

# ASDO TIE BAR DESIGN CAPACITIES

ASDO tie bars can be supplied in two grades of carbon steel and stainless steel. All components are designed to exceed the capacity of the bar.

Table 1 - ASDO grade

	ASDO350-S	ASDO540-S					ASDOE600-S		
Nominal thread size	M100 - M130	M12	M16-42	M45-85	M90 - M100	M105 - M160*	M12 - M42	M48 - M56	
$f_y$ [N/mm <sup>2</sup> ]	355	355	540	540	520	630	600	460	
$f_{ub}$ [N/mm <sup>2</sup> ]	510	510	700	700	700	710	800	650	

Minimum elongation for all grades 17%; Minimum charpy for all grades 27J @ -20 °C; ASDO350-S M140-M160 differ from above, refer to table 3 for design resistance  
\*ASDO540-S bars M105-M160 are quench and tempered and should not be galvanised

Table 2 - Standard stock bar lengths

Nominal thread size		ASDO350-S	ASDO540-S	ASDOE600-S
M16-M42	m	-	12	6
M45-M100	m	-	16	6
M105-M160	m	16	12	-

For longer system lengths bars are connected using couplers or turnbuckles. M12 available in 6m lengths only.



Table 3 - Carbon steel

Dimensional data			M12	M16	M20	M24	M27	M30	M36	M42	M45	M48	M52	M56	M60	M64	M68	M72	M76	M80	M85	M90	M95	M100	M105	M110	M115	M120	M130	M140	M150	M160
Nominal thread size																																
Nominal shaft size	mm		12	16	20	24	27	30	36	42	45	48	52	56	60	64	68	72	76	80	85	90	95	100	105	110	115	120	130	140	150	160
Shaft area, $A_s$	mm <sup>2</sup>		113	201	314	452	573	707	1,018	1,385	1,590	1,810	2,124	2,463	2,827	3,217	3,632	4,072	4,536	5,027	5,675	6,362	7,088	7,854	8,659	9,503	10,387	11,310	13,273	15,394	17,671	20,106
Thread pitch	mm		1.75	2	2.5	3	3	3.5	4	4.5	4.5	5	5	5.5	5.5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Thread stress area, $A_s$	mm <sup>2</sup>		84	157	245	353	459	561	817	1,121	1,306	1,473	1,758	2,030	2,362	2,676	3,055	3,460	3,889	4,344	4,948	5,591	6,273	6,995	7,755	8,556	9,395	10,274	12,149	14,181	16,370	18,716
Weight per metre (bar)	kg/m		0.9	1.6	2.5	3.6	4.5	5.5	8.0	10.9	12.5	14.2	16.7	19.3	22.2	25.3	28.5	32.0	35.6	39.5	44.5	49.9	55.6	61.7	68.0	74.6	81.5	88.8	104.2	120.8	138.7	157.8
Load capacities	ASDO350-S	Yield	kN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,483	2,753	3,037	3,335	3,647	4,313	4,183	4,829	5,334
	ASDO540-S	Ultimate	kN	30	85	132	190	248	303	441	605	705	795	949	1,096	1,275	1,445	1,650	1,868	2,100	2,346	2,672	2,907	3,262	3,637	4,886	5,390	5,919	6,472	7,654	8,934	10,313
Design resistance <sup>1</sup>	ASDO350-S	$F_{t,Rd}$	kN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,535	2,795	3,067	3,352	3,650	4,284	4,128	4,739	5,209
	ASDO540-S	$F_{t,Rd}$	kN	31	79	123	178	232	283	412	565	658	742	886	1,023	1,190	1,349	1,540	1,744	1,960	2,189	2,494	2,818	3,162	3,525	3,965	4,374	4,803	5,252	6,210	7,249	8,368

Table 4 - Stainless steel

Dimensional data			M12	M16	M20	M24	M27	M30	M36	M42	M48	M56	M60+	
Nominal thread size														
Nominal shaft size	mm		10.8	15	18	22	25	28	34	39	45	52		
Shaft area, $A_s$	mm <sup>2</sup>		92	177	254	380	491	616	908	1,195	1,590	2,124		
Thread pitch	mm		1.75	2	2.5	3	3	3.5	4	4.5	5	5.5		
Thread stress area, $A_s$	mm <sup>2</sup>		84	157	245	353	459	561	817	1,121	1,473	2,030		
Weight per metre (bar)	kg/m		0.7	1.4	2.0	3.0	3.9	4.9	7.3	9.6	12.7	17.0		
Load capacities	ASDOE600-S	Yield	kN	51	94	147	212	276	336	490	673	678	934	Larger diameters available at request
		Ultimate	kN	67	125	196	282	368	448	653	897	958	1,320	
Design resistance <sup>1</sup>		$F_{t,Rd}$	kN	47	87	136	195	255	311	453	621	656	900	

Notes for tables 3 & 4:  
 1. Design tensile resistance  $F_{t,Rd} = \min \{ f_t \times A_s / \gamma_{M2}; 0.9 \times f_{ub} \times A_s / \gamma_{M2} \}$  as per EN1993-1-8 with partial factors  $\gamma_{M2} = 1.0$  &  $\gamma_{M2} = 1.25$  for carbon steel and  $\gamma_{M2} = 1.1$  &  $\gamma_{M2} = 1.25$  for stainless steel according EN1993-1-4  
 2. For the full design resistance to be utilised connection plates must be fabricated from S355J2 to EN10025 (or equivalent) and to minimum dimensions given in table 5  
 3. All threads are cut threads and are not suitable for dynamic loads. Rolled threads with higher fatigue resistance can be made on request - please contact our technical department  
 4. For full design capacity threads must be engaged at least 1.2 x thread diameter, see installation guide page 17  
 5. Stainless steel bar grades M12-M42 are austenitic 1.4401/4, M48+ are duplex 1.4462.

### Corrosion protection

ASDO systems can be supplied self colour or galvanised as standard. Sizes up to M42 are supplied with forks, pins, turnbuckles, couplers and thread-cover sleeves hot dip galvanised as standard. Note ASDO540-S bars M105-M160 are quench and tempered steel and therefore should not be galvanised.

Bar threads can be formed after galvanising or are re-machined to size following galvanizing; repairs to the zinc coating are made in accordance with DIN EN ISO 1461. Spanner flats on the tie-rods are pressed following hot galvanizing to prevent brittle fracture. Note, due to the nature of the galvanising process the visual finish of galvanised product is variable. If a high level of aesthetic finish is required systems should be subsequently painted after a suitable primer has been applied. ASDO tie bars cannot be supplied with 'top-coat' finishes, this should be applied by the customer. Please advise us before placing an order if bars are intended to be painted.



Self colour Galvanised Stainless

Please contact our technical department for more detail.