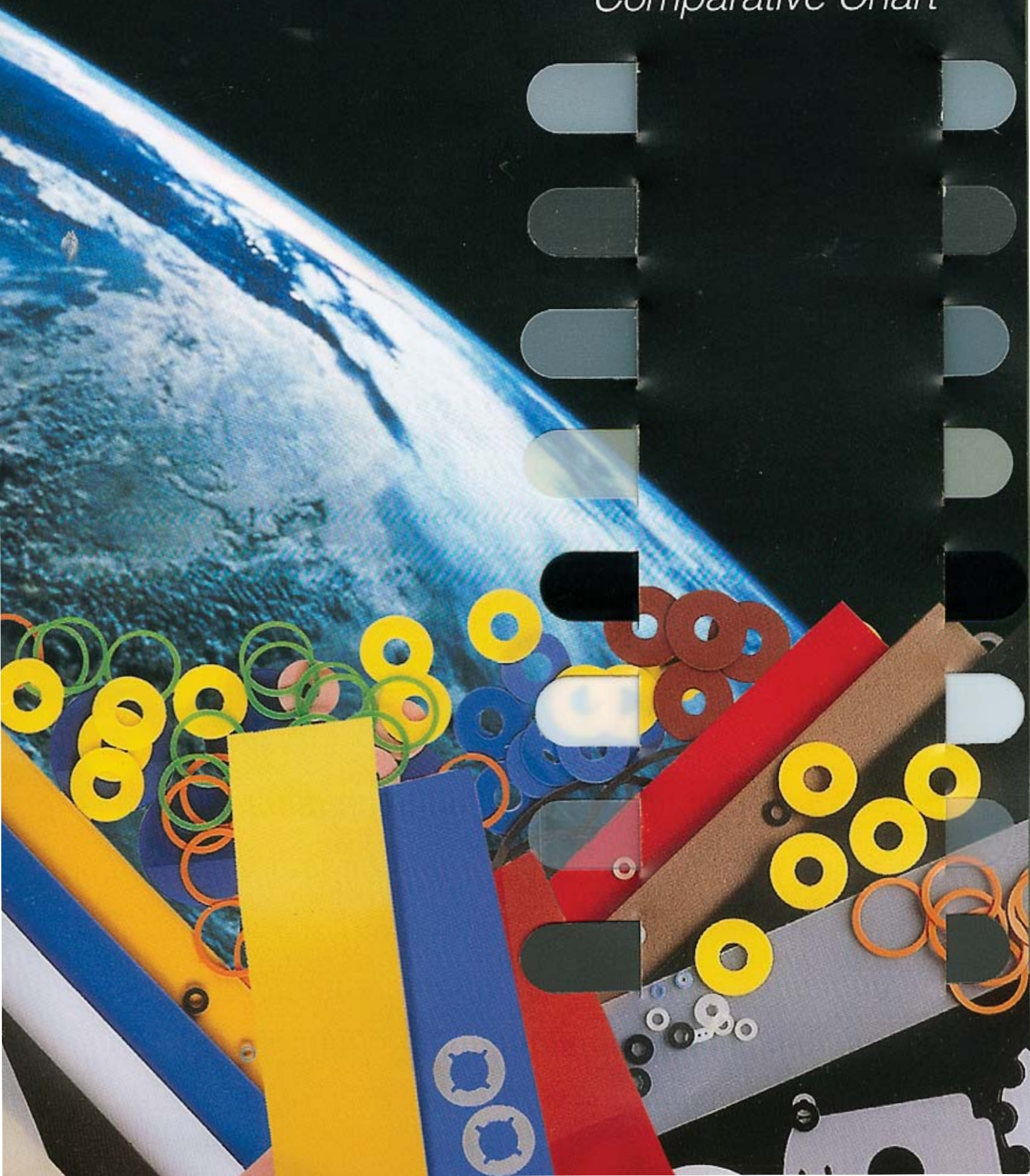



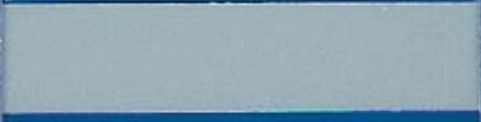

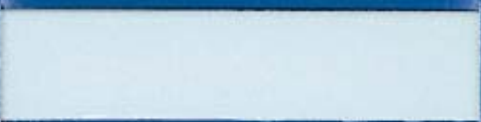




Comparative Chart



ENSINGER/PennFibre specializes in offering a wide variety of engineering thermoplastic and thermoset materials in thin gauge strip, sheet, rolls and punched parts for a broad range of industrial applications. All Federal, Military, ASTM and AIAG specifications are met where applicable. This chart presents a portion of Penn Fibre's standard and custom products and materials. If you don't see what you need, call our Sales Engineers for more material availabilities and recommendations at (800) 662-7366.

	Comparative Cost	Elongation, % At Break, DAM*	Maximum Continuous Service Temperature °F	Dielectric Strength, Volts/Mil	Tensile Strength, PSA DAM*
POLYETHYLENE 	Low	1100	150	500	4,000
POLYPROPYLENE 	Moderate	300	160	500	5,000
UHMWPE 	Moderate	5	200	320	3,500
POLYESTER (PET) 	Moderate	50	230	750	25,000
POLYESTER (IMPACT MODIFIED) 	High	20	220	385	6,300
POLYESTER (PBT) 	Moderate	200	230	500	10,000
NYLON (POLYAMIDE) 6/6, 6, 11, 12, 6/12, ETC. 	Moderate	60	220	475	25,000
NYLON (POLYAMIDE) MDS 	Moderate	60	220	300	12,000

*DAM = Dry as Molded

ENSINGER/PennFibre is the leading Extruder/Fabricator specializing in:

Non-Metallic Punched Parts
Washers • Spacers • Special Shapes

Extruded
Sheets • Coils • Strips

Plastic Comparative Chart and Samples

Typical properties and cost of materials most commonly used in mechanical, electrical and chemical applications.

	Comparative Cost	Elongation, % At Break, DAM*	Maximum Continuous Service Temperature °F	Dielectric Strength, Volts/Mil	Tensile Strength, PSA DAM*
Zytel 45 HSB Nylon 6/6 with a heat stabilizer boosts the continuous service temperature up about 80 F. over its unstabilized counter part. All other properties remain the same. Black (weather stabilized) also available. Material displayed is Zytel 45 HSB.	High	60	300	400	12,000
Nylon 6/6 and 6 with glass fibers added for strengthening and stiffening the BASF polymer. Mechanical properties more than double, while elongation drops substantially. Reduces water absorption. Blends typically contain 13% and 33% glass fibers. Material displayed is Pennite® nylon 6/6 with 13% glass fibers.	High	5	250	475	25,000
Delrin®, Ultraform®, Celcon® This polymer has superior mechanical properties. Should be used in place of nylon 6/6 in bearing and wear applications in wet environments. Has very low coefficient of friction. (limiting PV is 4,500) Material displayed is acetal copolymer.	Moderate	75	210	380	10,000
Delrin® AF Blend This is acetal homopolymer with 12% PTFE fibers added for low friction and non stick properties. Features are: no slip-stick, no lubrication necessary and superior bearing and wear properties. Boosts limiting PV to 7,500. Material displayed is Delrin® AF Blend.	Premium	20	210	500	7,600
ESD Materials Static dissipative and conductive polymers. Acetal, polyethylene, polypropylene, polycarbonate, nylons, and other polymers. Ohms resistance from 10 ² to 10 ¹¹ for applications requiring a thermoplastic material and where static bleed or conductivity is required. Material displayed is static dissipative polycarbonate (10 ⁷ to 10 ¹⁰ ohms resistance).	High	800	150 to 220	N/A	4,500
Ultem® This amorphous polymer is especially suited for electrical/electronic applications in high temperature environments. Light weight coupled with flame retardancy and lowest smoke generation of all plastics make it a candidate for aircraft applications. Material displayed is Ultem® 1000. (crazing can occur with oil under stress). Material displayed is Ultem® 1000.	Premium	60	320	800	15,000
Teflon®, Fluoropolymers Unequaled chemical resistance, high temperature resistance, non-slicking, non-flammable, unusually good electrical properties, low coefficient of friction, and non burning. Available in electrical and mechanical grades as well as glass reinforced grades. Material displayed is unfilled, electrical grade Teflon®.	High	150	500	500	2,000
Paper, linen & canvas laminated phenolic, G-7, G-9, G-10, G-11 and vulcanized fiber. Thermosetting materials fortified with various additives to improve mechanical properties. Mostly used in form of punched and fabricated parts for electrical and mechanical applications. Material displayed is vulcanized fiber.	Moderate	5	300	700	13,000

NYLON (POLYAMIDE) 6/6 HS

NYLON (POLYAMIDE) 6/6 AND 6 GLASS REINFORCED

ACETAL (POLYOXYMETHYLENE, POM)

ACETAL (POLYOXYMETHYLENE (POM) PLUS PTFE

STATIC DISSIPATIVE POLYMERS

POLYETHERIMIDE

POLYTETRAFLUOROETHYLENE (PTFE)

THERMOSETS



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