999805702 - 12/2017
en-GB

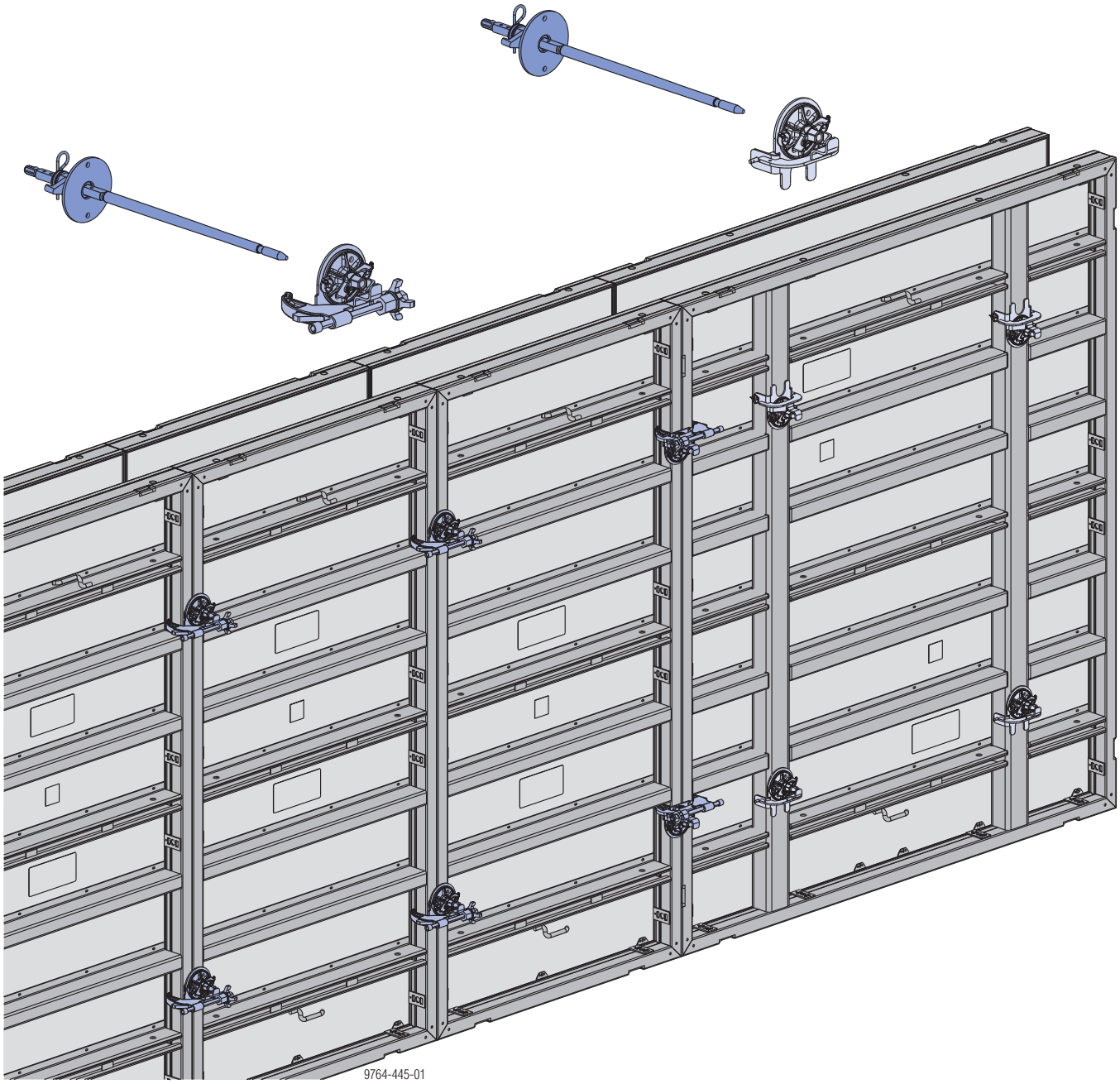
The Formwork Experts.

Tie rod system Monotec

Framed formwork Framax Xlife

User Information

Instructions for assembly and use (Method statement)

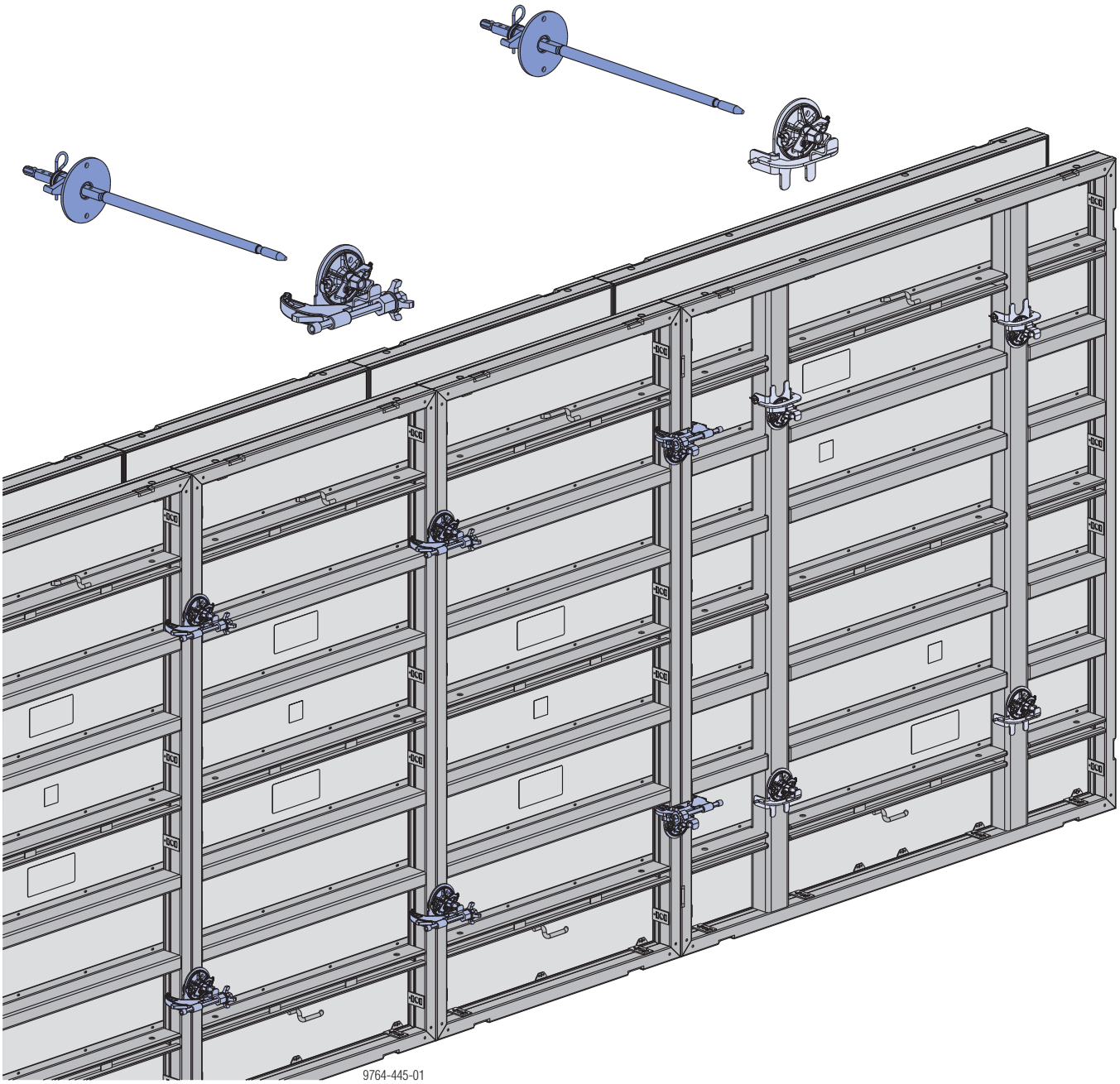


Contents

Product description

Fast tying with the Monotec tying system

- formwork can be tied by just 1 man working from one side only
- no time-consuming fitting of jacket tubes
- exact pre-setting of the desired wall thickness on the Monotec tie
- form-tie nut integrated in the connector component
- enhances your Framax Xlife framed formwork with no need to invest in a new formwork system
- particularly ergonomic where space is tight, as the tie can be installed from the accessible side
- long lifespan, as the tie is operated using a ratchet, minimising wear-and-tear on the equipment
- the Monotec ties are easy to unscrew, so the formwork can be stripped out faster



NOTICE

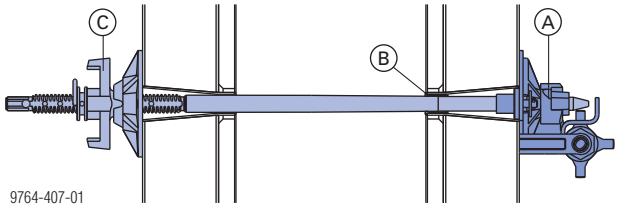
This document is only valid in conjunction with the following underlying document(s):
'Framed formwork Framax Xlife' User Information booklet.

Tie rod system Monotec

- can be operated from one side
- for wall thicknesses from 15 cm to 35 cm
- no expendable jacket tubes

	Wall thicknesses in 1 cm increments
Monotec tie 15.0 B 15-25cm Framax	15 to 25 cm
Monotec tie 15.0 B 25-35cm Framax	25 to 35 cm

If the tie is placed through a universal waling, this reduces the max. wall thickness by 5 cm.



A Monotec combination nut 15.0 Framax or Monotec form-tie nut 15.0 Framax

B Monotec sealing plug Framax

C Monotec tie 15.0 B

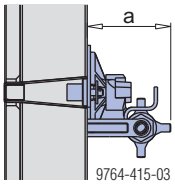
Monotec tie 15.0 B:

Permitted capacity, allowing a 1.6 : 1 factor of safety against failure: 120 kN

Permitted capacity to DIN 18216: 90 kN

NOTICE

Do not bend or drop Monotec ties!



	Space required (dimension 'a')
Monotec combination nut 15.0 Framax	13.0 cm
Framax combination nut 20.0	
Monotec form-tie nut 15.0 Framax	10.5 cm
Framax form-tie nut 20.0	

WARNING

Sensitive rod steel!

- ➤ Never weld or heat tie rods.
- ➤ Tie rods that are damaged or have been weakened by corrosion or wear must be withdrawn from use.

Choosing the right tie-length

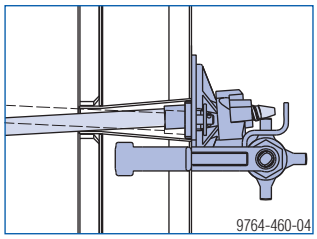
Wall thickness	Monotec tie 15.0 B	
	15-25cm	**25-35cm**
15 - 20 cm	✓	✓[1]
21 - 24 cm	✓[2]	✓[1]
25 cm	✓[2]	✓
26 - 30 cm		✓
31 - 35 cm		✓[2]

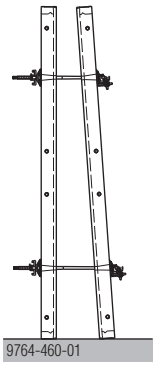
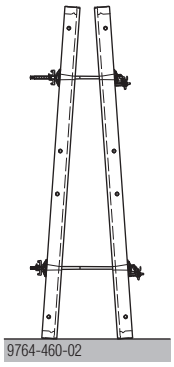
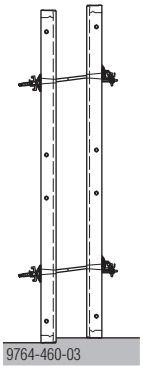
[1] Only on closures with universal walings.

[2] Closure with universal waling not possible.

Inclined and height-mismatched positioning

Thanks to their large, conical form-tie sleeves, the panels can be inclined on one or both sides, and/or height-mismatched.



Conical on 1 side	**Conical on both sides**	**Height mismatch**
max. 4°	max. 2 x 4.5°	max. 1.0 cm per 15 cm of wall thickness
		
9764-460-01	9764-460-02	9764-460-03

Lateral mismatch

max. 0.5 cm
per 15 cm of wall thickness

Note:

Secure all inclined panels against uplift.

Inclined and mismatched positioning are not possible with panels that have been placed on their sides.

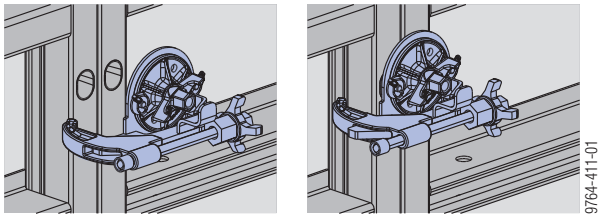
Fitting the nuts to the holding formwork

Combination nut

The combination nut is used **on the joint between Framax Xlife panels**.

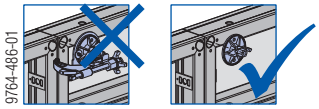
The combination nut is used instead of the Framax quick acting clamp RU as the panel connector.

➤ Position the combination nut on the form-tie hole of the Framax Xlife panel, and tighten it.



NOTICE

Ties in the corners of panels (i.e. corner ties) must always be made using tie rods and super plates.

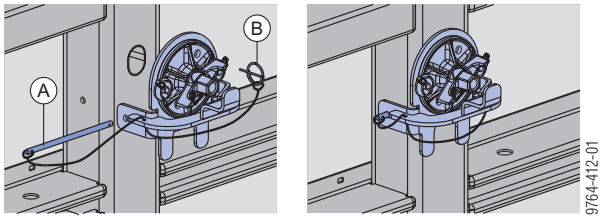


Form-tie nut

The form-tie nut is used for tying **extra-large panels**.

➤ Position the form-tie nut on the form-tie hole of the extra-large panel and fix it to the panel with a safety pin.

➤ Secure the safety pin with a spring pin.

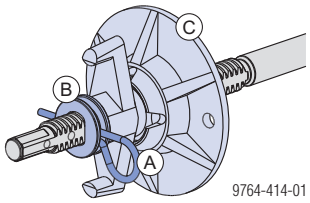


A Safety pin
B Spring pin

Adjusting the Monotec tie

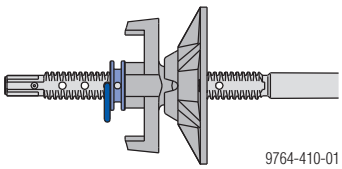
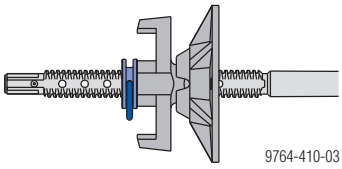
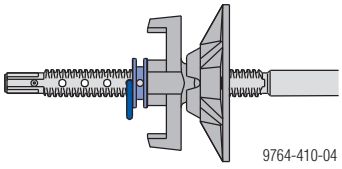
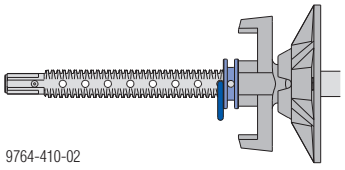
Adapting to the wall thickness

- ➤ Pull out the spring cotter.
- ➤ Position the adjusting ring.
- ➤ Fix the adjusting ring back on again with the spring cotter.
- ➤ Screw the wing-nut tightly back onto the adjusting ring.

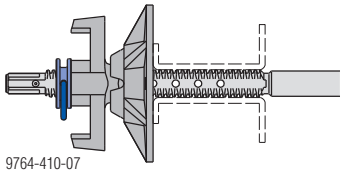
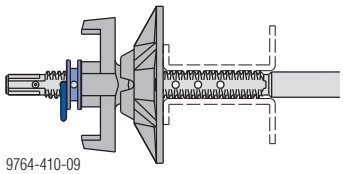
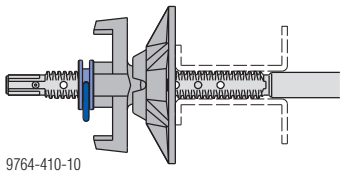
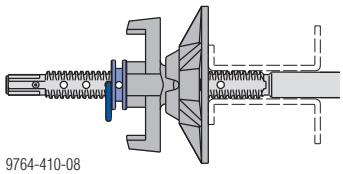
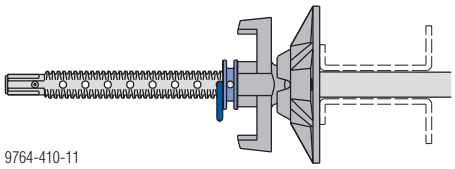


A	Spring cotter
B	Adjusting ring
C	Wing nut

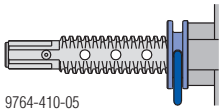
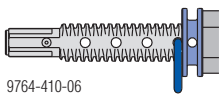
Wall thicknesses without universal waling

Position of adjusting ring and spring cotter	Monotec tie 15.0 B **15-25cm**	**25-35cm**
 9764-410-01	**25 cm**	**35 cm**
 9764-410-03	**24 cm**	**34 cm**
 9764-410-04	**23 cm**	**33 cm**
	etc.	etc.
 9764-410-02	**15 cm**	**25 cm**

Wall thicknesses with universal waling

Position of adjusting ring and spring cotter	Monotec tie 15.0 B **15-25cm**	**25-35cm**
 9764-410-07	**20 cm**	**30 cm**
 9764-410-09	**19 cm**	**29 cm**
 9764-410-10	**18 cm**	**28 cm**
	etc.	etc.
 9764-410-08	**15 cm**	
 9764-410-11		**15 cm**

Wall-thickness grid

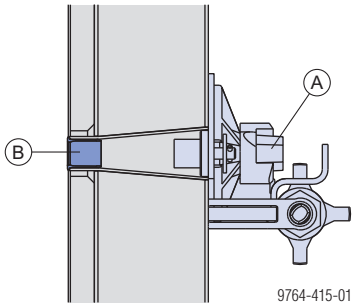
Even-numbered wall thicknesses (24 cm, 22 cm, 20 cm, etc.)	Spring cotter is in the adjusting ring	 9764-410-05
Odd-numbered wall thicknesses (25 cm, 23 cm, 21 cm, etc.)	Spring cotter is outside the adjusting ring	 9764-410-06

Tying / stripping the Framax Xlife panels

Holding formwork:

➤ Install a Monotec combination nut 15.0 or a Monotec form-tie nut 15.0.

➤ Press Monotec sealing plugs Framax into the tie-holes that will be needed on the Framax Xlife panels.

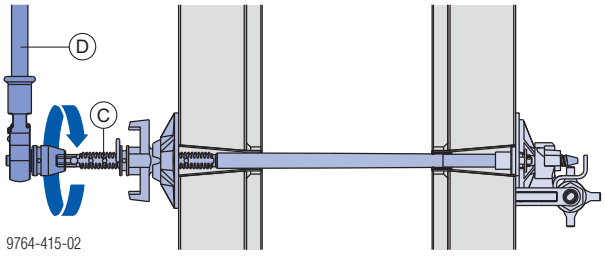


A Monotec combination nut 15.0 Framax or Monotec form-tie nut 15.0 Framax

B Monotec sealing plug Framax

Opposing formwork:

➤ Set up the opposing formwork and close with Monotec ties (by screwing them in with the Monotec ratchet until they are fully engaged).



C Monotec tie 15.0 B

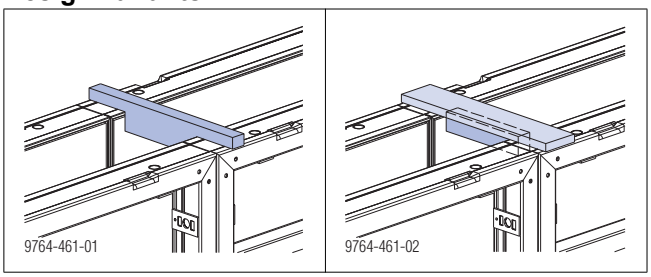
D Monotec ratchet 3/4" SW17

- Spraying the conical parts of the form ties with release agent makes it easier to detach them from the concrete.
- Minor adjustments to the wall thickness (e.g. to pull the formwork tight at wall junctions, box-outs etc.) are possible by tightening the super plate on the Monotec tie.

Pressure bracing at top

The Monotec ties do not need any jacket tubes. For this reason, the top of the formwork must be braced apart with a field-built pressure brace (wooden spacer).

Design variants

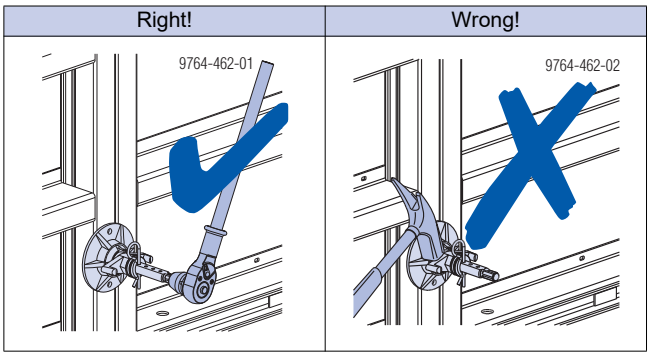


Squared timber: min. 4 x 4 cm

Distance between pressure braces: max. 2.70 m

Removing the Monotec ties

➤ Unscrew the Monotec ties using the Monotec ratchet.



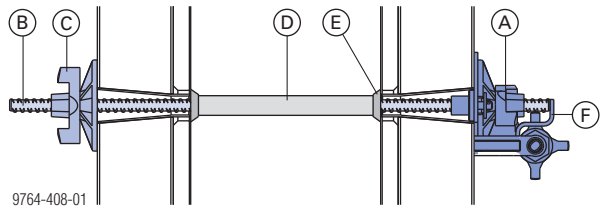
Loosening the form ties sooner rather than later after pouring the concrete makes them easier to remove at a later time.

Cleaning

➤ When cleaning the formwork, always remove any dried concrete residues from the form-tie sleeves of the opposing formwork.

Variant with Tie rod system 15.0 / 20.0

The Doka tie rod system 15.0



A	Monotec combination nut 15.0 Framax or Monotec form-tie nut 15.0 Framax
B	Tie rod 15.0mm
C	Super plate 15.0
D	Plastic tube 22mm
E	Universal cone 22mm
F	Stopper plate for tie rod

Both the combination nut and the form-tie nut have an integrated stopper plate for the tie rod.

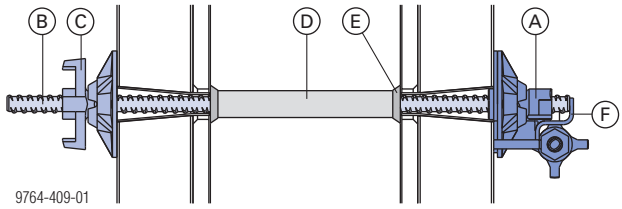
Tie rod 15.0mm:

Permitted capacity, allowing a 1.6 : 1 factor of safety against failure: 120 kN

Permitted capacity to DIN 18216: 90 kN

The Doka tie rod system 20.0

For high formwork pressures of up to 80 kN/m², use the Tie rod system 20.0.



A	Framax combination nut 20.0 or Framax form-tie nut 20.0
B	Tie rod 20.0mm
C	Super plate 20.0 B
D	Plastic tube 26mm
E	Universal cone 26mm
F	Stopper plate for tie rod

Both the combination nut and the form-tie nut have an integrated stopper plate for the tie rod.

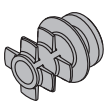
Tie rod 20.0mm:

Permitted capacity, allowing a 1.6 : 1 factor of safety against failure: 220 kN

Permitted capacity to DIN 18216: 150 kN

Closing off the form-tie point

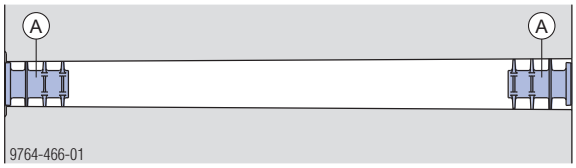
Monotec plug



- fire-resistant
- for tie-holes of diam. 20 to 23 mm

Fitted flush with wall (shadow gap)

➤ Press a Monotec plug into the tie-hole, by hand (using a piece of wood makes it easier to fit the plug flush with the wall).

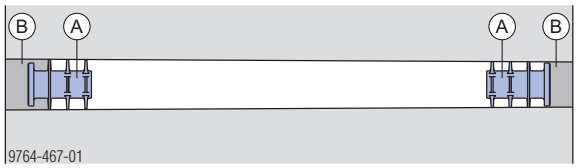


A Monotec plug

Fitted deeper in tie-hole (filled and smoothed)

➤ Press the Monotec plug approx. 10 mm into the tie-hole, by hand.

➤ Trowel off the tie hole with mortar.



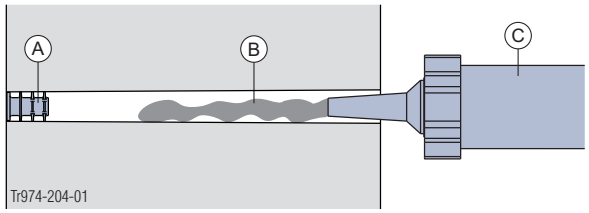
A Monotec plug

B Mortar

Water-impermeable form-tie point

➤ Press a Monotec plug into the tie-hole, flush with the wall.

➤ Use the backfilling syringe to inject the form-tie hole with sufficient moulding mortar that this is at least 5 cm long when compressed.



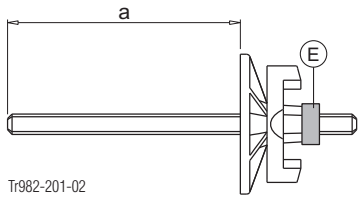
A Monotec plug

B M-Bed moulding mortar

C Backfilling syringe 600ml

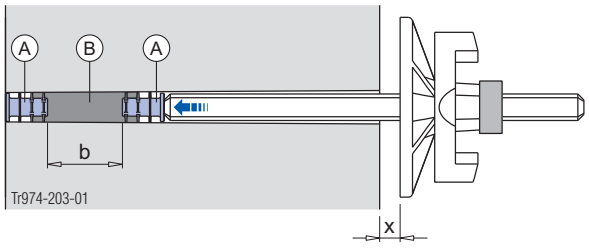
Using a Tie rod 15.0mm plus Super plate 15.0 makes it easier to fit the second plug.

To prevent the super plate from turning, fix it to the tie rod using adhesive tape **(E)** .



a ... wall thickness minus 11 cm

➤ Using the tie rod, press a second Monotec plug into the tie-hole and compress the moulding mortar with it.

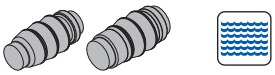


b ... M-Bed moulding mortar, min. 5 cm
x ... when there is a gap between the concrete and the super plate, the moulding mortar has been compressed to a length of min. 5 cm

A Monotec plug

B M-Bed moulding mortar

Combi-plug 22 and Monotec combi-plug 20

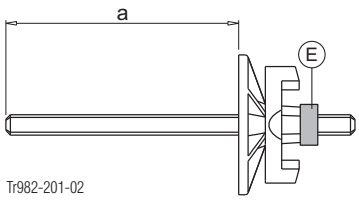


- water-impermeable

Note:
No mortar is needed for installing Combi plugs 22 or Monotec combi-plugs 20.

Using a Tie rod 15.0mm plus Super plate 15.0 makes it easier to fit the plugs flush with the wall.

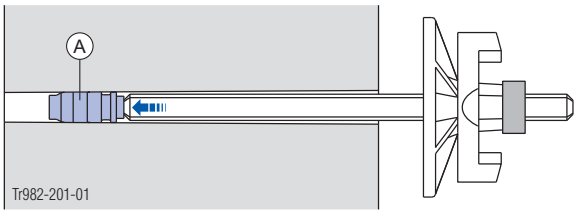
To prevent the super plate from turning, fix it to the tie rod using adhesive tape **(E)** .



a ... wall thickness minus 5 cm

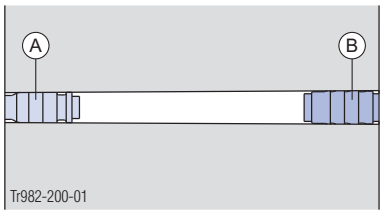
Fitted flush with wall (shadow gap)

➤ Moisten a Monotec combi-plug 20 with water and push it into the form-tie hole with the tie rod.



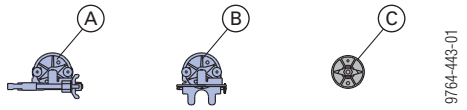
A Monotec combi-plug 20

➤ Push in the combi-plug by hand as far as the first sealing lip, and hammer it into the form-tie hole with a rubber mallet until it is flush with the wall.



B Combi-plug 22

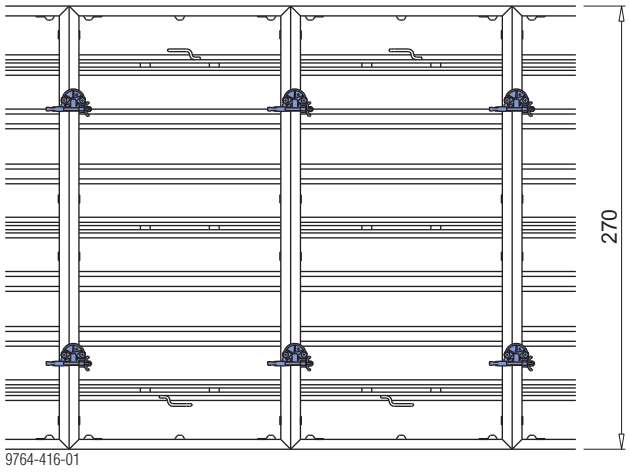
Practical examples



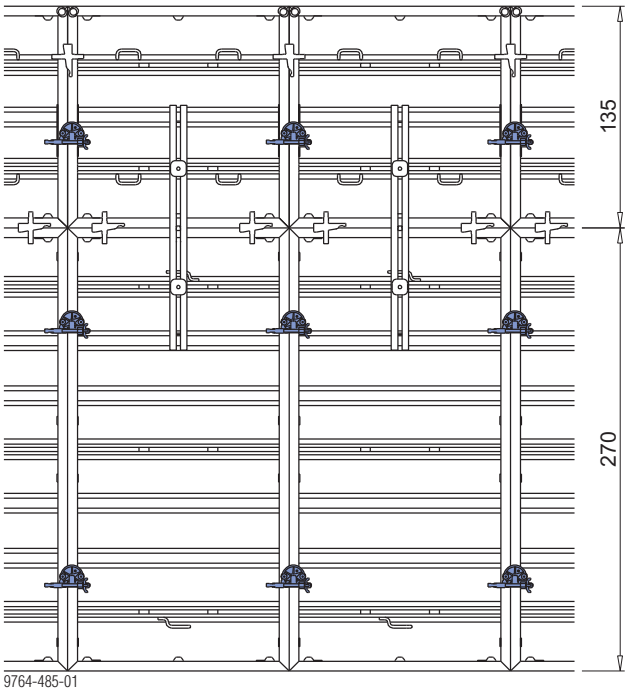
A Combination nut (single-side-operable form-tie point)
B Form-tie nut (single-side-operable form-tie point)
C Tie rod + super plates (conventional form-tie point)

Framax Xlife panel 2.70m

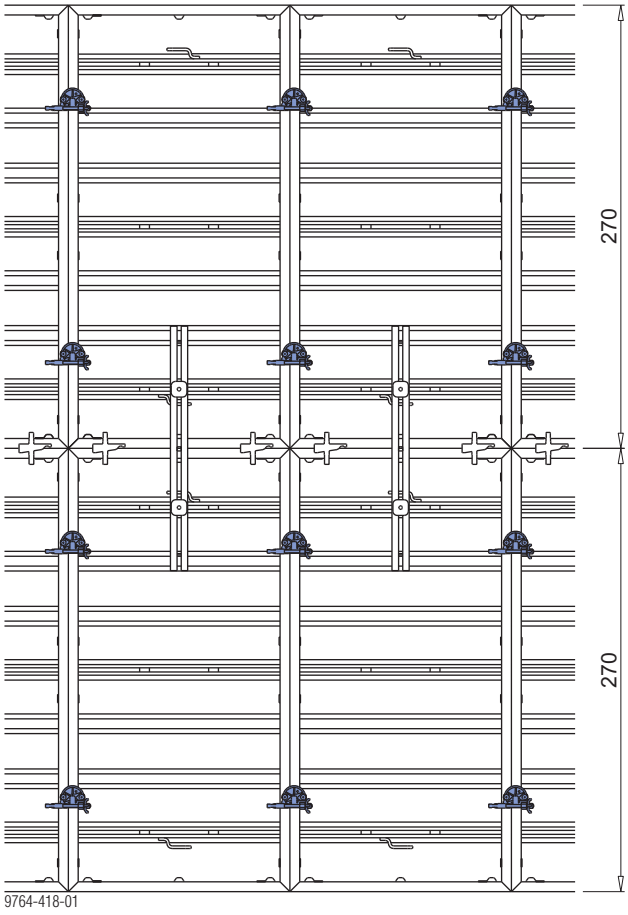
Formwork height: 270 cm



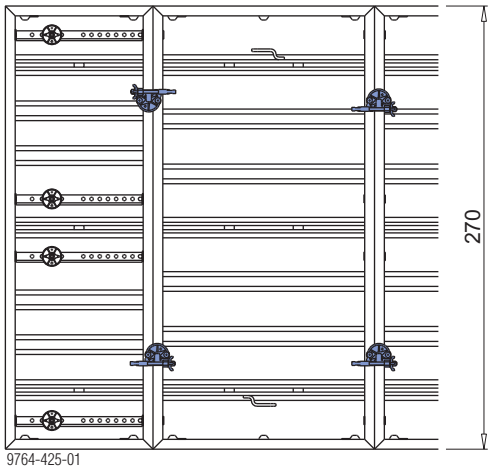
Formwork height: 405 cm



Formwork height: 540 cm



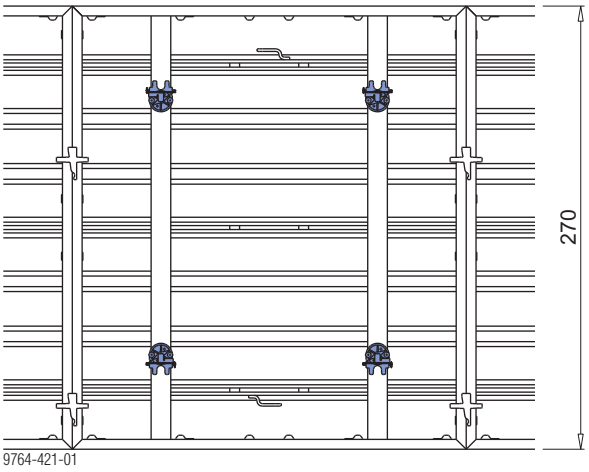
Framax Xlife universal panel 2.70m



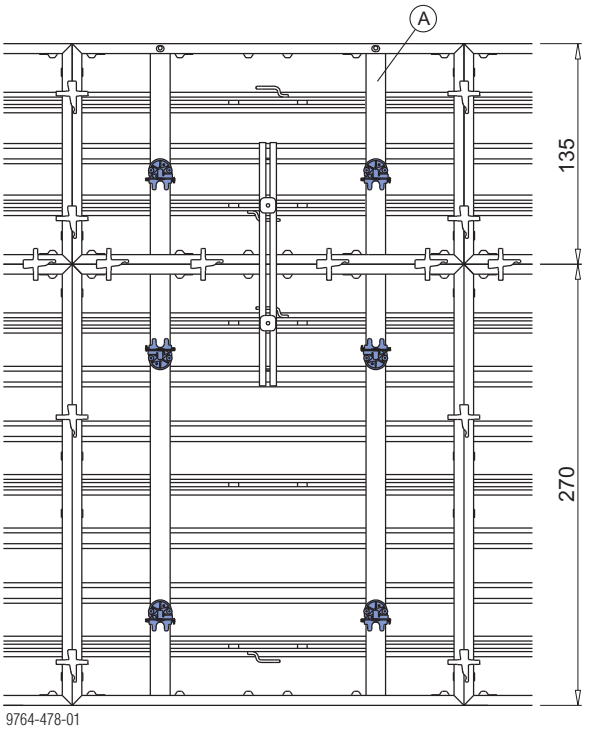
On universal panels, the top combination nut must be positioned 'upside-down' (i.e. turned 180°).

Framax Xlife panel 2.40x2.70m

Formwork height: 270 cm

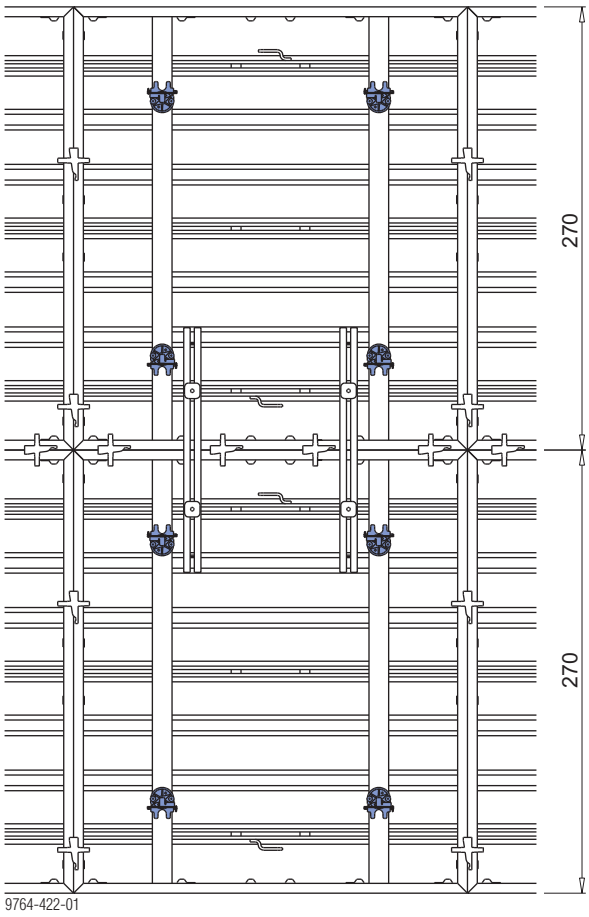


Formwork height: 405 cm



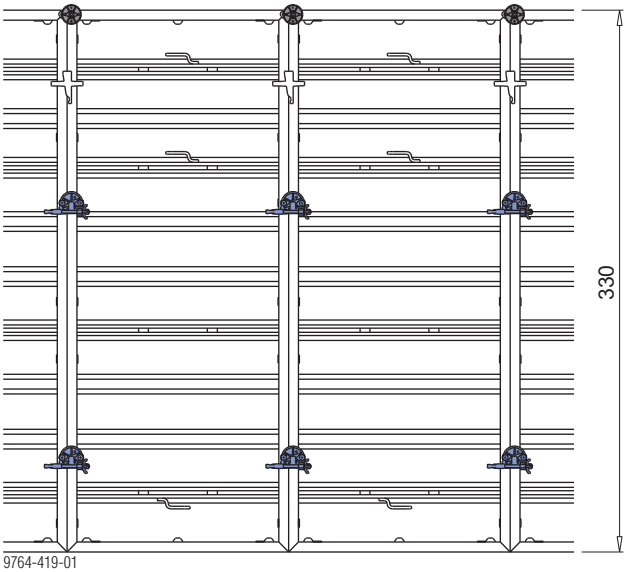
A Framax Xlife panel 2.40x1.35m

Formwork height: 540 cm



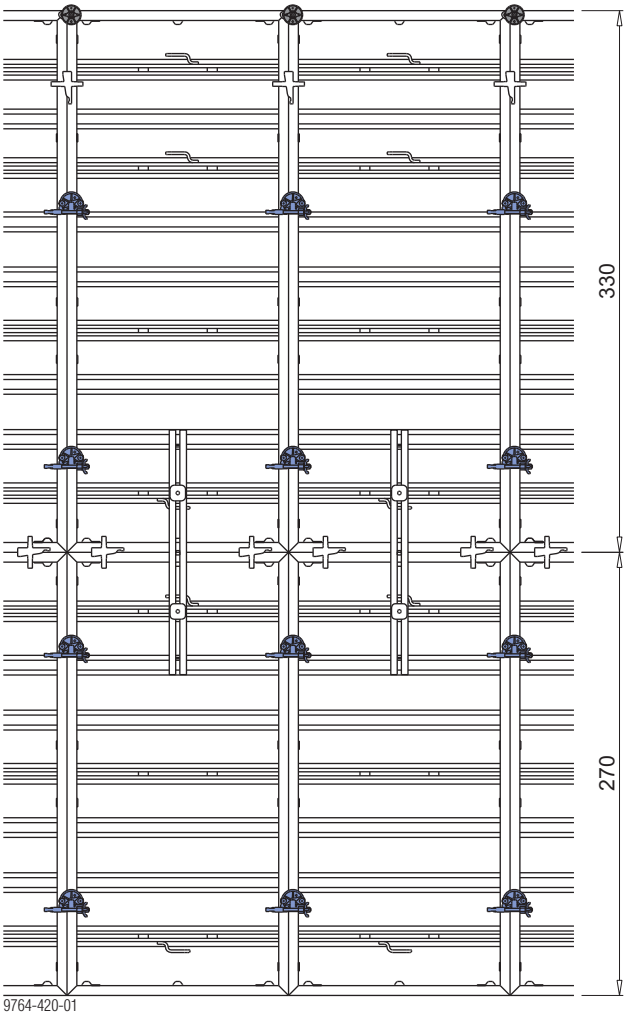
Framax Xlife panel 3.30m

Formwork height: 330 cm



9764-419-01

Formwork height: 600 cm

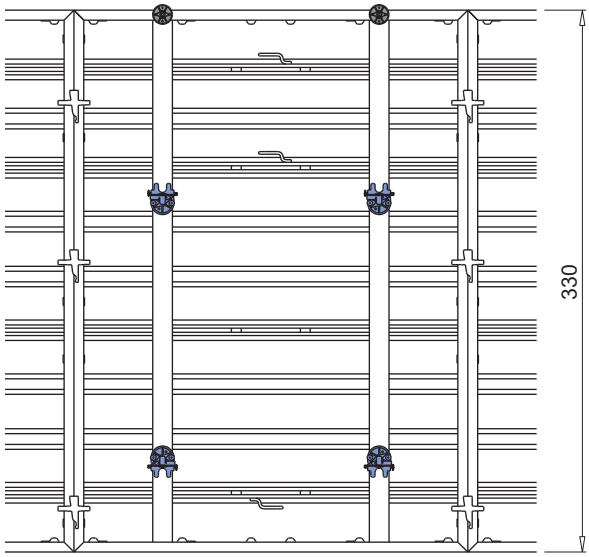


9764-420-01

Ties in the corners of panels (i.e. corner ties) must always be made using tie rods and super plates.

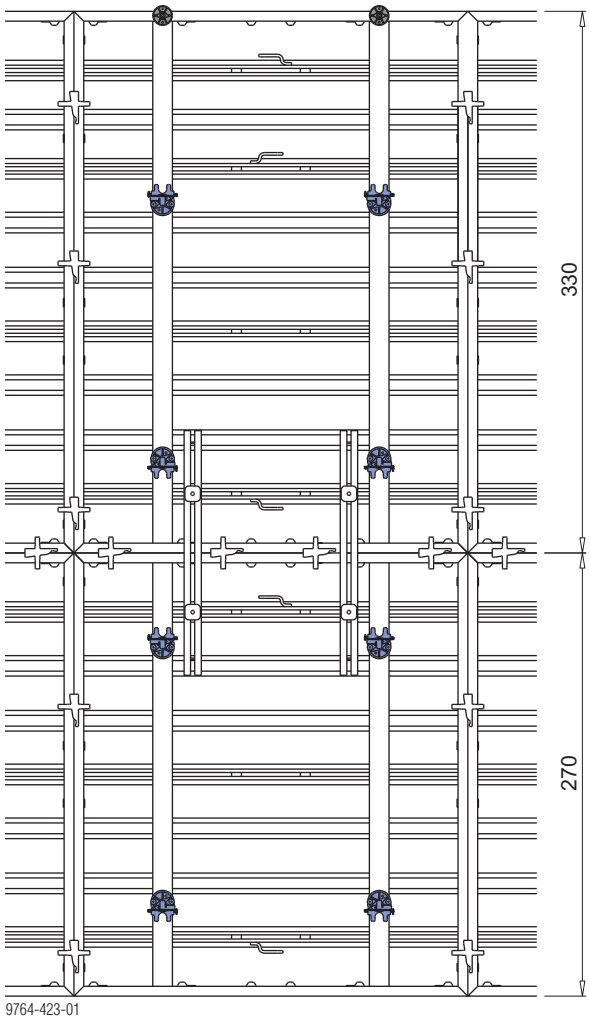
Framax Xlife panel 2.40x3.30m

Formwork height: 330 cm



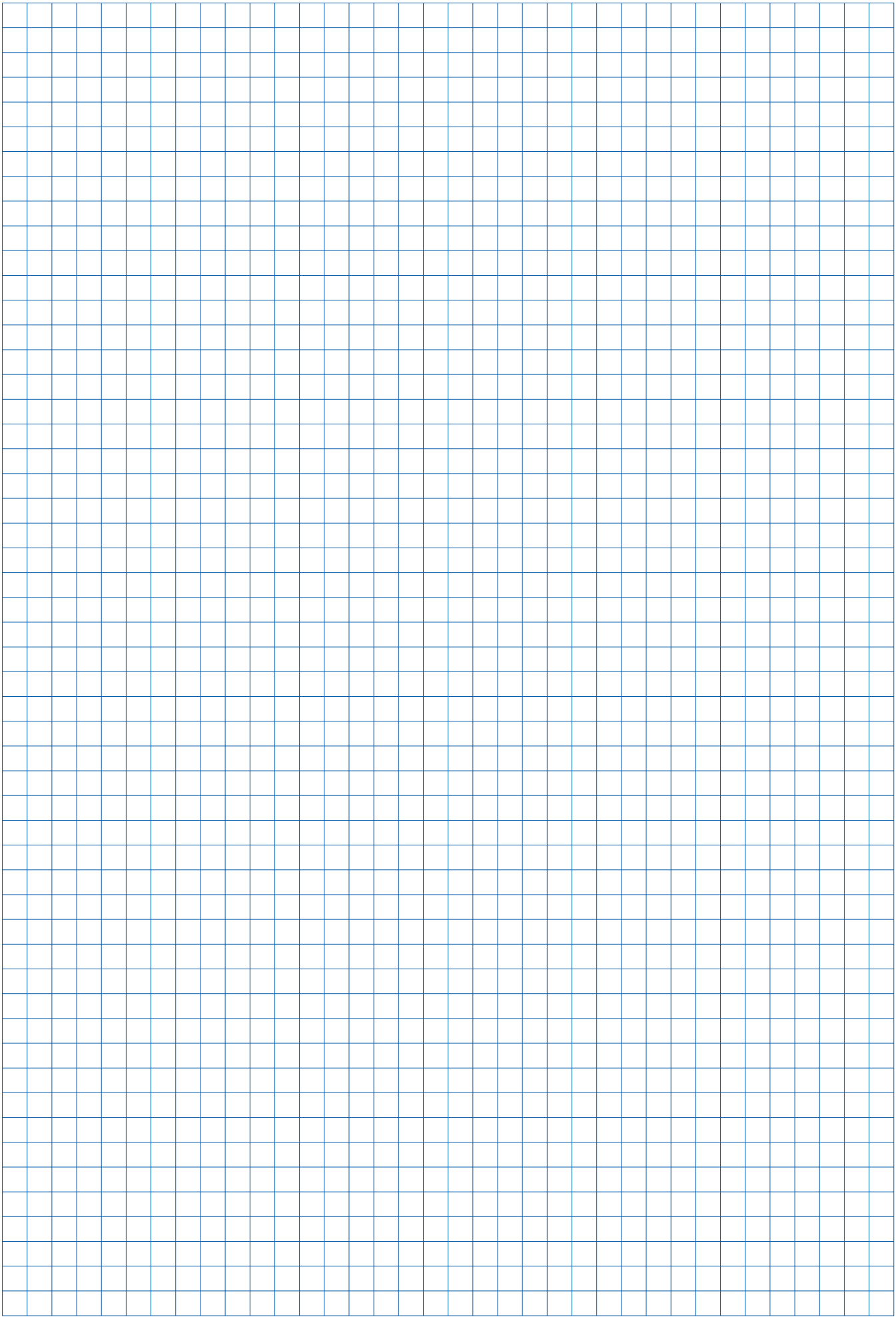
9764-424-01

Formwork height: 600 cm



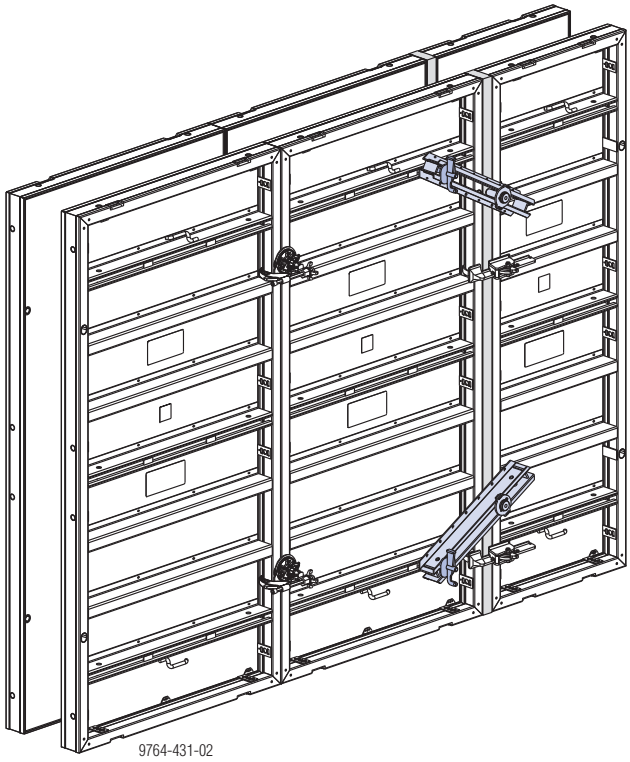
9764-423-01

Ties at the edges of panels must always be made using tie rods and super plates.



Framax Xlife with Tie rod system Monotec

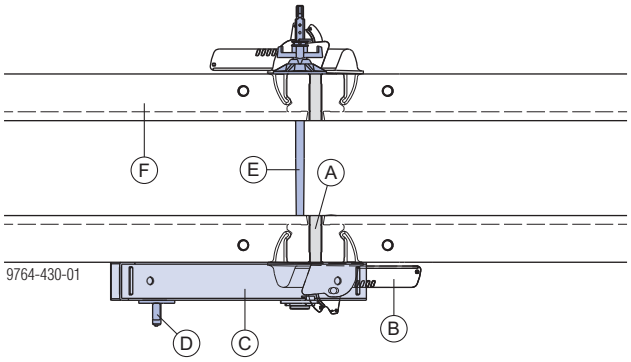
Length adjustment using closures



Monotec joint plate 0.75m Framax:
Permitted moment: 5.2 kNm

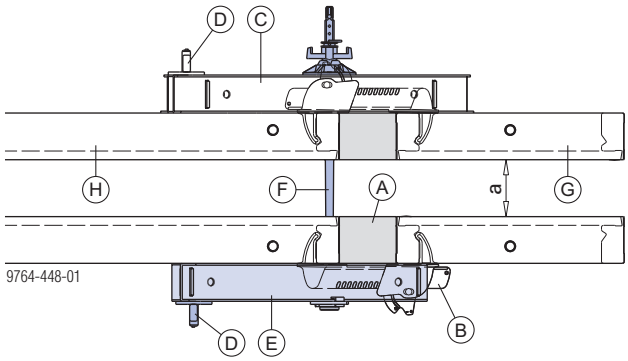
Tie through frame profile

Closures: 0 - 3 cm



A	Fitting timber
B	Framax multi function clamp
C	Monotec joint plate 0.75m Framax
D	Framax wedge clamp
E	Monotec tie 15.0 B
F	Framax Xlife panel

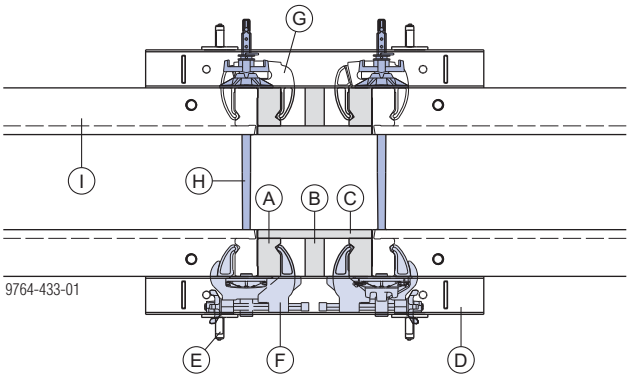
Closures: 3 - 15 cm



a ... max. 30 cm (Monotec tie passes through universal waling)

A	Fitting timber
B	Framax multi function clamp
C	Framax universal waling
D	Framax wedge clamp
E	Monotec joint plate 0.75m Framax
F	Monotec tie 15.0 B
G	Framax Xlife panel (max. width 60cm)
H	Framax Xlife panel

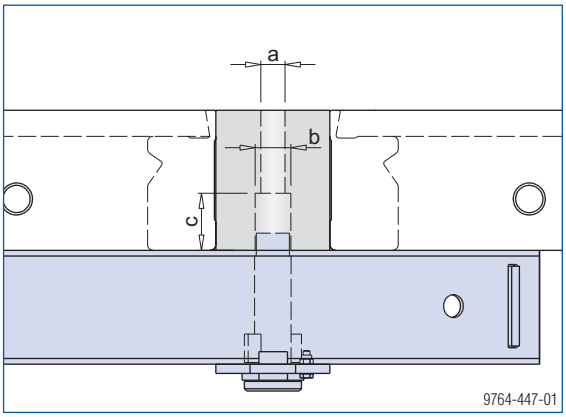
Closures: 17 - 30 cm



A	Framax moulded timber
B	Squared timber
C	Formwork sheet
D	Framax universal waling
E	Framax wedge clamp
F	Monotec combination nut 15.0 Framax
G	Framax quick acting clamp RU
H	Monotec tie 15.0 B
I	Framax Xlife panel

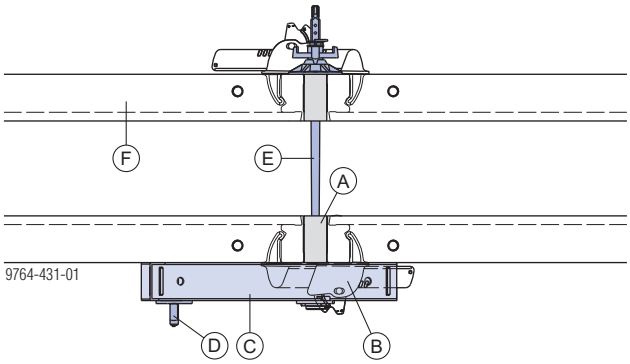
Ties through fitting timber

Hole in the fitting timber for Monotec joint plate:



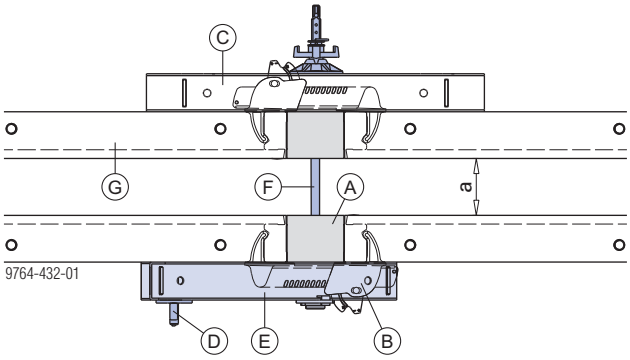
a ... diam. 21 mm
b ... diam. 32 mm
c ... min. 50 mm

Closures: 3 - 6 cm



A	Fitting timber
B	Framax multi function clamp
C	Monotec joint plate 0.75m Framax
D	Framax wedge clamp
E	Monotec tie 15.0 B
F	Framax Xlife panel

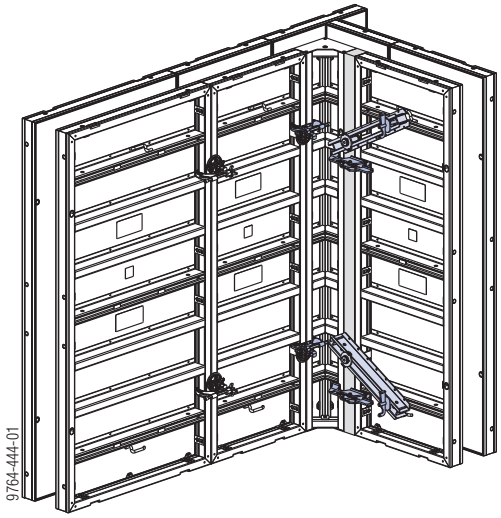
Closures: 6 - 15 cm



a ... max. 30 cm (Monotec tie passes through universal waling)

A	Fitting timber
B	Framax multi function clamp
C	Framax universal waling
D	Framax wedge clamp
E	Monotec joint plate 0.75m Framax
F	Monotec tie 15.0 B
G	Framax Xlife panel

90 degree corners

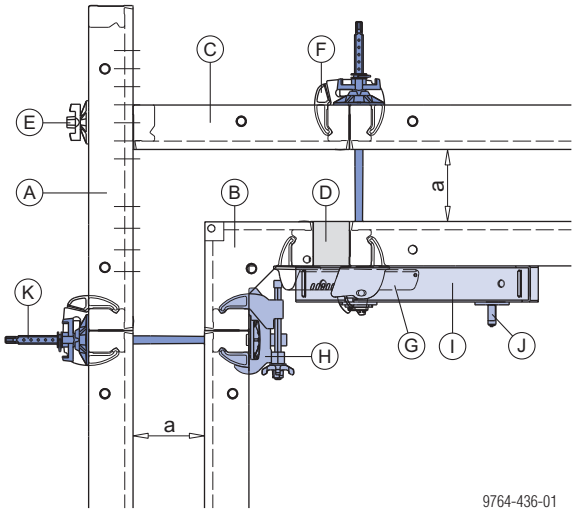


Note:
For details on extra inter-panel connections near outside corners (for increased tensile loads), see the 'Framed formwork Framax Xlife' User Information booklet.

Ties operated on the outside formwork only

Closure on inside

Example:

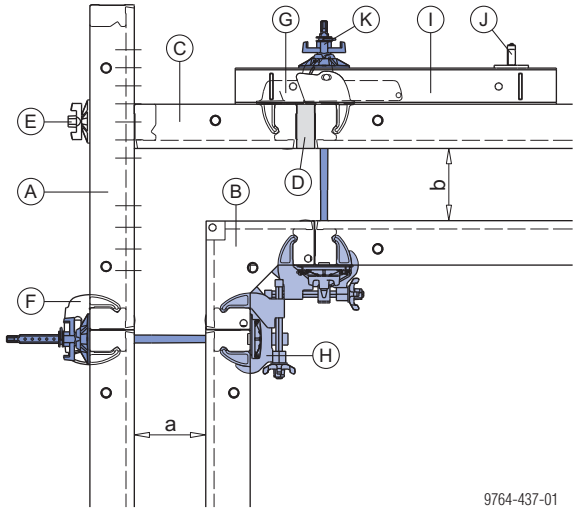


a ... 15 cm to 35 cm

A	Framax Xlife universal panel
B	Framax Xlife inside corner
C	Framax Xlife panel 0.60m
D	Fitting timber
E	Framax universal fixing bolt + Super plate 15.0
F	Framax quick acting clamp RU
G	Framax multi function clamp
H	Monotec combination nut 15.0 Framax
I	Monotec joint plate 0.75m Framax
J	Framax wedge clamp
K	Monotec tie 15.0 B

Closure on outside

Example:



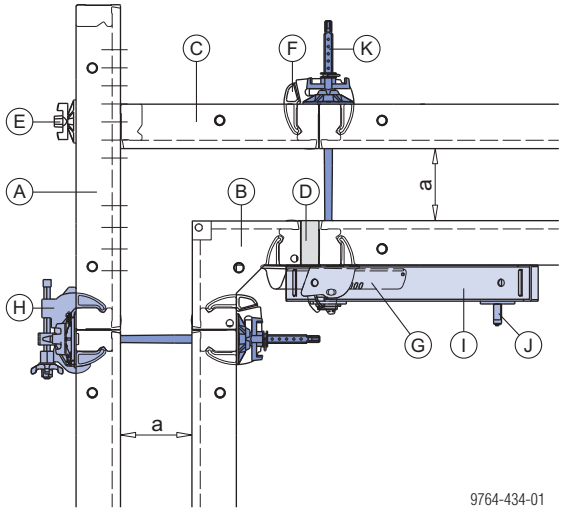
a ... 15 cm to 35 cm
b ... 15 cm to 30 cm (Monotec tie passes through universal waling)

A	Framax Xlife universal panel
B	Framax Xlife inside corner
C	Framax Xlife panel 0.45m
D	Fitting timber
E	Framax universal fixing bolt + Super plate 15.0
F	Framax quick acting clamp RU
G	Framax multi function clamp
H	Monotec combination nut 15.0 Framax
I	Framax universal waling
J	Framax wedge clamp
K	Monotec tie 15.0 B

Ties operated on both outside and inside formwork

Closure on inside

Example:

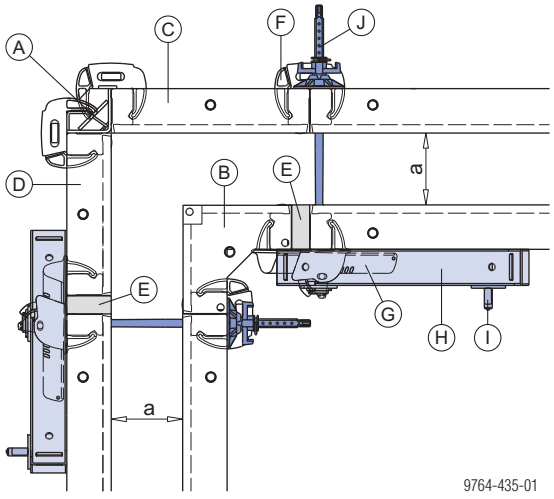


a ... 15 cm to 35 cm

A	Framax Xlife universal panel
B	Framax Xlife inside corner
C	Framax Xlife panel 0.55m
D	Fitting timber
E	Framax universal fixing bolt + Super plate 15.0
F	Framax quick acting clamp RU
G	Framax multi function clamp
H	Monotec combination nut 15.0 Framax
I	Monotec joint plate 0.75m Framax
J	Framax wedge clamp
K	Monotec tie 15.0 B

Closures on inside and outside

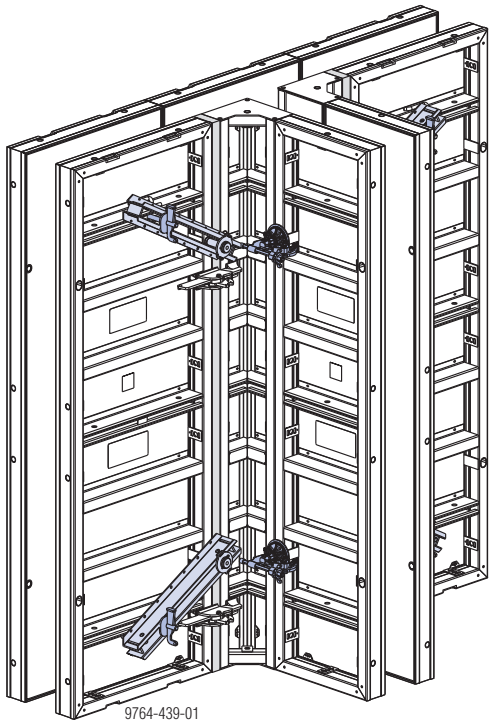
Example:

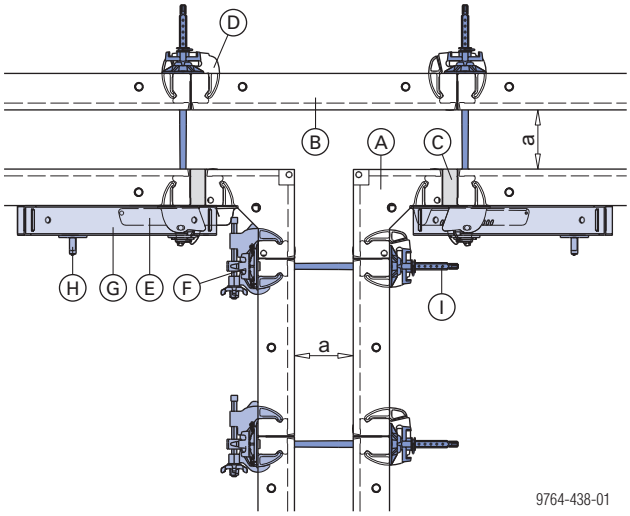


a ... 15 cm to 35 cm

A	Framax outside corner
B	Framax Xlife inside corner
C	Framax Xlife panel 0.55m
D	Framax Xlife panel 0.45m
E	Fitting timber
F	Framax quick acting clamp RU
G	Framax multi function clamp
H	Monotec joint plate 0.75m Framax
I	Framax wedge clamp
J	Monotec tie 15.0 B

Example: T-junction



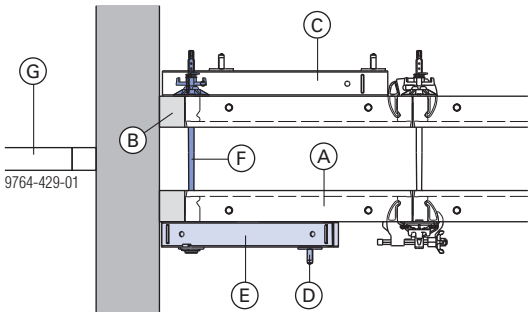


a ... 15 cm to 35 cm

A	Framax Xlife inside corner
B	Framax Xlife panel 0.90m
C	Fitting timber
D	Framax quick acting clamp RU
E	Framax multi function clamp
F	Monotec combination nut 15.0 Framax
G	Monotec joint plate 0.75m Framax
H	Framax wedge clamp
I	Monotec tie 15.0 B

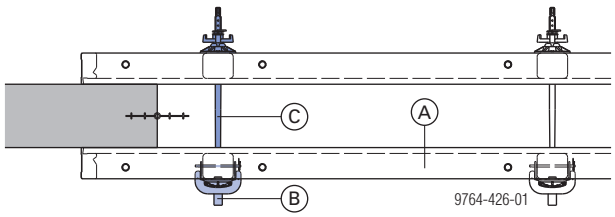
Wall junctions

Right-angled connections

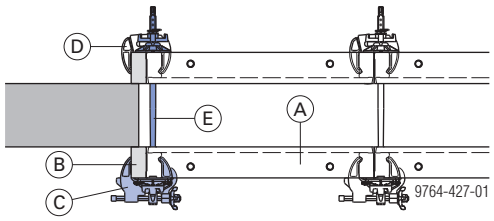


A	Framax Xlife panel
B	Squared timber (min. 5 cm up to max. 20 cm)
C	Framax universal waling (not needed if the squared timber is less than 6 cm wide)
D	Framax wedge clamp
E	Monotec joint plate 0.75m Framax
F	Monotec tie 15.0 B
G	In-place timber brace

In-line connections

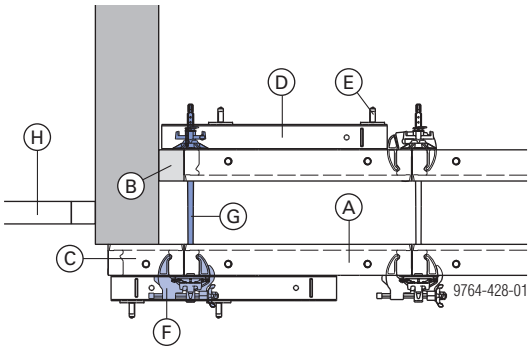


A	Framax Xlife panel 2.40x2.70m
B	Monotec form-tie nut 15.0 Framax
C	Monotec tie 15.0 B



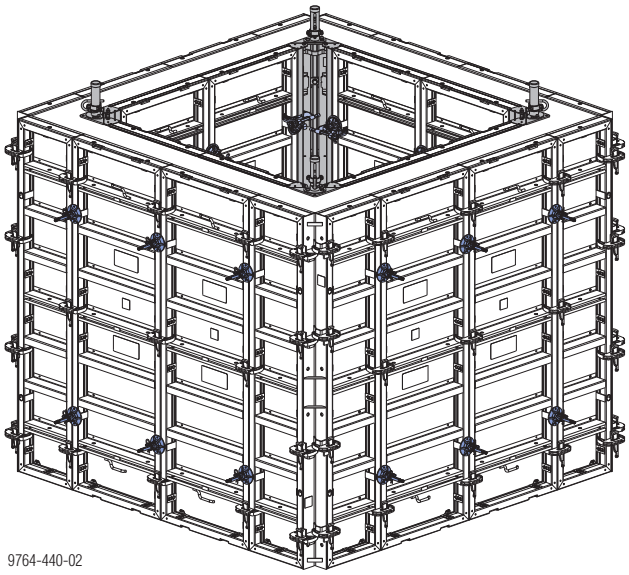
A	Framax Xlife panel
B	Squared timber 6 cm
C	Monotec combination nut 15.0 Framax
D	Framax quick acting clamp RU
E	Monotec tie 15.0 B

Corner connections

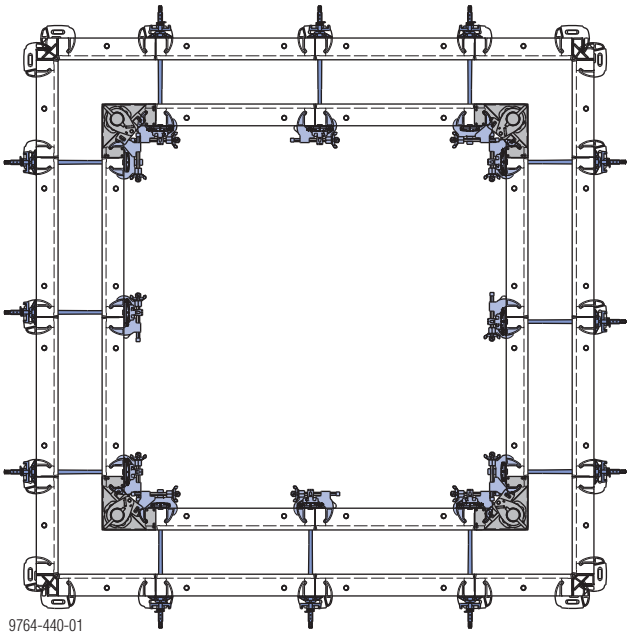


A	Framax Xlife panel
B	Squared timber (min. 5 cm up to max. 20 cm)
C	Framax Xlife panel 0.30m
D	Framax universal waling (not needed if the squared timber is less than 6 cm wide)
E	Framax wedge clamp
F	Monotec combination nut 15.0 Framax
G	Monotec tie 15.0 B
H	In-place timber brace

Shaft formwork



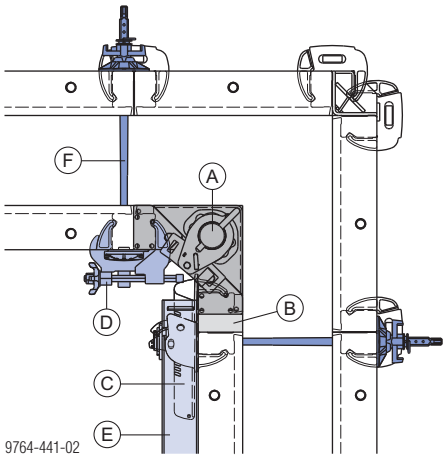
9764-440-02



9764-440-01

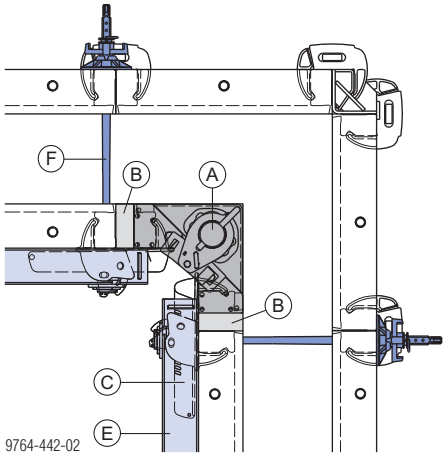
Closures beside the stripping corner

Inside closure, on one side



9764-441-02

Inside closure, on both sides

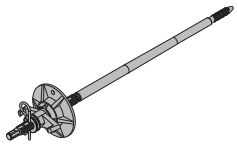


9764-442-02

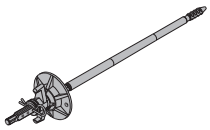
A	Framax stripping corner I
B	Fitting-timber
C	Framax multi function clamp
D	Monotec combination nut 15.0 Framax
E	Monotec joint plate 0.75m Framax
F	Monotec tie 15.0 B

Tie rod system Monotec

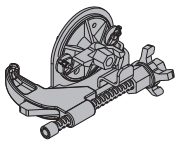
	[kg]	Article n°
Monotec tie 15.0 B 15-25cm Framax Length: 77 cm	3.9	588930500
Monotec tie 15.0 B 25-35cm Framax Length: 87 cm Monotec-Anker 15,0 B Framax Galvanised	4.1	588931500



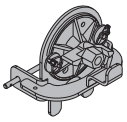
Monotec tie 15.0 15-25cm Framax	3.9	588930000
Monotec tie 15.0 25-35cm Framax Monotec-Anker 15,0 Framax	4.2	588931000



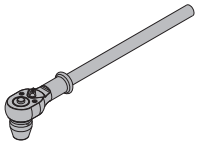
Monotec combination nut 15.0 Framax Monotec-Kombimutter 15,0 Framax Galvanised Width: 27 cm	5.2	588681000



Monotec form-tie nut 15.0 Framax Monotec-Ankermutter 15,0 Framax Galvanised Width: 19 cm	2.7	588684000

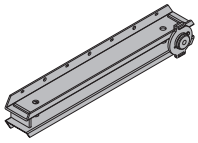


Monotec ratchet 3/4" SW17 Monotec-Knarre 3/4" SW17	1.6	588933000



Monotec sealing plug Framax Monotec-Dichtstopfen Framax Yellow Diameter: 2.9 cm	0.005	588932000

Monotec joint plate 0.75m Framax Monotec-Ausgleichsschiene 0,75m Framax Painted blue	9.9	588934000



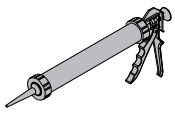
Combi-plug 22 Kombistopfen 22 Grey Length: 5 cm	0.03	588928000

Monotec combi-plug 20 Monotec-Kombistopfen 20 Grey Length: 5 cm	0.02	588929000

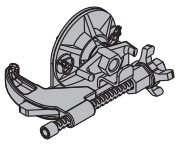
	[kg]	Article n°
Monotec plug Monotec-Verschlussstopfen PE Grey Diameter: 2.4 cm	0.003	588935000

M-Bed moulding mortar M-Bed Quellvergussmörtel	25.0	588938000

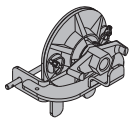
Backfilling syringe 600ml Verfüllspritze 600ml	0.98	588939500



Framax combination nut 20.0 Framax-Kombimutter 20,0 Galvanised Width: 27 cm	6.1	588683000



Framax form-tie nut 20.0 Framax-Ankermutter 20,0 Galvanised Width: 19 cm	3.6	588687000



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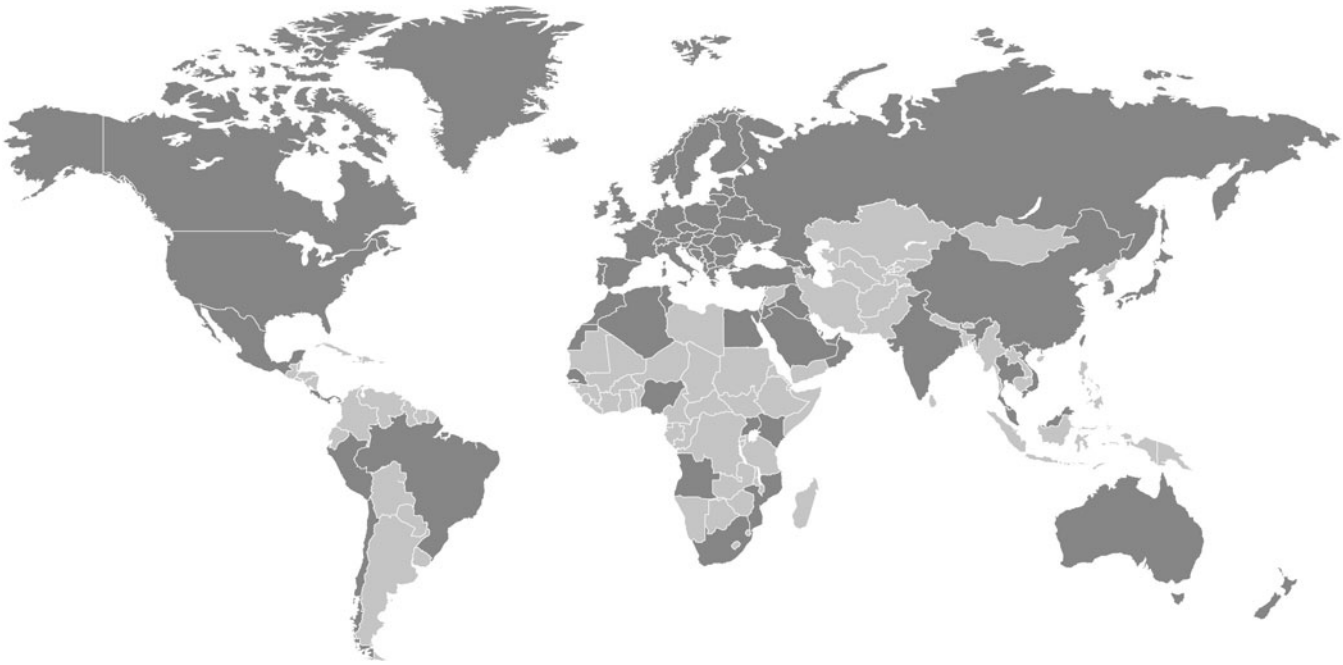
With more than 160 sales and logistics facilities in over 70 countries, the Doka Group has a highly efficient distribution network which ensures that equipment and technical support are provided swiftly and professionally.

An enterprise forming part of the Umdasch Group, the Doka Group employs a worldwide workforce of more than 6000.



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