

HALFEN HZA DYNAGRIP®

TECHNICAL PRODUCT INFORMATION



HALFEN TOOTHED CHANNELS HZA DYNAGRIP®

BD 11-US

CONCRETE



HALFEN

YOUR BEST CONNECTIONS

HALFEN HZA TOOTHED CHANNELS

HALFEN hot rolled toothed channels type HZA offer ideal solutions for high security structures that require adjustable non-invasive connections to concrete or to steel.

Manufactured to ISO 9001 and subjected to extensive quality controls the channels are supplied with matching

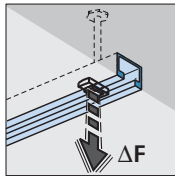
toothed T-head bolts. The exceptional quality and load supporting characteristics of these products make them an ideal choice for applications requiring resistance to dynamic, seismic or impact loads. They also provide superb connections for applications where high loads need to be supported in the direction of the required adjustment.



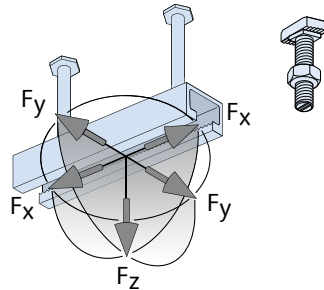
Choice of three high performance hot rolled profiles

Safe working load up to **4950 lbs. (22kN)** in all directions.

Allowable amplitude of dynamic loads up to **1350 lbs. (6kN)** at 2×10^6 cycles.



DYNAGRIP® toothed bolts carry loads in channel longitudinal direction F_x as well as pullout loads F_z and transverse shear F_y .



Toothed bolts engage with teeth on the lips of the channel to provide a mechanical support for longitudinal loads (F_x).



Important note:
All DYNAGRIP® anchor channels shown or mentioned in this catalog may be furnished with bolt-type anchor or with welded I-anchors. The performance and capacity of both styles is the same.

HZA 53/34 Toothed Channel

Safe working load up to 4950 lbs. (22kN). Available hot dip galvanized (HDG) and stainless steel equivalent to type 316 (A4) (→ see page 4)

HZS 53/34 Toothed T-bolts

(→ see page 5)

HZA 38/23 Toothed Channel

Safe working load 2700 lbs. (12kN). Available hot dip galvanized (HDG) and stainless steel equivalent to type 316 (A4) (→ see page 4)

HZS 38/23 Toothed T-bolts

(→ see page 5)

HZA 29/20 Toothed Channel

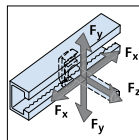
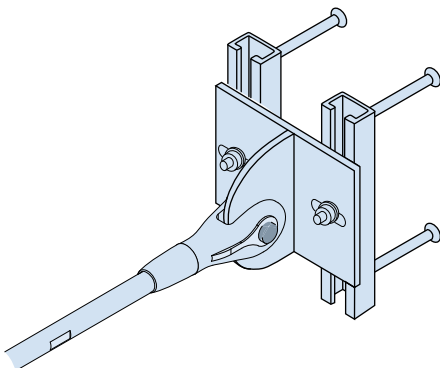
Safe working load 1800 lbs. (8kN). Available hot dip galvanized (HDG) (→ see page 4)

HZS 29/20 Toothed T-bolts

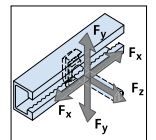
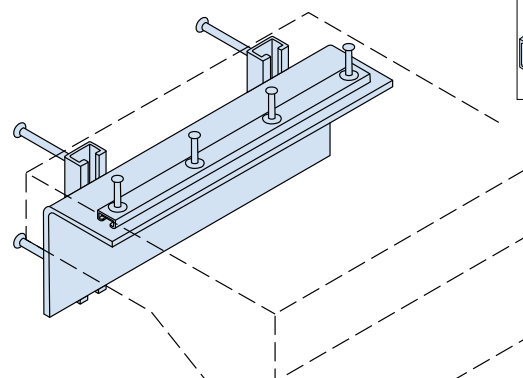
(→ see page 5)

Applications

Detan tension rod connection



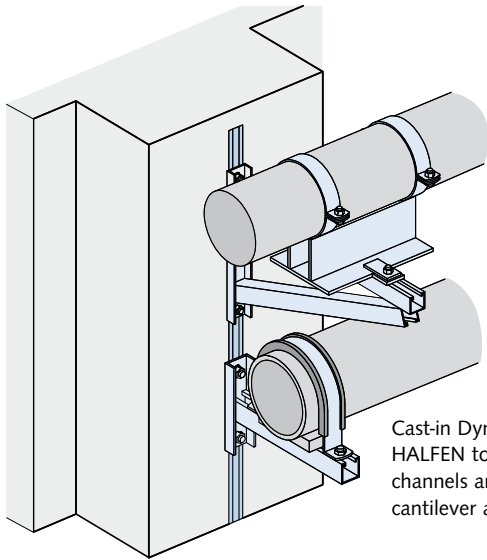
Precast staircase to wall connection



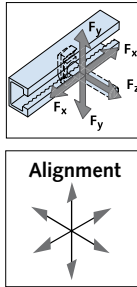
HALFEN HZA TOOTHED CHANNELS

Applications

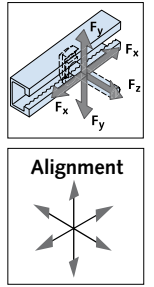
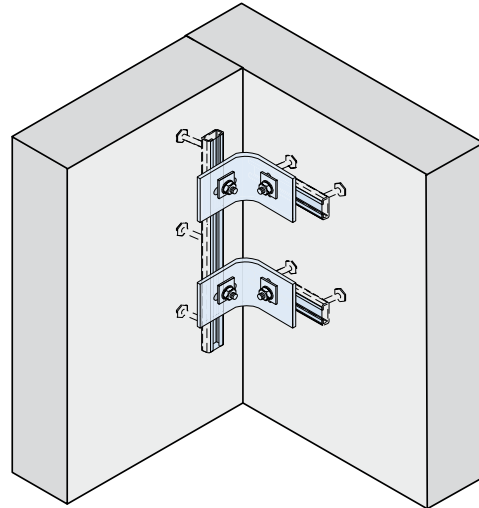
Support for mechanical services



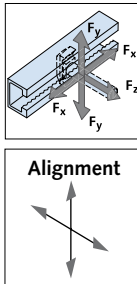
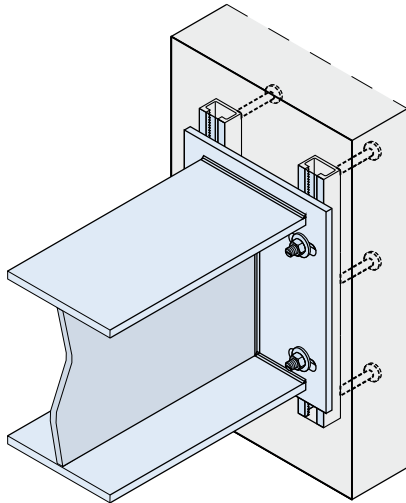
Cast-in Dynagrip®
HALFEN toothed
channels and
cantilever arms



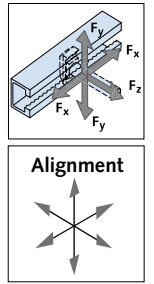
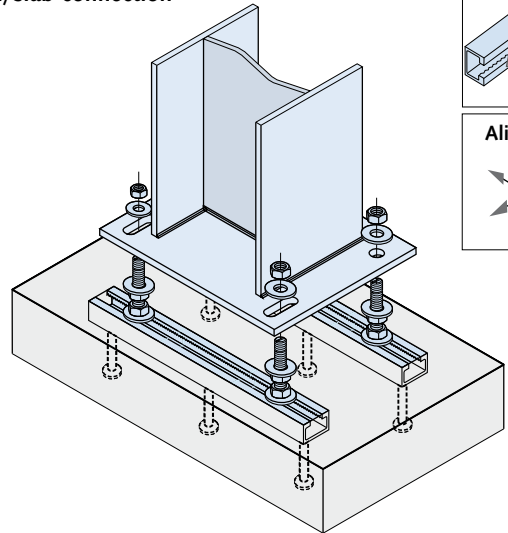
Precast panel to panel connection



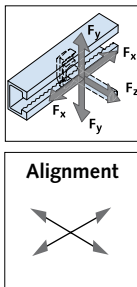
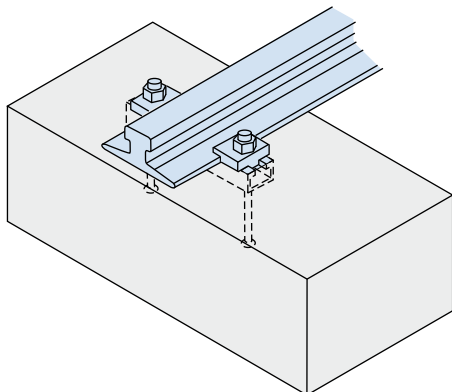
Beam to wall or column connection



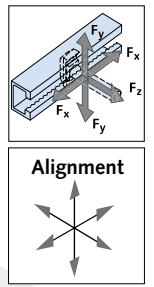
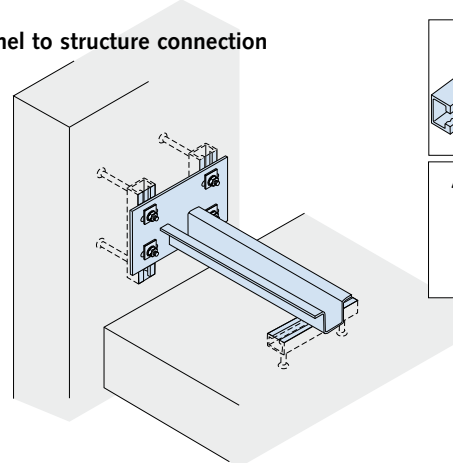
Column/slab connection



Crane rail connection



Precast panel to structure connection

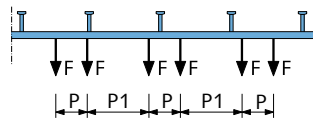
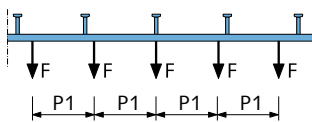


HALFEN HZA TOOTHED CHANNELS

For casting into concrete

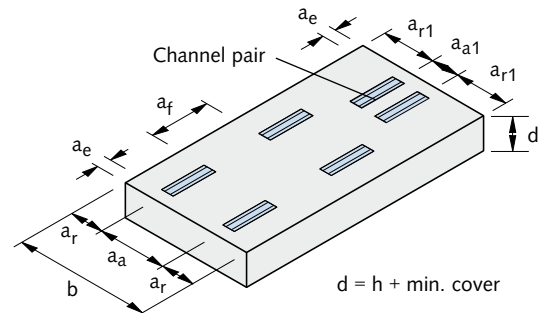
HALFEN HZA Toothed Channels																		
Channel Type	HZA 53/34 Toothed Channel						HZA 38/23 Toothed Channel						HZA 29/20 Toothed Channel					
<p>l = T-bolt length i = channel lip thickness</p>																		
	Available hot dip galvanized (HDG) and stainless steel (A4)						Available hot dip galvanized (HDG) and stainless steel (A4)						Available hot dip galvanized (HDG)					
Length selection	No. of Anchors		Part No.*				No. of Anchors		Part No.*				No. of Anchors		Part No.*			
6" (150mm)	2		HZ5406				2		HZ3806				2		HZ2906			
8" (200mm)	2		HZ5408				2		HZ3808				2		HZ2908			
10" (250mm)	2		HZ5410				2		HZ3810				2		HZ2910			
12" (300mm)	2		HZ5412				2		H3812				2		HZ2912			
16" (400mm)	3		HZ5416				3		HZ3816				3		HZ2916			
19-11" (6070mm)	25		HZ5400				25		HZ3800				31		HZ2900			
Anchor types (min. values)	Welded "I"-anchors		Pressed bolt anchors				Welded "I"-anchors		Pressed bolt anchors				Welded "I"-anchors		Pressed bolt anchors			
	h ₁ = 6 3/8" (162mm) y ₁ = 1 3/16" (30mm)		h ₂ = 6 11/16" (170mm) y ₂ = 1" (25mm)				h ₁ = 5 15/16" (151mm) y ₁ = 9/16" (15mm)		h ₂ = 3 3/4" (96mm) y ₂ = 3/4" (20mm)				h ₁ = 3 1/4" (82mm) y ₁ = 1/2" (12mm)		h ₂ = 3 1/8" (80mm) y ₂ = 5/8" (16mm)			
Allowable Static Loads (F) at load Spacing	Point Loads		Load Pairs				Point Loads		Load Pairs				Point Loads		Load Pairs			
	P ₁ ≥ 10" (250mm)		P ≥ 6" (150mm)		P ≥ 4" (100mm)		P ₁ ≥ 10" (250mm)		P ≥ 6" (150mm)		P ≥ 2" (50mm)		P ₁ ≥ 10" (250mm)		P ≥ 6" (150mm)		P ≥ 2" (50mm)	
$\sqrt{F_x^2 + F_z^2 + F_y^2} \leq \text{Allow.F}$	4950 lbs (HDG) 4275 lbs (A4)		3525 lbs		3100 lbs		2700 lbs		1950 lbs		1500 lbs		1800 lbs		1450 lbs		1000 lbs	
	(22 kN HDG) (19 kN A4)		(15.7 kN)		(13.8 kN)		(12 kN)		(8.6 kN)		(6.7 kN)		(8 kN)		(6.4 kN)		(4.5 kN)	
Minimum dimensions	a _r	a _a	a _e	a _f	a _{r1}	a _{a1}	a _r	a _a	a _e	a _f	a _{r1}	a _{a1}	a _r	a _a	a _e	a _f	a _{r1}	a _{a1}
Inches	8	16	7	14	-	-	6	12	5	10	9	6	4	8	3 1/4	8	5 1/2	5
Millimeter	200	400	175	350	-	-	150	300	130	250	225	150	100	200	80	200	140	125

* Part No. for pressed bolt anchors



Load data and minimum concrete dimensions are based on a minimum concrete strength of 3000 psi (20.7 MPa) confirmed using a standard cylinder test.

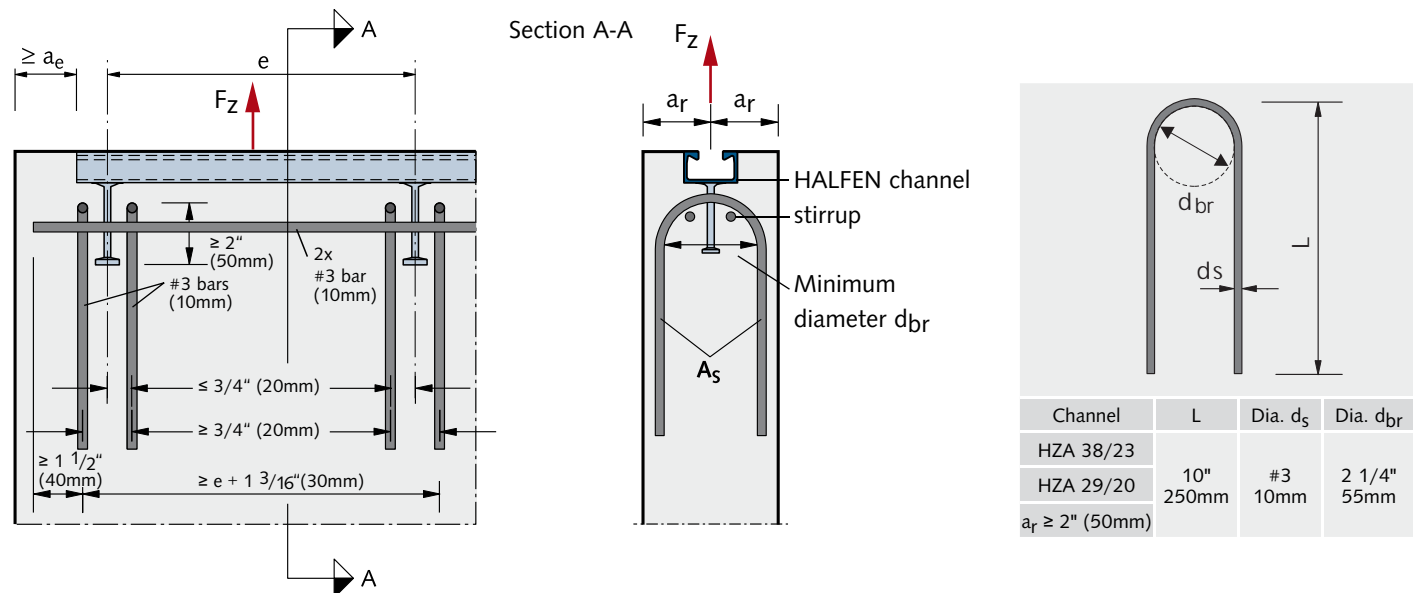
Channels may be supplied with either welded "I"-anchors, or pressed bolt anchors.



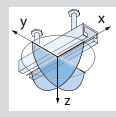
HALFEN HZA TOOTHED CHANNELS

For casting into concrete

Reduced edge distances for tension loads - reinforcement requirements



HALFEN toothed T-bolts



$$\sqrt{F_x^2 + F_z^2 + F_y^2} \leq \text{Allow.F}$$

HALFEN toothed T-bolts are manufactured from high tensile carbon steel grade to ASTM F568 8.8 (essentially equivalent to ASTM A325) or ASTM F738, A4-70, CW stainless steel. Carbon steel bolts are plated using a proprietary process (GV-S) that performs well in salt spray tests compared to hot dip galvanizing.

			HZS 53/34		HZS 38/23		HZS 29/20
	M20 (3/4")	M16 (5/8")	M16 (5/8")	M12 (1/2")	M12 (1/2")		
Allowable Static Loads (Allow.F) - Carbon Steel ①	12675 lbs. (56.4kN)	8115 lbs. (36.1kN)	8115 lbs. (36.1kN)	4360 lbs. (19.4kN)	4360 lbs. (19.4kN)		
Allowable Static Loads (Allow.F) - Stainless Steel ①	8275 lbs (36.8kN)	5300 lbs. (23.6kN)	5300 lbs. (23.6kN)	2830 lbs. (12.6kN)			
Tightening Torque - Carbon & Stainless Steel	260 ft.lb (350Nm)	150 ft. lb (200Nm)	90 ft. lb (120Nm)	60 ft. lb (80 Nm)	60 ft. lb (80 Nm)		
Allowable Bending Moment - Carbon Steel ②	159 ft. lb (216 Nm)	82 ft. lb (111Nm)	82 ft. lb (111Nm)	32 ft. lb (44Nm)	32 ft. lb (44Nm)		
Allowable Bending Moment - Stainless Steel ②	119 ft. lb (162 Nm)	61 ft. lb (83 Nm)	61 ft. lb (83 Nm)	24 ft. lb (32.8 Nm)			
Allowable Dynamic Tension Amplitude - Carbon Steel③	1350 lbs (6kN)	1350 lbs (6kN)	675 lbs (3 kN)	Not recommended	450 lbs (2kN)		
Allowable Dynamic Tension Amplitude - Stainless Steel ③	900 lbs (4kN)	900 lbs (4kN)	540 lbs (2.4 kN)	Not recommended			
Length Availability (l)	mm	In.	M20	M16	M16	M12	M12
<p>Carbon Steel T-bolts are coded "GV-S" Stainless steel T-bolts are coded "A4"</p> <p>Notes: Part numbers shown are available in electroplated finish (s) Indicates T-bolt is special order (non-stock in USA) (*) Indicates T-bolt is also available in stainless steel</p>	30	1-1/4"			S	BD6421	BD0421
	40	1-1/2"			S	S	S
	50	2"			BH6521	BH6421	BH0421
	60	2-3/8"		BJ8521 *	S *	S	S
	65	2-1/2"	BK8621 *				
	80	3-1/4"			S *		
	100	4"	BP8621 *	BP8521 *	BP6521	S	S
	125	5"			S	S	S
	150	6"			S	S	S
	200	8"			S		S
250	10"					S	
300	12"			S		S	

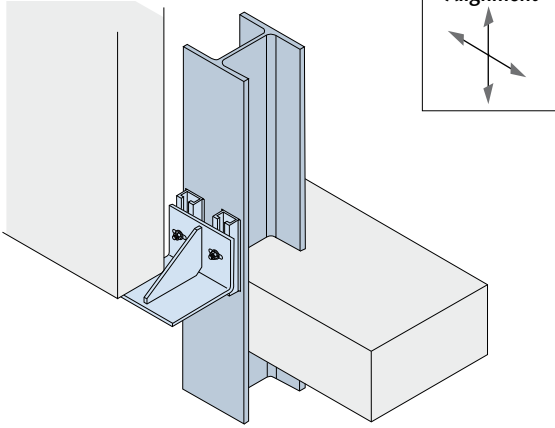
① Loads applied to T-bolts should not exceed the allowable load for the channel (see page 4)
 ② $F \leq \text{allow.}$ $F \times (1-M/\text{allow.M})$, allow.F = allowable pull out, allow.M = allowable bending moment, F = actual pullout load, M = actual bending Moment
 ③ Allowable dynamic amplitudes are added to the acting static load. The sum of these two forces should not exceed the allowable load for the channel (see page 4). Dynamic amplitude values are based on 2×10^6 cycles.

HALFEN HZM TOOTHED CHANNELS

For welding or surface mounting

Applications

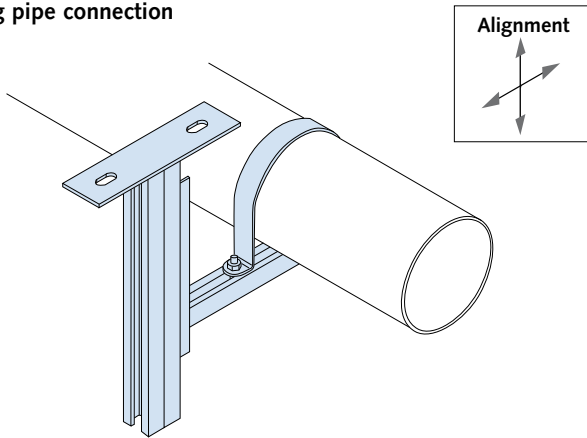
Precast panel connection



Bridge service connections



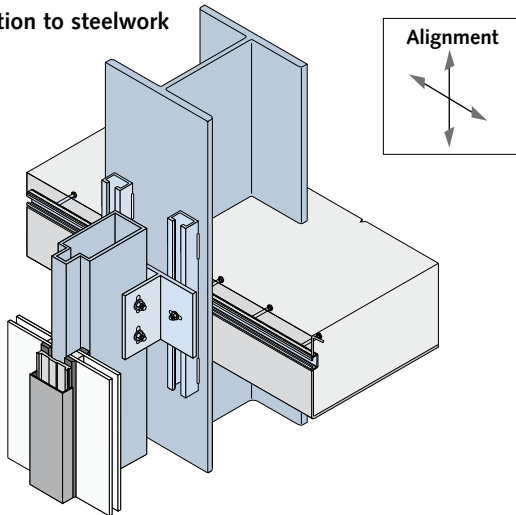
Hanging pipe connection



Tunnel connections



Façade connection to steelwork



Dynamic vehicle connections



HALFEN HZM TOOTHED CHANNELS

For welding or surface mounting

HALFEN HZM Toothed Channels						
Channel Type	HZM 53/34 Toothed Channel		HZM 38/23 Toothed Channel		HZM 29/20 Toothed Channel	
l = T-bolt length i = channel lip thickness						
Product Selection for standard length 19 - 11" (6070mm) ①	Part No.	Material/Finish	Part No.	Material/Finish	Part No.	Material/Finish
	HZM 5300	Mill Finish	HZM 3800	Mill Finish	HZM 2900	Mill Finish
	HZM 5300 HDG	Hot-Dip-Galvanized	HZM 3800 HDG	Hot-Dip-Galvanized	HZM 2900 HDG	Hot-Dip-Galvanized
	HZM 5300 A4	Stainless Steel	HZM 3800 A4	Stainless Steel		
Allowable static loads						
	Tension F_z	4950 lbs (22kN) for Carbon Steel 4275 lbs (19kN) for Stainless Steel	2700 lbs (12kN)	1800 lbs (8kN)		
	Transverse Shear F_y ②	1395 lbs (6,2kN)	740 lbs (3.3kN)	495 lbs (2.2kN)		
	Longitudinal Shear F_x	4950 lbs (22kN) for Carbon Steel 4275 lbs (19kN) for Stainless Steel	2700 lbs (12kN)	1800 lbs (8kN)		
	Effective Weld Throat a_w	3/16" (4mm)	1/8" (3mm)	1/8" (3mm)		
	Weld Length l_w	1 1/2" (38mm)	1 1/2" (38mm)	1 1/2" (38mm)		
	Weld pitch e_w	8" (200mm)	8" (200mm)	6" (150mm)		
	Centre of Gravity	0.73" (1.85cm)	0.52" (1.33cm)	0.44" (1.12cm)		
	Moment of Inertia I_y/I_z	0.223/0.558 in ⁴ (9.26/23.23cm ⁴)	0.051/0.148 in ⁴ (2.11/6.17cm ⁴)	0.025/0.058 in ⁴ (1.02/2.42cm ⁴)		
	Section modulus W_y/W_z	0.306/0.540 in ³ (5.01/8.85cm ³)	0.097/0.198 in ³ (1.59/3.25cm ³)	0.056/0.102 in ³ (0.91/1.67cm ³)		
	Area of Section ③	0.916 in ² (5.91 cm ²)	0.479 in ² (3.09 cm ²)	0.307 in ² (1.98cm ²)		
	Weight ③	3.12 lbs./ft (4.64 kg/m)	1.63 lbs./ft (2.42 kg/m)	1.02 lbs./ft (1.51 kg/m)		
① Shorter lengths cut to order. ② Transverse shear load is limited by the single side wall capacity of the channel profile. Any magnification to the shear load caused by eccentricity should be checked. ③ Carbon Steel profile assumed. ④ Load Spacing $\geq 4"$ (100mm). Welds to both sides of the channel.						

CONTACT HALFEN WORLDWIDE

HALFEN has a global network of Subsidiary Companies to assist you. The main contact information for North America, Europe and Asia is provided below. For a full list of offices please visit www.halfen.com



www.halfen.com

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