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Technical Data Sheet: The Corrugated HC-Omega®



Figure 1. Corrugated HC-Omega[®] armor joint on grade.

Description

The Corrugated HC-Omega[®] cold rolled steel armor construction and expansion joint is made of two continuous cold-rolled profiles in 5 mm thick structural S235JRG2 (ASTM A 283 C - A 570 Gr. 33, 35 ksi) steel. The bottom half is shaped like the HC-Omega[®], but the top is corrugated providing smooth and vibration free travel. These profiles fit together tightly due to the male and female connection. See Figure 1. The joint is anchored into the concrete with 10 mm (0.39 in) thick diameter and 125 mm (4.92 in) long nelson studs. These studs are robotically attached using resistance butt welding every 200 mm (7.87 in).

The top sides of the profiles are milled after being assembled to guarantee that both profiles are the same height. Both male and female forms are connected together using wing bolts with nylon nuts that do not need to be removed after being installed. The profiles are assembled with an overlap of 15 mm (0.59 in). This speeds up installation as the next piece of joint can easily be connected to the previous joint.

The profile is made in standard lengths of 3 m (9.84 ft) and is available in heights from 120 to 300 mm (4.72 to 11.81 in). See Table 2. Custom solutions are available above 300 mm (11.81 in) upon request. The Corrugated HC-Omega[®] armor joint comes standard in S235JRG2 (ASTM A 283 C - A 570 Gr. 33, 35 ksi) structural steel, but may be requested as galvanized, or in stainless steel. See Table 1.



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Characteristics

The Corrugated HC-Omega[®] is a permanent expansion and contraction joint. Also acting as a construction joint, it is used as a stable construction form ideal for starting or finishing a concrete pour. As the concrete cures, the two profiles separate and take up the contraction of the slab. This helps prevent cracking as a result of the curing process.

The geometry and design of the joint restrains vertical movement. This means that slab curling and slab rocking from dynamic loads are mitigated. However, the high tolerances between the profiles ensure that longitudinal and transverse movement is not impeded by the design of the joint.

The Corrugated HC-Omega[®] is a continuous load transfer armor joint. This profile provides complete transfer of static and dynamic loads from slab to slab. For example, these loads are mechanical handling equipment (MHE), airplanes, or racking. The joint transfers the load through the male and female form and then to into the sub-base.

The Corrugated HC-Omega[®] corrugation ensures that the wheels crossing the joint will be on two slabs at once. The wheels of even the smallest and hardest size will not generate vibration or noise creating an unprecedented level of comfort.

Both 5 mm (0.20 in) thick steel profiles provide maximum edge protection. The rigid steel structure ensures that maximum loads are handled with minimum deformation all along the length of the joint. The Because of the corrugated profile, the joint is less subject to wear as it mitigates spalling of concrete near the joint. This new profile mitigates spalling of concrete near the joint. Consequently, the likeliness of damage is significantly reduced and the lifetime of the industrial slab is lengthened considerably.

Each joint profile is placed according to a layout plan. They are then installed and finished according to the daily schedule. These joints are placed in unreinforced and reinforced concrete. Rebar, steel fiber, and other types of reinforcing are regularly used with these armor joints. The maximum recommended opening for these joints is 20 mm (0.79 in). This key profile is recommended for slabs on piles, on grade, on insulation and other applications.

The Corrugated HC-Omega[®] expansion joint is reliably convenient to install according to the Installation Guide. The Corrugated HC-Omega[®] is 100% compatible with the straight HC-Omega[®] and the corrugated Cosinus Slide[®] joint for every available height.

This Corrugated HC-Omega[®] armor joint is especially recommended for high traffic locations such as indoor and outdoor docking bays and doorways or airports. This shock and vibration free crossing will vastly reduce the damage to the slab and save the investor substantial sums of money on the wear and tear of MHE's and MHE wheels, greatly reduce slab repair costs, and support a high quality workplace. Consequently, in most applications, the payback period can be limited to a year while the slab will be in operation for decades. This payback period is only calculating the repair costs of MHE wheels.



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Specifications



Figure 2. Corrugated HC-Omega® with two rows of Nelson

Table 1. Technical Specifications: Corrugated HC-Omega[®].

Technical specifications of the Corrugated HC-Omega® Armor Joint								
Thickness	2 x 5 mm (2 x 0.20 in) See Figure 4.							
Steel grade	S235JRG2 (ASTM A 283 C - A 570 Gr. 33, 35 ksi)							
Length	3 m (9.84 ft)							
Type of anchor bolts	Nelson Studs: Ø10 mm x 125 mm (0.39 in dia. x 4.92 in length) 2 x 10 pieces/m (one stud on each side, every 8 in) Automatic resistance butt welding							
Production	Cold rolled for optimal tolerances in construction							
Steel construction	Standard: Untreated natural steel By Request: Electro-galvanized. See Figure 2. By Request: Stainless steel by request							
Profile height	120-300 mm (20 & 40 mm intervals) See Table 2. Common joint heights: 5.5" (6" Slab), 7.1" (8" Slab), 9.4" (10" Slab), 11.8" (12" Slab). Larger dimensions by request							
Finishing	Top side milled, 15 mm (0.59 in) overlap at the end for smooth connections Maximum opening 20 mm (0.79 in)							
Fastening These attachments must not be removed after installation. The tens the concrete breaks the connection with the nylon nut.								
Concrete reinforcement	steel mesh, rebar, steel fiber, and poly-fiber added concrete							
Fittings	L, T, and X-shaped intersections. See Figure 5-7.							

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Auxiliary equipment	Tool for height adjustment and placement. See Figure 8.
Straightness of horizontal surface	1 mm over 3 m (0.04 in over 10 ft)
Straightness of vertical surface	2 mm over 3 m (0.08 in over 10 ft)
Shock-free transition	YES



Figure 3. Profile view of Corrugated HC-Omega[®].



Figure 4. Plan view of Corrugated HC-Omega[®].



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*to make the corrugated Sinus Slide[®] joint compatible with the traditional straight HC-Omega joint the real height differs slightly.

Table 2. Standard dimensions from 4.75 to 12 inches: Corrugated HC-Omega® with two rows of Nelson Studs.

Corrugated HC-Omega [®] type 3 = ax5 standard with 2x2 row of anchors										
Type and height a [in] (mm) of joint	Real height of the joint a [in] (mm)	Slab thickness [in] (mm)	B [in] (mm)	C [in] (mm)	D [in] (mm)	Weight [lb/ft] (Kg/m)	Max Length per pallet [ft] (m)	Compatible with		
Corrugated HC- Omega [®] 120	5.12 (130*)	5-5.5 in Slab (130-140)	2.12 (54)	2.95 (75)	-	12.11 (18.03)	393.7 (120)	HC-Omega 120		
Corrugated HC- Omega® 140 (6 in Slab)	5.63 in (143*)	6 in Slab (150-160)	2.72 (68)	2.95 (75)	-	13.02 (19.38)	354.3 (108)	HC-Omega 140		
Corrugated HC- Omega® 150 Corrugated HC-	5.90 (150) 6.30	6.5 in Slab (160-170) 7 in Slab	2.68 (68) 2.68	2.95 (75) 2.95	0.79 (20) 1.18	13.23 (19.69) 13.33	354 (108) 354	HC-Omega 150 HC-Omega (+) 150 HC-Omega 160		
Omega® 160 Corrugated HC- Omega® 180 (8 in Slab)	160 7.09 (180)	170-180 7.5-8 in Slab (190-200)	(68) 2.95 (75)	(75) 2.95 (75)	(30) 1.57 (40)	(19.84) 13.90 (20.69)	(108) 295.2 (90)	HC-Omega (+) 160 HC-Omega 180 HC-Omega (+) 180		
Corrugated HC- Omega [®] 200 Corrugated HC- Omega [®] 220	7.87 (200) 8.66 (220)	8.5 in Slab (210-220) 9.0 in Slab (230-240)	3.27 (83) 3.27 (83)	2.95 (75) 2.95 (75)	2.17 (55) 2.95 (75)	14.12 (21.01) 14.32 (21.32)	295.2 (90) 265.7 (81)	HC-Omega 200 HC-Omega (+) 200 HC-Omega 220 HC-Omega (+) 220		
Corrugated HC- Omega® 240 (10 in Slab)	9.45 (240)	10.0 in Slab (250-260)	3.27 (83)	4.53 (115)	1.57 (40)	16.91 (25.16)	265.7 (81)	HC-Omega 240 HC-Omega (+) 240		
Corrugated HC- Omega® 260 Corrugated HC- Omega® 280	10.24 (260) 11.02 (280)	10.5-11 in Slab (270-280) 11.5 in Slab (290-300)	3.27 (83) 3.27 (83)	4.53 (115) 4.53 (115)	2.56 (65) 3.35 (85)	17.11 (25.47) 17.32 (25.78)	265.7 (81) 206.7 (63)	HC-Omega 260 HC-Omega (+) 260 HC-Omega 280 HC-Omega (+) 280		
Corrugated HC- Omega® 300 (12 in Slab)	11.81 (300)	12-12.5 in Slab (310-320)	3.27 (83)	4.53 (115)	4.13 (105)	17.53 (26.09)	206.7 (63)	HC-Omega 300 HC-Omega (+) 300		



Crossings

These crossings are designed and engineered to best suit the joints at intersections. These crossings are available in all dimensions in proportion to the profile used.

X, T and L-crossings for Corrugated HC-Omega® joints



Figure 5. X-Crossing.



Figure 6. T-Crossing.



Figure 7. L-Crossing.

Assembly assistance

This assembly tool is ideal for levelling and adjusting the joint to the proper height. Engineered to precisely raise and level the joints, this tool is available upon request.



Figure 8. Assembly Tool.