

X-IE 6 and X-IE 9 Insulation fasteners

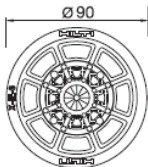
Product Data

Dimensions

X-IE 6



X-IE 9



General information

Material specifications

Plastic plate X-IE 6: HDPE, colourless
X-IE 9: HDPE, black

Nail X-PX
Carbon steel shank: HRC 58
Zinc coating: 5 – 20 µm

Recommended fastening tools

DX 460 IE, DX 460 IE XL, DX 5 IE, DX 5 IE XL

See **X-IE fastener program** in the next pages and **Tools and equipment** chapter for more details

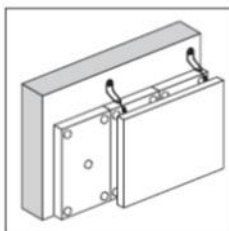
Approvals

SOCOTEC WX 1530 (France)

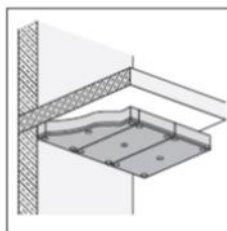
Note: technical data presented in these approvals and design guidelines reflect specific local conditions and may differ from those published in this handbook

Applications and suitable insulation materials

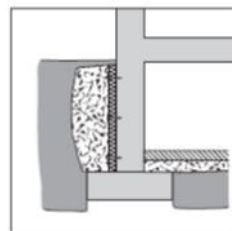
- Mineral wool
- EPS
- XPS
- PIR
- PUR
- Multilayer



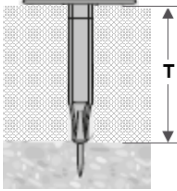
Insulation behind curtain walls



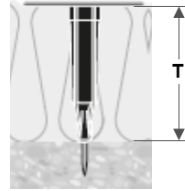
Insulation in ceilings



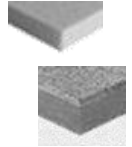
Temporary fixing of insulation of moisture barriers / drainage plates

Fastener program
X-IE 6
 Ø 60mm


T =
fastenable
insulation
thickness

X-IE 9
 Ø 90mm


X-IE 6: For use with mineral wool, EPS, XPS, PIR, PUR and soft core multilayer boards *



T (mm)	Designation	Item no.	T (mm)	Designation	Item no.
20	X-IE 6- 20	2143956	80	X-IE 6- 80	2041742
25	X-IE 6- 25	2041714	90	X-IE 6- 90	2041743
30	X-IE 6- 30	2041715	100	X-IE 6- 100	2041744
35	X-IE 6- 35	2041716	120	X-IE 6- 120	2041745
40	X-IE 6- 40	2041717	100	X-IE 6- 140	2041393
50	X-IE 6- 50	2041718	150	X-IE 6- 150	2048523
60	X-IE 6- 60	2041719	160	X-IE 6- 160	2041394
70	X-IE 6- 70	2041740	180	X-IE 6- 180	2041395
75	X-IE 6- 75	2041741	200	X-IE 6- 200	2041396

* Soft core multilayer are boards with hard top layer and mineral wool insulation core

X-IE 9: For use with soft mineral wool



T (mm)	Designation	Item no.	T (mm)	Designation	Item no.
50	X-IE 9- 50 BK	2092034	120	X-IE 9- 120 BK	2041750
60	X-IE 9- 60 BK	2041746	140	X-IE 9- 140 BK	2041751
80	X-IE 9- 80 BK	2041747	160	X-IE 9- 160 BK	2041752
90	X-IE 9- 90 BK	2041748	180	X-IE 9- 180 BK	2041753
100	X-IE 9- 100 BK	2041749	200	X-IE 9- 200 BK	2041754

Fastener program
X-IE 6: For use with stiff core multilayer boards *

T (mm)	Designation	Item no.	T (mm)	Designation	Item no.
14 - 17	X-IE 6- 20	2143956	74 - 77	X-IE 6- 80	2041742
19 - 22	X-IE 6- 25	2041714	84 - 87	X-IE 6- 90	2041743
24 - 27	X-IE 6- 30	2041715	94 - 97	X-IE 6- 100	2041744
29 - 32	X-IE 6- 35	2041716	114 - 117	X-IE 6- 120	2041745
34 - 37	X-IE 6- 40	2041717	134 - 137	X-IE 6- 140	2041393
44 - 47	X-IE 6- 50	2041718	144 - 147	X-IE 6- 150	2048523
54 - 57	X-IE 6- 60	2041719	154 - 157	X-IE 6- 160	2041394
64 - 67	X-IE 6- 70	2041740	174 - 177	X-IE 6- 180	2041395
69 - 72	X-IE 6- 75	2041741	194 - 197	X-IE 6- 200	2041396


Must pre-drill holes of \varnothing 20 mm


* Stiff core multilayer are boards with hard top layer and insulation core of EPS, XPS, PIR, PUR

Notes

Maximum allowable insulation compressive strength 500 kN/m²

Maximum insulation board thickness tolerance +/- 3mm

Mineral wool, soft mineral wool: For intermediate thicknesses, not covered, use next shorter fastener.

Example: for mineral wool insulation thickness 110 mm, use X-IE 6-100

EPS, XPS, PIR, PUR: For intermediate thicknesses, not covered, use next longer fastener.

Example: for PIR insulation thickness 110 mm, use X-IE 6-120

Multilayer: For sizes not covered with above portfolio, please contact Hilti

System recommendation

Tool

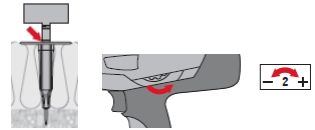
DX 460 IE, DX 460 IE XL, DX 5 IE, DX 5 IE XL

Cartridge recommendation

Steel	6.8/11M yellow or red cartridge
Concrete	6.8/11M yellow or red cartridge
Masonry	6.8/11M yellow or green cartridge

Tool energy adjustment

Energy to be adjusted by setting tests on site and checking proper fastening using the check gauge provided in every box of fasteners



Application limits

Thickness of base material

Concrete thickness	≥ 80 mm
Steel thickness	4 – 6 mm

Base material

Concrete	$f_{cc} = 15-65$ N/mm ²	(aggregate size ≤ 32 mm)
Solid sand-lime masonry	$f_b = 15-45$ N/mm ²	
Clinker brick	$f_b = 28-45$ N/mm ²	
Steel	$f_u = 360-450$ N/mm ²	(thickness 4-6mm)

Insulation

Insulation thickness	20 – 200 mm
Insulation max compressive strength	500 kN/m ²
Insulation board thickness tolerance (max)	+/- 3mm

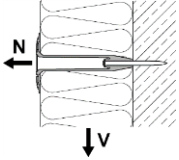
Fastener density recommendation

For number, spacing and edge distance of fasteners, please inquire at the insulation supplier. If recommendations from suppliers are not available, use minimum

Board density [kg/m ³]	Number of fasteners per m ²
≤ 75	4
> 75	5

Performance Data (Base material: concrete)
Recommended loads

Load data – governed by insulation fastener (pullout of fastener) *



	Tension N_{rec} [kN]	Shear V_{rec} [kN]	Estimated stick rate
Soft concrete	0.4	0.4	90% - 95%
Tough concrete	0.2	0.2	85% - 90%

* Load data governed by pullover of the insulation material is available in the Socotec approval

Conditions

- Visible setting failures must be replaced with a new fastener, not in the same hole
- Soft concrete up to $f_{cc} = 45 \text{ N/mm}^2$, Tough concrete up to $f_{cc} = 65 \text{ N/mm}^2$
- When base material properties are questionable, jobsite qualification is necessary

Thermal efficiency	Point thermal transmittance χ [W/K]	
Basement perimeter insulation	60 mm:	$\chi = 0.003$
	70 – 100mm:	$\chi = 0.002$
	120 – 200 mm:	$\chi = 0.001$
Curtain wall insulation	60 – 90 mm:	$\chi = 0.002$
	100 – 200mm:	$\chi = 0.001$