

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-15/0386**  
**of 13 January 2017**

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

JORDAHL Mounting Channels JM

Product family  
to which the construction product belongs

Hot-rolled mounting channel

Manufacturer

JORDAHL GmbH  
Nobelstraße 51  
12057 Berlin  
DEUTSCHLAND

Manufacturing plant

JORDAHL GmbH  
Industriestraße 5  
14959 Trebbin  
GERMANY

This European Technical Assessment  
contains

14 pages including 9 annexes which form an integral part  
of this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

European Assessment Document (EAD)  
330667-0602, "Hot-rolled mounting channel"

**European Technical Assessment**

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**Page 2 of 14 | 13 January 2017**

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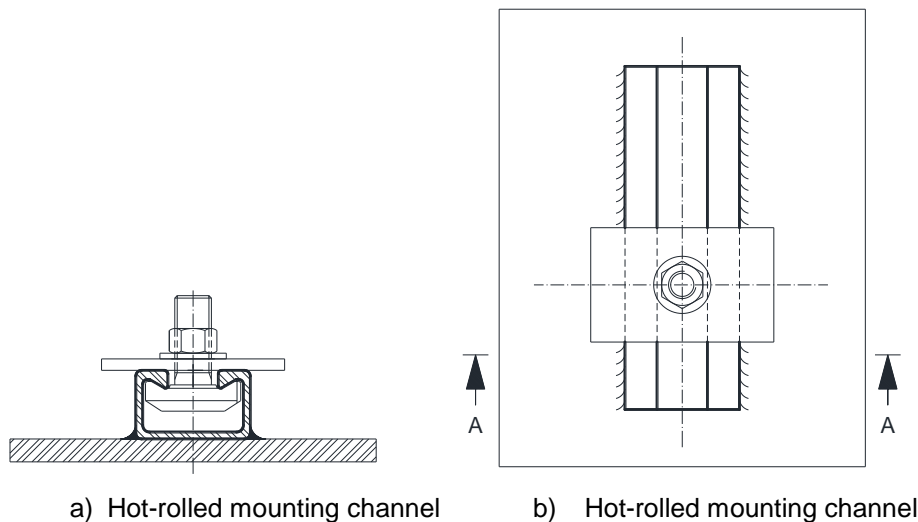
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## Specific part

### 1 Technical description of the product

The construction product is a hot-rolled mounting channel consisting of a channel profile with two lips produced of carbon steel or stainless steel, in combination with channel bolts. This product has a smooth surface of the channel lips and also a smooth surface on the underside of the channel bolt head in contact with the channel. The hot-rolled mounting channels are welded on a steel plate. A fixture shall be connected to the hot-rolled mounting channel by T-bolts with appropriate hexagon nuts and washers. Figure 1 shows an example for a hot rolled mounting channel.



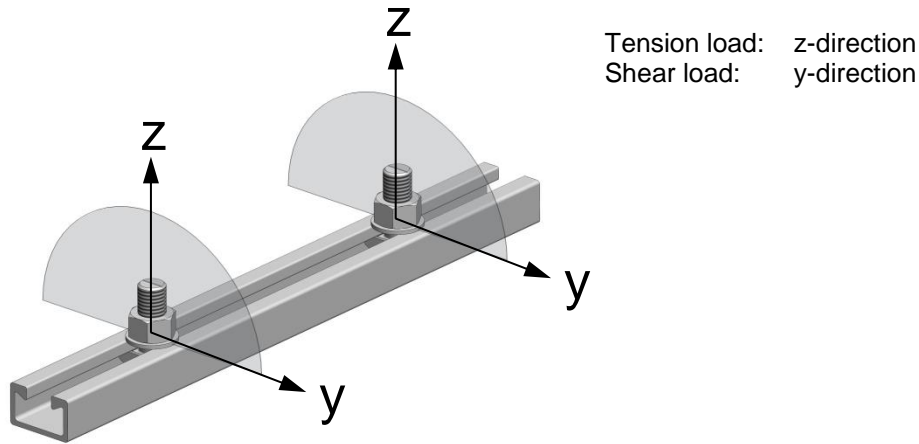
**Figure 1: Example of a hot-rolled mounting channels with corresponding channel bolt**

The components and the system setup of the product are given in Annex (1-9).

### 2 Specification of the intended use in accordance with the applicable EAD 330667-0602 – Hot-rolled mounting channel

The hot-rolled mounting channels may be used for the installation and the connection of several construction systems. They can be welded to steel constructions or can be connected to frame constructions. The rectangular corners of the channel have very good properties for welding processes. The hot-rolled mounting channel may be used to transmit tensile loads, shear loads perpendicular to the longitudinal channel axis or a combination of these loads (see Fig. 2).

The shear loads may be applied with or without lever arm.



**Figure 2: Admissible load directions covered by this EAD: tension loads and shear load perpendicular to the longitudinal axis**

The performances given in Section 3 are only valid if the hot-rolled mounting channel is used in compliance with the specifications and conditions given in Annex (1-9).

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the hot-rolled mounting channel of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

### 3 Performance of the product and references to the methods used for its assessment

#### 3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance for tension under static and quasi-static loading	See Annex 4
Characteristic resistance for shear under static and quasi-static loading	See Annex 5
Installation parameters	See Annex 9
Geometric values	See Annex 1 - 3
Durability	See Annex 1
Characteristic resistance for fatigue tensile loading	See Annex 6

#### 3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	No performance assessed

#### 3.3 Hygiene, health and the environment (BWR 3)

Not relevant

**3.4 Safety and accessibility in use (BWR 4)**

Not relevant

**3.5 Protection against noise (BWR 5)**

Not relevant

**3.6 Energy economy and heat retention (BWR 6)**

Not relevant

**3.7 Sustainable use of natural resources (BWR 7)**

Not relevant

**4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base**

For the products covered by this EAD the applicable European legal act is: Decision 1998/214/EC

The system is: **2+**

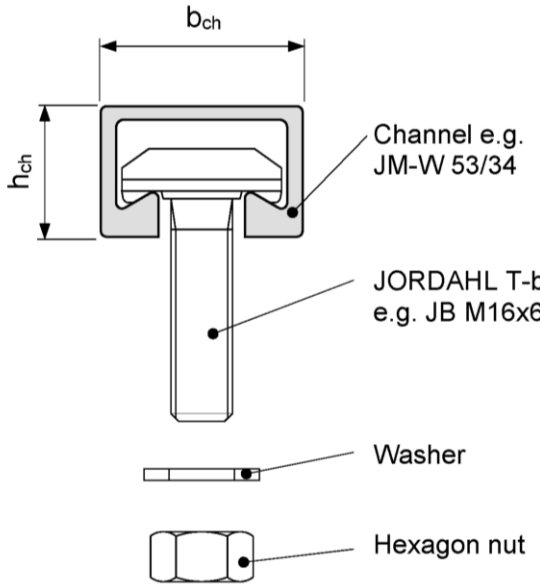
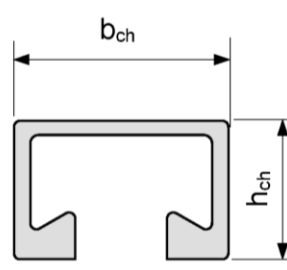
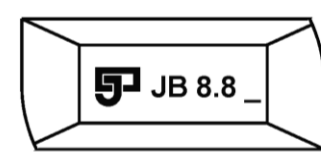
**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 13 January 2017 by Deutsches Institut für Bautechnik

Uwe Bender  
Head of Department

*beglaubigt:*  
Hahn

<div><p>Mounting channel hot rolled profile</p><p>Channel e.g. JM-W 53/34</p><p>JORDAHL T-bolt e.g. JB M16x60</p><p>Washer</p><p>Hexagon nut</p><p><b>Legend:</b> <math>h_{ch}</math> Channel height <math>b_{ch}</math> Width of the channel</p></div>	<div><p>Product Identification</p><p>W = hot rolled</p><p>Table 1: Profile sizes</p><table><tr><th>Mounting channel</th><th><math>b_{ch}</math> [mm]</th><th><math>h_{ch}</math> [mm]</th></tr><tr><td>W 40/22</td><td>39.50</td><td>23.00</td></tr><tr><td>W 50/30</td><td>49.00</td><td>30.00</td></tr><tr><td>W 53/34</td><td>52.50</td><td>33.50</td></tr><tr><td>W 55/42</td><td>54.50</td><td>42.00</td></tr><tr><td>W 72/48</td><td>72.00</td><td>48.00</td></tr></table><p><b>Marking of the JORDAHL – T-bolts: e.g. JB 8.8</b></p><p>J = Identifying mark of the manufacturer B = T-bolts type 8.8 = Material/Strength grade</p></div>	Mounting channel	$b_{ch}$ [mm]	$h_{ch}$ [mm]	W 40/22	39.50	23.00	W 50/30	49.00	30.00	W 53/34	52.50	33.50	W 55/42	54.50	42.00	W 72/48	72.00	48.00
Mounting channel	$b_{ch}$ [mm]	$h_{ch}$ [mm]																	
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W 72/48	72.00	48.00																	
<div><p><b>Materials channels and bolts</b></p><p>Table 2: Materials and intended use</p><table><tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr><tr><td><b>Channel profile</b></td><td>Steel 1.0038; 1.0044 EN 10025 hot-dip galv. <math>\geq 50\mu\text{m}</math></td><td>Steel 1.0038; 1.0044 EN 10025 hot-dip galv. <math>\geq 50\mu\text{m}</math></td><td>Stainless steel 1.4401/1.4404/1.4571; 1.4362 EN 10088</td><td>Stainless steel 1.4462 / 1.4529/1.4547 EN 10088</td></tr><tr><td><b>Jordahl T-bolts</b></td><td>Steel, strength grade 4.6/8.8 in dependence on EN ISO 898-1 electroplated <math>\geq 5\mu\text{m}</math></td><td>Steel, strength grade 4.6/8.8 in dependence on EN ISO 898-1 hot-dip galv. <math>\geq 40\mu\text{m}</math></td><td>Stainless steel 1.4401/ 1.4404/ 1.4571; 1.4362 EN ISO 3506-1</td><td>Stainless steel 1.4462, 1.4529/ 1.4547 EN ISO 3506-1</td></tr></table><p>Use conditions</p><ul style="list-style-type: none"><li>Structures subject to dry internal conditions (e.g. accommodations, bureaus, schools, hospitals, shops, exceptional internal conditions with usual humidity) (acc. to Table 2 column 2)</li><li>Structures subject to internal conditions with usual humidity (e.g. kitchen, bath and laundry in residential buildings, exceptional permanent damp conditions and application under water) (acc. to Table 2 column 3)</li><li>The stainless steel channels, T-bolts, washers and nuts may be used in structures subject to external atmospheric conditions, if no particular aggressive conditions (e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with chemical pollution e.g. desulphurization plants or road tunnels where de-icing materials are used) exist (acc. to Table 2 column 4 – 5)</li></ul></div>		1	2	3	4	5	<b>Channel profile</b>	Steel 1.0038; 1.0044 EN 10025 hot-dip galv. $\geq 50\mu\text{m}$	Steel 1.0038; 1.0044 EN 10025 hot-dip galv. $\geq 50\mu\text{m}$	Stainless steel 1.4401/1.4404/1.4571; 1.4362 EN 10088	Stainless steel 1.4462 / 1.4529/1.4547 EN 10088	<b>Jordahl T-bolts</b>	Steel, strength grade 4.6/8.8 in dependence on EN ISO 898-1 electroplated $\geq 5\mu\text{m}$	Steel, strength grade 4.6/8.8 in dependence on EN ISO 898-1 hot-dip galv. $\geq 40\mu\text{m}$	Stainless steel 1.4401/ 1.4404/ 1.4571; 1.4362 EN ISO 3506-1	Stainless steel 1.4462, 1.4529/ 1.4547 EN ISO 3506-1			
1	2	3	4	5															
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<div><p><b>JORDAHL Mounting Channel</b></p><p>Product and material</p></div>		<div><p>Annex 1</p></div>																	

### Hot rolled profile

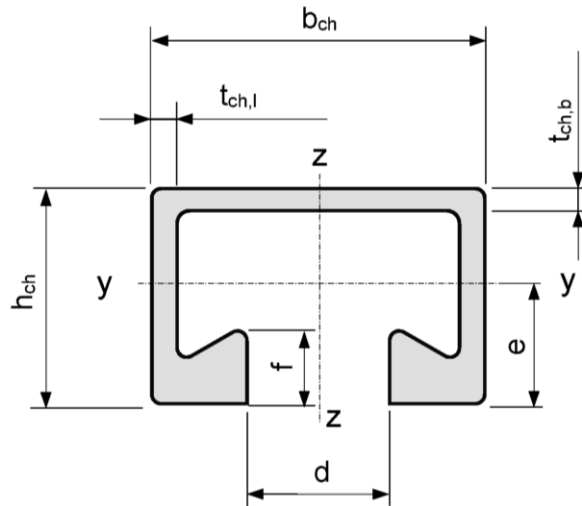


Table 3: Geometrical profile properties

Mounting channel	Dimensions						Material	$I_y$	$I_z$	$e$	$W_z$	$W_y$	$W_{pl}$
	$b_{ch}$	$h_{ch}$	$t_{ch,b}$	$t_{ch,l}$	$d$	$f$							
	[mm]							[mm <sup>4</sup> ]	[mm <sup>4</sup> ]	[mm]	[mm <sup>3</sup> ]	[mm <sup>3</sup> ]	[mm <sup>3</sup> ]
W 40/22	39.50	23.00	2.60	2.30	18.00	6.00	Steel	19939	58053	12.43	2939	1604	2180
W 50/30	49.00	30.00	3.20	2.65	22.50	7.85		52695	138121	16.26	5638	3241	4395
W 53/34	52.50	33.50	4.10	4.00	22.50	10.50		93262	236986	17.44	9028	5348	7177
W 55/42	54.50	42.00	5.00	5.00	26.00	12.90		187464	362726	22.08	13311	8490	11721
W 72/48	72.00	48.50	4.50	5.00	33.00	15.50		349721	832707	24.01	23131	14565	18282
W 40/22	39.50	23.00	2.60	2.30	18.00	6.00	Stainless steel	19939	58053	12.43	2939	1604	2180
W 50/30	49.00	30.00	3.20	2.65	22.50	7.85		52695	138121	16.26	5638	3241	4395
W 53/34	52.50	33.50	4.10	4.00	22.50	10.50		93262	236986	17.44	9028	5348	7177
W 72/48	72.00	48.50	4.50	5.00	33.00	15.50		349721	832707	24.01	23131	14565	18282

JORDAHL Mounting Channel

Geometrical profile properties

Annex 2

Table 4: Minimum spacing and setting torque of JORDAHL – T-bolts

Mounting channel	T-bolts Ø	Setting Torque $T_{inst}^{2)}$			
		Steel-Steel contact			
		4.6	8.8	A4-50; HC-50 <sup>1)</sup>	A4-70; HC-70; F4-70 L4-70 <sup>1)</sup>
	[mm]	[Nm]			
W 40/22	10	15	40	13	30
	12	25	70	24	50
	16	65	180	60	130
W 50/30	10	15	40	13	30
	12	25	70	24	50
	16	65	180	60	130
	20	130	360	115	250
W 53/34	10	15	40	13	30
	12	25	70	24	50
	16	65	180	60	130
	20	130	360	115	250
W 55/42	10	15	40	13	30
	12	25	70	24	50
	16	65	180	60	130
	20	130	360	115	250
	24	230	620	200	420
W 72/48	20	130	360	115	250
	24	230	620	200	420
	27	340	900	300	630
	30	460	1200	400	850

<sup>1)</sup> Materials according to Annex 9

<sup>2)</sup>  $T_{inst}$  must not be exceeded

Table 6: Strength grade

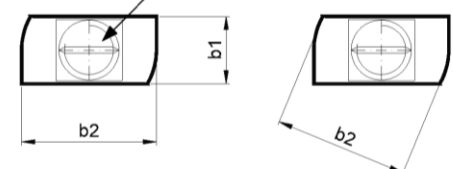
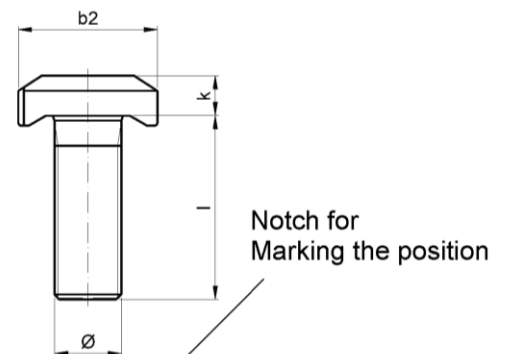
T-bolts		Steel <sup>1)</sup>		Stainless Steel <sup>1)</sup>	
Strength grade		4.6	8.8	A4-50 HC-50	A4-70 HC-70 F4-70 L4-70
f <sub>uk</sub>	[N/mm²]	400	800	500	700
f <sub>yk</sub>		240	640	210	450
Finish		z.p., h.d.g.		—	

<sup>1)</sup> Materials according to Annex 9

Table 5: Dimensions of the JORDAHL – T-bolts

Mounting channel	T- bolts type	T-bolts dimensions				Length l
		b <sub>1</sub>	b <sub>2</sub>	k	Ø	
		[mm]				[mm]
W 40/22	JC	14.0	32.0	8.0	10	20-150
				8.0	12	20-250
		17.0		11.0	16	30-300
W 50/30 W 53/34	JB	17.0	41.5	9.0	10	25-100
				10.0	12	30-300
				12.5	16	30-300
		21.0		14.5	20	30-300
W 55/42	JB	17.0	41.5	9.0	10	25-100
				10.0	12	30-300
				12.5	16	30-300
		21.0		14.5	20	30-300
	JE	24.5		18.5	24	40-300
W 72/48	JA	25.0	58.0	14.0	20	50-300
				20.0	24	50-250
				21.6	27	50-250
		31.0		21.6	30	30-300

Hook-head  
T-bolt



alternative head shape

Marking of the T-bolts head acc. to Annex 1

JORDAHL Mounting Channel

JORDAHL – T-bolts

Annex 3

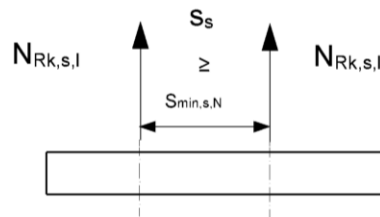


Table 7: Characteristic values – Steel failure channel

Mounting channel			W 40/22	W 50/30	W 53/34	W 55/42	W 72/48
<b>Steel failure, Local flexure of channel lips for <math>s_s \geq s_{min,s,N}</math></b>							
Spacing of T-bolts for $N_{Rk,s,l}$	$s_{min,s,N}$	[mm]	150	200	200	250	300
Characteristic resistance	$N_{Rk,s,l}^{2)}$	[kN]	21	37	66	98	119
Partial safety factor	$\gamma_{Ms,l}^{1)}$		1.8				

<sup>1)</sup> In absence of other national regulations

<sup>2)</sup> For steel and stainless steel



Assumption of system

Table 8: Characteristic values for tension loads – Steel failure JORDAHL – T- bolts

T - bolts Ø				M 10	M 12	M 16	M 20	M 24	M 27	M 30
				Steel failure						
Characteristic resistance	$N_{Rk,s,s}^{2)}$	[kN]	4.6	23.2	33.7	62.8	98.0	141.2	183.6	224.4
			8.8	46.4	67.4	125.6	196.0	282.4	367.2	448.8
			A4-50 HC-50 <sup>1)</sup>	29.0	42.2	78.5	122.5	176.5	229.5	280.5
			A4-70 F4-70 L4-70 HC-70 <sup>1)</sup>	40.6	59.0	109.9	171.5	247.1	321.3	392.7
Partial safety factor	$\gamma_{Ms,s}^{3)}$		4.6	2.00						
			8.8	1.50						
			A4-50 HC-50 <sup>1)</sup>	2.86						
			A4-70 F4-70 L4-70 HC-70 <sup>1)</sup>	1.87						

<sup>1)</sup> Materials according to Annex 9

<sup>2)</sup> In conformity to EN ISO 898-1:1999

<sup>3)</sup> In absence of other national regulations

Table 9: Displacement under tension loads

Mounting channel			W 40/22	W 50/30	W 53/34	W 55/42	W 72/48
Tension load	$N_{Ek}$	[kN]	8.3	14.7	26.2	38.9	47.2
displacement	$\delta_{Vw}$	[mm]	1.2	1.2	1.2	1.2	1.2

JORDAHL Mounting Channel

Characteristic values for tension loads

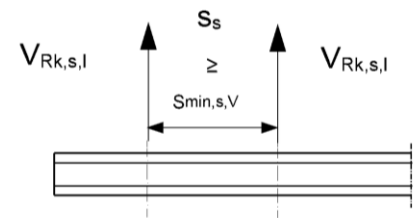
Annex 4

Table 10: Characteristic values for shear loads

Mounting channel			W 40/22	W 50/30	W 53/34	W 55/42	W 72/48
<b>Steel failure, Local flexure of channel lips for <math>s_s \geq s_{min,s,V}</math></b>							
Spacing of T-bolts for $V_{Rk,s,l}$	$s_{min,s,V}$	[mm]	150	200	200	250	300
Characteristic resistance	$V_{Rk,s,l}^{2)}$	[kN]	12	26	38	44	44
Partial safety factor	$\gamma_{Ms,l}^{1)}$		1.8				

<sup>1)</sup> In absence of other national regulations

<sup>2)</sup> For steel and stainless steel



Assumption of system

Table 11: Characteristic values for shear loads – steel failure JORDAHL – T-bolts

T-bolts Ø			M 10	M 12	M 16	M 20	M 24	M 27	M 30
			<b>Steel failure</b>						
Characteristic resistance	$V_{Rk,s,s}^{2)}$	[kN]	4.6	13.9	20.2	37.7	58.8	84.7	110.2
			8.8	23.2	33.7	62.8	98.0	141.2	183.6
			A4-50 HC-50 <sup>1)</sup>	17.4	25.3	47.1	73.5	105.9	137.7
			A4-70 F4-70 L4-70 HC-70 <sup>1)</sup>	24.4	35.4	65.9	102.9	148.3	192.8
Characteristic flexure resistance	$M_{Rk,s}^{2)}$	[Nm]	4.6	29.9	52.4	133.2	259.6	449.0	665.8
			8.8	59.8	104.8	266.4	519.3	898.0	1331.5
			A4-50 HC-50 <sup>1)</sup>	37.4	65.5	166.5	324.5	561.3	832.2
			A4-70 F4-70 L4-70 HC-70 <sup>1)</sup>	52.3	91.7	233.1	454.4	785.8	1165.1
Partial safety factor	$\gamma_{Ms,s}^{3)}$		4.6	1.67					
			8.8	1.25					
			A4-50 HC-50 <sup>1)</sup>	2.38					
			A4-70 F4-70 L4-70 HC-70 <sup>1)</sup>	1.56					

<sup>1)</sup> Materials according to Annex 9

<sup>2)</sup> In conformity to EN ISO 898-1:1999

<sup>3)</sup> In absence of other national regulations

Table 12: Displacement under shear loads

Mounting channel			W 40/22	W 50/30	W 53/34	W 55/42	W 72/48
Shear load	$V_{Ek}$	[kN]	4.7	10.3	15.1	17.5	17.5
displacement *	$\delta_{V_{Ek}}$	[mm]	0.9	0.9	1.8	1.8	1.8

\* without slip of channel bolt (hole clearance)

JORDAHL Mounting Channel

Characteristic values for shear loads

Annex 5

Table 13: Combinations for hot-rolled mounting channels and T-bolts for fatigue-inducing repeated tensile loading

Mounting channel	T-bolts			
	Type	d [mm]	Strength	Finish
W 40/22	JC	M12	8.8	z.p. h.d.g.
		M16	4.6 8.8	
W 50/30	JB	M16	4.6	
		M20	8.8	
W 53/34	JB	M16	8.8	
		M20		

Table 14: Determined values for fatigue resistance

Mounting channel	$n_c$	k	$\Delta N_{Rsk,C}$ [kN]
W 40/22	$2 \cdot 10^6$	3.601	2.7
W 50/30	$2 \cdot 10^6$	4.151	5.2
W 53/34	$2 \cdot 10^6$	4.680	7.8

Equation for determining the characteristic fatigue resistance for repeated tensile loading (in accordance with EN 1993-1-9: 7.1)

$$\Delta N_{Rsk,0} = \Delta N_{Rsk,C} \cdot \left(\frac{n}{n_c}\right)^{-1/k}$$

where

$\Delta N_{Rsk,0}$  = characteristic fatigue resistance after n load cycles without static preload

$n_c$  = number of load cycles

$\Delta N_{Rsk,C}$  = characteristic fatigue resistance after  $2 \cdot 10^6$  load cycles

$n_c$ , k see Table 14

Table 15: Characteristic fatigue resistance after n load cycles without static preload ( $N_{Ek} = 0$ )

Mounting channel			W40/22	W50/30	W53/34
Steel failure					
characteristic fatigue resistance for n load cycles	$\leq 10^5$	$\Delta N_{Rsk,0}^{1)}$ [kN]	6.2	10.8	14.9
	$\leq 2 \cdot 10^5$		5.1	9.1	12.8
	$\leq 5 \cdot 10^5$		3.9	7.3	10.5
	$\leq 10^6$		3.2	6.2	9.1
	$\leq 2 \cdot 10^6$		2.7	5.2	7.8
	$\leq 5 \cdot 10^6$		2.1	4.2	6.4
	$\leq 10^7$		1.7	3.6	5.6
	$> 10^7$		1.7	3.6	5.6

<sup>1)</sup> The given resistances are valid for the profile and the T-bolt.

Determining the characteristic fatigue resistance with static preload ( $N_{Ek} > 0$ ).

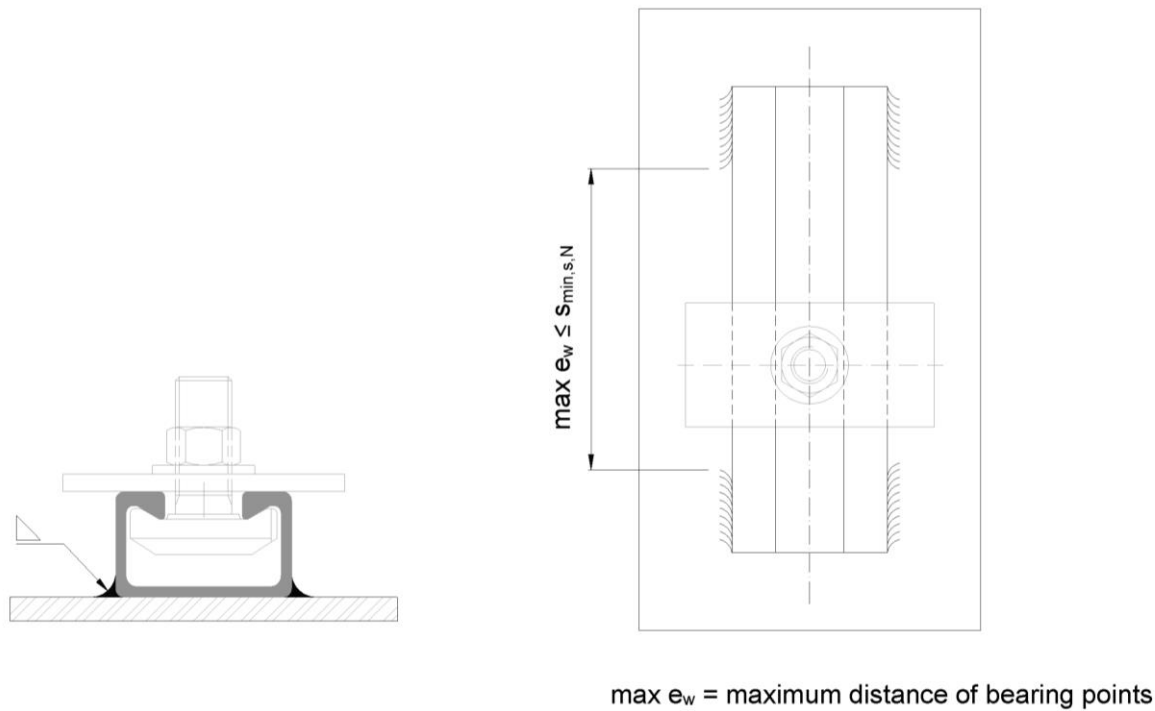
$$\Delta N_{Rsk} = \Delta N_{Rsk,0} \cdot \left(1 - \frac{N_{Ek}}{N_{Rk,s,l}}\right)$$

where:  $\Delta N_{Rk,s}$  = characteristic fatigue resistance

JORDAHL Mounting Channel

Characteristic resistance under fatigue cyclic tension load

Annex 6



a) Hot-rolled mounting channel section

b) Hot-rolled mounting channel top view

Fig. 1.1: Example of a hot-rolled mounting channel with corresponding channel bolt

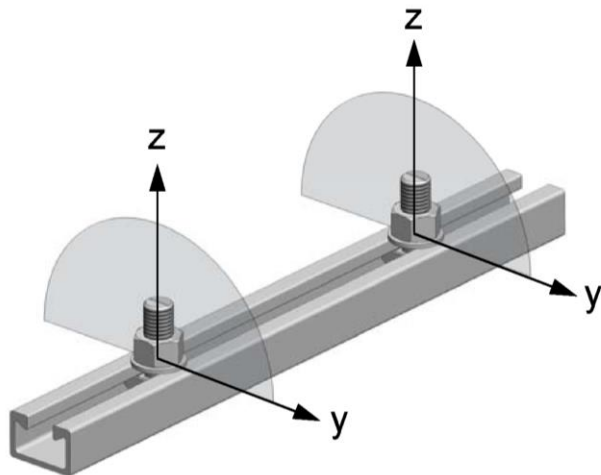


Fig. 1.2: Admissible load directions: tension loads and shear loads perpendicular to the longitudinal axis

JORDAHL Mounting Channel

Applications

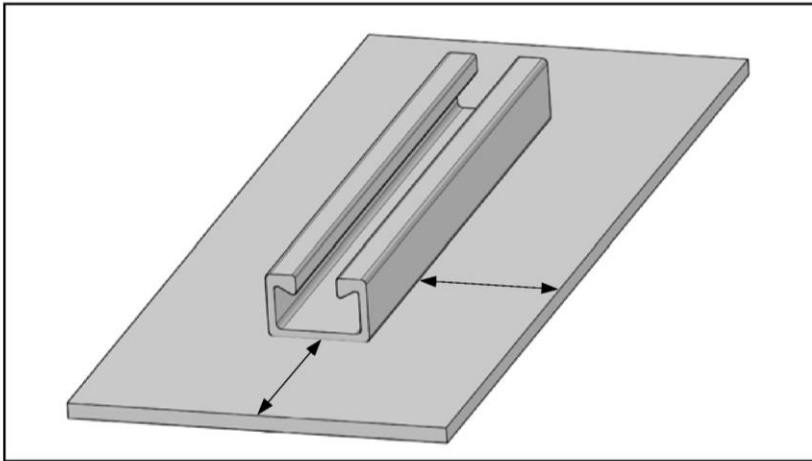
Annex 7

**Information for storage and transport of stainless steel mounting channels:**

- Ensure sufficient distance to other metals
- Avoid any damage of surface and tramp iron contamination; no direct contact with carbon steel
- Keep packaged goods dry

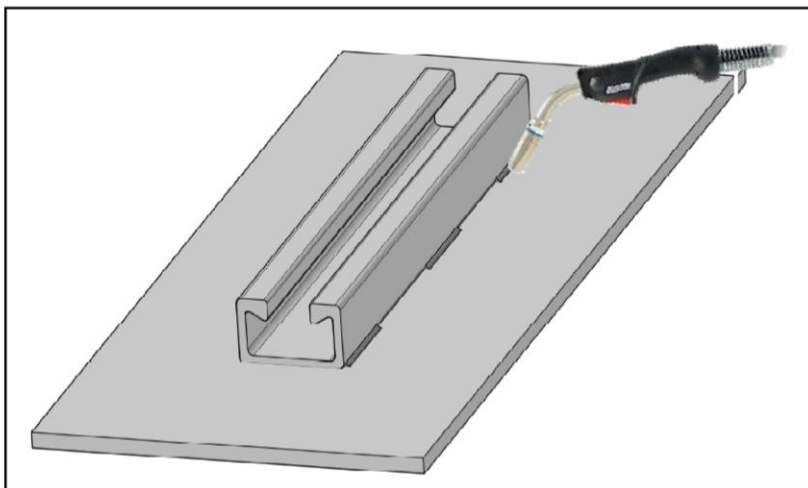
**1. Fixing of the mounting channels**

Cut, debur, derust and position the mounting channel.  
If necessary, tack the mounting channel by welding points.



**2. Welding**

Weld with suitable welding procedures and qualified personnel.  
Then check weld quality, if necessary perform non-destructive testing.  
Welds have to be designed in accordance with EN 1993-1-8.



**3. Corrosion protection**

Free from welding residues and protect the mounting channel together with the basic structure against corrosion e.g. by painting, hot dip galvanization etc.

**JORDAHL Mounting Channel**

Manufacturer`s specification: Mounting Channel

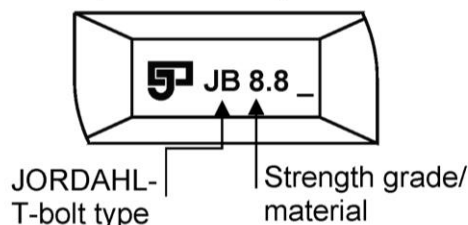
Annex 8



#### 4. Installation of the JORDAHL - T-bolts in the mounting channels

JORDAHL – T-bolt and mounting channels system components may only be used together. For combination of channels and T-bolts see Table 5.

Example for marking:



Material/Strength grade T-bolts:

- 4.6 = Strength grade 4.6, EN ISO 898-1
- 8.8 = Strength grade 8.8, EN ISO 898-1
- A4 = Stainless steel (1.4401/1.4404/1.4571), Strength grade – 50, EN ISO 3506-1
- A4-70 = Stainless steel (1.4401/1.4404/1.4571), Strength grade – 70, EN ISO 3506-1
- F4-70 = Stainless steel (1.4462), Strength grade – 70, EN ISO 3506-1
- L4-70 = Stainless steel (1.4362), Strength grade – 70, EN ISO 3506-1
- HC-50 = Stainless steel (1.4529/1.4547) Strength grade – 50, EN ISO 3506-1
- HC-70 = Stainless steel (1.4529/1.4547) Strength grade – 70, EN ISO 3506-1

Figure 2

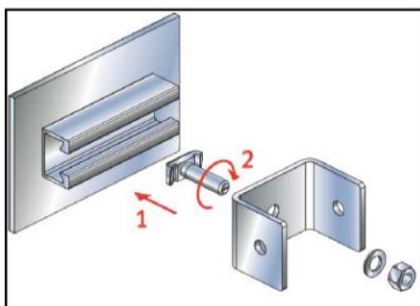
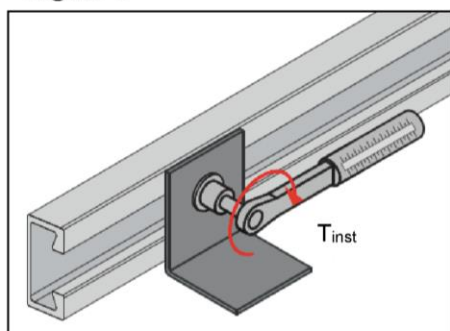


Figure 3



#### Setting Torques (Steel-to-Steel contact)

1. Insert the JORDAHL-T-bolt into the channel slot at any point along the channel length (Fig. 2).
2. Turn the channel bolt 90° clockwise and the head of the bolts locks into position (Fig. 2).
3. Install the fixture. Use a washer under the nut (Fig. 2).
4. Check the correct fit of the JORDAHL- T-bolt. The groove on the shank end of the channel bolt must be perpendicular to the channel longitudinal axis.
5. Tighten the nuts by a calibrated torque wrench (see Fig. 3) to the setting torque according to Table 16. The setting torque shall not be exceeded.

Table 16: Installation torque

	Strength/ Material grade	T <sub>inst</sub> [Nm]						
		M10	M12	M16	M20	M24	M27	M30
JA, JB JC, JE JD/JUD JH/JUH	4.6	15	25	65	130	230	340	460
	8.8	40	70	180	360	620	900	1200
	A4-50, HC-50	13	24	60	115	200	300	400
	A4-70, HC-70 F4-70, L4-70	30	50	130	250	420	630	850

#### JORDAHL Mounting Channel

Manufacturer's Specification:  
Installation of JORDAHL T-bolts in the mounting channel

Annex 9