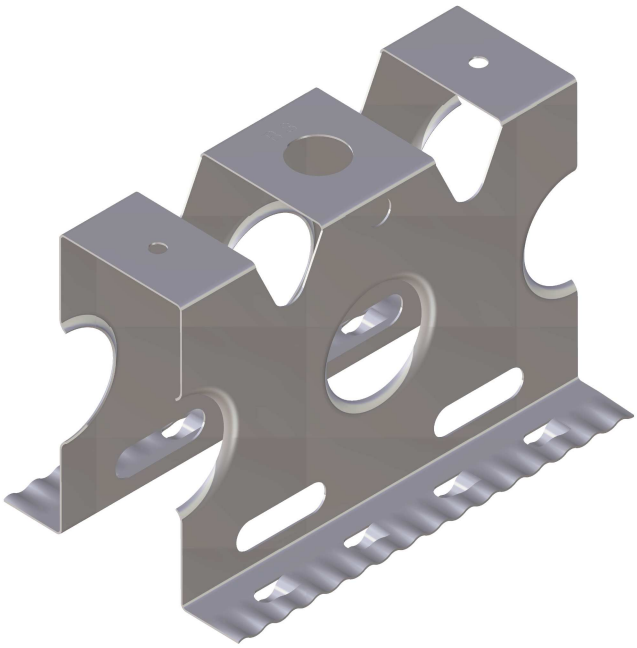
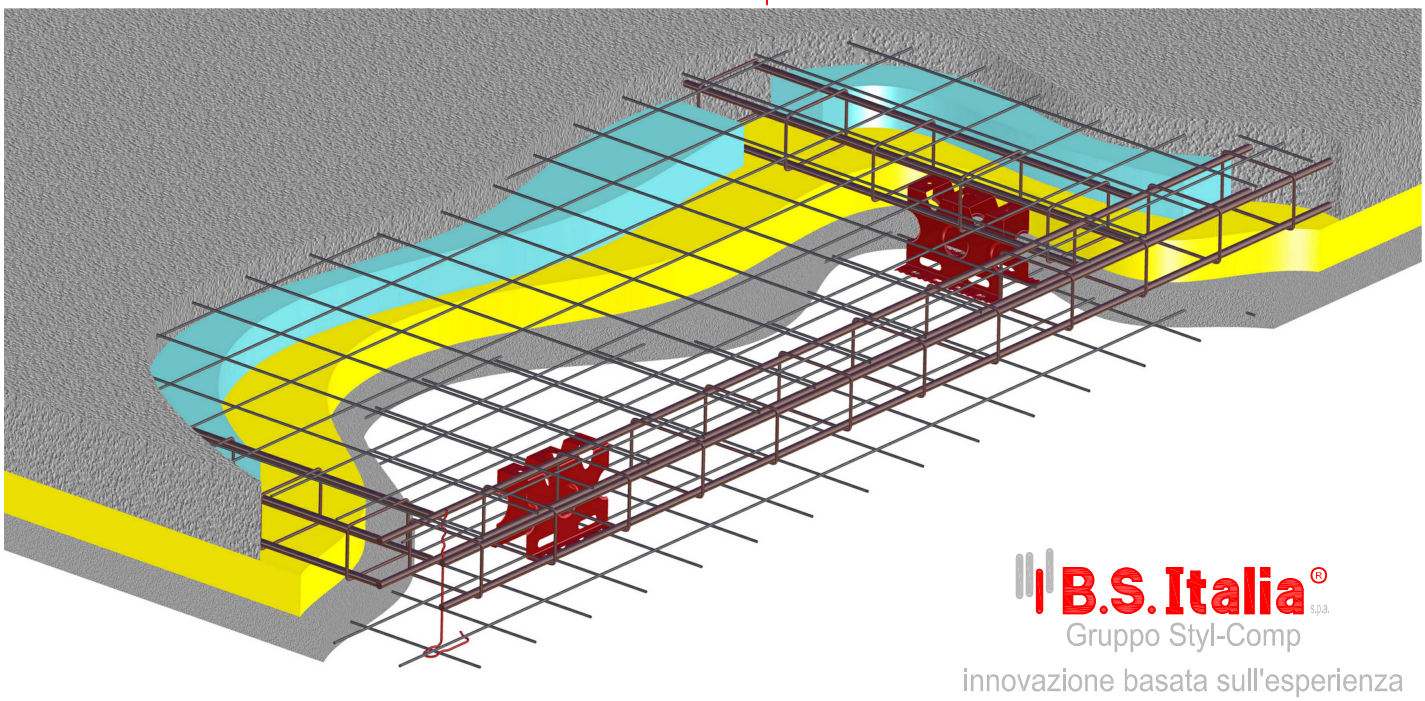
OMEGA-X SYSTEM

User manual 2025





B.S.Italia® s.p.a.
Gruppo Styl-Comp
innovazione basata sull'esperienza
innovation based on experiece

BEFORE MANUFACTURING PRODUCTS WITH THE OMEGA-X SYSTEM, THE USER IS INVITED TO VIEW AND THOROUGHLY UNDERSTAND THE INFORMATION AND SAFETY REGULATIONS CONTAINED IN THIS MANUAL. FAILURE TO COMPLY WITH THESE INDICATIONS COULD COMPROMISE THE OPERATION OF THE SYSTEM

If you have any doubts regarding the correct use of the components described, please contact our customer service:

B.S.Italia S.p.A.

- 24050 Zanica (BG) registered office : Via Stezzano, 16 headquarters operational: via Falcone, 9
- tel +39 035 670569
- fax +39 035 671854
- www.bs-italia.it
- info@bs-italia.it

The OMEGA-X system was designed, built and internationally patented by B.S. Italia S.p.A., an ISO 9001 and EN1090-1 certified company:

EN 1090-1
FPC verificato secondo AVCP 2+ da
BUREAU VERITAS
Certification

B.S. Italia spa
SERVIZI E SISTEMI TECNOLOGICI PER L'EDILIZIA INDUSTRIALIZZATA
Uffici: Via Stezzano, 16 - Stabilimento: G. Falcone, 9
24050 ZANICA (Bg) - infobsitalia@styl-comp.it
Tel. +39 035 671746 - Fax +39 035 672265

BUREAU VERITAS Certification

DECLARATION OF PERFORMANCE

N° 01/19

1. *Code identification of the product :* **9000-22.I**
2. *Intended use :* **Supporting layer of the sandwich panel**
3. *Name and address of manufacter ,in accordance with article 11 paragraph 5:* **see header**
4. *Rapresentative (article 12, paragraph 2):* **Not applicable**
5. *System or systems of evaluation and verification of the consistency of the performance of the construction product , in accordance with the annex V:* **System 2+**
6. *In the case of declaration of performance concerning a construction product covered by a harmonized standard:* **Bureau Veritas (certification body notified n° 1370) issued the certificate of compliance with standard EN1090-2, certifying constancy of performance , compliance control factory production and relation of tests/calculations**
7. *In the case of a declaration of performance concerning a construction product for which a European technical assessment has been issued :* **Not applicabe**
8. *Declarated performance:*

Essential characteristics	Performance	Harmonized technical specification
Load capacity	See calculation report	
Tollerance of dimensions and shape	EN 1090-2	EN 1090-1:2009 + A1:2011
Weldability	AISI316 EN 10028-7	EN 1090-1:2009 + A1:2011
Resistance to breakage	≥100J	EN 1090-1:2009 + A1:2011
Reaction to fire	Class A2 according to EN 13501	EN 1090-1:2009 + A1:2011
Release of cadmium	NPD	EN 1090-1:2009 + A1:2011
Radioactivity	NPD	EN 1090-1:2009 + A1:2011
Duratibility	Surface preparation according to EN 1090-2, preparation grade P1. Surface austenitic steel	EN 1090-1:2009 + A1:2011
Fatigure resistance	NPD	EN 1090-1:2009 + A1:2011
Fire resistance	NPD	EN 1090-1:2009 + A1:2011
Manufacturing	EN 1090 EXC3	EN 1090-1:2009 + A1:2011

SUMMARY

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The drawings shown in the following User Manual are indicative

ADVANTAGES

OMEGA-X is an innovative bracket for supporting the concrete layer hanging from the load-bearing layer in prefabricated sandwich panels. It supports and locally joins the two layers of concrete separated from each other by the presence of the insulating layer that creates the thermal break.
In the panorama of proposals for thermal cutting, ΩX stands out thanks to its high compatibility with the concrete of the panel and the almost irrelevant thermal bridge.
In fact, thanks to an in-depth engineering of the shape and materials, ΩX guarantees high performance in both static and thermal terms.

Maximum performance minimum thickness

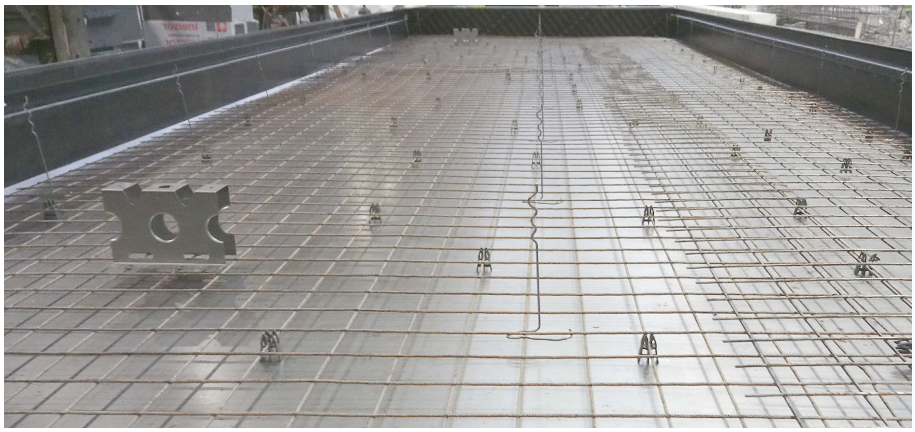
These innovative brackets activate a resistant trellis mechanism, therefore bidirectional, a synthesis of extreme power and robustness, but for the first time with minimum thickness. We are in the presence of the Top of performance in static + thermal terms, simultaneously.

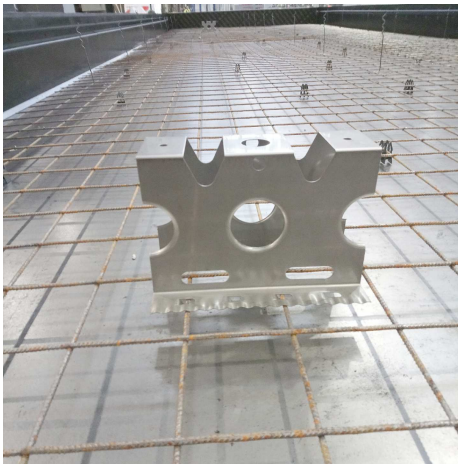
Toughness

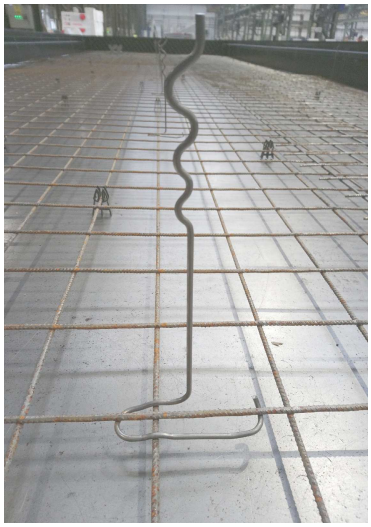
The system guarantees an inseparable and tenacious connection with the reinforcement of the hanging layer.

Improved adhesion

The OMEGA-X brackets are characterised by perforations and corrugations that create improved adhesion with the concrete, enhancing their interaction with it and ensuring maximum collaboration: adhesion-interaction-anchoring-stitching, consecrating them as the best ally of concrete.

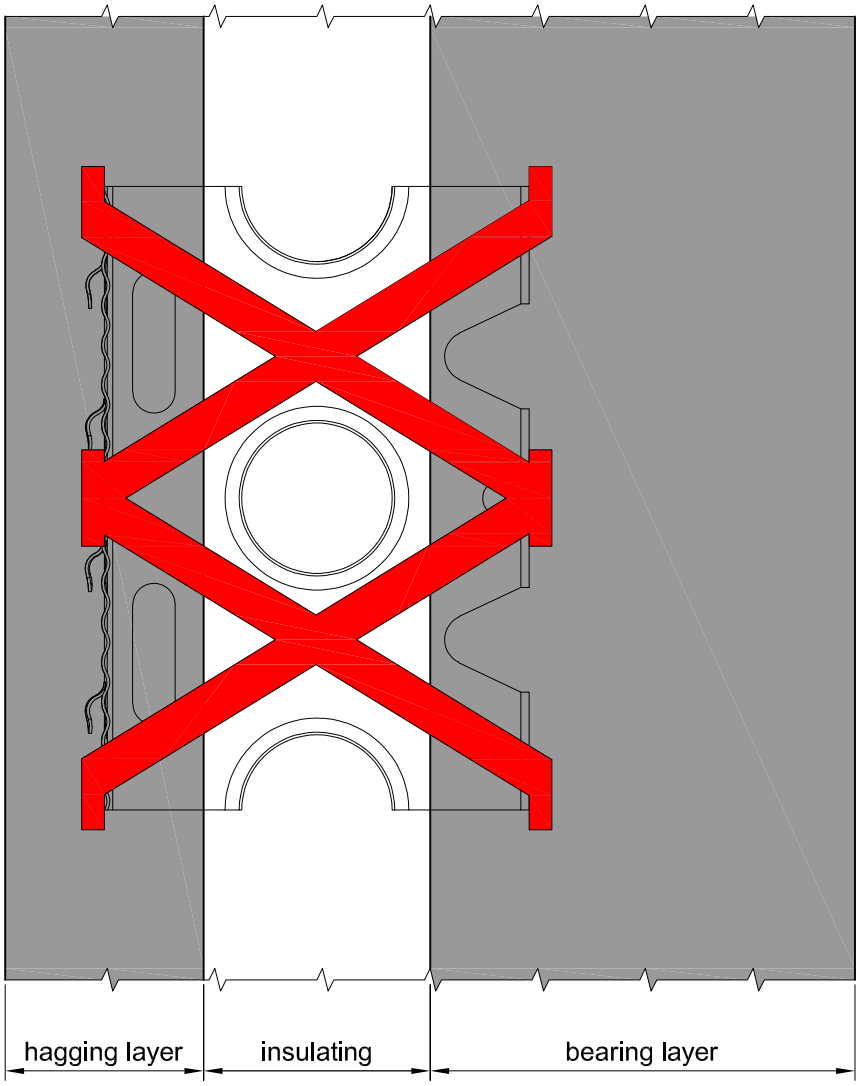




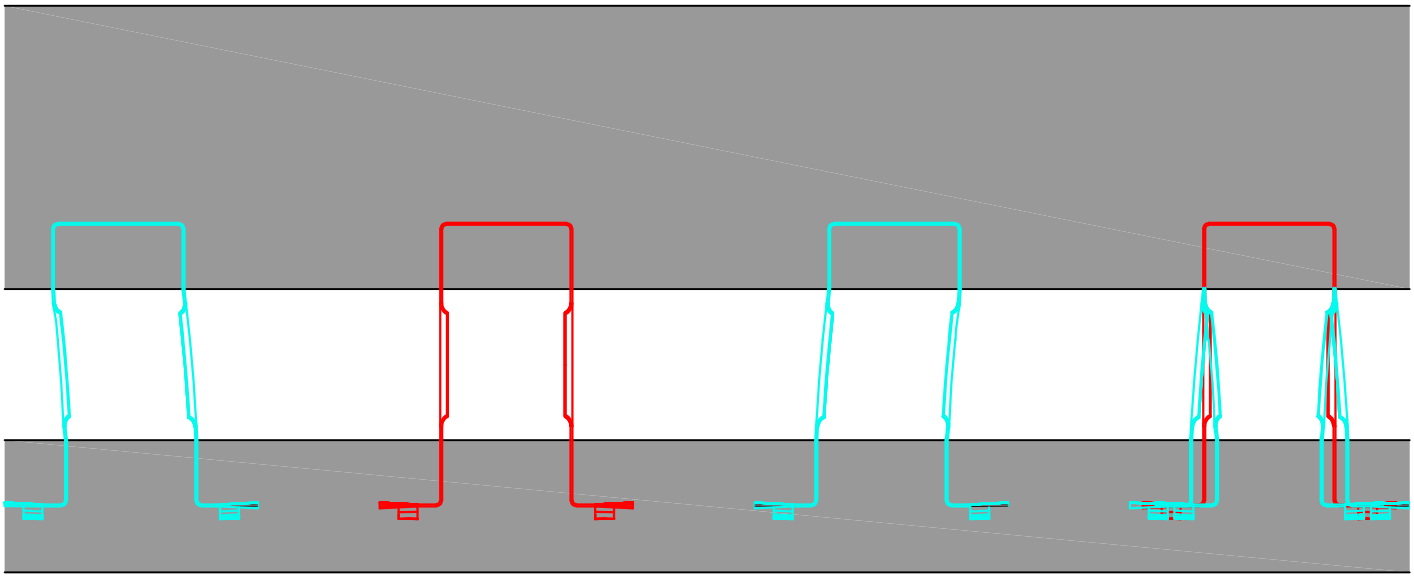


CONCEPT OF STATIC AND DEFORMABILITY

The ΩX system is based on the concept of the static function STRUT-and-TIE "X"



The transverse deformability of the ΩX system supports the thermal expansions that act on the external layer of the artefacts, preventing damage such as cracks and fissures, to the advantage of long-term durability.



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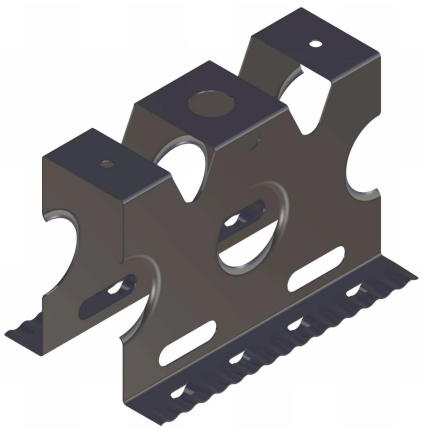
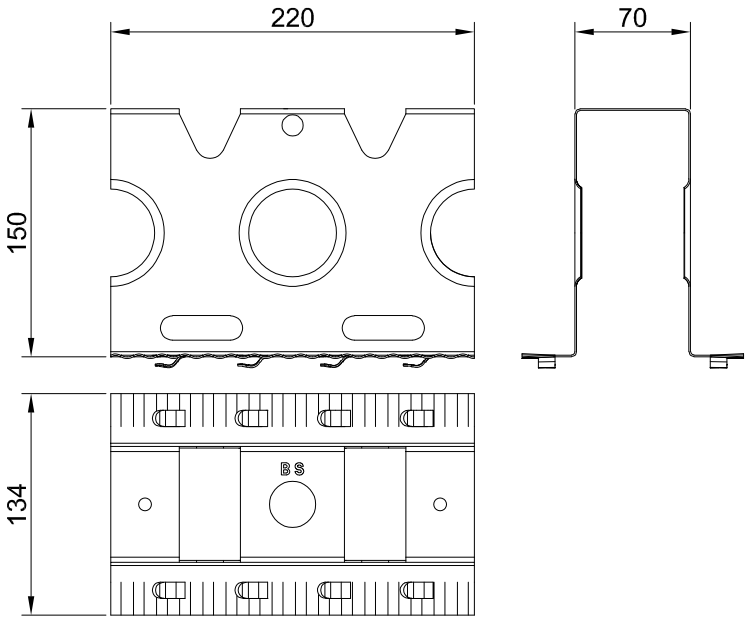
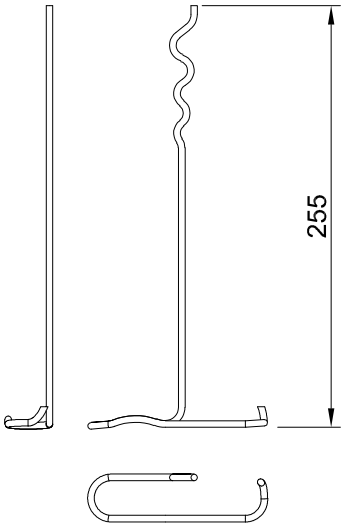
COMPONENTS OF THE SYSTEM

- ***OMEGA-X***
  support insert



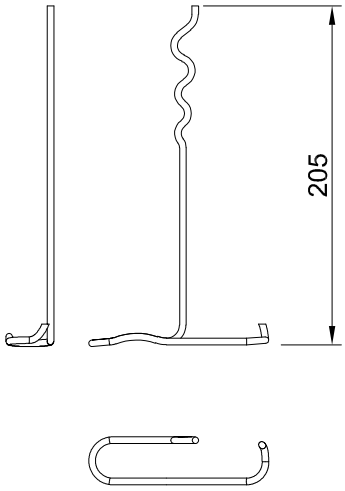


- ***FORK H255***
  stitching insert

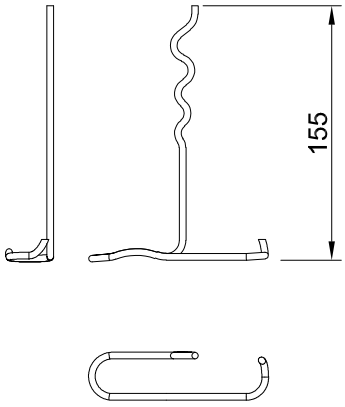


COMPONENTS OF THE SYSTEM

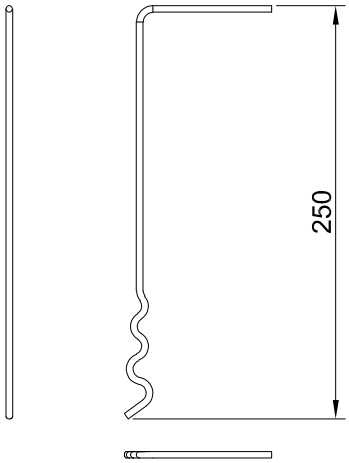
- ***FORK H205***
  stitching insert



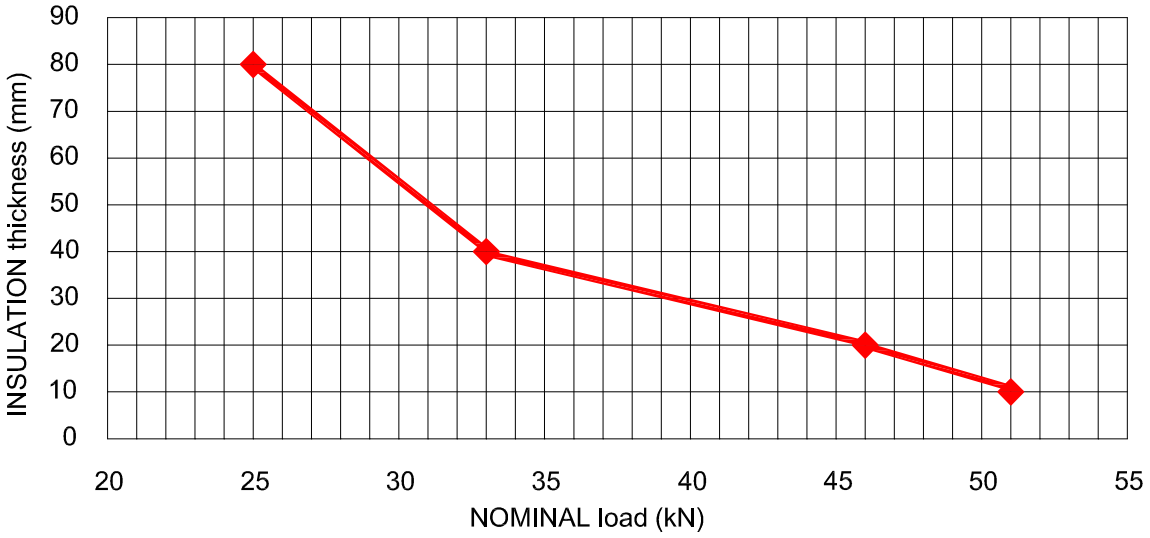
- ***FORK H155***
  stitching insert

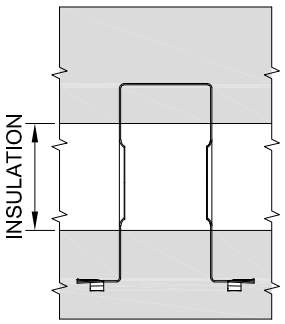


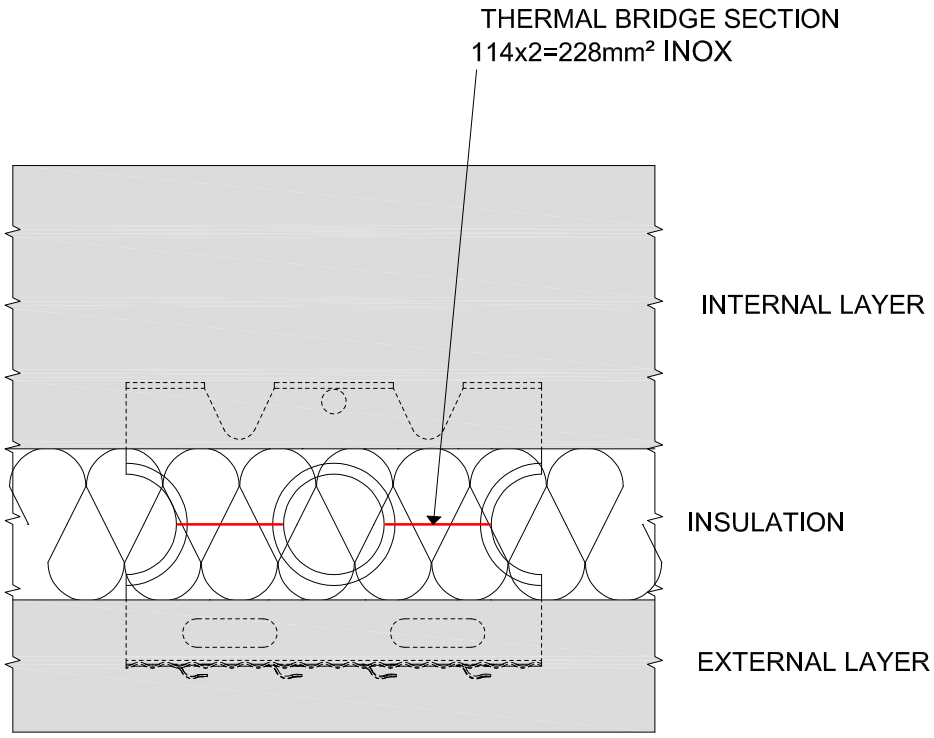
- ***FORK "L"***
  stitching insert after pour



OMEGA-X L=220mm Th.10/10

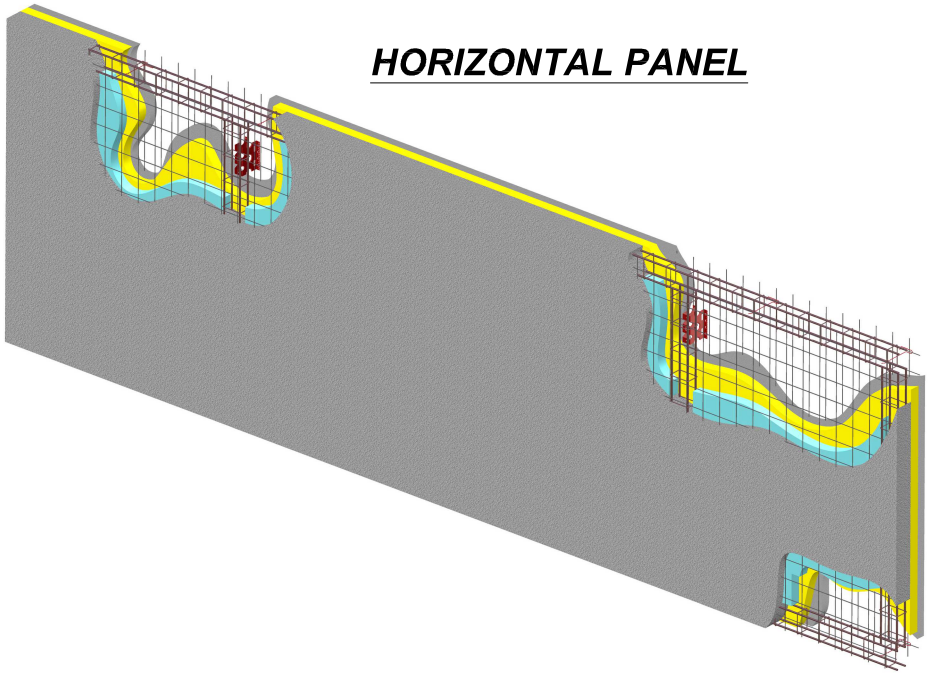




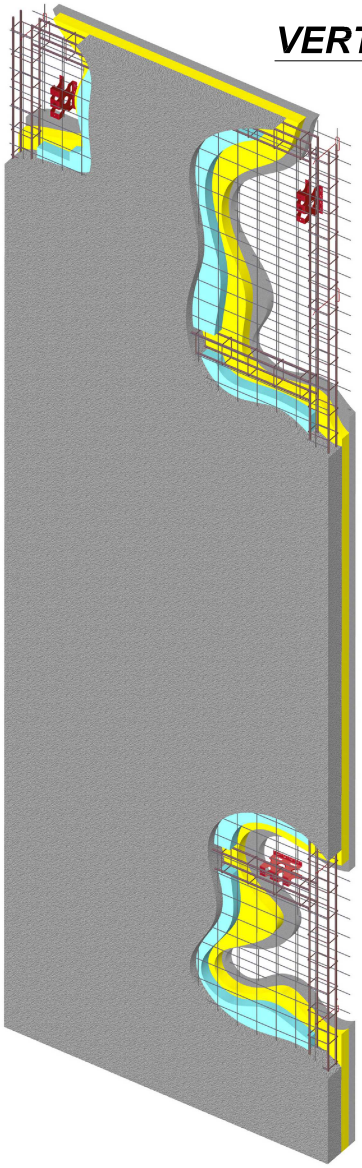


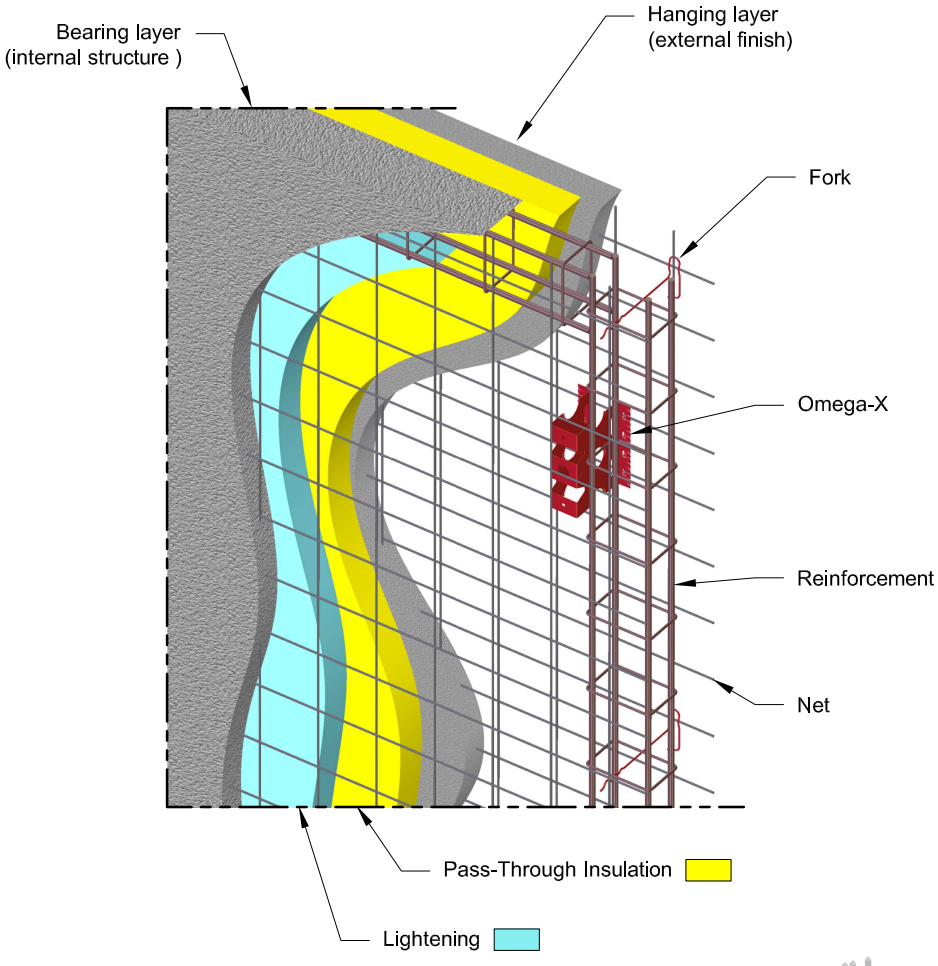
TYPICAL PANEL CONFIGURATION

HORIZONTAL PANEL

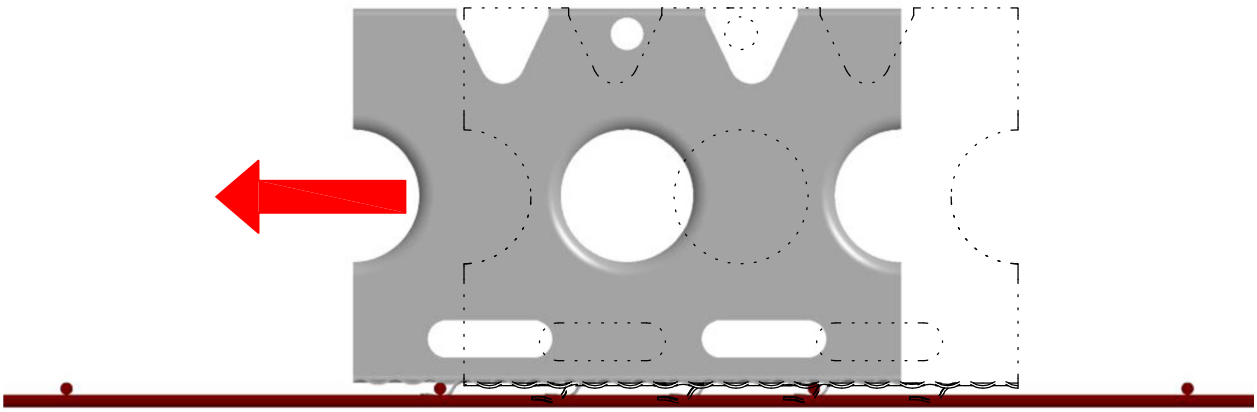


VERTICAL PANEL

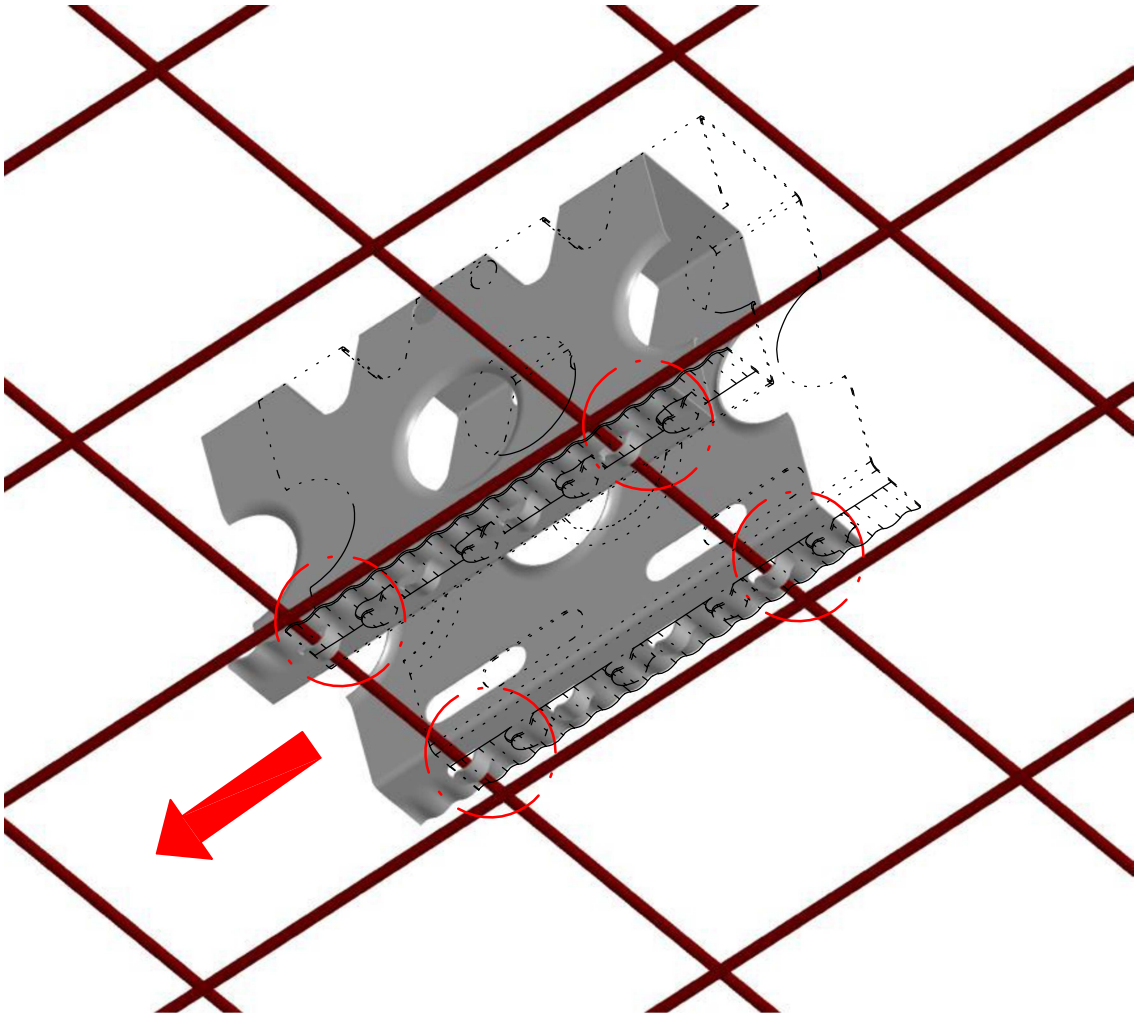




OMEGA-X HOOK UP TO THE NET

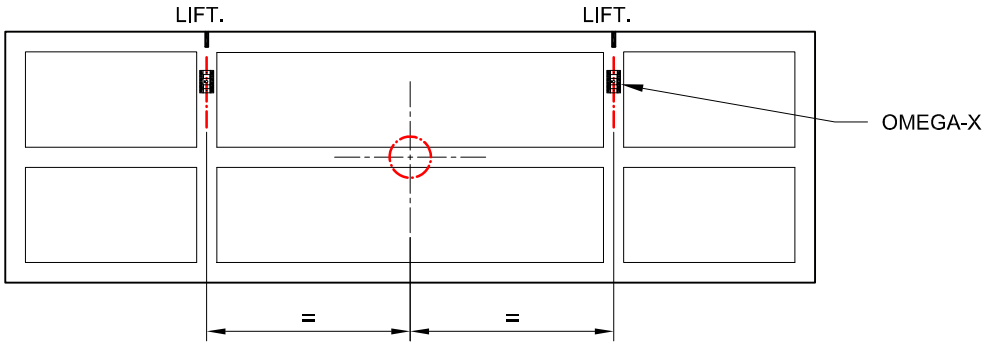


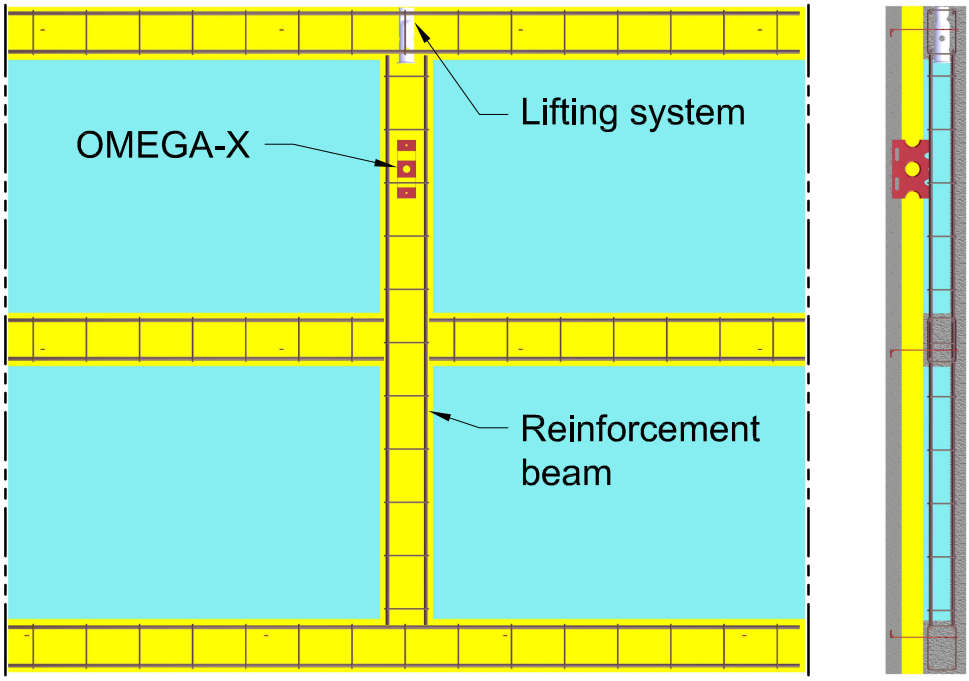
Place the Omega-X insert on the net and slide it until the cross wires of the net fit into the elastic tabs.

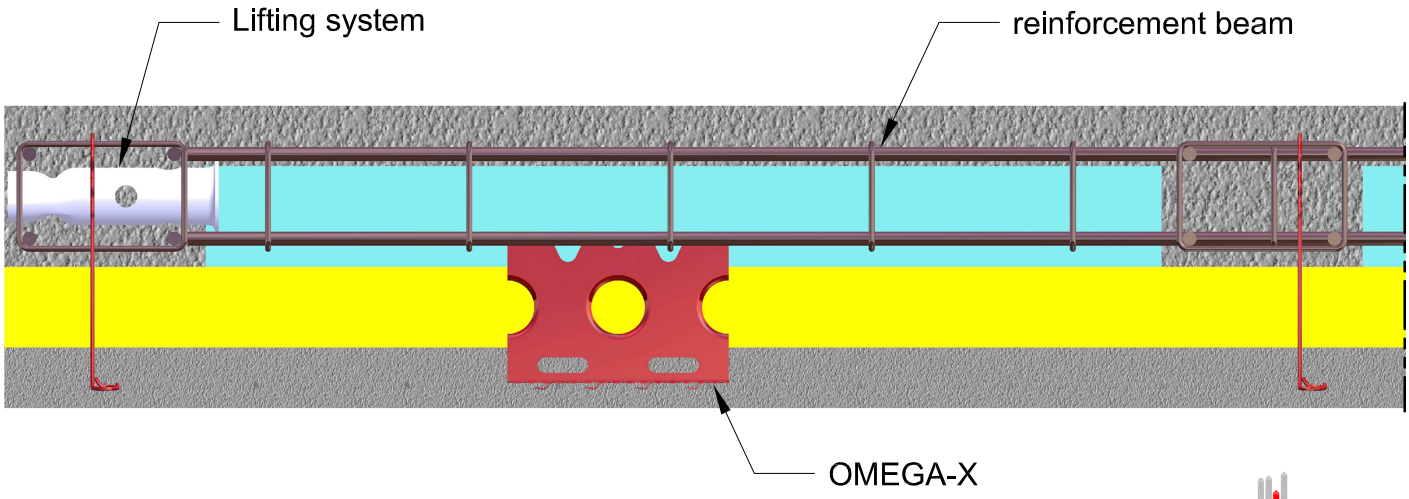


OMEGA-X POSITIONING IN THE PANNEL

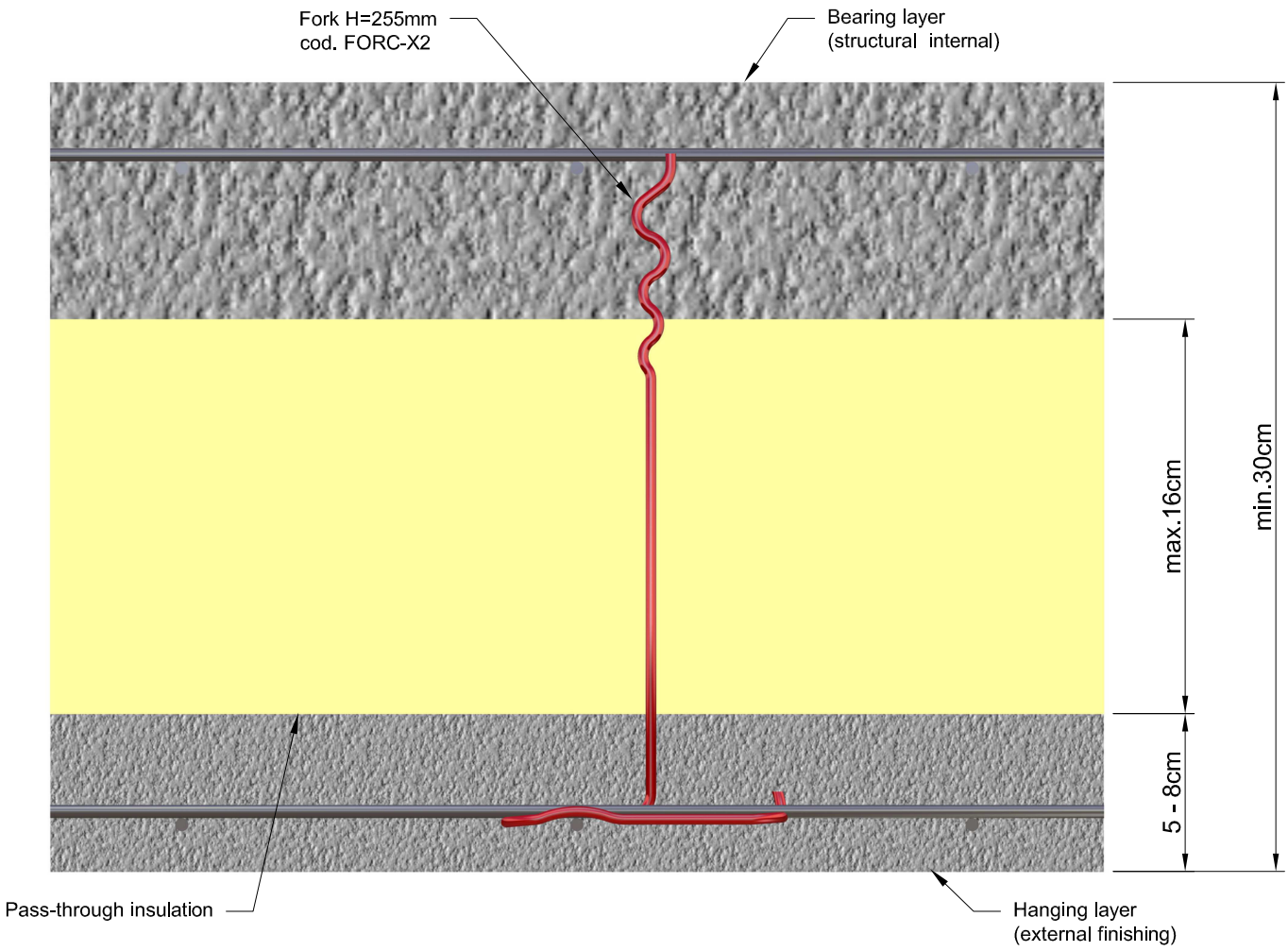
OMEGA-X inserts must be positioned in adequately confined concrete, therefore they must be inserted in correspondence with the reinforcement beams.
To adequately balance the weight of the suspended external layer, it is advisable to position the inserts at a symmetrical distance from the centre of gravity of the artifact, therefore in line with the lifting systems.

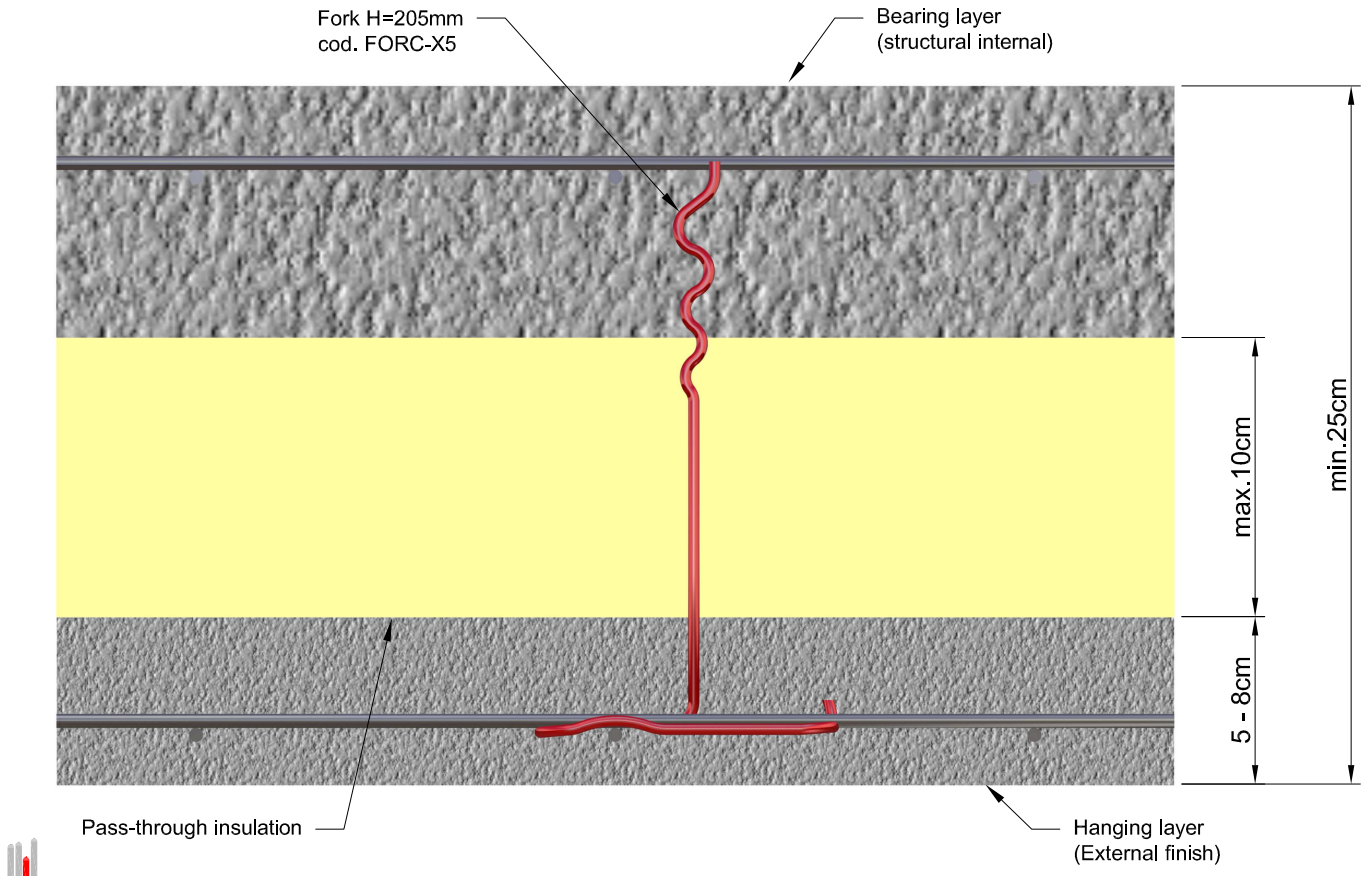




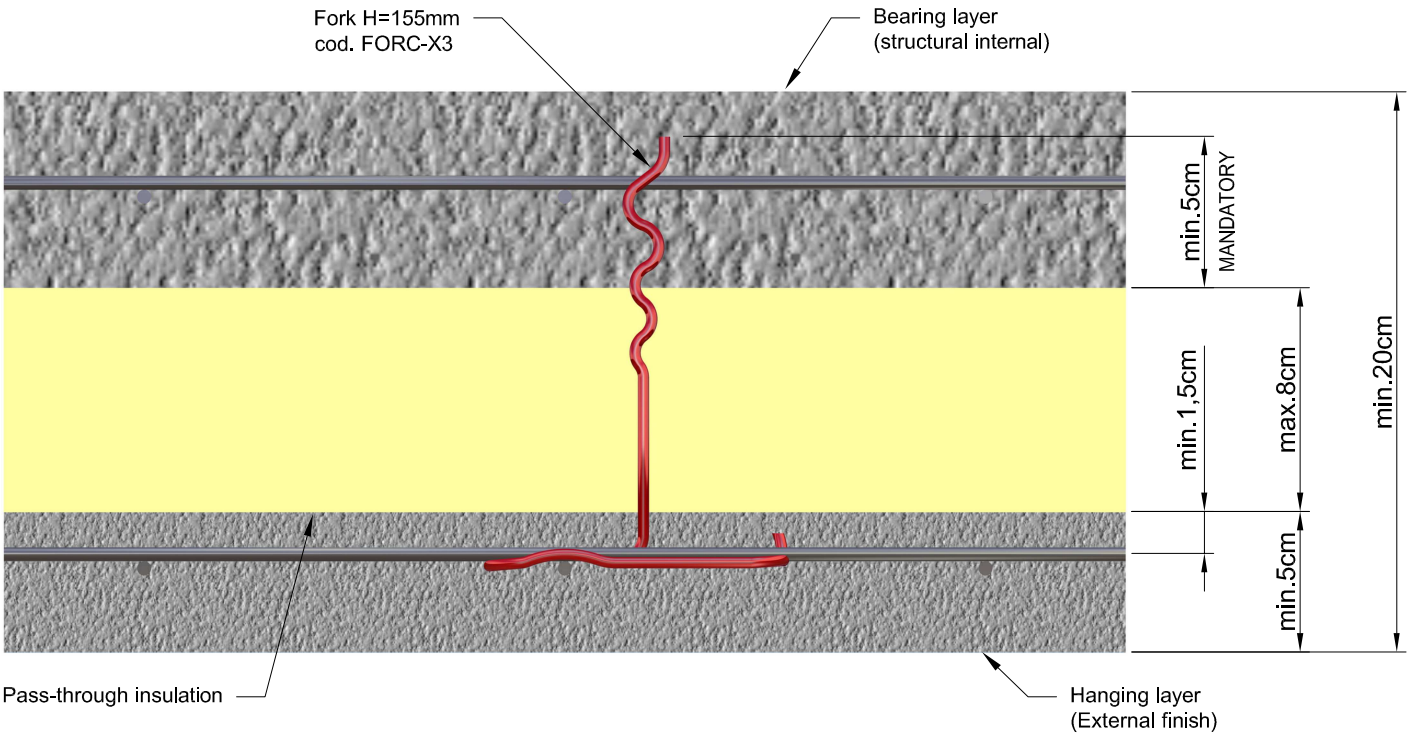


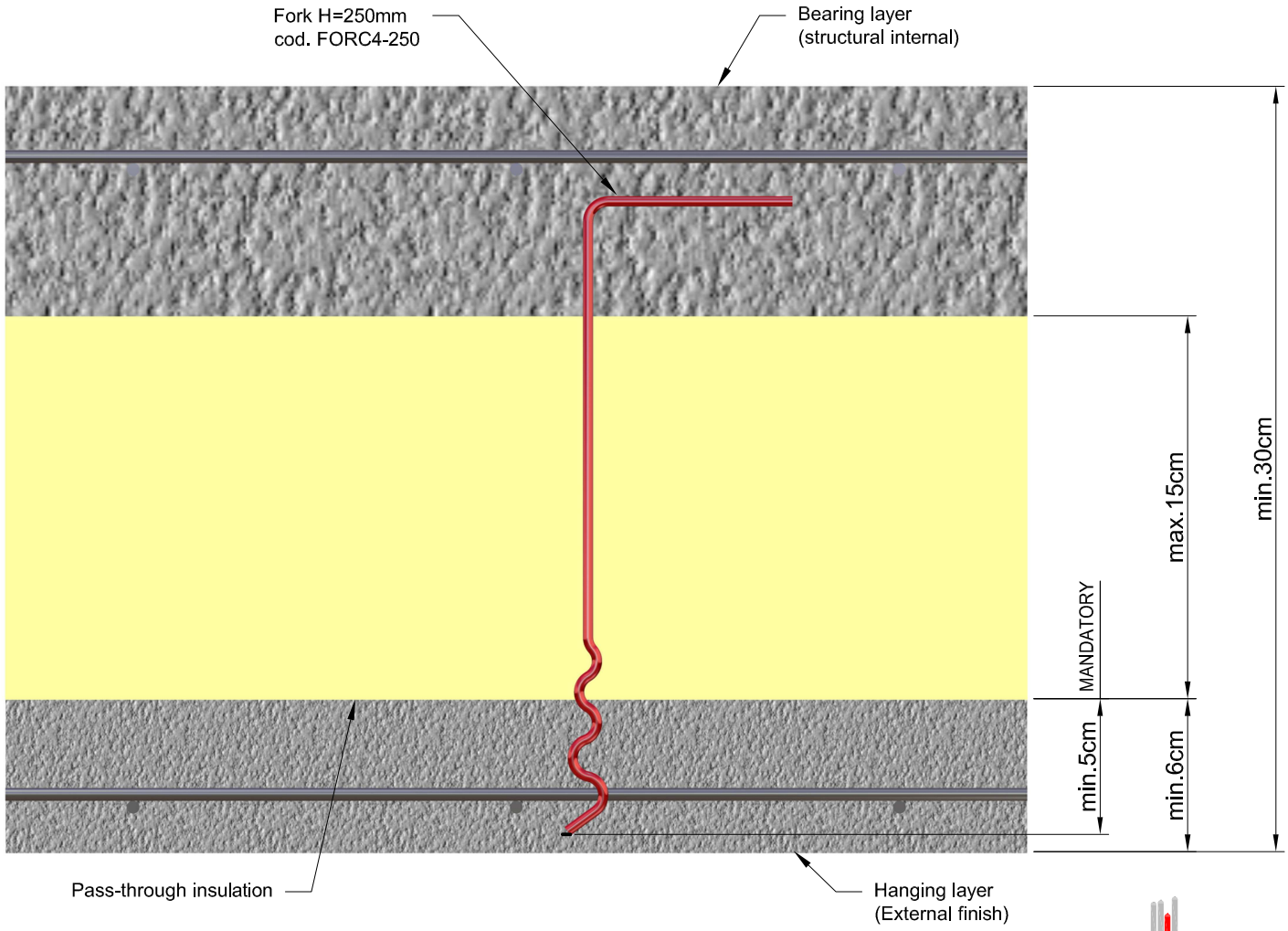
CRITERIA FOR CHOOSING THE FORK





CRITERIA FOR CHOOSING THE FORK





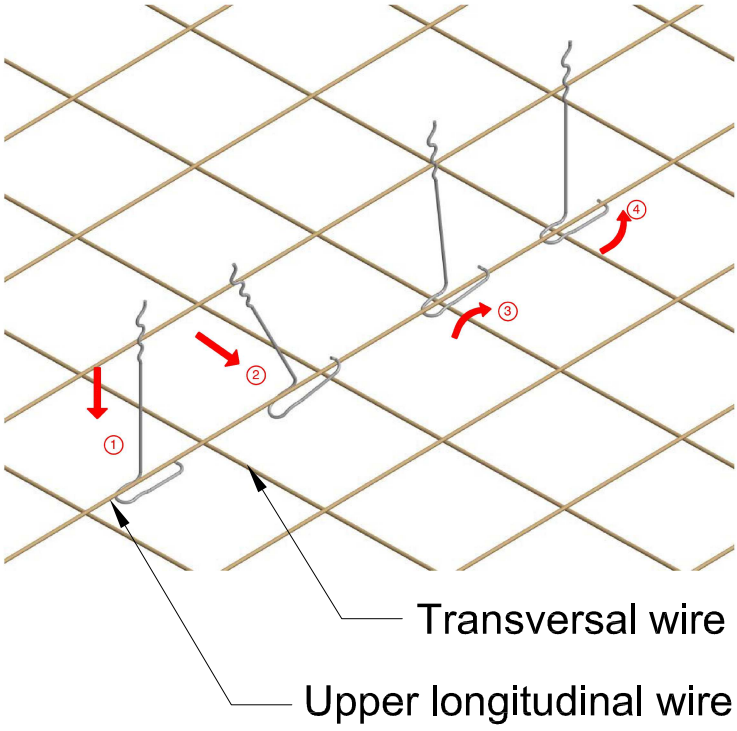
PHASES OF HOOK UP TO THE FORK AT THE NET

1. insert the fork in a vertical position next to the longitudinal wire of the net.

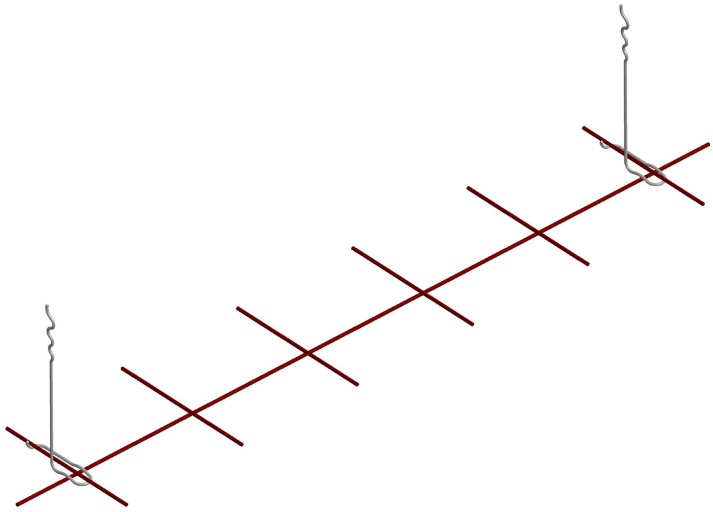
2. translate horizontally towards the longitudinal wire and lift the end of the fork.

3. Return the fork to a vertical position by passing the end of the fork over the transversal wire.

4. Finish the attachment of the fork by passing the tail under the longitudinal wire .



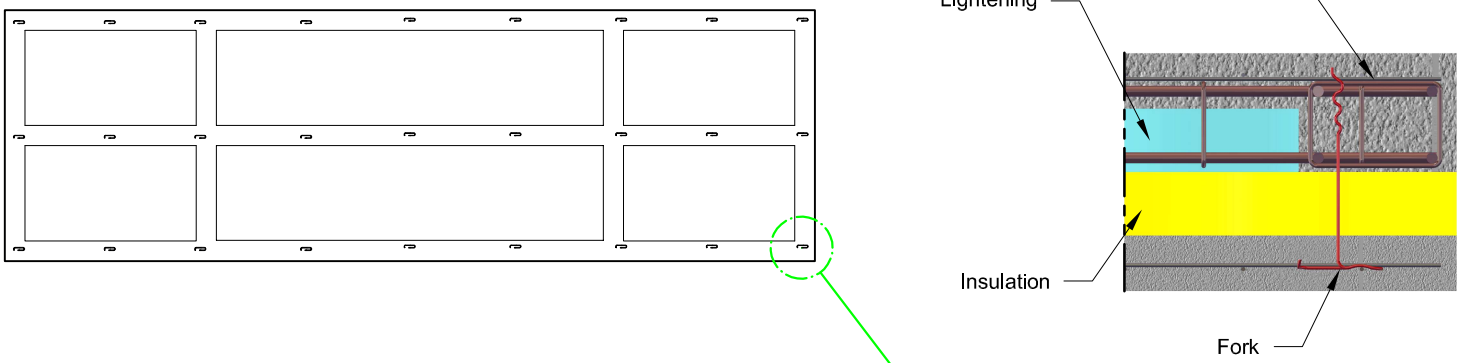
Pre-assembled forks on a net to be placed after casting the outer layer.
The procedure for attaching the fork to the mesh is the same as described in the previous points.



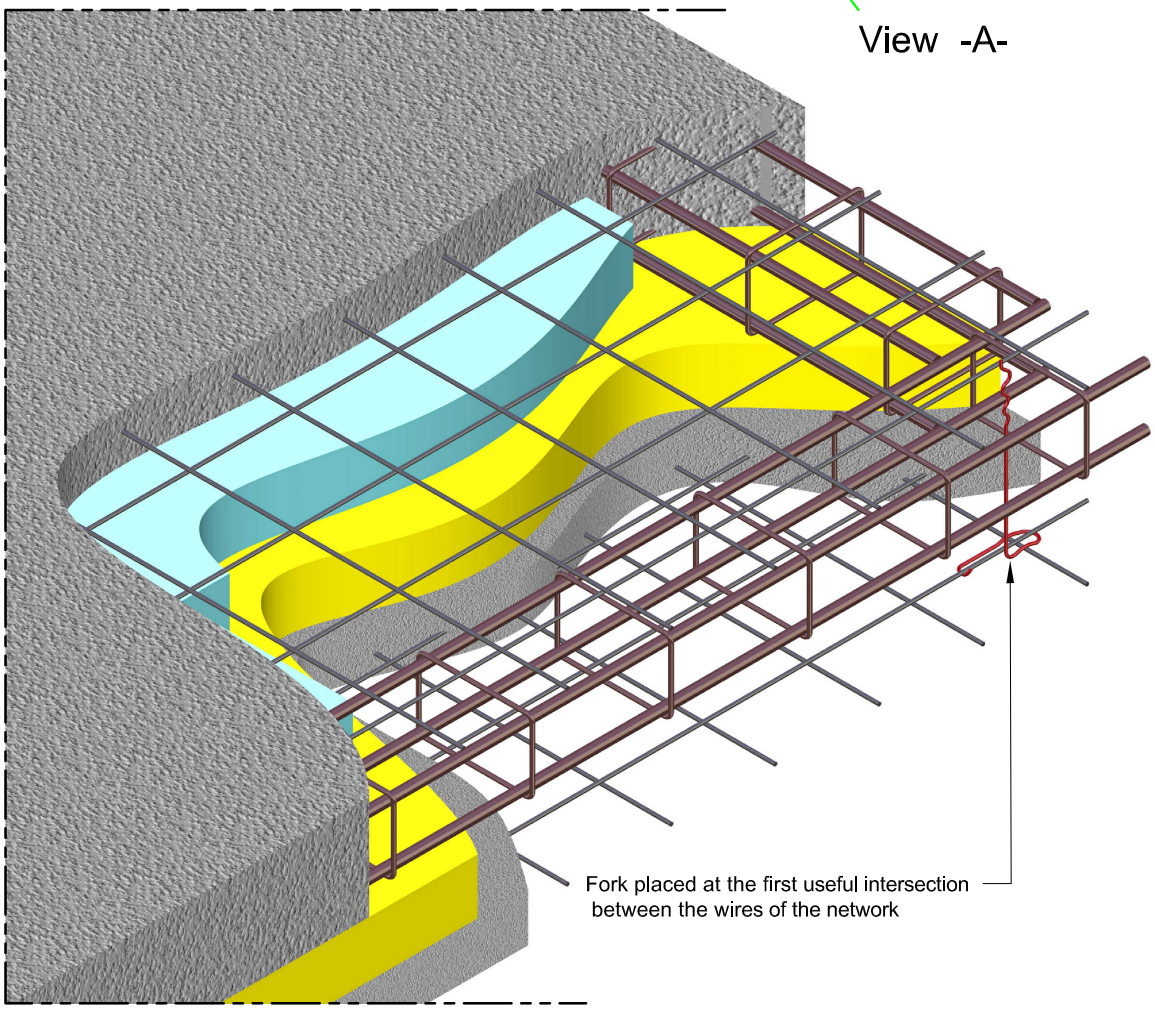
N.B.: The position of the fork can be either transversal or longitudinal to the formwork.
"Longitudinal and transversal wire of the net" means the positions relative to the axis of the fork. The longitudinal wire of the net must ALWAYS be the UPPER ONE indicated in the figure.

FORK POSITIONING IN THE PANEL

The forks are arranged in 2 or 3 lines (as shown in the following pages) along the longitudinal edges and in the center of the panel at a constant distance. In order not to interfere with the lightweight polystyrene, the forks are fixed to the net in correspondence with the reinforcement beam .
It is important that the corners of the panel are always protected by a fork that must be placed at the first useful intersection between the wires of the net itself (as shown in view -A-)



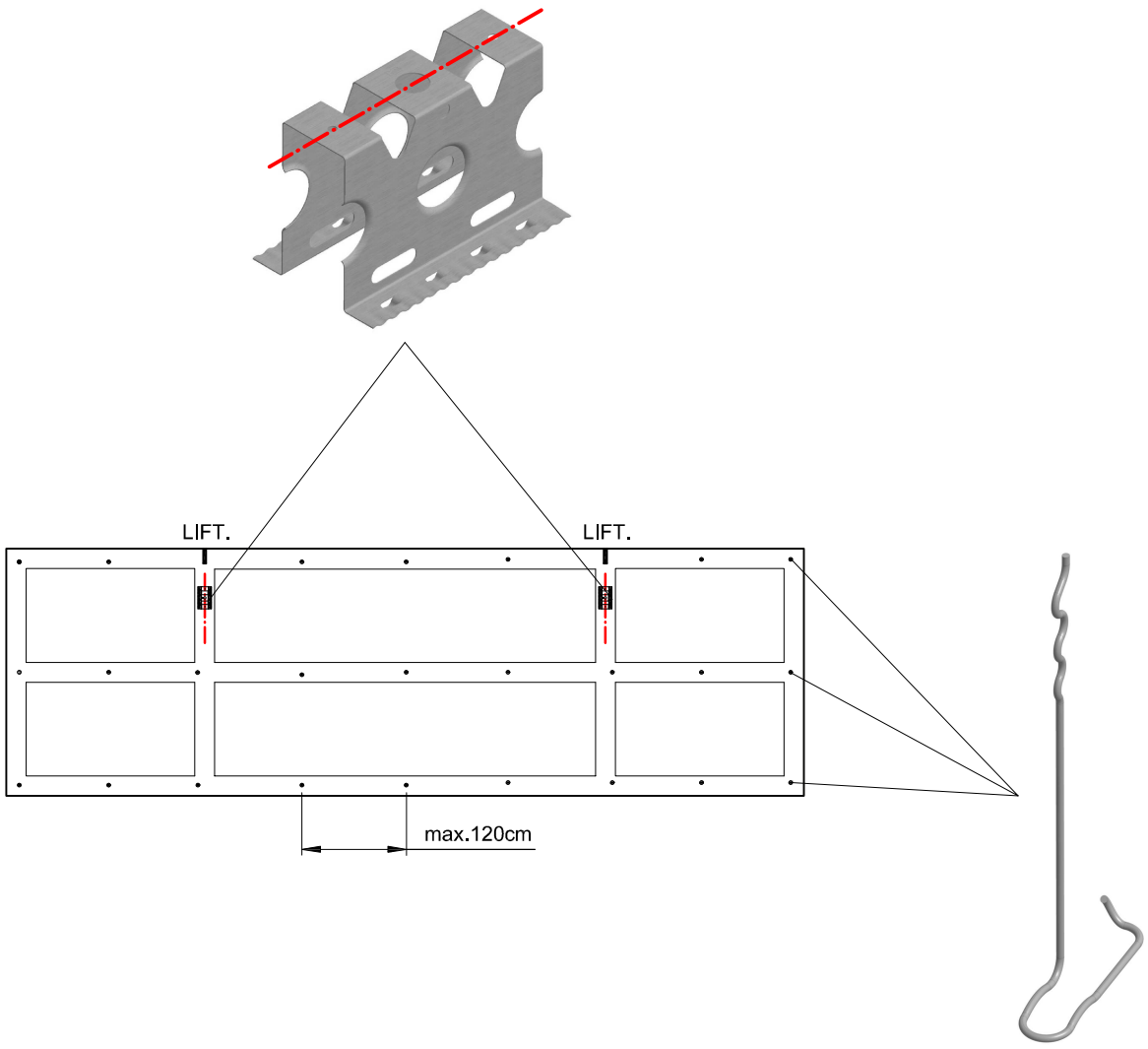
View -A-



POSITIONING IN THE FORMWORK (horizontal panel)

The OMEGA-X support inserts, in the construction of horizontal panels, must be positioned along the axes of the lifting systems underneath them (see figure) and the number of inserts can vary based on the weight and size of the panel. For panels with small dimensions it is possible to insert a single OMEGA-X in axis with the center of gravity, at the discretion of the user.

N.B.: the axis of the OMEGA-X inserts must always be parallel to the load action of the hanging layer.



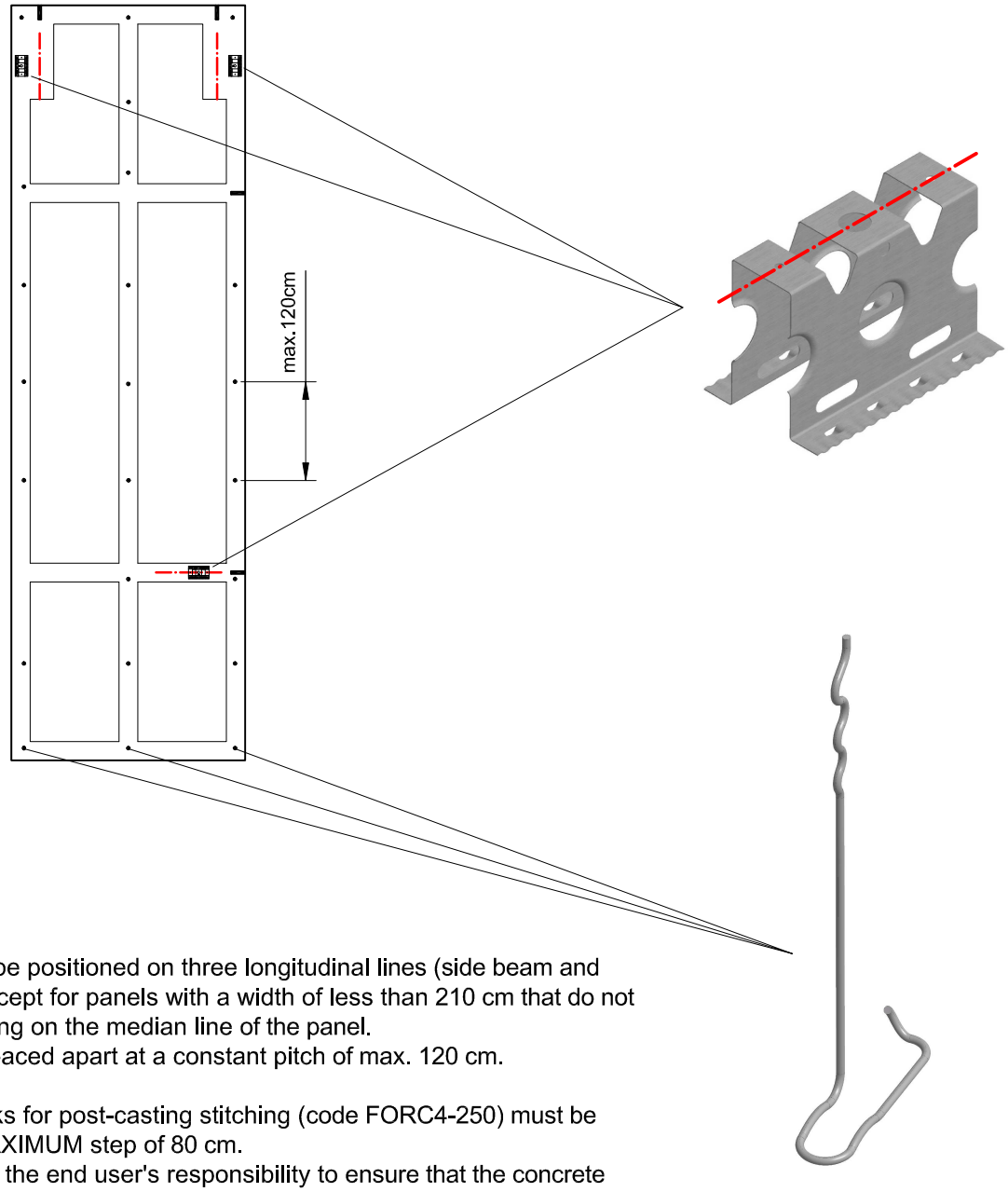
The forks must be positioned on three longitudinal lines(upper kerb, midline and lower kerb), except for panels with a height of less than 210 cm which do not require positioning on the midline of the panel.
The forks are spaced apart at a constant step of max. 120 cm

N.B.: the "L" forks for post-casting stitching (code FORC4-250) must be inserted at a MAXIMUM step of 80 cm.
In any case, it is the end user's responsibility to ensure that the concrete setting/hardening phases have not already started in the hung layer in order to avoid poor adhesion between the post-installed fork and the concrete itself.

POSITIONING IN THE FORMWORK (vertical panel)

The OMEGA-X support inserts, in the construction of vertical panels, must be positioned along the longitudinal reinforcement beam and parallel to the lifting systems for tilting the panels themselves (see figure) and the number of inserts can vary based on the weight and size of the panel.
For the transitory phase of removal of the formwork and movement of the panel, an OMEGA-X insert is positioned in the beam where the lower lifting system works (as shown in the figure). The third Omega-X is always mandatory for panels with a height > 5.5 meters while for panels with a height < 5.5 meters it can be omitted provided that in storage, after having loaded the panel onto the trestles, some shims are placed under the hanging layer.

N.B.: the axis of the OMEGA-X inserts must always be parallel to the load action of the hanging layer.

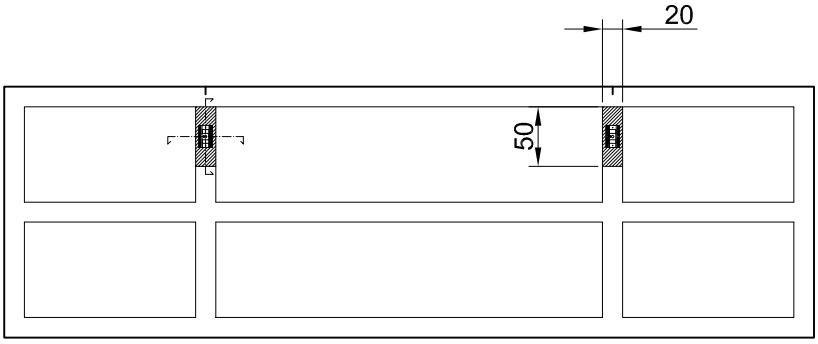


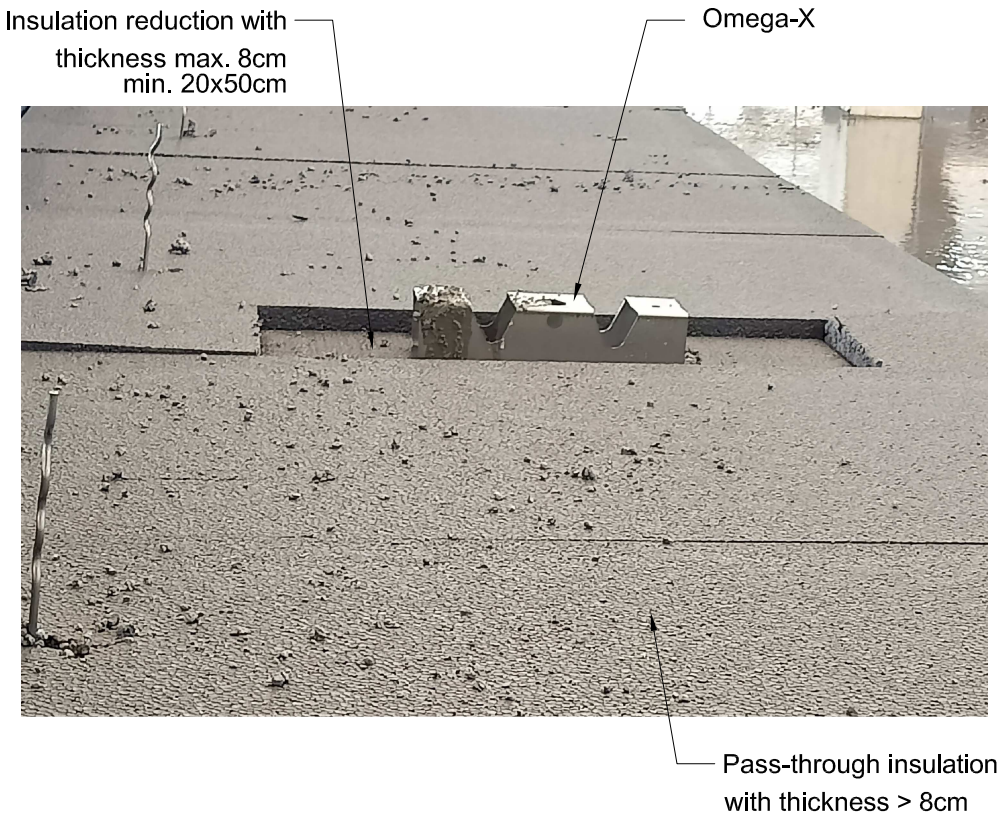
The forks must be positioned on three longitudinal lines (side beam and median line), except for panels with a width of less than 210 cm that do not require positioning on the median line of the panel.
The forks are spaced apart at a constant pitch of max. 120 cm.

N.B.: the "L" forks for post-casting stitching (code FORC4-250) must be inserted at a MAXIMUM step of 80 cm.
In any case, it is the end user's responsibility to ensure that the concrete setting/hardening phases have not already started in the hung layer in order to avoid poor adhesion between the post-installed fork and the concrete itself.

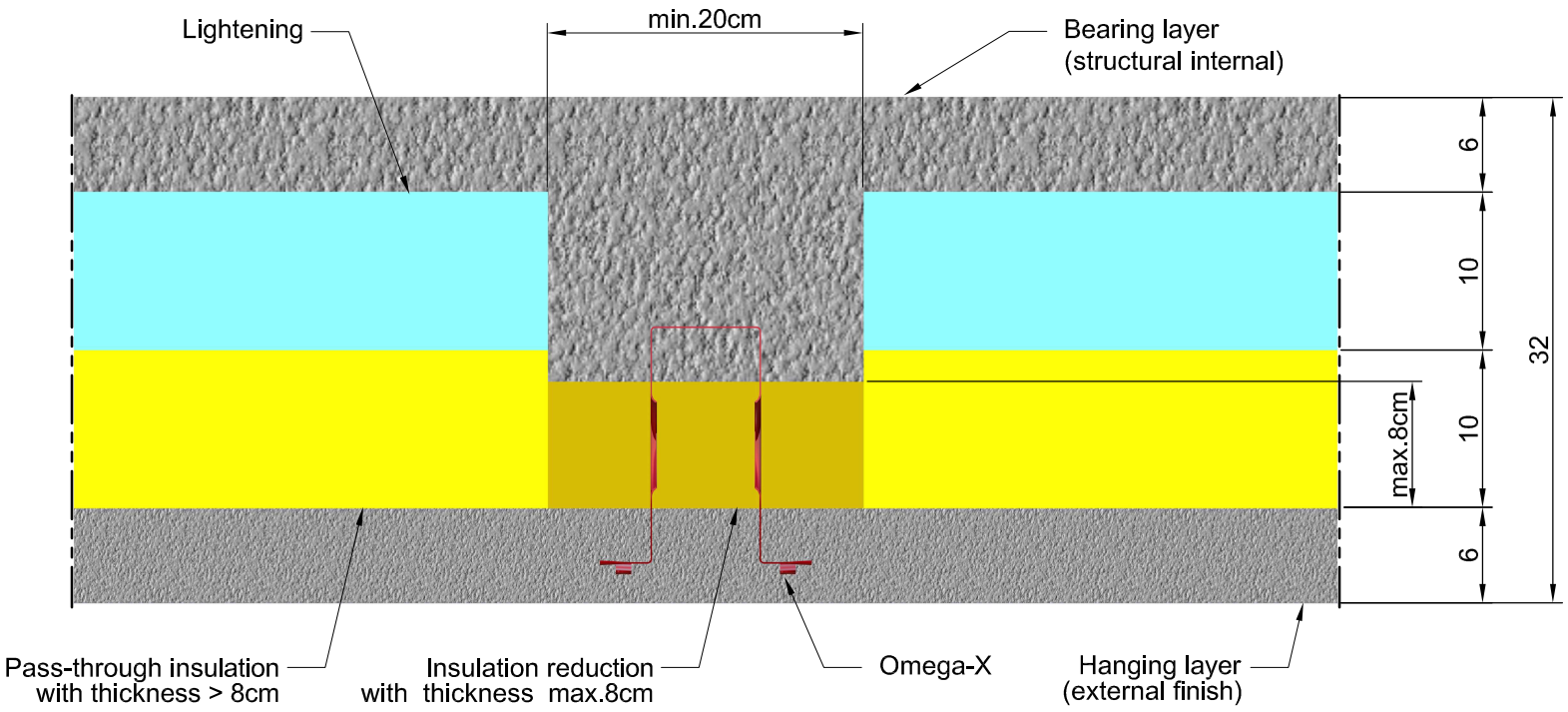
POSITIONING WITH REDUCED INSULATION

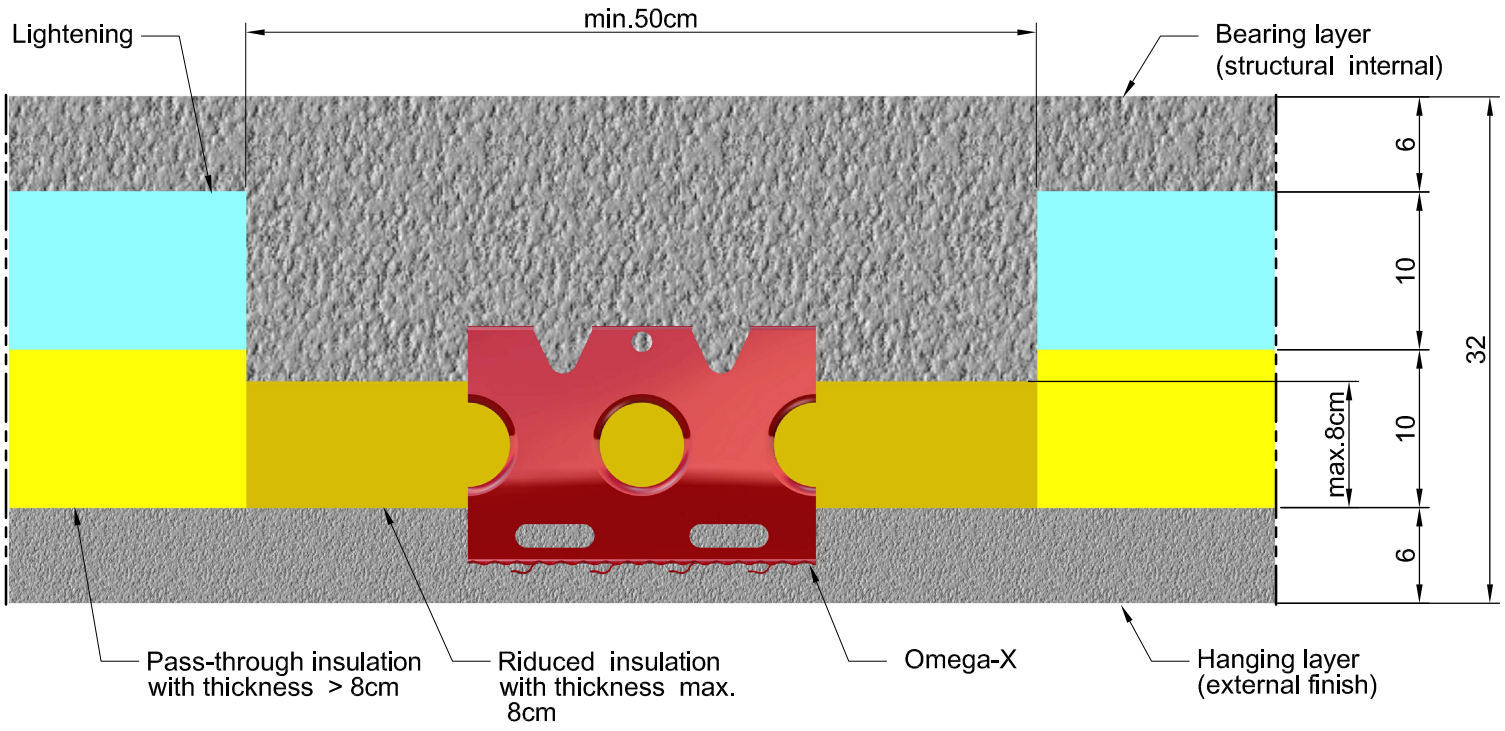
To ensure the load capacity, in the case where the insulation has a thickness greater than 8 cm., it must be lowered locally as shown in the figures below, the same concept is valid when it is necessary to increase the load capacity of the insert by decreasing the thickness of the insulation passing through the Omega-X itself as shown in the graph on page 7. This type of lowering can only be used if the Omega-X insert is positioned in correspondence with the reinforcement beam, if this is not the case see pages 19-20





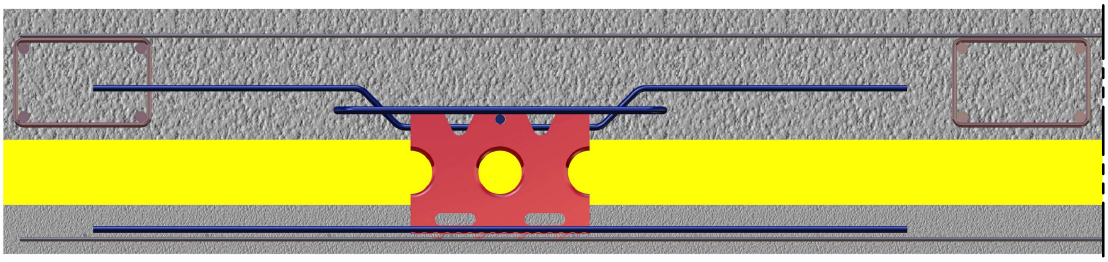
POSITIONING WITH REDUCED INSULATION

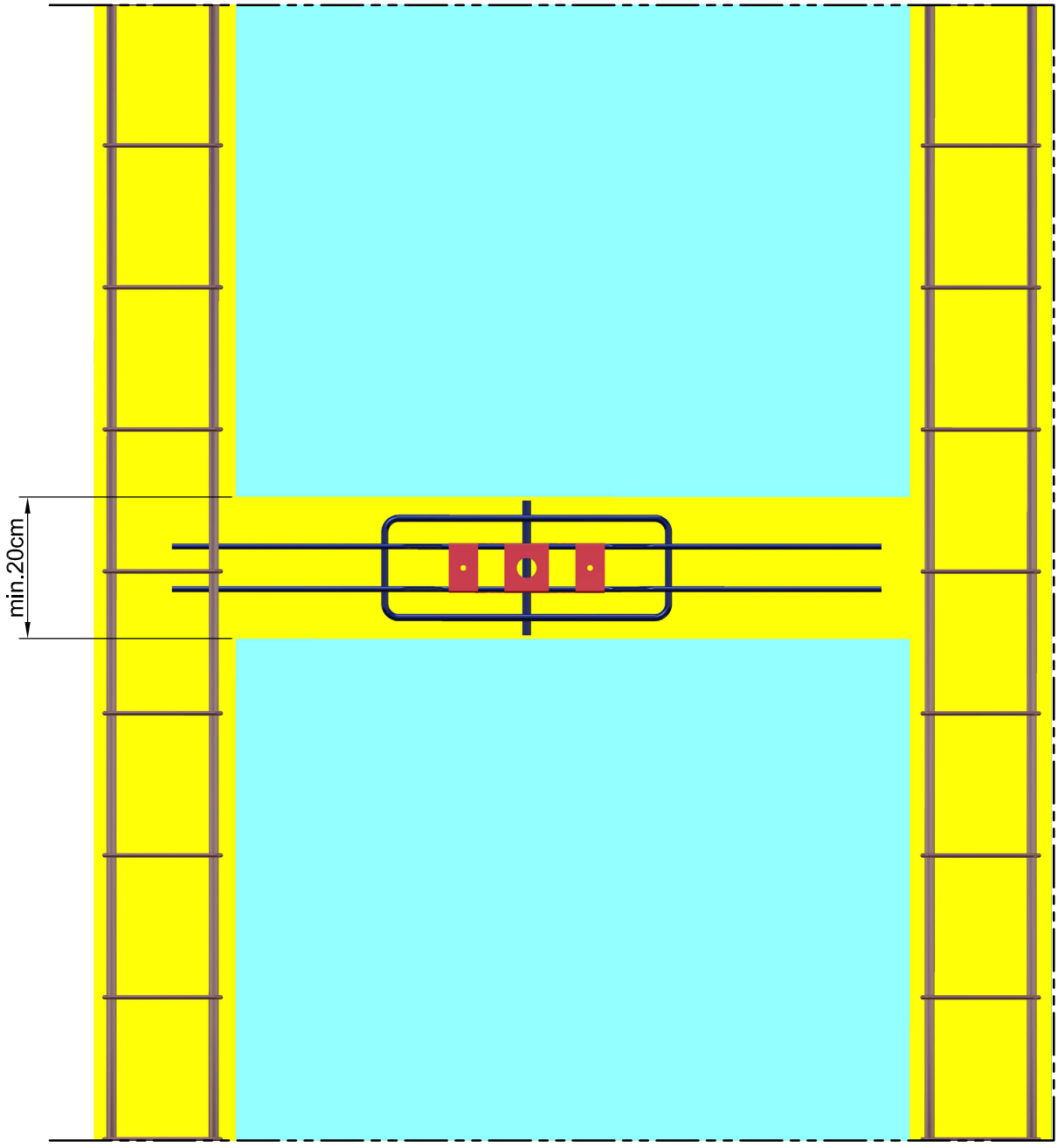




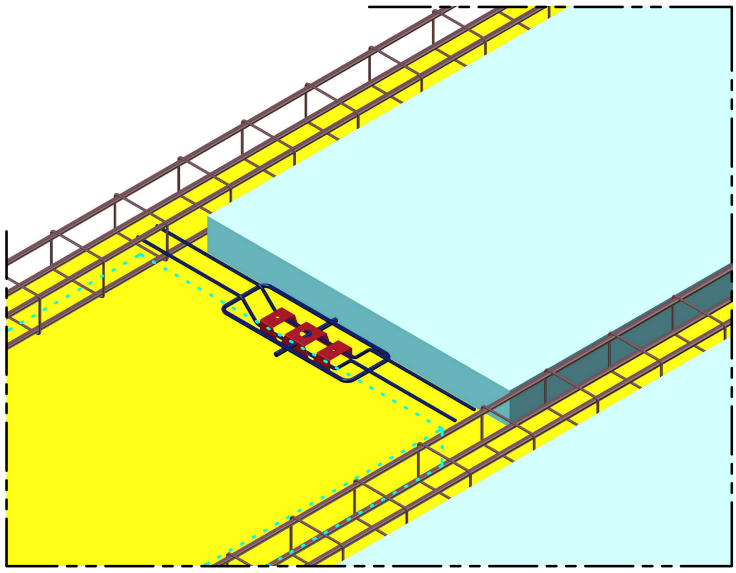
POSITIONING IN ABSENCE OF A BEAM

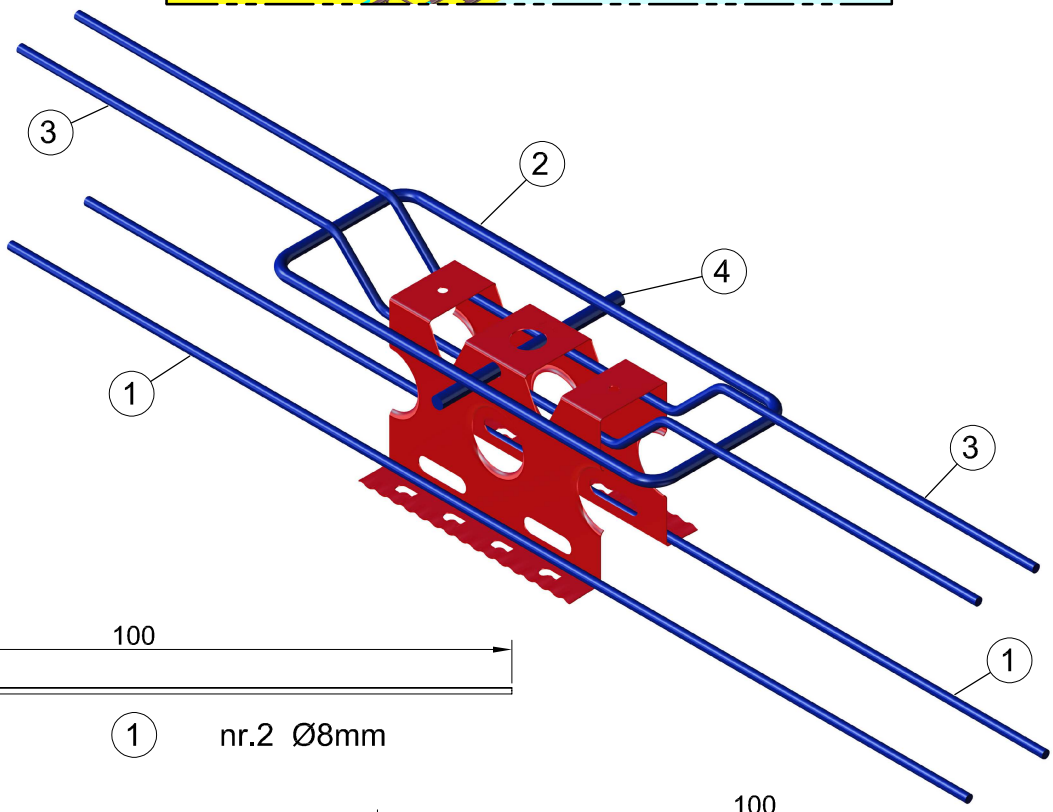
There may be cases where the OMEGA-X insert cannot be positioned in correspondence with the reinforcement beam (for example in small panels where there are no central beams), it is necessary to position it inside the lightening panels. To insert the OMEGA-X, it is necessary to prepare brackets as in the solution shown below



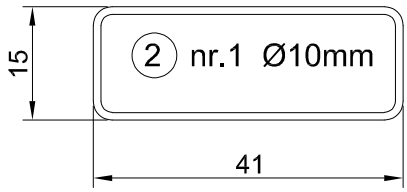


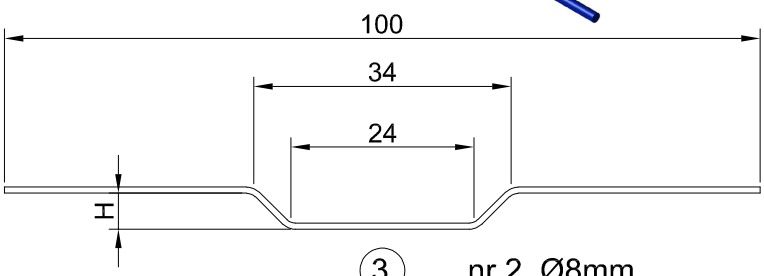
POSITIONING IN ABSENCE OF A BEAM





1 nr.2 Ø8mm





3 nr.2 Ø8mm

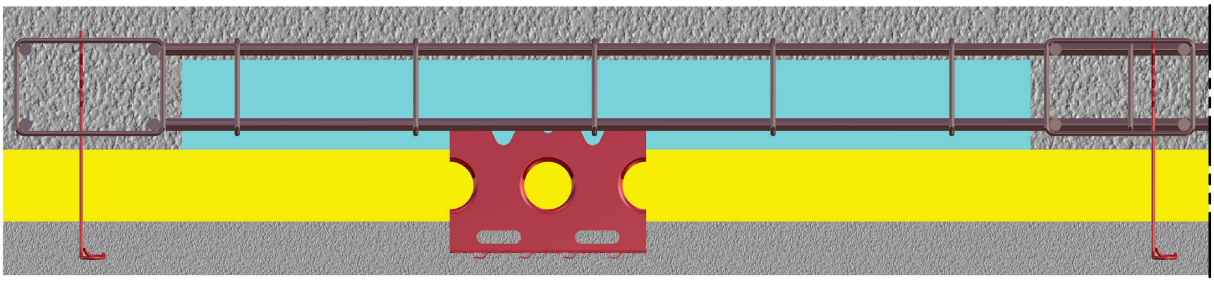
N.B.: dimensions expressed in cm.
H = variable based on the thickness of the through insulation.
the additional stirrups (pos. 1 - 2 - 3 - 4) are to be considered as MINIMUM reinforcement. In any case, the sizing of the protective reinforcements for the correct anchoring of the Omega-X insert and adequate confinement of the concrete is the responsibility of the end user

4 nr.1 Ø12mm

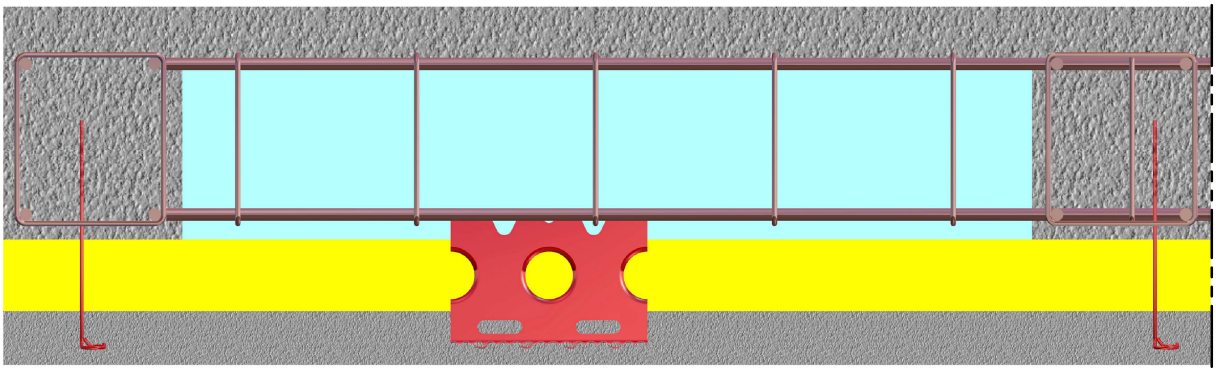
POSITIONING IN THE PANELS WITH TH.>30cm

It is possible to create panels with a thickness greater than 30cm.
If the insulation has a maximum thickness of 8cm, no specific procedure other than the standard use of the system is required, while in the case of insulation with a thickness > 8cm, the solutions described previously for the use of Omega-X inserts with a lowering of the through insulation and in the case of the absence of the reinforcement beam are contextualized.
Several examples are illustrated below.

Panels with th.≥30cm with insulation th.8cm. max

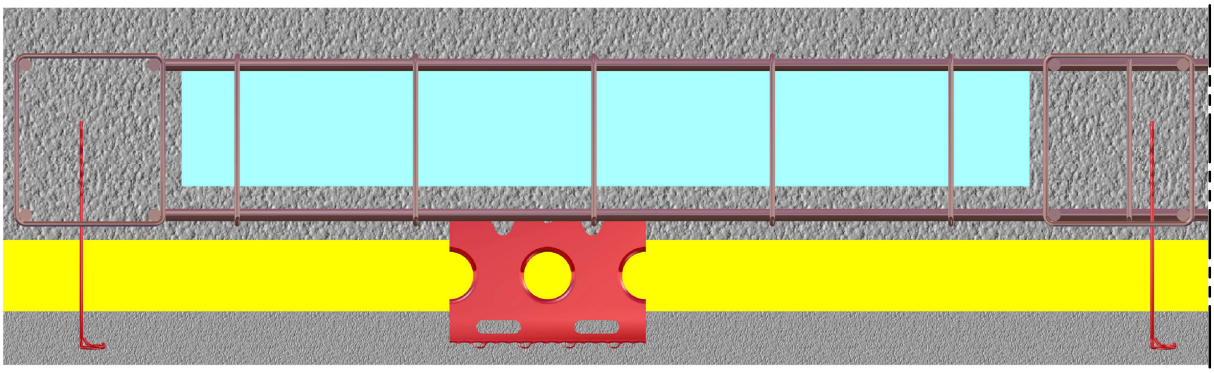


Panel th.>30cm with insulation th.8cm.

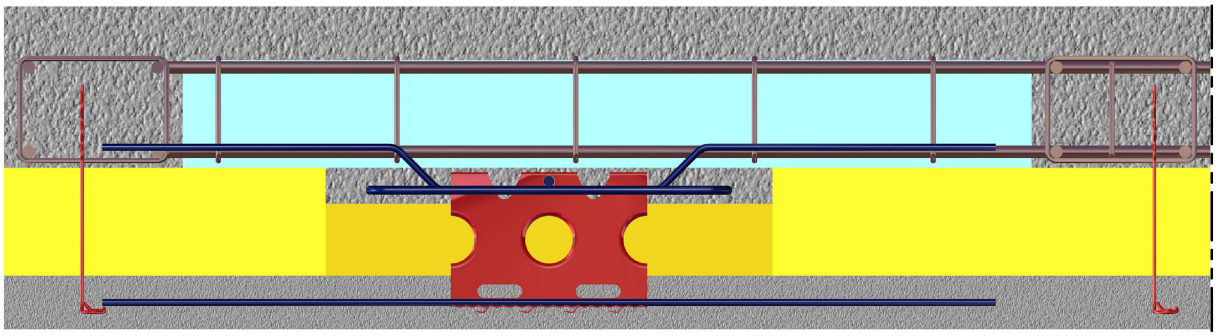


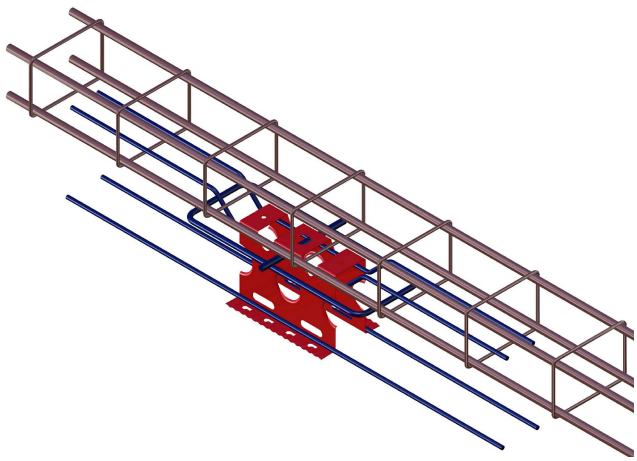
POSITIONING IN THE PANELS WITH TH.>30cm

Panel th.>30cm with insulation th.8cm. and with concrete between insulation and lightening



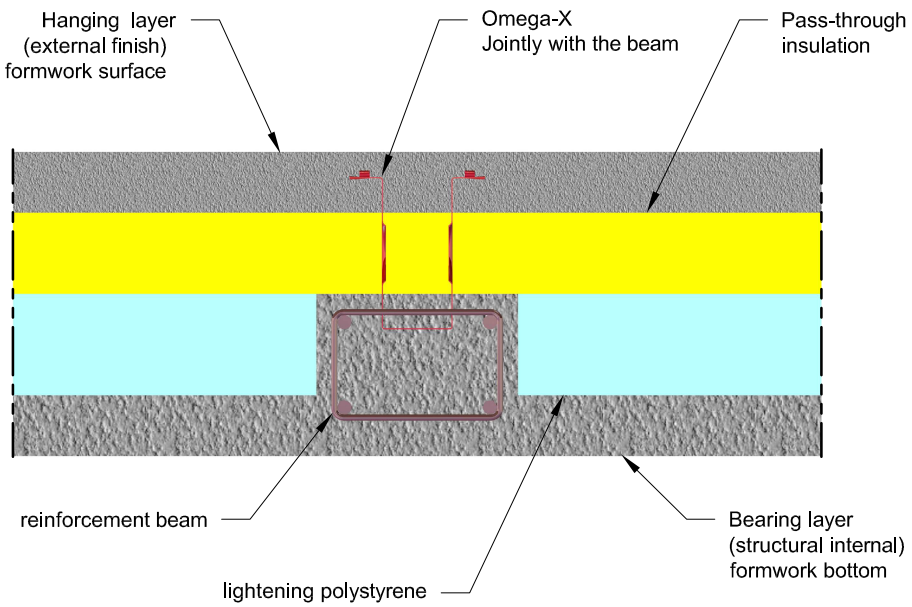
Panel th.>30cm with insulation th.>8cm. lowered with additional reinforcement stirrups

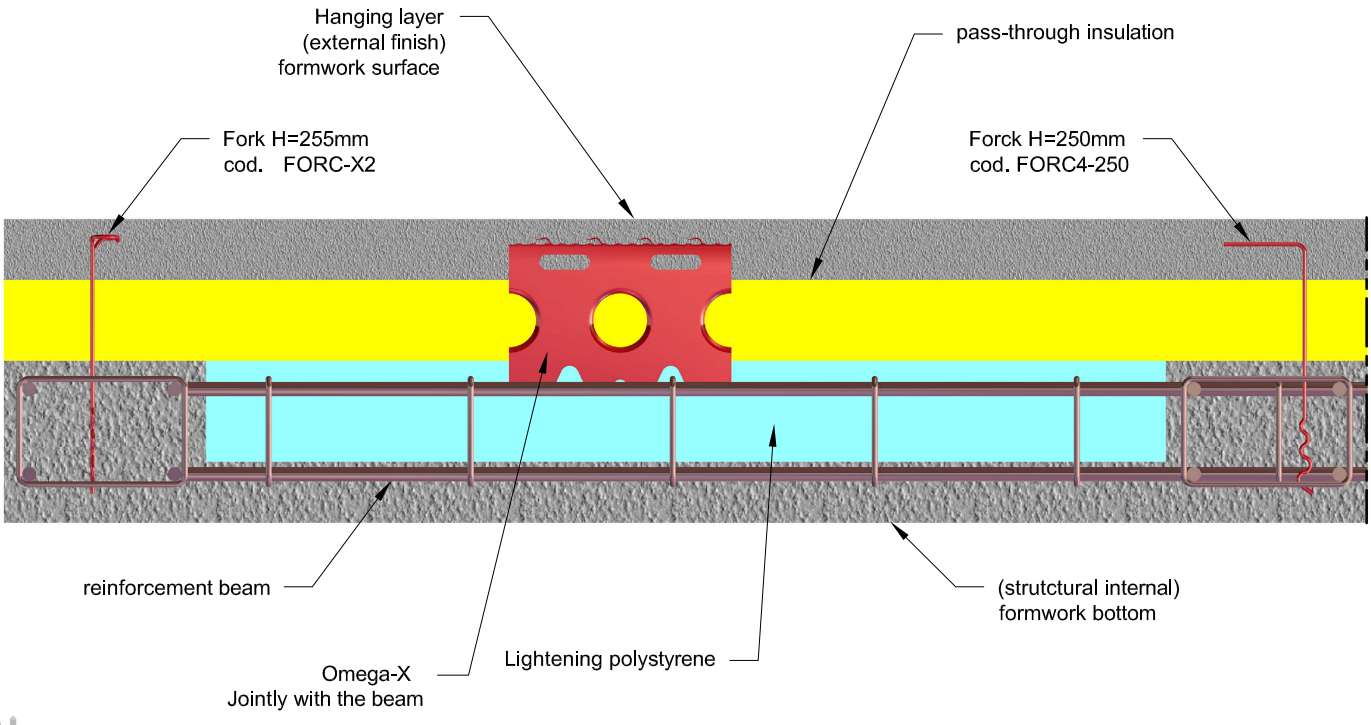




POSITIONING IN "SCRATCHED" PANELS

For the production of panels with the load-bearing layer on the bottom of the formwork and the external finishing layer on the surface (for example "scratched" panels or with other finishes made through special processes with wet concrete) the Omega-X system will be inserted as shown in the following figures.
After casting the base, inserting the lightweight polystyrene blocks and the reinforcement beams, the Omega-X inserts will be positioned upside down by 180° compared to standard use, fixing them to the beams themselves.
Once the structural concrete layer has been completed, the through insulation will be laid, which will be fixed with the appropriate forks. In this particular production, all the various types of forks can be used, but we recommend using the "L" forks (code FORC4-250) which are easier to handle and insert by the personnel in charge.
Once this has been done, the exposed layer of the panel will be cast.

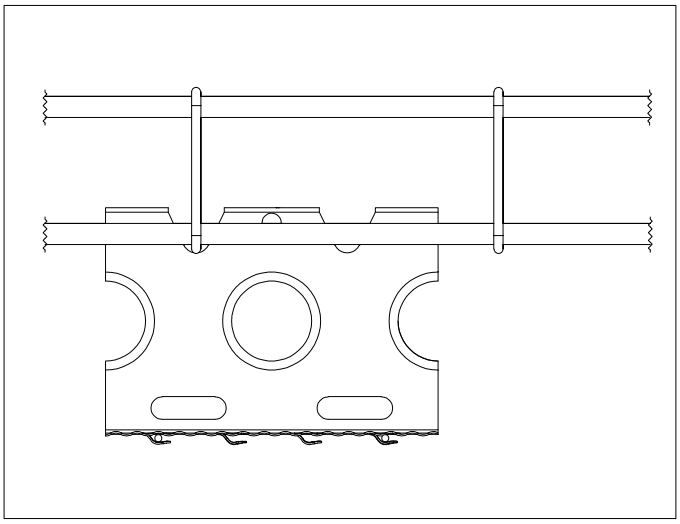




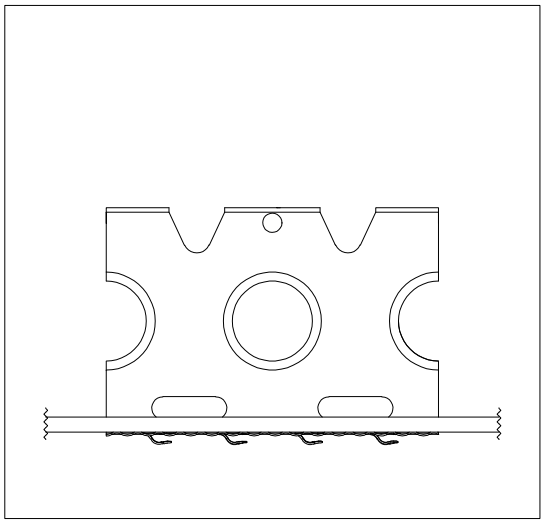
COUPLING WITH BEAMS AND STIRRUPS

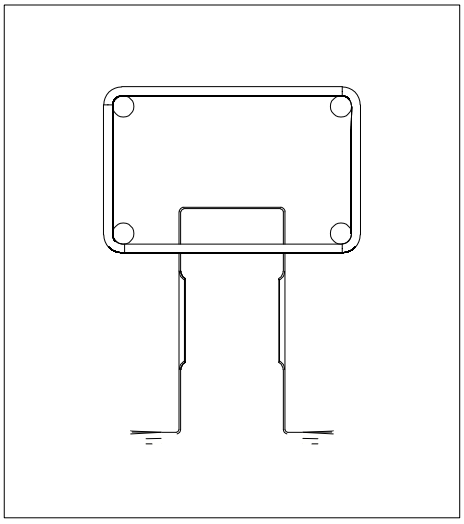
The Omega-X insert, thanks to its particular geometry characterised by engineered openings and holes, allows for quick and easy coupling with the reinforcement beams and, if necessary, with additional stirrups

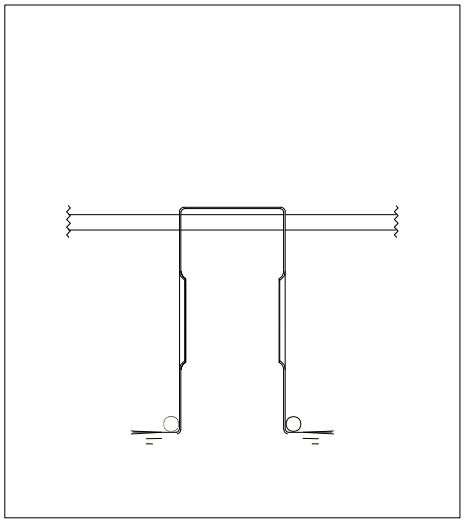
REINFORCEMENT BEAM

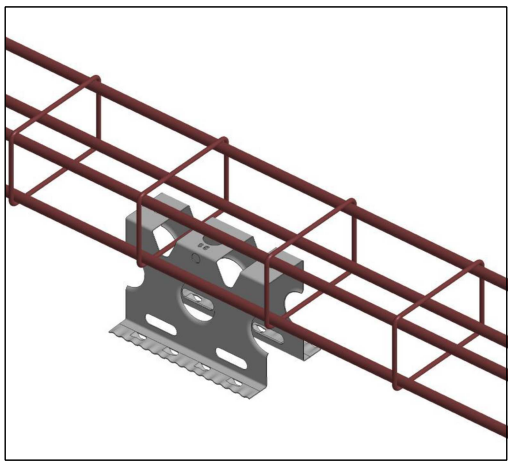


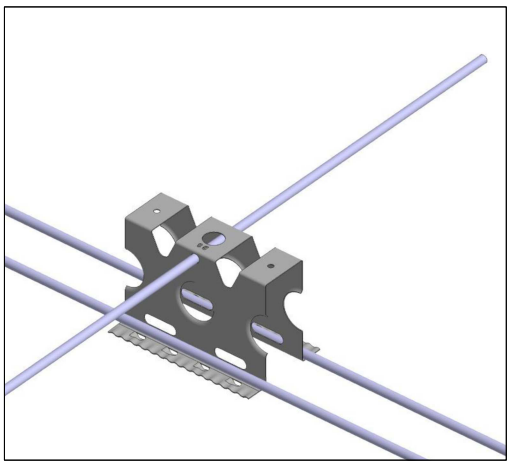
STIRRUPS





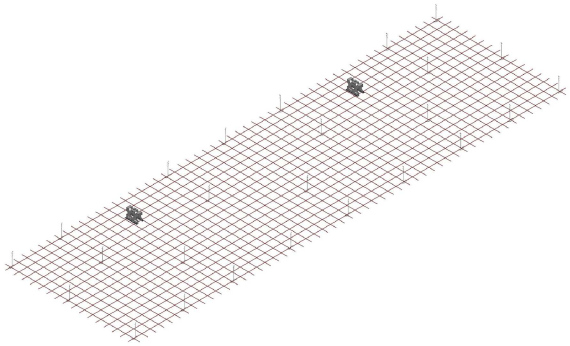




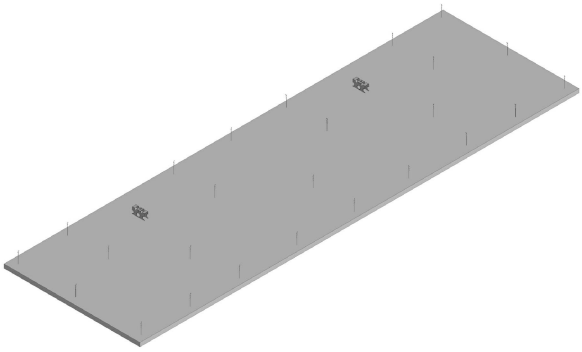


PANEL PRODUCTION PHASES

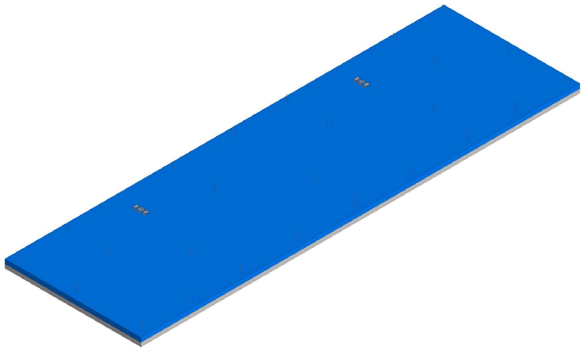
Omega-X inserts and forks fix at the net



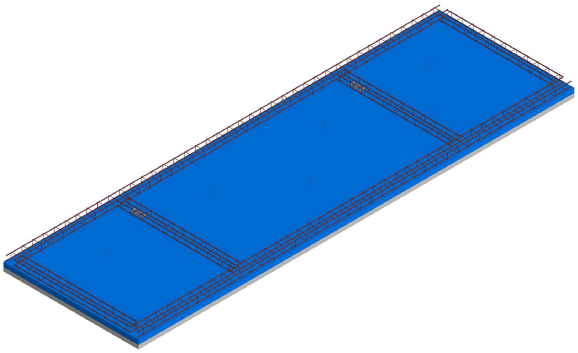
Cast of the hanging layer (exernal)



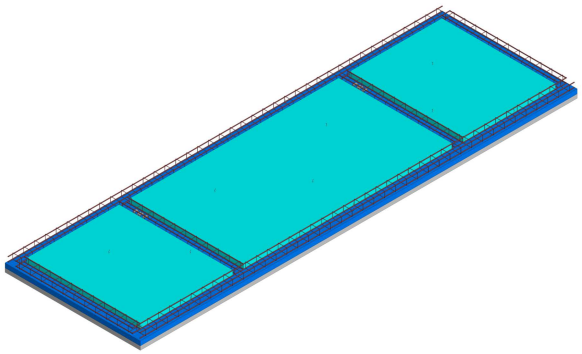
Laying of the insulation



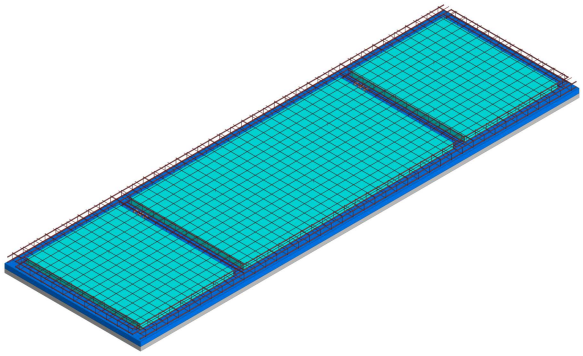
cage insertion



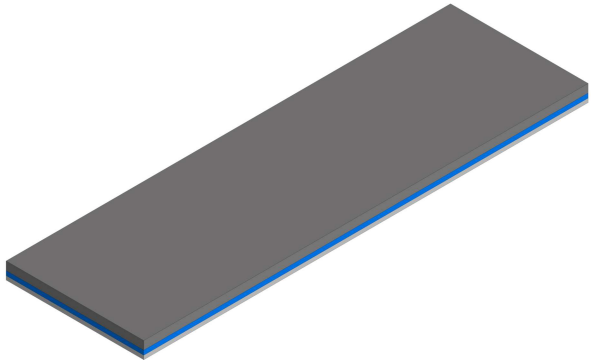
Positioning lightening polystyrene



Positioning of the upper net

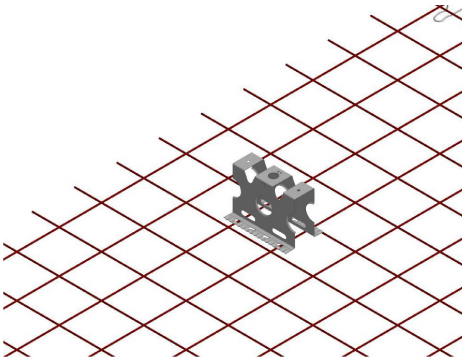


Cast of the bearing layer (internal)

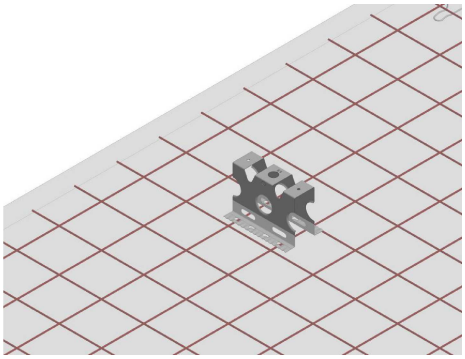


PRODUCTION PHASES OMEGA-X DEMOLDING SIDE

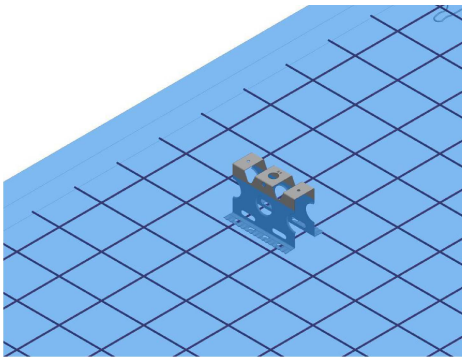
Omega-X insert fixed at the net



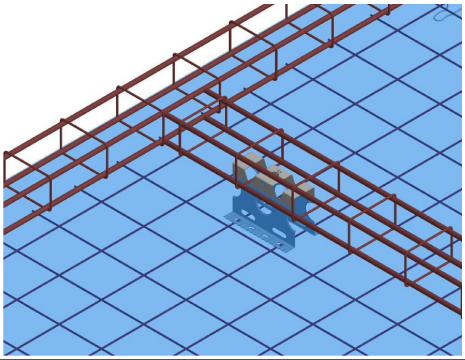
Cast hanging layer (external)



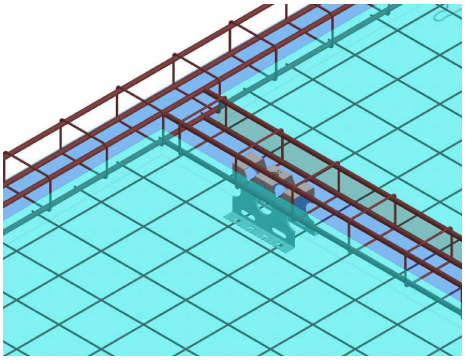
Laying of the insulation



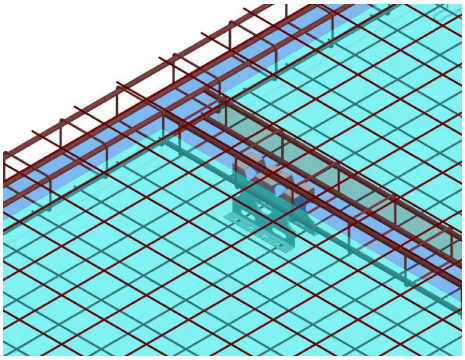
cage insertion



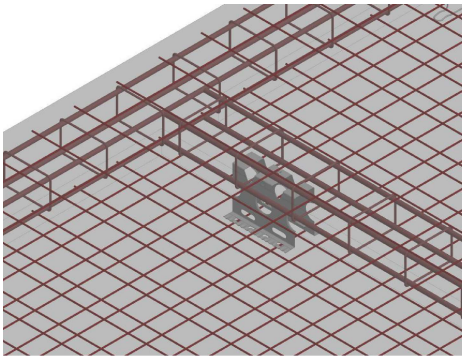
Positioning lightening polystyrene



Positioning of the upper net

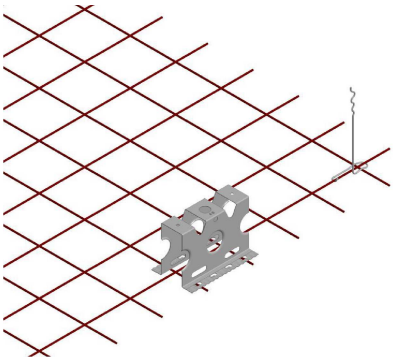


Cast of the bearing layer (internal)

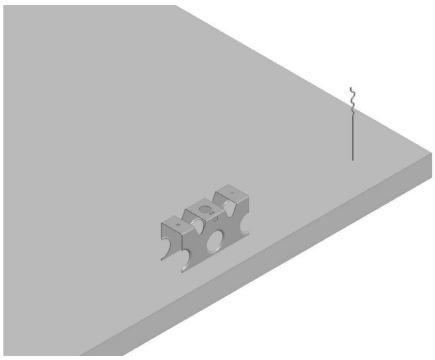


PRODUCTION PHASES OMEGA-X TILTING SIDE

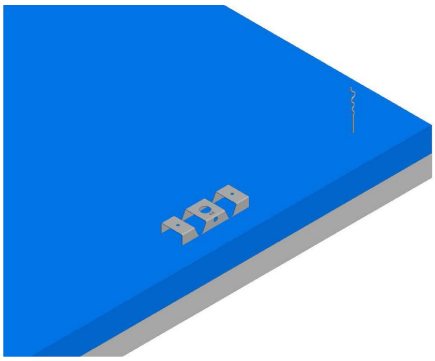
Omega-X insert fixed at the net



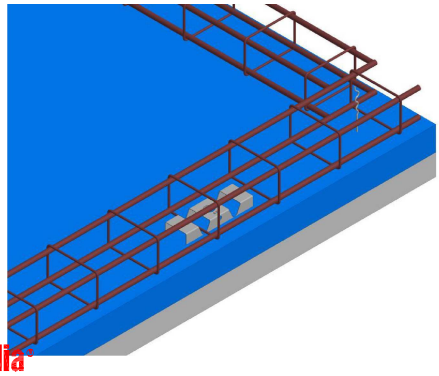
Cast hanging layer (external)



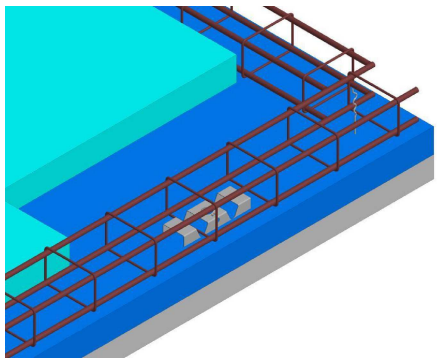
Laying of the insulation



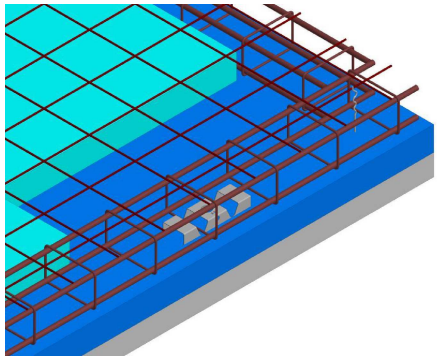
cage insertion



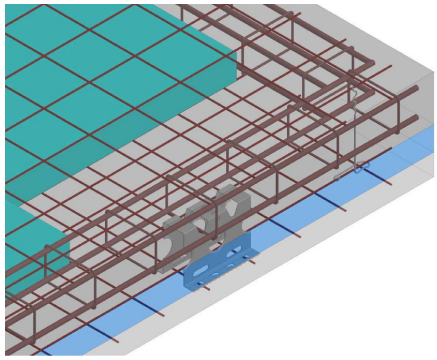
Positioning lightening polystyrene



Positioning of the upper net

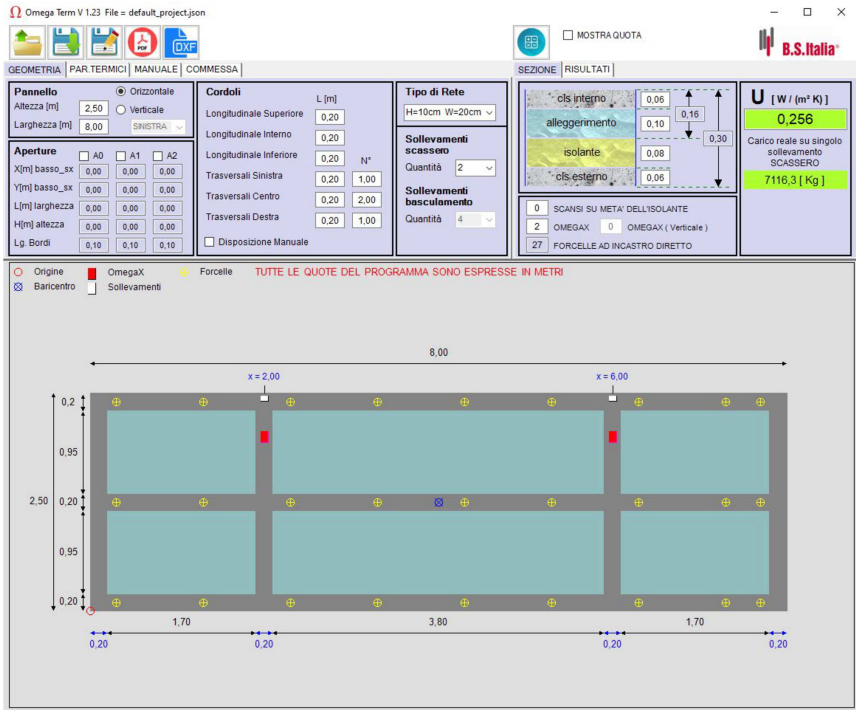


Cast of the bearing layer (internal)



OMEGA TERM

B.S. Italia offers, in addition to its innovative "Omega-X" system for stitching between the layers of thermal break walls, the calculation software for determining the transmittance called "OmegaTerm".
This tool, developed in collaboration with engineering and thermotechnical studios, allows the thermal capacities of the panel being studied to be recreated in a simple and intuitive way.
OmegaTerm guides the designer in choosing the optimal materials and stratigraphies to achieve the desired transmittance (U = W/m²°K), ensuring the correctness of the data in full compliance with current industry regulations.



The validation by TUV Italia, obtained through rigorous conformity tests, certifies the reliability and precision of OmegaTerm in providing accurate results in line with the highest standards.


ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

CERTIFICATO DI ISPEZIONE
INSPECTION CERTIFICATE

Certificato N. / *Certificate N.*
TUV-722138824-270219-CF

Cliente: / Company: **B.S. Italia S.p.A.**

Sede legale: / Registered office: **Via Stezzano 28 I-24050 ZANICA (BG)**

Sede operativa: / Operating office: **Via G. Falcone 9 I-24050 ZANICA (BG)**

Oggetto del certificato: / Scope of the certificate:

Determinazione della trasmittanza termica di pannelli prefabbricati in calcestruzzo mediante l'algoritmo OMEGA TERM ver. 1.23

conformità ai requisiti indicati nelle seguenti norme: / compliance with the requirements of the following standards:

ISO 6946:2017	Componenti ed elementi per edilizia – Resistenza termica e trasmittanza termica – Metodo di calcolo
ISO/IEC 17020:2012	Valutazione della conformità - Requisiti per il funzionamento di vari tipi di organismi che eseguono ispezioni

L'esito è dettagliato nel Rapporto di Ispezione n. TUV-722186377-270219-PUG-RF, che costituisce l'allegato tecnico del presente certificato
The result is detailed in the Inspection Report n. TUV-722186377-270219-PUG-RF, which is the technical annex of this certificate

Data di emissione/Issue date: 2019-02-27

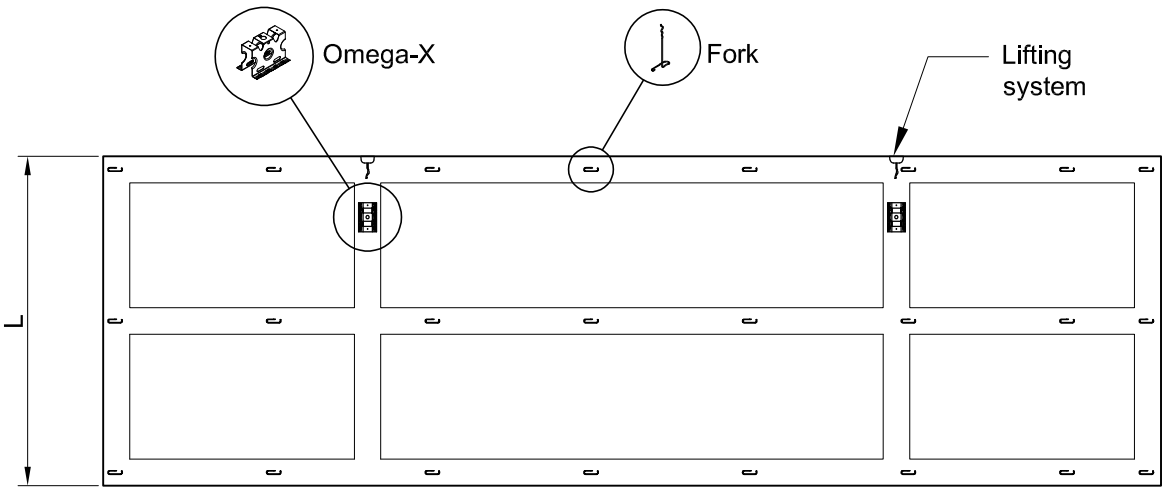
Per l'Organismo di Ispezione / *For the Inspection Body*
TÜV Italia S.r.l.
Sesto S. Giovanni (MI)

Alberto Carelli
Direttore Industry Service – Industry Service Manager

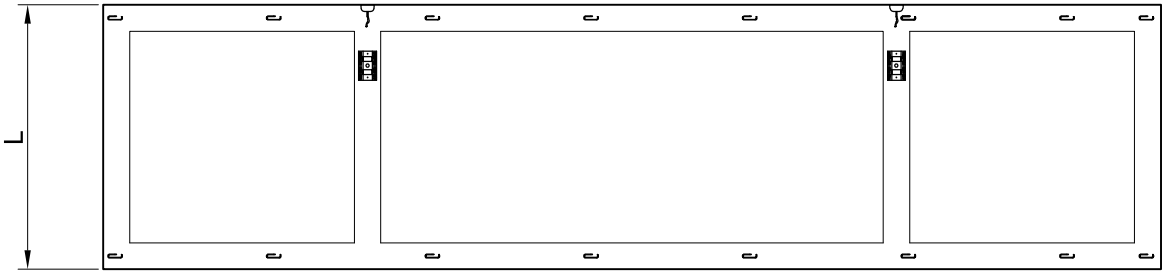
TÜV Italia • Gruppo TÜV SÜD • Via Carducci 125, Pal. 23 • 20099 Sesto San Giovanni (MI) • Italia • www.tuv.it
ISP-M035.001

B.S.Italia Gruppo Styl-Comp

EXAMPLES OF PANELS WITH OMEGA-X

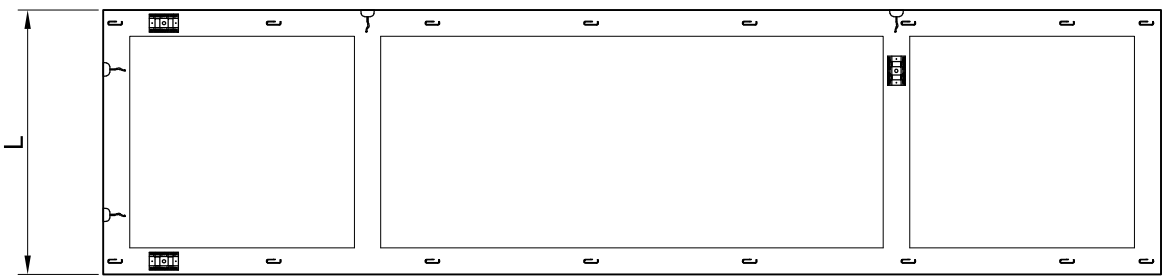


Horizontal panel L > 2,1m without opening



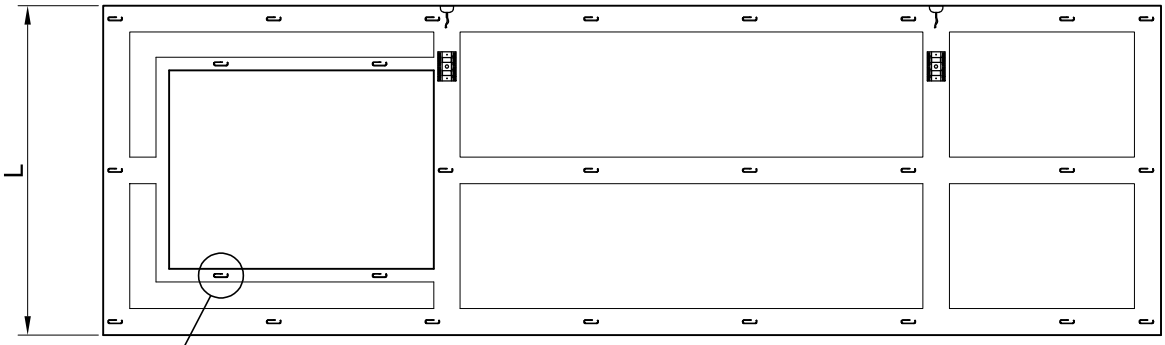
Horizontal panel L < 2,1m without opening

Vertical panel L > 2,1m without opening



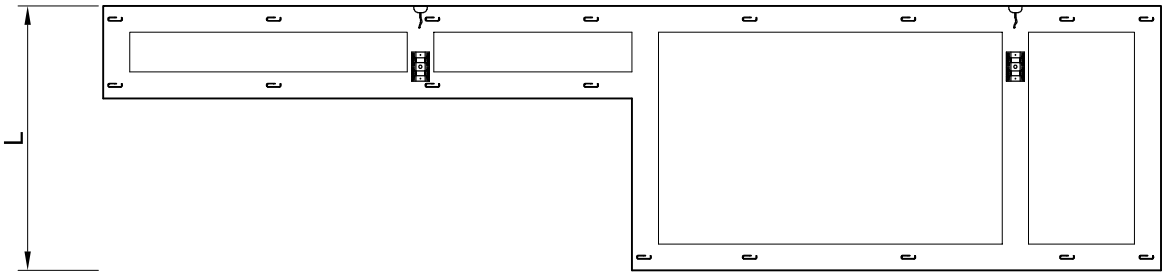
Vertical panel L < 2,1m without opening

EXAMPLES OF PANELS WITH OMEGA-X

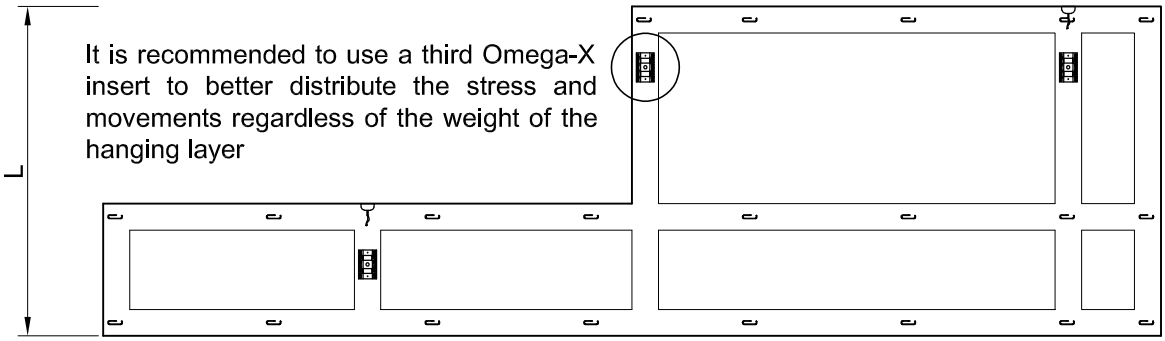


Horizontal panel L > 2,1m with window

In the case of panels with windows, doors and/or recesses, it is recommended to protect the edges of the openings using forks, with spacing at the user's discretion.

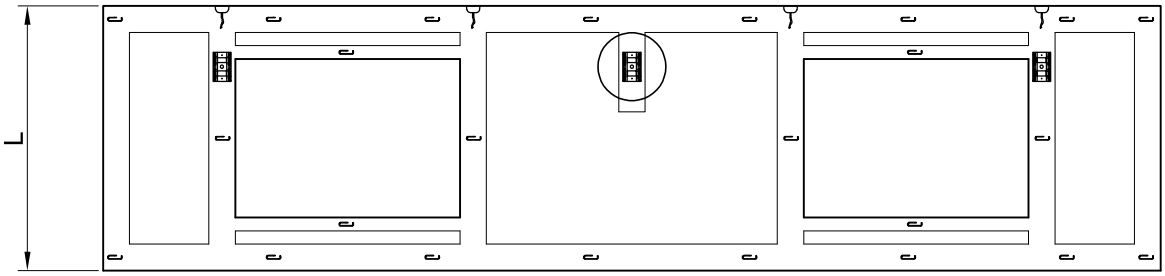


Horizontal panel L < 2,1m with resects lower



It is recommended to use a third Omega-X insert to better distribute the stress and movements regardless of the weight of the hanging layer

Horizontal panel L > 2,1m with resects upper

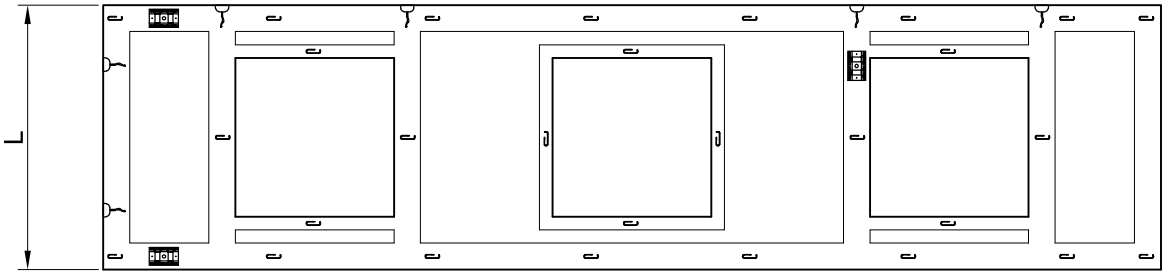


Horizontal panel L < 2,1m with 2 windows

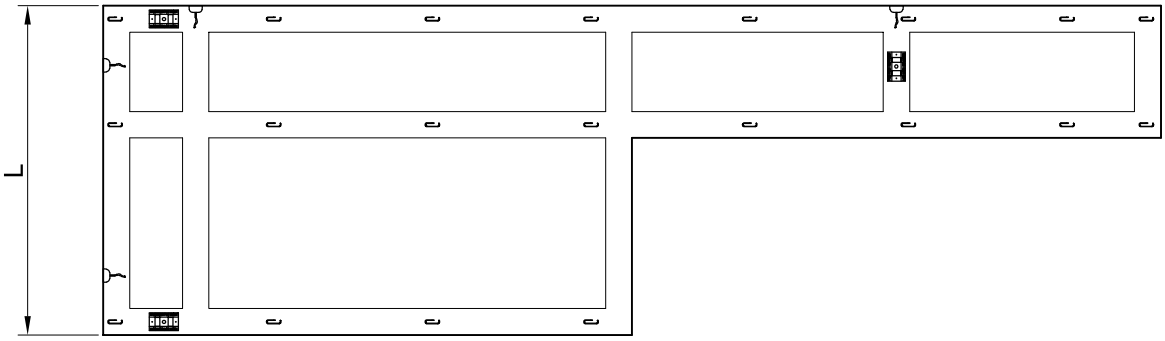
it is raccomanded to use the third Omega-X insert to better distribute the stress and movement regardless of the weight of the hanging layer

EXAMPLES OF PANELS WITH OMEGA-X

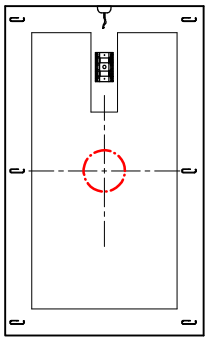
Vertical panel L > 2,1m with window

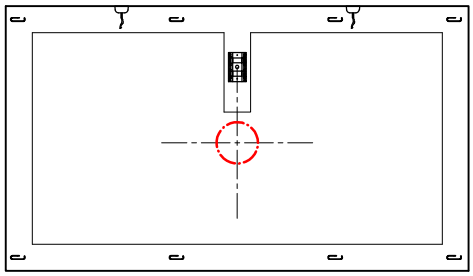


Vertical panel L < 2,1m with three windows



Vertical panel L > 2,1m lame



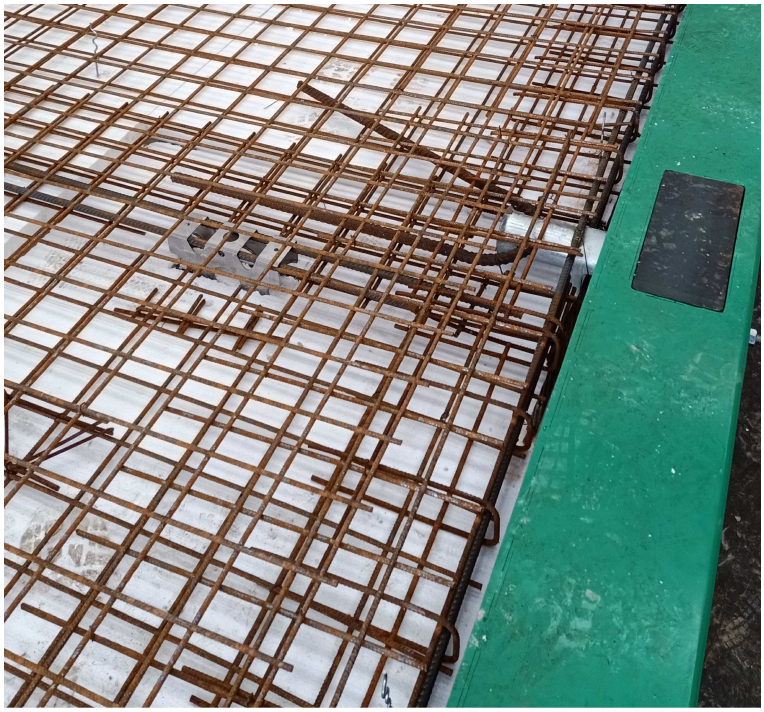


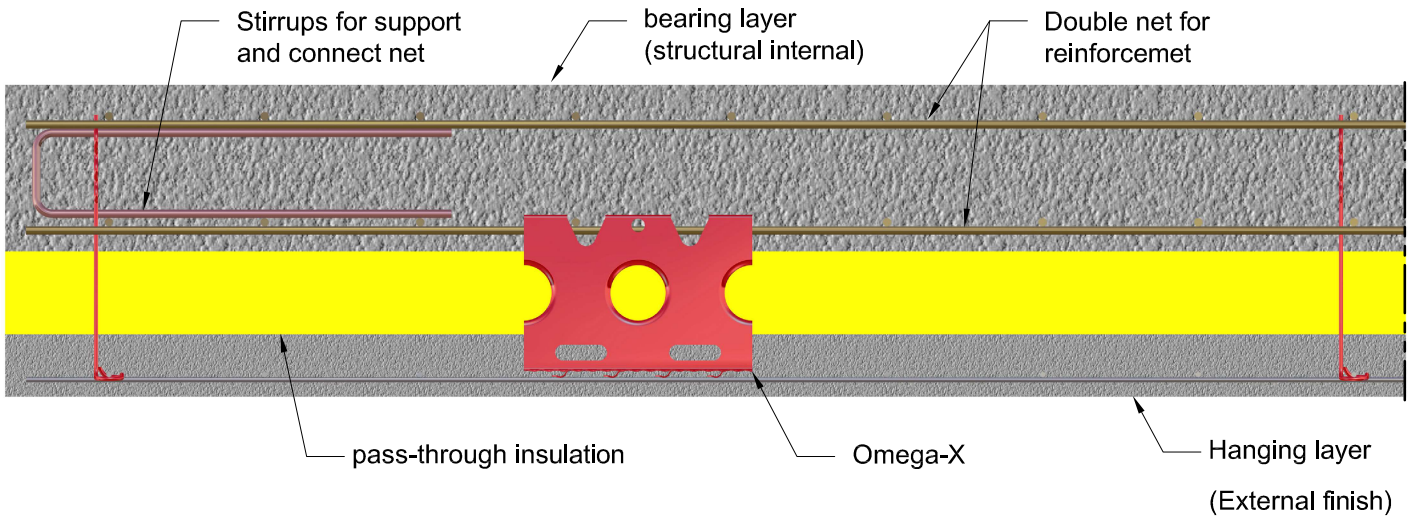
Panels small size

The Omega-X insert must be positioned in line with the centre of gravity axis of the panel

PANELS REINFORCED WITH NET

The OMEGA-X inserts can be positioned in panels without beams but with a load-bearing layer of solid concrete reinforced with 2 fine mesh nets and/or in any case suitable for the correct reinforcement of the panel, possibly integrated with single construction steel bars





For any doubts regarding the correct use of the components described in this manual, contact:
B.S. Italia S.p.A. ● 24050 Zanica (BG) ● Via Falcone, 9
tel +39 035 670569 ● fax +39 035 671854
www.bs-italia.it ● info@bs-italia.it

WELDING OR MODIFICATIONS

Welding or modifications to the components of the OMEGA-X system that may cause a reduction in the capacity, a change in the technical characteristics of the materials or induce dangerous working conditions are not permitted.

B.S. Italia assumes no responsibility for damages of any kind in the event of modifications made to its products or individual components.

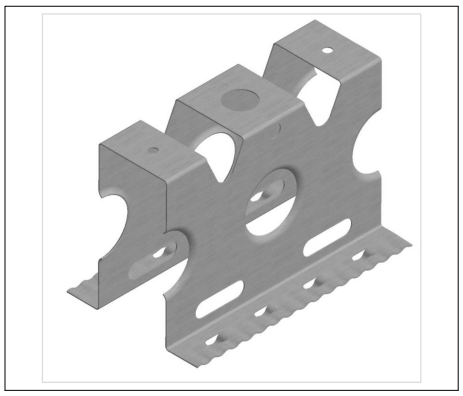
DESIGN CHANGES

B.S. Italia reserves the right to make design changes regarding components and/or accessories and/or capacities at any time, without prior notice.

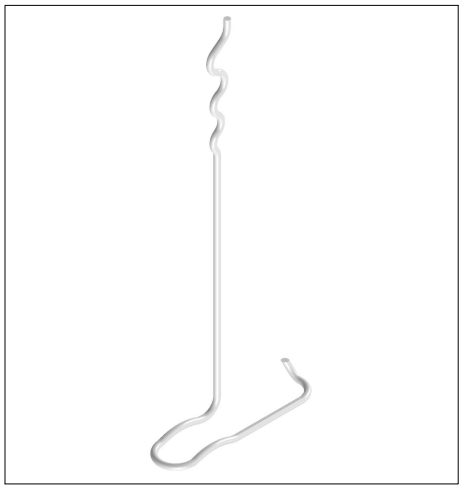
CALCULATION

For the design of inserts and protective reinforcements, it is necessary to strictly follow the instructions in this manual. In any case, it is the responsibility of the designer of the concrete products to choose the appropriate component of the OMEGA-X system, related to the application in question and the actions involved.

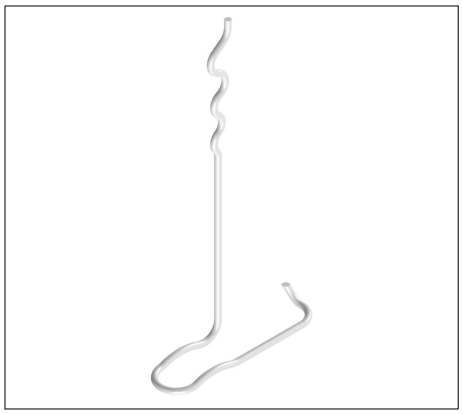
For each project, in accordance with legal obligations, to whose full compliance we refer, a safety manager must be appointed and a detailed assembly plan must be drawn up and followed. This manual must always be available at the place of use of the system itself and delivered to the relevant managers: in production, storage and construction site



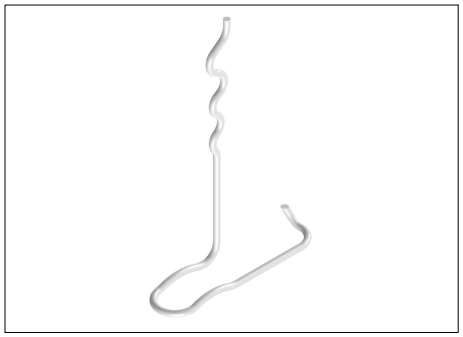
Description	Code
Omega-X inox L=220mm	9000-22.I



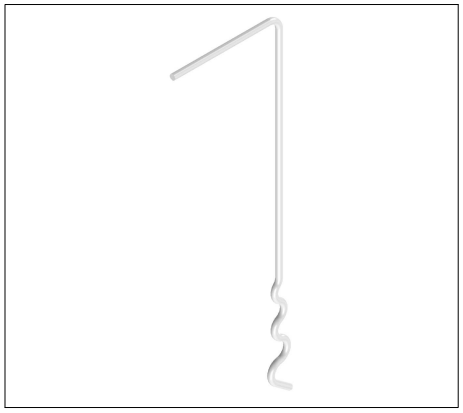
Description	Code
Fork inox H=255mm	FORC -X2



Description	Code
Fork inox H=205mm	FORC-X5



Description	Code
Fork inox H=155mm	FORC-X3



Description	Code
Fork "L" inox H=250mm	FORC4-250

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innovazione basata sull'esperienza
innovation based on experiece

24050 ZANICA (BG) Italia•Via Falcone, 9•tel +39 035 670569•fax +39 035 671854
www.bs-italia.it • info@bsitalia.it