

# Stränggjutet Gjutjärn: Unibar ADI Grades 1 – 5 (Egenskapsdata)



## Austempered Ductile Iron Property Data File

ASTM897M (SI units)	8850-550-10	1050-700-07	1200-850-04	1400-110-01	1600-1300-00
TYPICAL PROPERTIES *	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
<b>MONOTONIC (STATIC) PROPERTIES</b>					
Tensile Strength (ksi/MPa)	140/966	165/1139	190/1311	220/1518	240/1656
0.2% Offset Yield Strength (ksi/MPa)	110/759	130-897	160/1104	180/1242	210/1449
Elongation (% in 2 inch Gauge Length)	11	10	7	5	3
Hardness Brinell BHN (B.I.D. mm)	302 (3.50)	340 (3.30)	387 (3.10)	418 (3.00)	460 (2.85)
Reduction in Area (%)	10	9	6	4	2
Young's Modulus (Msi/GPa)	23.6/163	23.2/160	22.9/158	22.6/156	22.5/155
Compressive Strength (ksi/MPa)	200/1380	240/1650	280/1935	330/2275	365/2520
Shear Strength (ksi/MPa)	125/870	150/1025	170/1180	200/1370	215/1490
Modulus of Rigidity (Msi/GPa)	9.44/65.1	9.28/64.0	9.16/63.2	9.04/62.4	9.00/62.1
Poisson's Ratio	0.25	0.25	0.25	0.25	0.25
** Strength Coefficient K (ksi, MPa)	218/1503				
** Strain Hardening Exponent n	0.143				
** True Fracture Strength $s_f$	150/1032				
** True Fracture Ductility $e_f$	0.082				
<b>DYNAMIC PROPERTIES</b>					
Fatigue strength (@ 10 million cycles)					
- Rotating bending as machined (ksi/MPa)	64/450	70/485	60/415		
- Reverse bending as machined (ksi/MPa)		60/415	55/380		
- Axial Push - Pull		55/385			
- G-50 Max. Allowable Contact Stress (ksi/MPa)	165/1155	180/1260	195/1365	220/1560	250/1750
- G-50 Single Tooth Bending as Machined (ksi/MPa)	50/350	52/365	50/350	48/335	46/320
- G-50 Single Tooth Bending as Shot Peened (ksi/MPa)	100/700	110/770	100/700	95/665	90/630
- Un-notched Charpy Impact (@ 70°F/21°C)(ft-lb/joules)	90/120	90/120	70/93	60/80	40/53
- Notched Charpy Impact (@ 70°F/21°C)(ft-lb/joules)	9/12	8/10.6	7/9.3	6.5/8.6	6/8
Dynamic Elastic Modulus (msi/GPa)	24.7/170	24/4168	24.2/167	23.9/165	23.7/164
Est. Ductile/Brittle Transition Temp. (°F/°C)	-2/-20	-2/-20	-2/-20	-2/-20	-2/-20
Fracture Toughness (ksi SQRT(in)/MPa*SQRT(m))	109/100	85/78	60/55	52/48	44/40
** Strength Coefficient K' (ksi/MPa)	253/1744				
** Strain Hardening Exponent n'	0.1330	0.1376	0.1465	0.1600	
** Fatigue Strength Coefficient ( $s_f'$ (ksi/MPa))	211/1455	2720	3100	5020	
** Fatigue Strength Exponent b	-0.0900	-0.1460	-0.1600	-0.2050	
** Fatigue Ductility Coefficient $e_f'$	0.115	-0.178	0.396	0.488	
** Fatigue Ductility Exponent C	-0.5940	-0.6280	-0.7520	-0.8480	
<b>PHYSICAL (INTRINSIC) PROPERTIES</b>					
Density (lb/in <sup>3</sup> )	0.2562	0.2558	0.2555	0.2552	0.2548
Density (g/cm <sup>3</sup> )	7.0965	7.0872	7.0779	7.0686	7.0593
Coefficient of Thermal Expansion (in/in/°F; mm/mm/C)x10 <sup>-6</sup>	8.1/14.6	8.0/14.3	7.8/14.0	7.7/13.8	7.5/13.5
Wear Resistance (AMAX PIN TEST, VOLUME LOSS cu mm)	10.9	10.8	10.6	10.3	9.8
Linear Expansion inches/inch (from ferritic/from pearlitic)	.0012/.0002	.0078/.0008	.0025/.0013	.0027/.0016	.0028/.0017
Linear Expansion mm/mm (from ferritic/from pearlitic)	.030/.005	.198/.020	.064/.033	.069/.041	.071/.043
Thermal Conductivity (BTU-in/h-sq.ft-°F;W/M-K)	153/22.1	151/21.8	149/21.5	147/21.2	145/20.9
Internal Damping (log decr.) x 0.0001	5.26	5.41	5.69	12.7	19.2

\* These data are not guaranteed minimums. They represent typical properties that one may observe in commercial ADI components

\*\* Grade 850 55-10 fatigue coef. & exponents courtesy of Ford. All other grades courtesy of John Deere.