



## S-MD03Z, S-MD23Z, S-MD2310Y carbon steel self-drilling screw for sheet overlaps

### Product data

#### General information

##### Material specification:

Carbon steel: case-hardened

S-MD03Z: Zinc coating  $\geq 8 \mu\text{m}$  galvanized

S-MD23Z: Zinc coating  $\geq 8 \mu\text{m}$  galvanized, with pressed-on flange.

S-MD2310Y: Zinc coating  $\geq 8 \mu\text{m}$  galvanized and yellow chromated, case-hardened, with pressed-on flange.

S-MD03Z 5.5x25 +	S-NSD8
S-MD23Z 5.5x22 +	Item no. 308901
S-MD2310Y 6.3x22M	
Stand-up tool with screwdriver	Hilti SDT 30, ST 1800
Torque settings:	$\varnothing 4.8 = 3-5$ $\varnothing 5.5 = 6-8$

##### Fastening tools:

Screwdriver: Hilti ST 1800

Torque settings:  
 $\varnothing 4.2 = 1-3$   
 $\varnothing 4.8 = 3-5$   
 $\varnothing 5.5 = 6-8$   
 $\varnothing 6.3 = 8-10$

Drive without depth gauge.  
 Cut-out controlled by torque clutch  
 Bit holder S-BH 435DT: Item no. 304415  
 Nut set driver:  
 S-MD03Z S-NS D8  
 Item no. 304413  
 S-MD23Z + S-NSD 10 DT  
 S-MD2310Y 6.3x22M Item no. 284485

Drive without depth gauge.

Cut-out controlled by torque clutch

Nut set driver:

S-MD03Z 4.2x16 + S-NSD7  
 S-MD03Z 4.8xL Item no. 308900

Approvals:



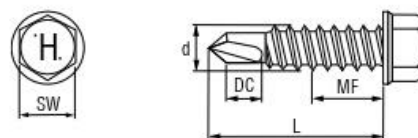
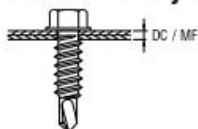
#### Dimensions

##### Uses:

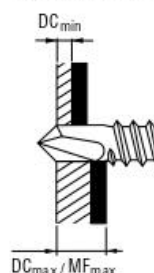
Overlap joints in load-bearing (decking) sheets not exposed to the weather.

Fastening liner trays, web joints.

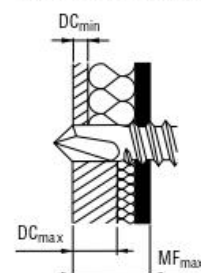
##### Sheet metal joints



##### without insulation



##### with insulation

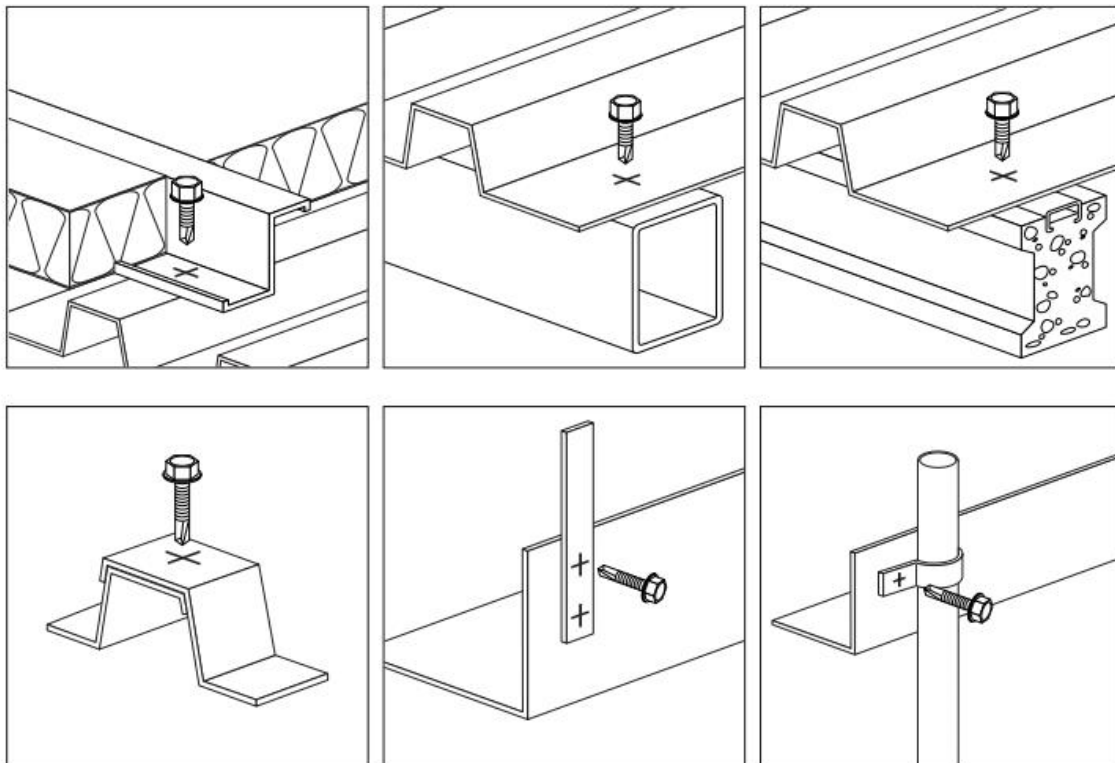


S-MD03Z 4.2

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### Applications

#### Examples





**Load data**

**Design data**

**Drilling capacity  $\Sigma t$**

max. 3.5 mm

**Tightening torque (recommendation)**

Screw in end-stop oriented

Total thickness  $\Sigma t$ : up to 2.65 mm up to 6.00 mm

Tightening torque: 2 Nm 4 Nm

<b>Component II</b> steel with $t_{II}$ [mm]			
S235J according to DIN EN 10025-2			
S280GD or S320GD (DIN EN 10326)			
<b>1.25</b>	<b>1.50</b>	<b>2.00</b>	

<b>Component I</b>				
steel with $t_I$ [mm]				
S280GD or S320GD				
(DIN EN 10326)				
	<b>Shear force <math>V_{R,k}</math> [kN]</b>			
<b>0.63</b>	2.20	2.40	2.40	
<b>0.75</b>	2.40	2.70	3.20	
<b>0.88</b>	2.60	2.90	3.30	
<b>1.00</b>	2.70	3.20	3.70	
<b>1.13</b>	2.70	3.20	3.70	
<b>1.25</b>	2.70	3.20	3.70	
	<b>Tension force <math>N_{R,k}</math> [kN]</b>			
<b>0.63</b>	1.00	1.60	2.00	
<b>0.75</b>	1.00	1.60	2.30	
<b>0.88</b>	1.00	1.60	2.60	
<b>1.00</b>	1.00	1.60	2.60	
<b>1.13</b>	1.00	1.60	2.60	
<b>1.25</b>	1.00	1.60	2.60	

S-MD03Z 4.2

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**Safety factors according to EN 1993-1-3 and CUAP 06.02/07**

	Tension	Shear
<b>Partial safety concept</b>		
Partial safety factor	$\gamma_M = 1.33$	$\gamma_M = 1.33$
Influence of cyclic loading	$\alpha_{cyclic} = 1.0$	- / -
Design load	$N_{Rd} = 1.0 \cdot N_{Rk} / 1.33$	$V_{Rd} = V_{Rk} / 1.33$
<b>Global safety concept</b>		
Global safety factor *	$\gamma_{GLOB} = 2.0$	$\gamma_{GLOB} = 2.0$
Recommended load	$N_{rec} = 1.0 \cdot N_{Rk} / 2.0$	$V_{rec} = V_{Rk} / 2.0$

\* Note: The global safety factor of 2.0 includes a partial safety factor of  $\gamma_F = 1.5$  for wind load. For other loads safety factors should be applied in accordance with the appropriate standards.

**Screw selection**

**Screw program**

Drilling thickness DC mm	Fastening thickness MF max. mm	Dimensions (dxL) mm	Head size AF	Package contents	Ordering designation	Item no.
2.1-3.50	7	4.2 x 16	7	1000	S-MD03Z 4.2 x 16	<b>219013</b>



**Load data**

**Design data**

**Drilling capacity  $\Sigma t$**

max. 4,5 mm

**Tightening torque (recommendation)**

Screw in end-stop oriented

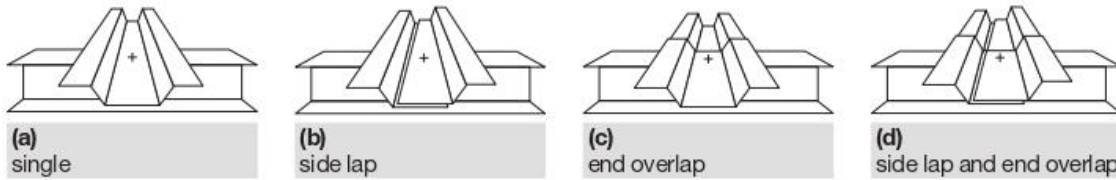
Total thickness $\Sigma t$ :	up to 2.15 mm	up to 4.50 mm
Tightening torque:	2 Nm	6 Nm

<b>Component II</b> steel with $t_{II}$ [mm] S235J according to DIN EN 10025-2 S280GD or S320GD (DIN EN 10326)				
	<b>1.50</b>	<b>2.00</b>	<b>2.50</b>	<b>3-00</b>

<b>Component I</b> steel with $t_I$ [mm] S280GD or S320GD (DIN EN 10326)				
	<b>Shear force <math>V_{R,k}</math> [kN]</b>			
<b>0.63</b>	2.30	2.70 ac	2.70 ac	2.70 ac
<b>0.75</b>	2.30	3.00	3.00	3.80 ac
<b>0.88</b>	2.60	3.50	3.50	4.90
<b>1.00</b>	2.90	4.00	4.00	6.00
<b>1.13</b>	3.50	4.60	4.60	6.60
<b>1.25</b>	4.10	5.20	5.20	7.10
<b>1.50</b>	5.20	6.00	6.00	7.30
<b>1.75</b>	5.20	6.00	6.00	–
<b>2.00</b>	5,20	6.00	6.00	–
	<b>Tension force <math>N_{R,k}</math> [kN]</b>			
<b>0.63</b>	1.60	1.60	1.60 ac	1.60 ac
<b>0.75</b>	1.60	2.20	2.20	2.20 ac
<b>0.88</b>	1.60	2.40	2.40	3.00
<b>1.00</b>	1.60	2.40	2.40	3.90
<b>1.13</b>	1.60	2.40	2.40	4.10
<b>1.25</b>	1.60	2.40	2.40	4.10
<b>1.50</b>	1.60	2.40	2.40	4.10
<b>1.75</b>	1.60	2.40	2.40	–
<b>2.00</b>	1.60	2.40	2.40	–

S-MD03Z 4.8

**HILTI**



**Safety factors according to EN 1993-1-3 and CUAP 06.02/07**

	Tension	Shear
<b>Partial safety concept</b>		
Partial safety factor	$\gamma_M = 1.33$	$\gamma_M = 1.33$
Influence of cyclic loading	$\alpha_{cyclic} = 1.0$	- / -
Design load	$N_{Rd} = 1.0 \cdot N_{Rk} / 1.33$	$V_{Rd} = V_{Rk} / 1.33$
<b>Global safety concept</b>		
Global safety factor *	$\gamma_{GLOB} = 2.0$	$\gamma_{GLOB} = 2.0$
Recommended load	$N_{rec} = 1.0 \cdot N_{Rk} / 2.0$	$V_{rec} = V_{Rk} / 2.0$

\* Note: The global safety factor of 2.0 includes a partial safety factor of  $\gamma_F = 1.5$  for wind load. For other loads safety factors should be applied in accordance with the appropriate standards.

**Screw selection**

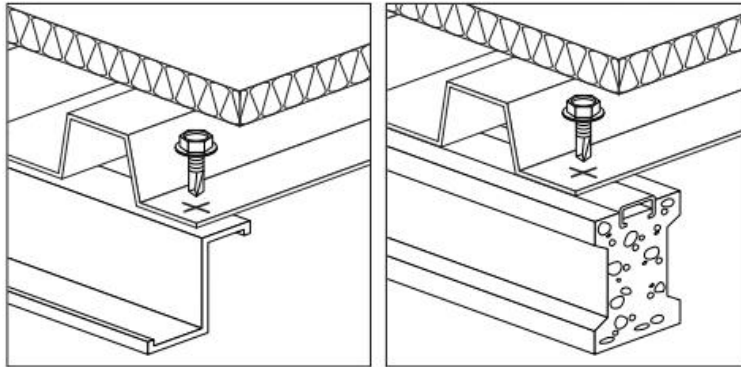
**Screw program**

Drilling thickness DC mm	Fastening thickness MF max. mm	Dimensions (dxL) mm	Head size AF	Package contents	Ordering designation	Item no.
2.1-4.50	7	4.8x16	8	500	S-MD03Z 4.8x16	219015
2.1-4.50	10	4.8x19	8	500	S-MD03Z 4.8x19	219016

**HILTI** S-MD03Z 5.5/S-MD23Z 5.5

**Applications**

Examples



**Load data**

**Design data**

**Drilling capacity  $\Sigma t$**

max. 6.0 mm

**Tightening torque (recommendation)**

Screw in end-stop oriented

Tightening torque: 7 Nm

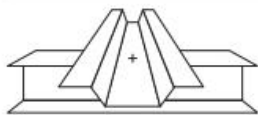
<b>Component II</b> steel with $t_{II}$ [mm]					
S235J according to DIN EN 10025-2					
S280GD, S320GD or S350GD (DIN EN 10326)					
	2.00	2.50	3.00	4.00	5.00

<b>Component I</b>						
steel with $t_I$ [mm]						
S280GD, S320GD or S350GD						
(DIN EN 10326)						
	<b>Shear force <math>V_{R,k}</math> [kN]</b>					
<b>0.63</b>	2.60 ac	2.60 ac	2.60 ac	2.60 ac	2.60 ac	
<b>0.75</b>	3.70 ac	3.70 ac	3.70 ac	3.70 ac	3.70 ac	
<b>0.88</b>	4.50	4.50	5.00 ac	5.00 ac	5.00 ac	
<b>1.00</b>	4.50	4.50	6.50 ac	6.50 ac	6.50 ac	
<b>1.13</b>	4.90	4.90	7.00	7.90 a		–
<b>1.25</b>	5.30	5.30	7.40	9.30		–
<b>1.50</b>	6.20	6.20	8.30	9.50		–
<b>1.75</b>	6.20	6.20	8.30	9.50		–
<b>2.00</b>	7.80	7.80	9.40	9.50		–

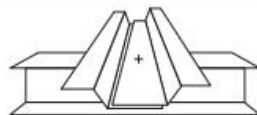
S-MD03Z 5.5/S-MD23Z 5.5

**HILTI**

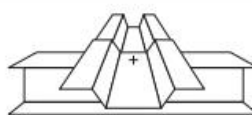
	Tension force $N_{R,k}$ [kN]				
<b>0.63</b>	1.70 ac	1.70 ac	1.70 ac	1.70 ac	1.70 ac
<b>0.75</b>	2.20 ac	2.20 ac	2.20 ac	2.20 ac	2.20 ac
<b>0.88</b>	2.90	2.90	2.90 ac	2.90 ac	2.90 ac
<b>1.00</b>	2.90	3.50	3.50 ac	3.50 a	3.50 a
<b>1.13</b>	2.90	4.30	4.30	4.30	–
<b>1.25</b>	2.90	4.35	5.10	5.10	–
<b>1.50</b>	2.90	4.35	5.61	6.90	–
<b>1.75</b>	2.90	4.35	5.61	6.90	–
<b>2.00</b>	2.90	4.35	5.61	6.90	–



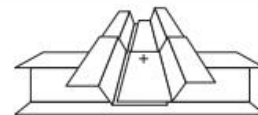
(a)  
single



(b)  
side lap



(c)  
end overlap



(d)  
side lap and end overlap

#### Safety factors according to EN 1993-1-3 and CUAP 06.02/07

	Tension	Shear
<b>Partial safety concept</b>		
Partial safety factor	$\gamma_M = 1.33$	$\gamma_M = 1.33$
Influence of cyclic loading	$\alpha_{cyclic} = 1.0$	– / –
Design load	$N_{Rd} = 1.0 \cdot N_{Rk} / 1.33$	$V_{Rd} = V_{Rk} / 1.33$
<b>Global safety concept</b>		
Global safety factor *	$\gamma_{GLOB} = 2.0$	$\gamma_{GLOB} = 2.0$
Recommended load	$N_{rec} = 1.0 \cdot N_{Rk} / 2.0$	$V_{rec} = V_{Rk} / 2.0$

\* Note: The global safety factor of 2.0 includes a partial safety factor of  $\gamma_F = 1.5$  for wind load. For other loads safety factors should be applied in accordance with the appropriate standards.

#### Screw selection

##### Screw program

Drilling thickness DC mm	Fastening thickness MF max. mm	Dimensions (dxL) mm	Head size AF	Package contents	Ordering designation	Item no.
<b>2.6–6.0</b>	6	5.5x19	8	500	S-MD03Z 5.5x19	<b>413415</b>
<b>2.6–6.0</b>	9	5.5x22	8	500	S-MD03Z 5.5x22	<b>413416</b>
<b>2.6–6.0</b>	12	5.5x25	8	500	S-MD03Z 5.5x25 *)	<b>413417</b>
<b>2.6–6.0</b>	19	5.5x32	8	500	S-MD03Z 5.5x32	<b>413419</b>
<b>2.6–6.0</b>	25	5.5x38	8	500	S-MD03Z 5.5x38	<b>413420</b>
<b>2.6–6.0</b>	37	5.5x50	8	500	S-MD03Z 5.5x50	<b>414293</b>
<b>2.6–6.0</b>	10	5.5x22	8	500	S-MD23Z 5.5x22	<b>413427</b>
<b>2.6–6.0</b>	10	5.5x22	8	500	S-MD23Z 5.5x22	<b>413428</b>

\*) Screw for sheet overlaps with reduced drill point diameter





**Load data**

**Design data**

**Drilling capacity  $\Sigma t$**   
 max. 6.0 mm

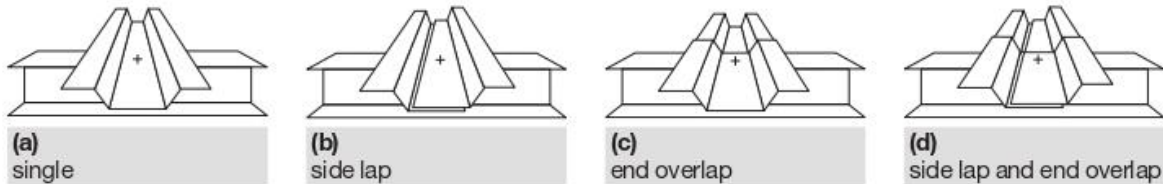
**Tightening torque** (recommendation)  
 Screw in end-stop oriented

Tightening torque:	7 Nm
<b>Component II</b> steel with $t_{II}$ [mm] S235, S272 or S355 according to DIN EN 10025-2 S280GD, S320GD or S350GD (DIN EN 10326)	
	<b>2.00      2.50      3.00      4.00      5.00</b>

<b>Component I</b> steel with $t_I$ [mm] S280GD, S320GD or S350GD (DIN EN 10326)					
	<b>Shear force <math>V_{R,k}</math> [kN]</b>				
<b>0.63</b>	3.10 ac	3.10 ac	3.10 abcd	3.10 abcd	3.10 abcd
<b>0.75</b>	4.20 ac	4.20 ac	4.20 abcd	4.20 abcd	4.20 abcd
<b>0.88</b>	5.40 ac	5.40 ac	5.40 ac	5.40 abcd	5.40 abcd
<b>1.00</b>	5.60	5.60	6.60 ac	6.60 ac	6.60 ac
<b>1.13</b>	5.70	5.70	7.80	8.00 ac	–
<b>1.25</b>	5.90	5.90	9.00	9.56 ac	–
<b>1.50</b>	7.00	7.00	9.70	10.00	–
<b>1.75</b>	7.00	7.00	9.70	10.00	–
<b>2.00</b>	7.00	7.00	9.70	10.00	–
	<b>Tension force <math>N_{R,k}</math> [kN]</b>				
<b>0.63</b>	1.90 ac	1.90 ac	1.90 abcd	1.90 abcd	1.90 abcd
<b>0.75</b>	2.60 ac	2.60 ac	2.60 abcd	2.60 abcd	2.60 abcd
<b>0.88</b>	3.21 ac	3.40 ac	3.40 ac	3.40 abcd	3.40 abcd
<b>1.00</b>	3.21	4.30	4.30 ac	4.30 ac	4.30 ac
<b>1.13</b>	3.21	4.62	5.30	5.30 ac	–
<b>1.25</b>	3.21	4.62	6.03	6.40 ac	–
<b>1.50</b>	3.21	4.62	6.03	6.90	–
<b>1.75</b>	3.21	4.62	6.03	6.90	–
<b>2.00</b>	3.21	4.62	6.03	7.20	–

S-MD03Z 6.3 / S-MD23Z 6.3 /  
 S-MD2310Y 6.3

**HILTI**



**Safety factors according to EN 1993-1-3 and CUAP 06.02/07**

	Tension	Shear
<b>Partial safety concept</b>		
Partial safety factor	$\gamma_M = 1.33$	$\gamma_M = 1.33$
Influence of cyclic loading	$\alpha_{cyclic} = 1.0$	- / -
Design load	$N_{Rd} = 1.0 \cdot N_{Rk} / 1.33$	$V_{Rd} = V_{Rk} / 1.33$
<b>Global safety concept</b>		
Global safety factor *	$\gamma_{GLOB} = 2.0$	$\gamma_{GLOB} = 2.0$
Recommended load	$N_{rec} = 1.0 \cdot N_{Rk} / 2.0$	$V_{rec} = V_{Rk} / 2.0$

\* Note: The global safety factor of 2.0 includes a partial safety factor of  $\gamma_F = 1.5$  for wind load. For other loads safety factors should be applied in accordance with the appropriate standards.

**Screw selection**

**Screw program**

Drilling thickness DC mm	Fastening thickness MF max. mm	Dimensions (dxL) mm	Head size AF	Package contents	Ordering designation	Item no.
2.6-6.00	6	6.3x19	3/8"	500	S-MD03Z 6.3x19	413421
2.6-6.00	9	6.3x22	3/8"	500	S-MD03Z 6.3x22	413422
2.6-6.00	12	6.3x25	3/8"	500	S-MD03Z 6.3x25	413423
2.6-6.00	19	6.3x32	3/8"	500	S-MD03Z 6.3x32	413424
2.6-6.00	25	6.3x38	3/8"	500	S-MD03Z 6.3x38	414295
2.6-6.00	37	6.3x50	3/8"	250	S-MD03Z 6.3x50	413425
2.6-6.00	57	6.3x70	3/8"	250	S-MD03Z 6.3x70	413426
2.6-6.00	9	6.3x22	10	200	S-MD23 Z 6.3x22M	413431
2.6-6.00	6	6.3x19	10	500	S-MD23Z 6.3x19	413429
2.6-6.00	9	6.3x22	10	500	S-MD23Z 6.3x22	413430
2.6-6.00	12	6.3x25	10	500	S-MD23Z 6.3x25	413432
2.6-6.00	37	6.3x55	10	250	S-MD23Z 6.3x50	413433