might be necessary to add a substructure or additional framework to transfer loads to the main structure.

EN 1366 Part 3 Sealants for perforations
The standard defines a "perforation" as an "aperture in a separating element for the transit of one or more service systems".
As regards insulation of ducts using combustible or non-combustible materials, the standard divides fire protection systems into various configurations based on the actual form of application on the worksite:

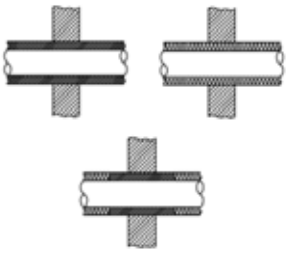
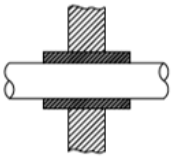
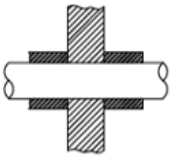
CS (Continuous and Sustained): insulation is applied for the entire length of the duct, passing through the inside of the perforated material.
CI (Continuous and Interrupted): insulation is applied for the entire length of the duct, interrupted where it runs through the perforated material.
LS (Local and Sustained): insulation is fitted for a limited length, passing through the perforated material.
LI (Local and Interrupted): insulation is fitted for a limited length, interrupted where it runs through the perforated material.

ATTRAVERSAMENTI

Uno degli obiettivi principali perseguito dalla protezione passiva dal fuoco è costituito dalla capacità di compartimentazione degli elementi costruttivi, ovvero la possibilità di limitare la propagazione dell'incendio e confinarlo in ambienti specifici. Frequentemente nelle realizzazioni si può notare che tali compartimentazioni non si presentano integre, ma sono interrotte da elementi quali ad esempio impianti elettrici o idraulici.
Per valutare il comportamento in caso di incendio nei casi in cui il pannello viene tagliato per permettere il passaggio di cavi o tubi, vengono solitamente previsti interventi per ripristinare la continuità dell'isolamento e della compartimentazione. Le performance in prossimità degli attraversamenti vengono valutate seguendo una specifica normativa, la EN 1366-3 "Prove di resistenza al fuoco per impianti di fornitura servizi-Parte 3 Sigillanti per attraversamenti".
Questa norma prevede le installazioni di prova su pareti rigide (in muratura o calcestruzzo) o pareti flessibili (in cartongesso). Isopan, per meglio supportare i progettisti, ha effettuato test di resistenza al fuoco secondo EN 13501-2 e EN 1366-3 con diverse tipologie di attraversamenti di una parete in pannello sandwich in lana di roccia "Isofire Wall".
In aggiunta, una valutazione dei carichi agenti sul pannello va condotta per considerare la perdita di resistenza meccanica a seconda della dimensione delle aperture e dei tagli effettuati, si potrebbe infatti rendere necessario il dimensionamento di una sottostruttura o un telaio aggiuntivo per trasferire il carico alla struttura principale.

EN 1366 Parte 3 Sigillanti per attraversamenti
La norma definisce "attraversamento" una "apertura in un elemento di separazione per il passaggio di uno o più servizi".
Per quanto concerne l'isolamento delle tubazioni, effettuato con materiale isolante combustibile o incombustibile, la norma suddivide i sistemi di protezione antincendio in varie configurazioni, a seconda delle condizioni di reale utilizzo in cantiere:

- **CS** (Continuo e Sostenuto): l'isolante è applicato per tutta la lunghezza del tubo e passa all'interno della parete
- **CI** (Continuo e Interrotto): l'isolante è applicato per tutta la lunghezza del tubo ed è interrotto in corrispondenza del supporto attraversato
- **LS** (Locale e Sostenuto): l'isolante è applicato per una lunghezza limitata e passa all'interno del supporto attraversato
- **LI** (Locale e interrotto): l'isolante è applicato per una lunghezza limitata ed è interrotto in corrispondenza del supporto attraversato

	Sustained	Interrupted
Continued		
	Case CS	Case CI
Local		
	Case LS	Case LI

Furthermore, the pipe test configuration can be chosen according to the pipe material and its intended use, generating a range of possibilities.

In aggiunta, la configurazione di prova delle tubazioni può essere scelta a seconda del materiale di cui il tubo è costituito e del suo uso finale andando ad individuare diverse possibilità.

CABLE DUCTS
Perforation diameter 26 mm
Maximum cable diameter 20 mm
Certification EI180/ EI 180 U/C

PASSAGGIO CAVI
Diametro foro 26mm
Dimetro massimo cavo 20mm
Certificazione EI180/ EI 180 U/C

TEST CONDITIONS	CONFIGURATIONS PIPE	
	Side exposed to fire	Unexposed side
U/U	Not Closed	Not Closed
C/U	Closed	Not Closed
U/C	Not Closed	Closed
C/C	Closed	Closed

COPPER pipe
Maximum perforation diameter 190 mm

Tubo RAME
Misura massima apertura 190 mm

Pipe diameter (mm)	EI Performance
88	EI 60 U/C
42	EI 90 U/C
18	EI 120 U/C

STEEL pipe
Maximum perforation diameter 210 mm

Tubo ACCIAIO
Misura massima apertura 210 mm

Pipe diameter (mm)	EI Performance
114	EI 120 U/C
42	EI 120 U/C
17	EI 120 U/C

TRANSITING PLASTIC PIPES
Maximum perforation diameter 160 mm
Maximum pipe diameter 160 mm
Certification EI 60 U/C

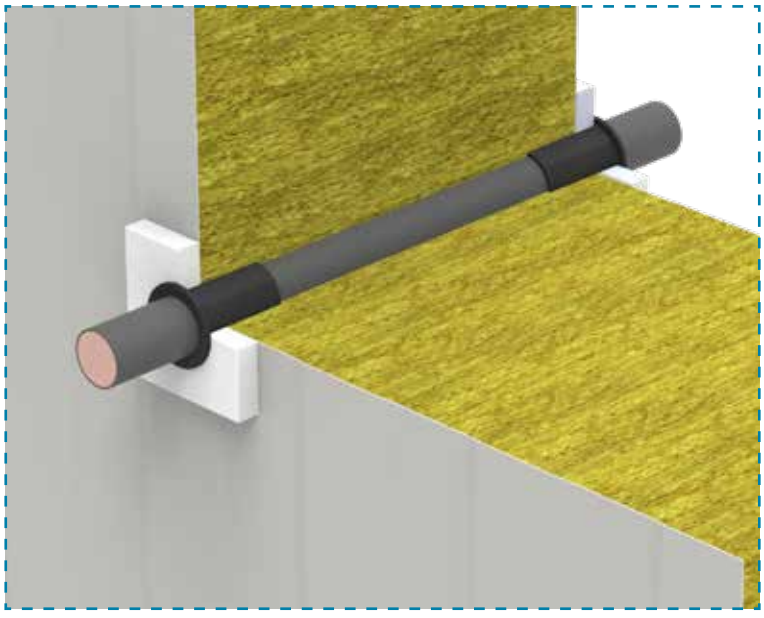
PASSAGGIO TUBI PLASTICI
Diametro massimo apertura 160 mm
Dimetro massimo tubo 160 mm
Certificazione EI 60 U/C

REI11

Penetrations in fire-rated structures

Solution tested
CHEMOLLI FIRE RESEARCH
Chemolli S.a.s.

With
PROMAT solutions



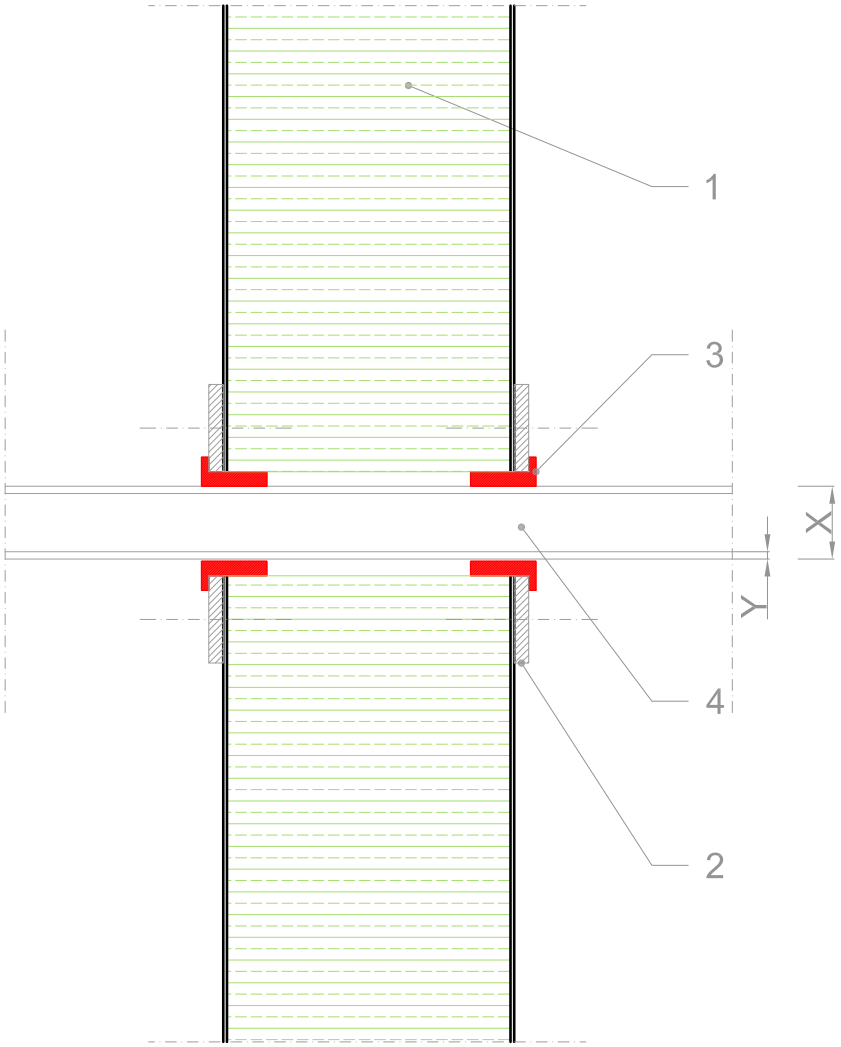
REI11

Penetrations in fire-rated structures

You can download the .dwg and .pdf files collection at isopan.com.

Solution tested
CHEMOLLI FIRE RESEARCH
Chemolli S.a.s.

With
PROMAT solutions



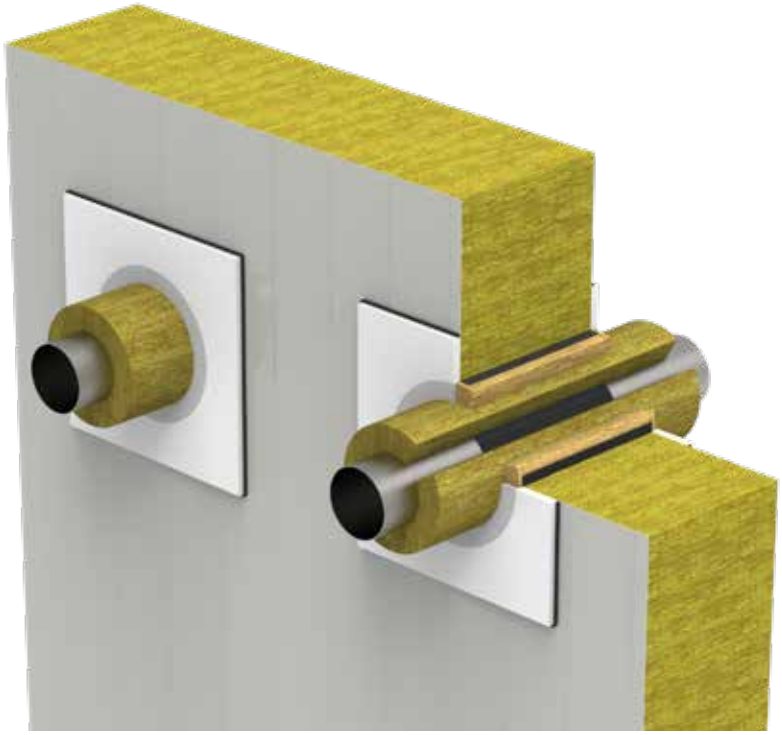
1. ISOPAN Isofire Wall Panel
2. IPROMATECT 10mm Thick
3. PROMASTOP SEAL
4. Pipe or cable

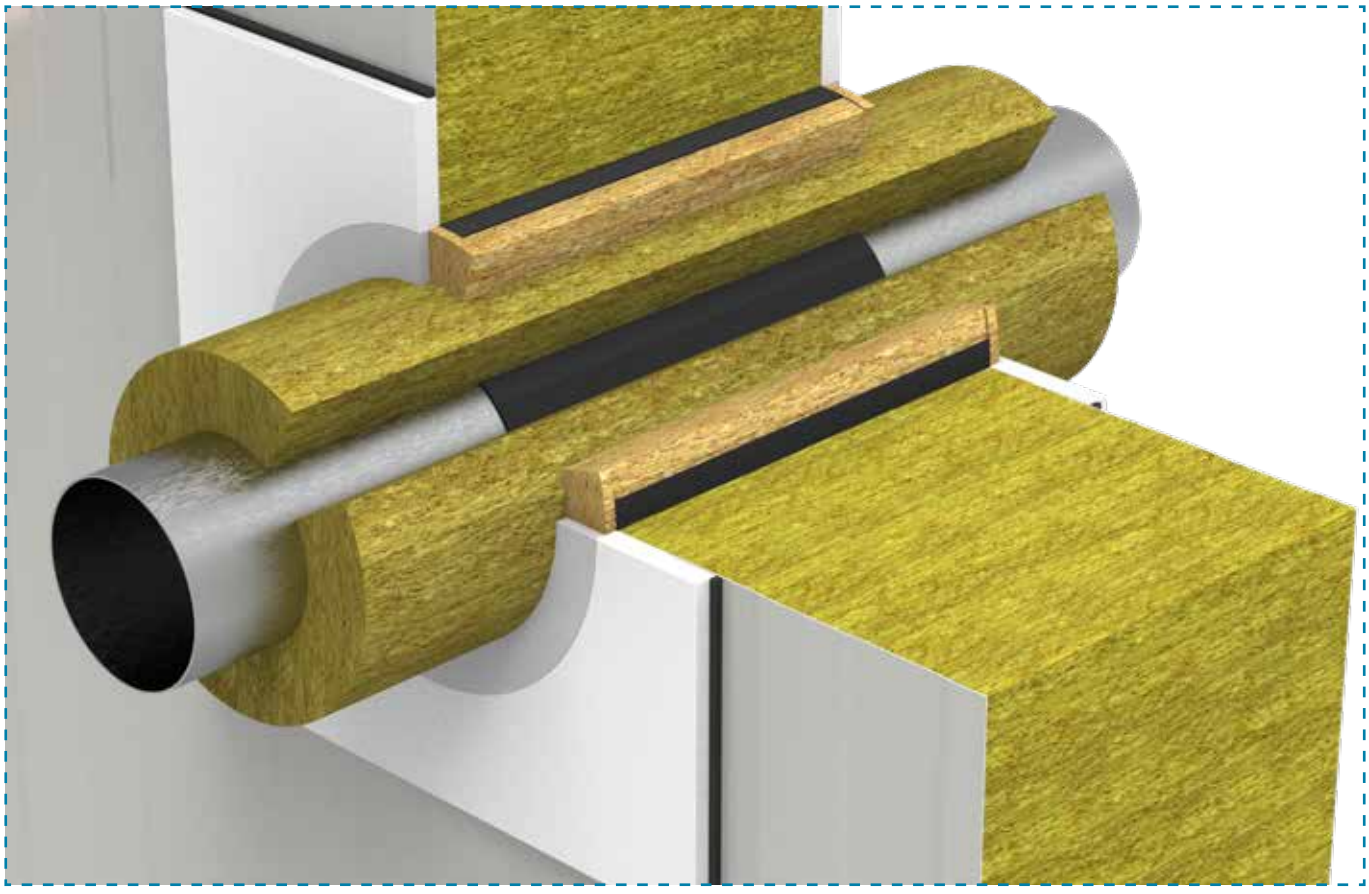
REI12

Penetrations in fire-rated structures

Solution tested
CHEMOLLI FIRE RESEARCH
Chemolli S.a.s.

With
PROMAT solutions





REI12

Penetrations in fire-rated structures

You can download the .dwg and .pdf files collection at isopan.com.

Solution tested
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With
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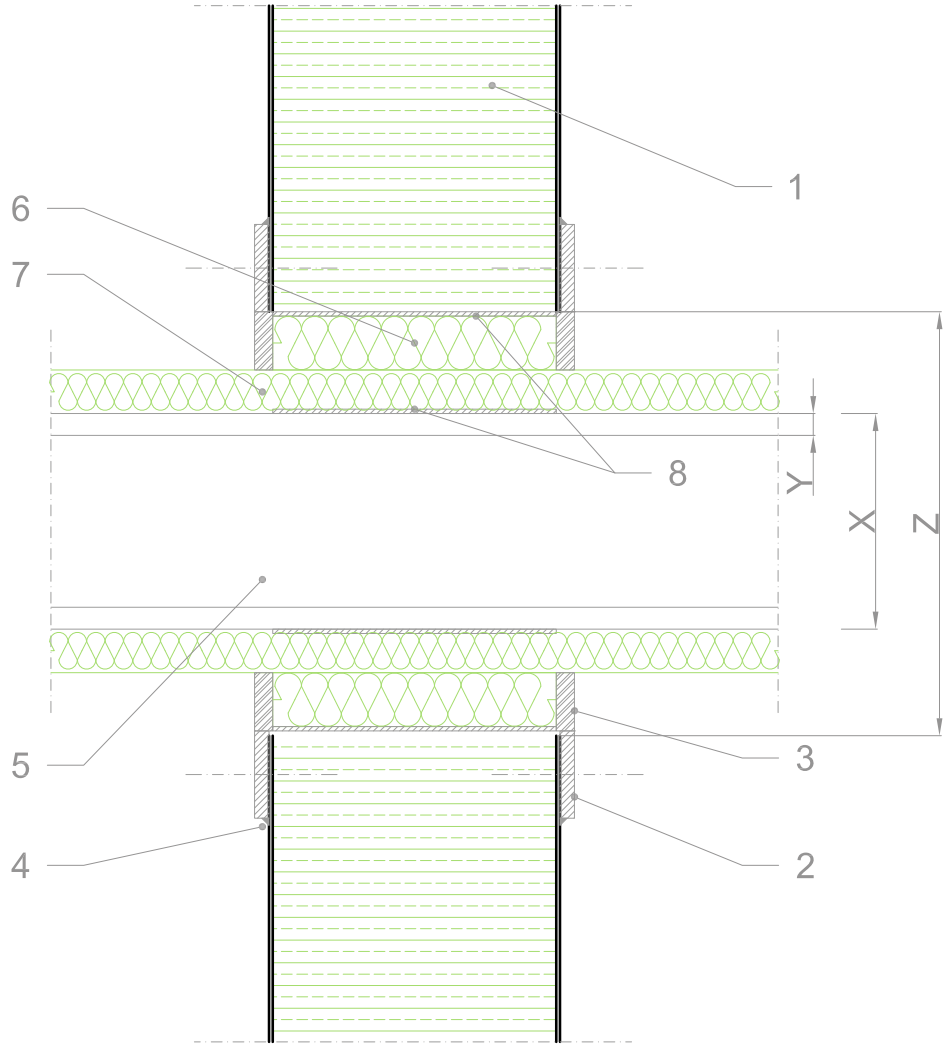

1. ISOPAN Isofire Wall Panel
2. IPROMATECT 10mm Thick
3. PROMASEAL A - 5mm thick
4. PROMASEAL A - 5mm thick
5. Pipe
6. Backing ISOVER PAR 90mm thick
7. Pipe insulation ISOVER PAR 30mm thick
8. PROMASEAL INTUMESCENT GASKET

REI13

Penetrations in fire-rated structures

Solution tested
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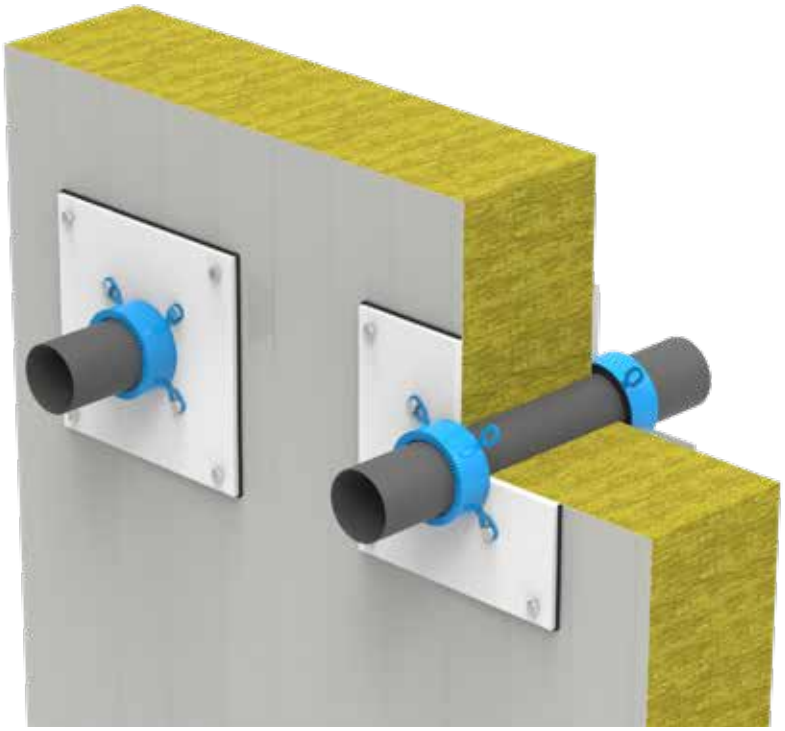

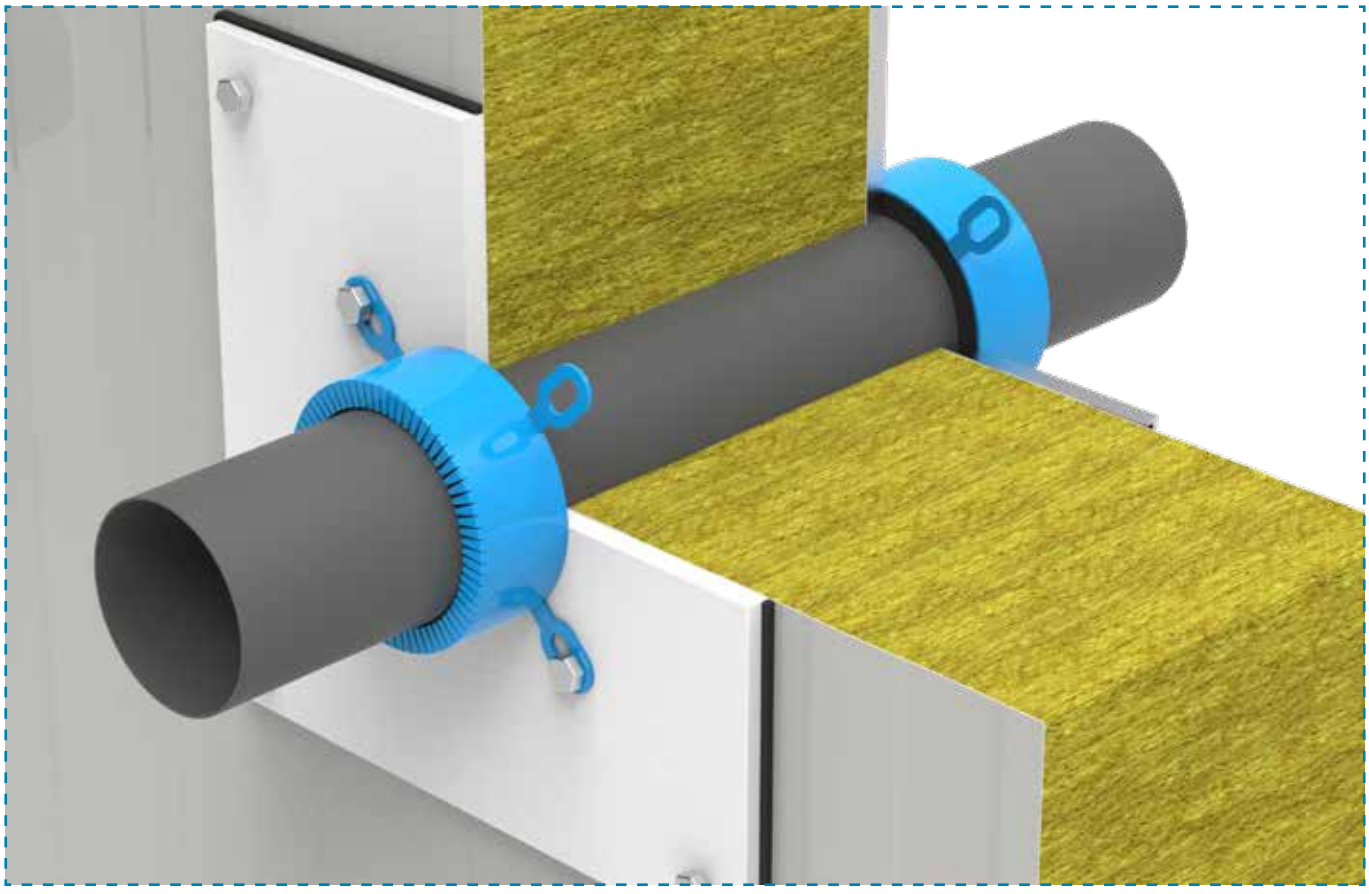

REI13

Penetrations in fire-rated structures

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Solution tested
CHEMOLLI FIRE RESEARCH
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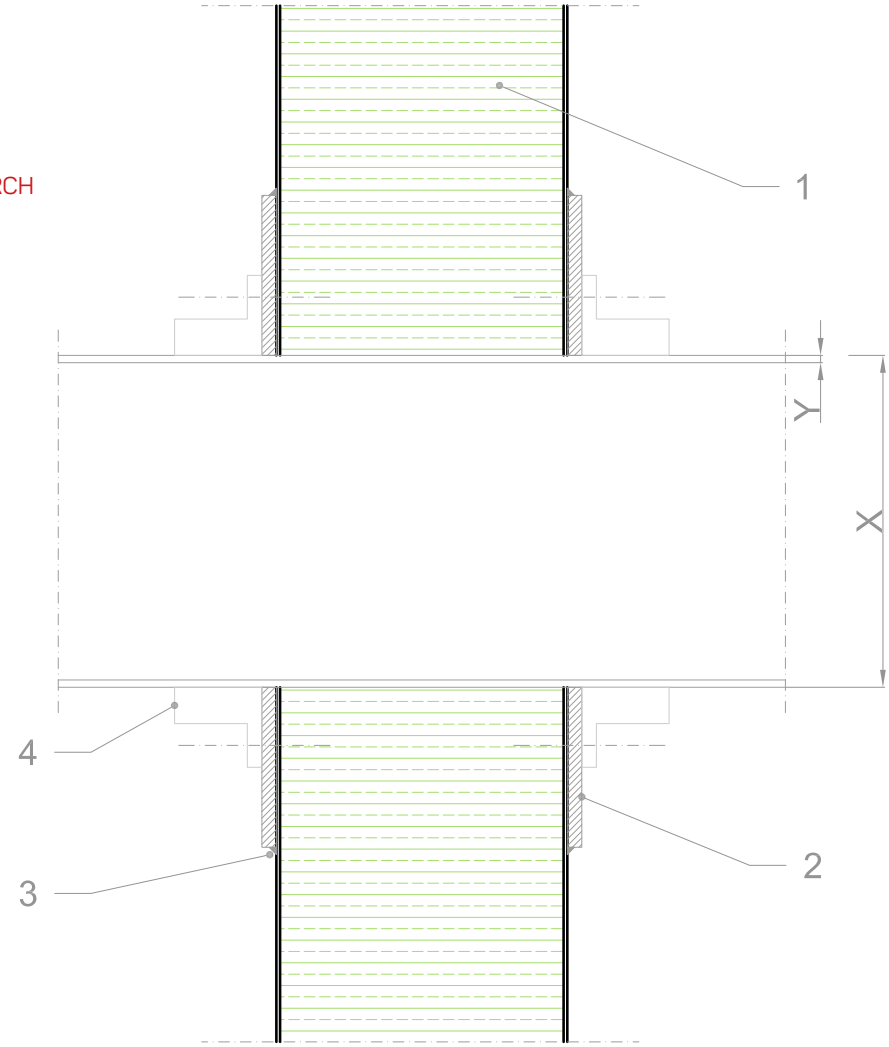
With
PROMAT solutions



1. ISOPAN Isofire Wall Panel
2. IPROMATECT 10mm Thick
3. PROMASTOP SEAL
4. PROMASTOP FC3

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