



X-SW DATA SHEET



Soft washer fastener



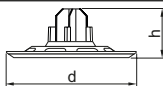
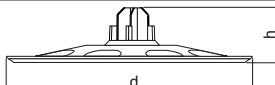
X-SW Soft washer

Product data

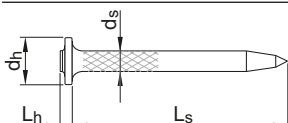
Product description


X-SW 30 MX	X-SW 30-C	<ul style="list-style-type: none"> • Bearing surface engineered for better clamping of thin membranes • Helps to prevent tearing or ripping of thin or soft membranes • Soft washer conforms to uneven surfaces • 30 mm soft washer – suitable for fastening fabric waterproofing membranes to concrete surfaces
		
X-SW 60 MX	X-SW 60-C	<ul style="list-style-type: none"> • 60 mm soft washer – provides large bearing surface for superior clamping of thin and delicate membranes
		

Dimensions for plastic elements

Technical drawing	Designation	Diameter d	Height h
	X-SW 30 MX, X-SW 30-C 37	36 mm	13.8 mm
	X-SW 60 MX, X-SW 60-C 37	68 mm	15 mm

Dimensions

Technical drawing	Designation	Shank length L_s	Head length L_h	Shank diameter d_s	Head diameter d_h
	X-C 37	37 mm	2 mm	3.5 mm	8 mm

 • Info for single nails are part the corresponding Product Data Sheets.

Material specification and material properties for plastic elements

Designation	Elements	Material	Color	Others
X-SW 30 MX	Soft washer	PE	Light grey, RAL 7035	
X-SW 60 MX	Soft washer	PE	Light grey, RAL 7035	

Material specification and material properties for steel elements

Designation	Elements	Material	Coating	Minimum coating thickness	Hardness
X-C 37	Nail	Carbon steel	Zinc	5 µm	56.5 HRC



• Info for single nails are part of the corresponding Product Data Sheets.

Approvals and certificates

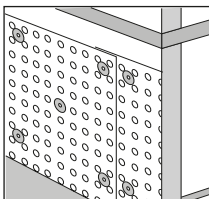
Authority	Approval / certificate no.	Date of issue	Country of issue
ITB	AT-15-7696/2016	12/2016	Poland
Rom. Ministry, ICECON	AT 016-01_420-2020	03/2020	Romania



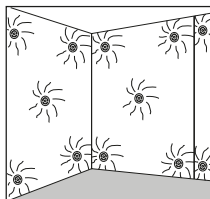
Not all information presented in this product data sheet might be subject to approval / certificate content. Please refer to approval / certificate for further information.

Applications

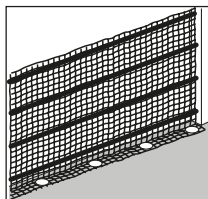
Drainage membrane



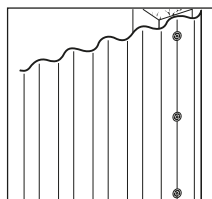
Insulation

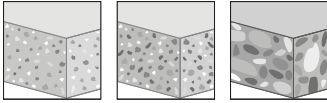


Nets, fabric and similar



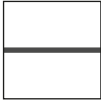
Plastic sheets



Base materials

 Soft
concrete

 Medium
concrete

 Tough
concrete

Load conditions

 Static/
quasi static

Environmental conditions


Dry indoor



- The intended use comprises fastening in dry conditions or temporary outdoor conditions.
- For more details, please refer to following technical document: Hilti Corrosion Handbook.

Fastener program
Item no. and description

Designation	Item no.	Description
X-SW 30 MX	371370	Soft washer
X-SW 60 MX	371371	
X-SW 30-C 37	40614	Soft washer with pre-mounted nail
X-SW 30-C 47	40615	
X-SW 30-C 62	40616	
X-SW 60-C 37	40643	
X-SW 60-C 47	40644	
X-SW 60-C 62	40645	

X-SW Soft washer – Fastening drainage membrane to concrete

Application recommendation

Fastened material properties

	Fastened material	Drainage membrane
	Fastened material thickness t_1	2–10 mm

Fastener positioning in fastened material

- Please consult drainage membrane supplier for data with regard to fastener edge distance, spacing and minimum number of fasteners per m^2 .

Base material properties and fastener positioning in base material

	Base material	Concrete
	Base material thickness h_{min}	80 mm
	Edge distance $c_{1,min}, c_{2,min}$	70 mm
	Fastener spacing $s_{1,min}, s_{2,min}$	100 mm

- For more details in relation to base material properties, please refer to the chapter **Fastener selection guide** in the Direct Fastening Technology Manual (DFTM).

Fastener shank length recommendation

	For standard fastening:	$L_s = h_{ET} + t_1$
--	-------------------------	----------------------

Performance data

- Temporary application, no load data required.

Stick rate estimation

	Designation	Soft/medium concrete	Tough concrete
	X-SW MX + X-X 27 MX	-	70-80 %
	X-SW MX + X-C MX	-	-
	X-SW MX + X-GN MX	-	-

- The stick rate indicates the percentage of nails that were driven correctly to carry a load.
- Stick rate can vary from the above values depending on job site conditions.

System recommendation

- For more details, please refer to the chapter **Accessories and consumables compatibility** in the Direct Fastening Technology Manual (DFTM).

System recommendation for fastening collated nails with powder-actuated tool

Designation	Powder-actuated tool			Base material		
	DX 6 MX	DX 5 MX	DX 460 MX	Soft concrete	Medium concrete	Tough concrete
X-SW 30, 60 MX + X-X 27 MX	■	■	□	■	■	■
X-SW 30, 60 MX + X-C 27 to 37 MX	■	■	□	■	■	

■ = recommended □ = feasible

System recommendation for fastening single nails with powder-actuated tool

Designation	Powder-actuated tool				Base material		
	DX 6 F8	DX 5 F8	DX 460 F8	DX 2	Soft concrete	Medium concrete	Tough concrete
X-SW 30, 60 MX + X-X 27 P8	■	■	□		■	■	■
X-SW 30, 60 MX + X-C 37 P8	■	■	□	■	■	■	□
X-SW 30-C 37, X-SW 60-C 37	■	■	□	■	■	■	

■ = recommended □ = feasible

Cartridge recommendation

Base material	Cartridge color (tool power level)	
	Tool type: DX 6 MX DX 6 F8 Cartridge type: 6.8/11 M	Tool type: DX 5 MX, DX 460 MX DX 5 F8, DX 460 F8, DX 2 Cartridge type: 6.8/11 M
Soft/medium concrete	titanium ■ (2-4)	yellow ■, red ■
Tough concrete	titanium ■ (2-6)	yellow ■, red ■



- Tool power level adjustment by setting tests on site.
- Start tool energy selection with lowest recommended tool power level.
- Correct according requirement from chapter quality assurance.

Recommendation for fastening collated nails with gas-actuated tool

Designation	Gas-actuated tool				Base material			
	GX 120-ME	GX 2	GX 3		Soft concrete	Medium concrete		
X-SW 30, 60 + X-GN 39 MX	☐				■	■		
X-SW 30, 60 + X-C 39 G2 MX		■			■	■		
X-SW 30, 60 + X-C 39 G3 MX			■		■	■		

■ = recommended ☐ = feasible



- Tool power level adjustment by setting tests on site (see chapter quality assurance).
- For more details, please refer to the chapter **Accessories and consumables compatibility** in the Direct Fastening Technology Manual (DFTM).

Quality assurance

Setting depth control

	Fastener stand-off h_{NVS}	7–11 mm
--	------------------------------	---------

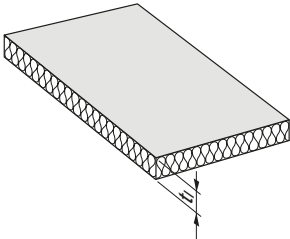


- Visible setting failures must be replaced with a new fastener, not in the same hole.
- These are abbreviated instructions which may vary by application.
- Always review/follow the instructions accompanying the product.

X-SW Soft washer - Fastening insulation to concrete

Application recommendation

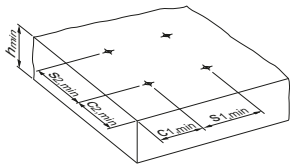
Fastened material properties



Fastened material	Insulation
Fastened material thickness t_i	2-30 mm

- Please consult insulation supplier for data with regard to fastener edge distance, spacing and minimum number of fasteners per m^2 .

Base material properties and fastener positioning in base material

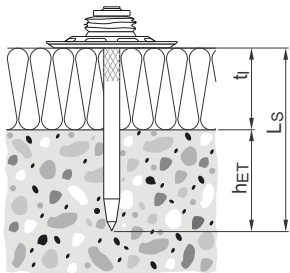


Base material	Concrete
Base material thickness h_{min}	80 mm
Edge distance $C_{1,min}$, $C_{2,min}$	70 mm
Fastener spacing $S_{1,min}$, $S_{2,min}$	100 mm

Base material properties

- For more details, please refer to the chapter **Fastener selection guide** in the Direct Fastening Technology Manual (DFTM).

Fastener shank length recommendation


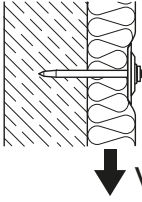



For standard fastening:

$$L_s = h_{ET} + t_i$$

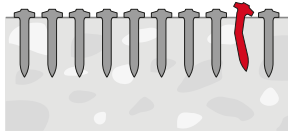
Performance data


Recommended resistance under tension and shear load

Designation	Tension load N_{rec}		Shear load V_{rec}	
	Soft/medium concrete		Soft/medium concrete	
X-SW + X-C	0.30 kN		0.30 kN	
X-SW 30-C	0.30 kN		0.30 kN	
X-SW 60-C	0.30 kN		0.30 kN	

-  • Redundancy of fastening points is required.
- Minimum number of fastening points for safety relevant fastenings: ≥ 5 .
- Predominantly static loading.
- Design loads valid for nail pull-out strength.
- Fastened material has to be considered separately.
- Valid for concrete C 30/37.

Stick rate estimation

	Designation	Soft/medium concrete	Tough concrete
	X-SW + X-C	-	-
X-SW 30-C	-	-	
X-SW 60-C	-	-	

-  • The stick rate indicates the percentage of nails that were driven correctly to carry a load.
- Stick rate can vary from the above values depending on job site conditions.

System recommendation



- For more details, please refer to the chapter **Accessories and consumables compatibility** in the Direct Fastening Technology Manual (DFTM).

System recommendation for fastening collated nails with powder-actuated tool

Designation	Powder-actuated tool				Base material			
	DX 6 MX	DX 5 MX	DX 460 MX		Soft concrete	Medium concrete		
X-SW 30 + X-C 37 MX	■	■	□		■	■		
X-SW 60 + X-C 37 MX	■	■	□		■	■		

■ = recommended □ = feasible

System recommendation for fastening single nails with powder-actuated tools

Designation	Powder-actuated tool				Base material			
	DX 6 F8	DX 5 F8	DX 460 F8	DX 2	Soft concrete	Medium concrete		
X-SW 30 MX + X-C 37 F8	■	■	□	□	■	■		
X-SW 60 MX + X-C 37 F8	■	■	□	□	■	■		
X-SW 30-C 37	■	■	□	□	■	■		
X-SW 30-C 47	■	■	□	□	■	■		
X-SW 30-C 62	■	■	□	□	■	■		
X-SW 60-C 37	■	■	□	□	■	■		
X-SW 60-C 47	■	■	□	□	■	■		
X-SW 60-C 62	■	■	□	□	■	■		

■ = recommended □ = feasible

Cartridge recommendation

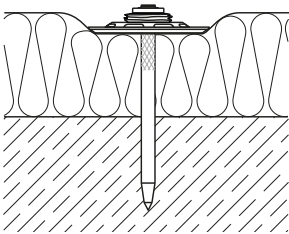
Base material	Cartridge color (tool power level)	
	Tool type: DX 6 MX DX 6 F8	Tool type: DX 5 MX, DX 460 MX DX 5 F8, DX 460 F8, DX 2
	Cartridge type: 6.8/11 M	Cartridge type: 6.8/11 M
Soft/medium concrete	titanium ■ (2-6)	yellow ■, red ■
Tough concrete	titanium ■ (2-6)	yellow ■, red ■



- Tool power level adjustment by setting tests on site.
- Start tool energy selection with lowest recommended tool power level.
- Correct according requirement from chapter quality assurance.

Quality assurance

Setting depth control



- Visible setting failures must be replaced with a new fastener, not in the same hole.
- These are abbreviated instructions which may vary by application.
- Always review /follow the instructions accompanying the product.