



CNC MATERIALS

PLASTICS

MATERIAL	PROPERTIES	METRIC	IMPERIAL
ABS	Tensile Strength	35 MPa	5,100 psi
	Elongation @ Break	40%	40%
	Hardness	Rockwell R100	Rockwell R100
	Density	0.969 g / cu. cm.	0.035 lbs / cu. in.
	Maximum Temperature	71° C	160° F
Acrylic	Tensile Strength	55 MPa	8,000 psi
	Elongation @ Break	6%	6%
	Hardness	Rockwell M95	Rockwell M95
	Density	1.19 g / cu. cm.	0.043 lbs / cu. in.
	Maximum Temperature	77° C	170° F
Delrin (30% Glass-Filled)	Tensile Strength	53 MPa	7,700 psi
	Elongation @ Break	6%	6%
	Hardness	Rockwell M87	Rockwell M87
	Density	1.55 g / cu. cm.	0.056 lbs / cu. in.
	Maximum Temperature	85° C	185° F
Delrin	Tensile Strength	62 MPa	9,000 psi
	Elongation @ Break	25%	25%
	Hardness	Rockwell M90	Rockwell M90
	Density	1.412 g / cu. cm.	0.051 lbs / cu. in.
	Maximum Temperature	82° C	180° F
Delrin AF (13% PTFE-Filled)	Tensile Strength	53-56 MPa	7,690-8,100 psi
	Elongation @ Break	10.30%	10.30%
	Hardness	Rockwell R115-R118	Rockwell R115-R118
	Density	1.495 g / cu. cm.	0.054 lbs / cu. in.
	Maximum Temperature	85° C	185° F

Garolite G-10	Tensile Strength	241 MPa	35,000-50,000 psi
	Elongation @ Break	N/A	N/A
	Hardness	Rockwell M110	Rockwell M110
	Density	1.91 g / cu. cm.	0.069 lbs / cu. in.
	Maximum Temperature	129° C	265° F
HDPE	Tensile Strength	28 MPa	4,000 psi
	Elongation @ Break	500%	500%
	Hardness	Rockwell R65	Rockwell R65
	Density	0.958 g / cu. cm.	0.035 lbs / cu. in.
	Maximum Temperature	82° C	180° F
Nylon (13% PTFE-Filled)	Tensile Strength	93 MPa	13,500 psi
	Elongation @ Break	3%	3%
	Hardness	Rockwell M88	Rockwell M88
	Density	1.329 g / cu. cm.	0.048 lbs / cu. in.
	Maximum Temperature	110° C	230° F
Nylon	Tensile Strength	77 MPa	11,200 psi
	Elongation @ Break	50%	50%
	Hardness	Rockwell R110	Rockwell R110
	Density	1.135 g / cu. cm.	0.041 lbs / cu. in.
	Maximum Temperature	85° C	185° F
PEEK (30% Glass-Filled)	Tensile Strength	28 MPa	14,000 psi
	Elongation @ Break	3%	3%
	Hardness	Rockwell R126	Rockwell R126
	Density	1.495 g / cu. cm.	0.054 lbs / cu. in.
	Maximum Temperature	249° C	480° F
PEEK	Tensile Strength	97 MPa	14,000 psi
	Elongation @ Break	20%	20%
	Hardness	Rockwell R125	Rockwell R125
	Density	1.301 g / cu. Cm.	0.047 lbs / cu. In.
	Maximum Temperature	249 C	480° F

Polycarbonate	Tensile Strength	55 MPa	8,000 psi
	Elongation @ Break	110%	110%
	Hardness	Rockwell R120	Rockwell R120
	Density	1.246 g / cu. cm.	0.045 lbs / cu. in
	Maximum Temperature	82° C	180° F
Polypropylene (13% PTFE-Filled)	Tensile Strength	17 MPa	2,500 psi
	Elongation @ Break	34%	34%
	Hardness	Rockwell R55	Rockwell R55
	Density	1.163 g / cu. cm.	0.042 lbs / cu. in
	Maximum Temperature	80° C	176° F
PPS (Polyphenylene Sulfide)	Tensile Strength	93MPa	13.500psi
	Elongation @ Break	4%	4%
	Hardness	Rockwell R125	Rockwell R125
	Density	1.356 g / cu. cm.	0.049 lbs / cu. in.
	Maximum Temperature	218° C	425° F
PTFE (Teflon)	Tensile Strength	31MPa	4,500psi
	Elongation @ Break	300%	300%
	Hardness	Rockwell R60	Rockwell R60
	Density	1.273 g / cu. cm.	0.046 lbs / cu. in.
	Maximum Temperature	204° C	400° F
UHMW	Tensile Strength	34MPa	5,000psi
	Elongation @ Break	200%	200%
	Hardness	Durometer 70D	Durometer 70D
	Density	0.941 g / cu. cm.	0.034 lbs / cu. In.
	Maximum Temperature	82° C	180° F
ULTEM 1000	Tensile Strength	117-121MPa	17,000psi-17,500psi
	Elongation @ Break	40%	40%
	Hardness	Rockwell R111-R125	Rockwell R111-R125
	Density	1.273 g / cu. cm.	0.046 lbs / cu. in.
	Maximum Temperature	168° C	335° F

METALS

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Aluminium (5052)	Yield Strength	159MPa	23,000psi
	Elongation @ Break	8%	8%
	Hardness	Brinell 60	Brinell 60
	Density	2.685 g / cu. cm.	0.097 lbs / cu. in.
	Maximum Temperature	149° C	300° F
Aluminium (6061-T6)	Tensile Strength	241MPa	35,000psi
	Elongation @ Break	12.5%	12.5%
	Hardness	Brinell 95	Brinell 95
	Density	2.768 g / cu. cm.	0.1 lbs / cu. in.
	Maximum Temperature	582° C	1080° F
Aluminium (6063)	Yield Strength	110MPa	16.000psi
	Elongation @ Break	11%	11%
	Hardness	Brinell 55	Brinell 55
	Density	2.685 g / cu. cm.	0.034 lbs / cu. in.
	Maximum Temperature	110° C	212 F
Aluminium (7050)	Yield Strength	469 MPa	17.000psi-17.500psi
	Elongation @ Break	11%	11%
	Hardness	Rockwell B86	Rockwell B86
	Density	2.823 g / cu. cm.	0.102 lbs / cu. in.
	Maximum Temperature	193° C	380° F
Aluminium (7050-T6)	Tensile Strength	421MPa	61,000 psi
	Elongation @ Break	11%	11%
	Hardness	Brinell 150	Brinell 150
	Density	2.768 g / cu. cm.	0.1 lbs / cu. in
	Maximum Temperature	476° C	890° F
Brass (360)	Tensile Strength	103MPa	15,000psi
	Elongation @ Break	53%	53%
	Hardness	Rockwell B35	Rockwell B35
	Density	4.918 g / cu. cm.	0.307 lbs / cu. in.
	Maximum Temperature	582° C	1650° F

Bronze (932)	Tensile Strength	124 MPa	18,000psi
	Elongation @ Break	10%	10%
	Hardness	Rockwell B34	Rockwell B34
	Density	8.913 g / cu. cm.	0.322 bs / cu. in.
	Maximum Temperature	260° C	500° F
Carbon Steel (1045)	Yield Strength	531 MPa	77,000psi
	Elongation @ Break	19%	19%
	Hardness	Rockwell B90	Rockwell B90
	Density	7.861 g / cu. cm.	0.284 lbs / cu. in.
	Maximum Temperature	-	-
Cast Iron	Yield Strength	827 MPa	120.000psi
	Elongation @ Break	1%	1%
	Hardness	Rockwell C20	Rockwell C20
	Density	7.141 g / cu. cm.	0.258 lbs / cu. in.
	Maximum Temperature	-	-
Copper (101)	Tensile Strength	255 MPa	37.000 psi (1/2hard)
	Elongation @ Break	14%	14%
	Hardness	Rockwell F60	Rockwell F60
	Density	8.940 g / cu. cm.	0.323 lbs / cu. in.
	Maximum Temperature	260° C	500° F
Copper (110)	Tensile Strength	290MPa	42,000psi (1/2 hard)
	Elongation @ Break	20%	20%
	Hardness	Rockwell F40	Rockwell F40
	Density	8.913 g / cu. cm.	0.322 lbs / cu. in.
	Maximum Temperature	260° C	500° F
Grade 5 Titanium	Yield Strength	827 MPa	120.000psi
	Elongation @ Break	10%	10%
	Hardness	Rockwell C30	Rockwell C30
	Density	4.429 g / cu. cm.	0.16 bs / cu. in.
	Maximum Temperature	1649° C	3000° F

Nitronic 60	Yield Strength	345 MPa	50,000psi
	Elongation @ Break	35%	35%
	Hardness	Rockwell B85	Rockwell B85
	Density	7.861 g / cu. cm.	0.284 lbs / cu. In.
	Maximum Temperature	982°C	1800°F
Stainless Steel (303)	Tensile Strength	241 MPa	35,000psi
	Elongation @ Break	42.5%	42.5%
	Hardness	Rockwell B95	Rockwell B95
	Density	8.027 g / cu. cm.	0.29 lbs / cu. in.
	Maximum Temperature	1399°C	2550°F
Stainless Steel (304L)	Tensile Strength	207 MPa	30,000 psi
	Elongation @ Break	50%	50%
	Hardness	Rockwell B80 (med)	Rockwell B80 (med)
	Density	8.027 g / cu. cm.	0.29 lbs / cu. in
	Maximum Temperature	816° C	1500° F
Stainless Steel (316L)	Tensile Strength	207MPa	30.000psi
	Elongation @ Break	39%	39%
	Hardness	Rockwell B95	Rockwell B95
	Density	8.027 g / cu. cm.	0.290 lbs / cu. in.
	Maximum Temperature	816° C	1500° F
Stainless Steel (410L)	Tensile Strength	448 MPa	65.000psi
	Elongation @ Break	30%	30%
	Hardness	Rockwell B90	Rockwell B90
	Density	7.750 g / cu. cm.	0.280 bs / cu. in.
	Maximum Temperature	649° C	1200° F
Stainless Steel (416)	Tensile Strength	517 MPa	75,000psi
	Elongation @ Break	22.5%	22.5%
	Hardness	Rockwell B80	Rockwell B80
	Density	7.750 g / cu. cm.	0.280 lbs / cu. In.
	Maximum Temperature	649°C	1200°F

Stainless Steel (440C)	Tensile Strength	758 MPa	110,000psi
	Elongation @ Break	8%	8%
	Hardness	Rockwell C20	Rockwell C20
	Density	7.750 g / cu. cm.	0.280 lbs / cu. in.
	Maximum Temperature	427°C	800°F
Stainless Steel (17-4 PH)	Tensile Strength	1103 MPa	160,000 psi
	Elongation @ Break	7%	7%
	Hardness	Rockwell C35	Rockwell C35
	Density	7.78 g / cu. cm.	0.280 lbs / cu. in.
	Maximum Temperature	593° C	1100° F
Steel (4140 Alloy)	Tensile Strength	413MPa	60,000psi
	Elongation @ Break	21%	21%
	Hardness	Rockwell C15	Rockwell C15
	Density	7.87 g / cu. cm.	0.284 lbs / cu. in.
	Maximum Temperature	248° C	480° F
Steel (1018 Low Carbon)	Tensile Strength	413 MPa	60,000psi
	Elongation @ Break	15%	15%
	Hardness	Rockwell B90	Rockwell B90
	Density	7.87 g / cu. cm.	0.284 bs / cu. in.
	Maximum Temperature	1260° C	2300° F
Tool Steel (A2)	Tensile Strength	53-56 MPa	7,690-8,100 psi
	Elongation @ Break	10.30%	10.30%
	Hardness	Rockwell R115-R118	Rockwell R115-R118
	Density	1.495 g / cu. cm.	0.054 lbs / cu. in.
	Maximum Temperature	85° C	185° F
Zinc-Galvanized-Low Carbon Steel	Tensile Strength	53-56 MPa	7,690-8,100 psi
	Elongation @ Break	10.30%	10.30%
	Hardness	Rockwell R115-R118	Rockwell R115-R118
	Density	1.495 g / cu. cm.	0.054 lbs / cu. in.
	Maximum Temperature	85° C	185° F