lindapter® Dynamic Load Testing

Proven steelwork clamping systems independently tested for dynamic loading.

Lindapter commissioned independent dynamic load testing of its **Hollo-Bolt**, **Type AF** and **Type AAF** products in order to offer specifiers an economic and technically improved connection

compared to welding or through bolting for dynamic load applications.

The independent tests were performed in Tensile accordance with Test Ria EN 1993-1-9: Desian of steel structures -Part 1-9: Fatigue. A number of tests were performed at different load levels from 10,000 to 2.5 million cycles in order to determine suitable detail categories. The results from the testing were then used to calculate Safe Working Loads.

Typical applications with dynamic loads present:

- Cranes and crane rails
- Lifting equipment
- Conveyor systems
- Manufacturing machinery
- Bridges and bridge refurbishment

Independently tested to EN 1993-1-9. See safe working loads overleaf >>>

For more information please contact Lindapter's Technical Support Team: Call: +44 (0)1274 521444 | Email: support@Lindapter.com | Visit: www.Lindapter.com

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lindapter® Dynamic Load Data

Hollo-Bolt (Hexagonal head, carbon steel)

Tension Data Hollo-Bolt

The following safe working loads in tension for dynamic loading have been calculated using Detail Category 63 according to EN 1993-1-9.

Number of cycles		SWL (Tension) 5:1 Factor of Safety					
from	Up to	M8 (kN)	M1O (kN)	M12 (kN)	M16 (kN)	<mark>M20</mark> (kN)	
-	1 x 10 ⁴	4.00	8.50	10.50	21.00	35.00	
1 x 10 ⁴	2 x 10 ⁴	1.84	3.65	5.82	11.43	20.20	
2 x 10 ⁴	6 x 10 ⁴	1.28	2.53	4.03	7.93	14.01	
6 x 10 ⁴	2 x 10 ⁵	0.86	1.69	2.70	5.31	9.38	
2 x 10 ⁵	6 x 10 ⁵	0.60	1.17	1.87	3.68	6.50	
6 x 10 ⁵	2 x 10 ⁶	0.40	0.79	1.25	2.46	4.35	
2 x 10 ⁶	5 x 10 ⁶	0.29	0.58	0.92	1.82	3.21	
5 x 10 ⁶	1 x 10 ⁷	0.26	0.50	0.80	1.58	2.79	
1 x 10 ⁷	2 x 10 ⁷	0.22	0.44	0.70	1.37	2.43	
Greater than	2 x 10 ⁷	0.16	0.32	0.51	1.00	1.76	

Hollo-Bolt (Hexagonal head, carbon steel)

Number of cycles		SWL (Shear) 5:1 Factor of Safety					
from	Up to	M8 (kN)	M10 (kN)	M12 (kN)	<mark>M16</mark> (kN)	<mark>M20</mark> (kN)	
-	1 x 10 ⁴	5.00	10.00	15.00	30.00	40.00	
1 x 10 ⁴	2 x 10 ⁴	3.67	7.44	10.74	21.81	30.69	
2 x 10 ⁴	6 x 10 ⁴	2.95	5.98	8.62	17.51	24.64	
6 x 10 ⁴	2 x 10 ⁵	2.32	4.70	6.78	13.76	19.37	
2 x 10 ⁵	6 x 10 ⁵	1.86	3.77	5.44	11.05	15.55	
6 x 10 ⁵	2 x 10 ⁶	1.46	2.96	4.28	8.68	12.22	
2 x 10 ⁶	5 x 10 ⁶	1.22	2.47	3.56	7.23	10.17	
5 x 10 ⁶	1 x 10 ⁷	1.06	2.15	3.10	6.29	8.86	
1 x 10 ⁷	2 x 10 ⁷	0.92	1.87	2.70	5.48	7.71	
Greater than	2 x 10 ⁷	0.67	1.36	1.96	3.97	5.59	

Type AF & Type AAF (4 bolt connections, property class 8.8)

Number of cycles		SWL (Tension) per 4 bolt connection (8.8) Type AF 5:1 FoS / Type AAF 4.5:1 FoS				
from	Up to	<mark>M12</mark> (kN)	<mark>M16</mark> (kN)	<mark>M20</mark> (kN)	M24 (AF only) (kN)	
-	1 x 10 ⁴	34.00	64.00	105.20	160.00	
1 x 10 ⁴	2 x 10 ⁴	22.30	41.54	64.82	93.39	
2 x 10 ⁴	6 x 10 ⁴	15.46	28.80	44.94	64.75	
6 x 10 ⁴	2 x 10 ⁵	10.35	19.28	30.09	43.35	
2 x 10 ⁵	6 x 10 ⁵	7.18	13.37	20.86	30.06	
6 x 10 ⁵	2 x 10 ⁶	4.18	8.95	13.97	20.12	
2 x 10 ⁶	5 x 10 ⁶	3.54	6.60	10.29	14.83	
5 x 10 ⁶	1 x 10 ⁷	3.08	5.74	8.95	12.90	
1 x 10 ⁷	2 x 10 ⁷	2.68	5.00	7.80	11.23	
Greater than	2 x 10 ⁷	1.94	3.62	5.65	8.14	

Lateral slip resistance = 10% of published tension values for short term use

Tension Data Type AF & Type AAF

The following safe working loads in tension for dynamic loading have been calculated using Detail Category 50 (for bolts) according to EN 1993-1-9.

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Shear Data Hollo-Bolt

The following safe working loads in shear for dynamic loading have been calculated using Detail Category 100 according to EN 1993-1-9.