TridentShapes™ ABS-FR15 BK4051

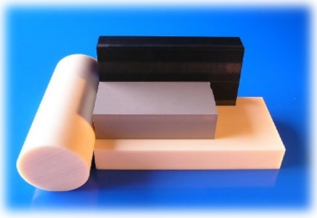
Acrylonitrile Butadiene Styrene

Product Description

TridentShapes™ ABS is an excellent choice for applications which require high impact resistance, strength and stiffness. Trident ABS is an ideal material for machining structural components and pre-production prototypes.
ABS resin is a terpolymer formed by blending an amorphous thermoplastic copolymer of acrylonitrile and styrene with an elastomeric component, such as polybutadiene or a butadiene polymer. By altering the ratio of these three monomers, ABS resins can offer an expansive assortment of performance properties tailored to meet a wide range of end-use requirements.
Because of its good balance of properties, toughness-strength-temperature resistance coupled with its ease of processing, TridentShapes™ ABS has a very wide range of applications.

Characteristics
- Lightweight
- Easy to fabricate
- Good strength & stiffness
- High impact resistance
- Excellent aesthetic properties

Applications
- Structural components
- Housings
- Support blocks
- Models
- Machined prototypes



General

Annealed Plate: .250 through 5.00" thick Plate sizes: 24x48 • 48x96 • 50x124 • 30x60

Extruded Rod: 1.00 through 6.00" diameter (minimums may apply)

Cut to size shapes and custom sizes available on request

Agency ratings: ASTM D4673 ABS0160 B00000 • UL94 V0 • UL94 5VA

Standard color: Black

Physical	Nominal Value	Unit	Nominal Value	Unit	Test Method
Density / Specific Gravity	0.043	lb/in^3	1.200	g/cm^3	ASTM D1505
Mechanical	**Nominal Value**	**Unit**	**Nominal Value**	**Unit**	**Test Method**
Tensile Modulus	339000	psi	2339	Mpa	ASTM D638
Tensile Strength (Yield)	5950	psi	41	Mpa	ASTM D638
Tensile Strength (Break)	5080	psi	35	Mpa	ASTM D638
Tensile Elongation (Yield)	2.3	%	2.3	%	ASTM D638
Tensile Elongation (Break)	9	%	9	%	ASTM D638
Flexural Modulus	395000	psi	2726	Mpa	ASTM D790
Flexural Strength	10300	psi	71	Mpa	ASTM D790
Impact	**Nominal Value**	**Unit**	**Nominal Value**	**Unit**	**Test Method**
Notched Izod Impact 73ºF (23ºC)	4	ft-lb/inch	214	J/m	ASTM D256
Instrumented Dart Impact 73ºF (23ºC) Total Energy	292	in-lb	33	J	ASTM D3763
Thermal	**Nominal Value**	**Unit**	**Nominal Value**	**Unit**	**Test Method**
Deflection Temperature 66 psi	180	ºF	82.29	ºC	ASTM D648
Deflection Temperature 264 psi	158	ºF	70.06	ºC	ASTM D648
Vicat Softening Temperature	187	ºF	86.18	ºC	ASTM D1525[2]

Electrical	Nominal Value Unit	Nominal Value Unit	Test Method
Arc Resistance	PLC 7	PLC 7	ASTM D495
Comparative Tracking Index (CTI)	PLC 2	PLC 2	UL 746A
High Amp Arc Ignition (HAI)	PLC 4	PLC 4	UL 746A
High Voltage Arc Resistance to Ignition (HVAR)	PLC 4	PLC 4	UL 746A
Hot-wire Ignition (HWI)	PLC 3	PLC 3	UL 746A
Flammability	**Nominal Value Unit**	**Nominal Value Unit**	**Test Method**
Flammability Rating	V0 @ .060	V0 @ .060	UL94
	5VA @ .100	5VA @ .100	UL94

* This information is based on average resin value specifications and is only to assist and advise you on the current technical knowledge, it is given without obligations or liability.

Fabrication & Machining Guidelines

The following guidelines are presented for those machinists not familiar with the machining characteristics of plastics. They are intended as guidelines only, and may not represent the most optimum conditions for all parts. TridentShapes™ performance plastics are stress relieved to ensure the highest degree of machinability and dimensional stability. However, the relative softness of plastics (compared to metals) generally results in greater difficulty maintaining tight tolerances during and after machining.

Things to know before machining performance plastics

- Thermal expansion is up to 10 times greater with plastics than metals
- Plastics lose heat more slowly than metals, so avoid localized overheating
- Softening (and melting) temperatures of plastics are much lower than metals
- Plastics are much more elastic than metals

Because of these differences, you may wish to experiment with fixtures, tool materials, angles, speeds and feed rates to obtain optimum results.

Tips for getting started

- Positive tool geometries with ground peripheries are recommended.
- Carbide tooling with polished top surfaces are suggested for optimum tool life and surface finish.
- Diamond coated or polycrystalline tooling provides optimum surface finish when machining PEI, PAI, PBI and other Polyimides.
- Use adequate chip clearance to prevent clogging.

Sawing

Band sawing is versatile for straight, continuous curves or irregular cuts. Tablesaws and panelsaws are convenient for straight cuts and can be used to cut multiple thicknesses and thicker cross sections up to 6.00" with adequate blade projection and power. Saw blades should be selected based upon material type and thickness. For precision cutting services, contact your sales representative or go to https://www.tridentplastics.com/capabilities/cutting/

Milling

Sufficient fixturing allows fast table travel and high spindle speeds when end milling plastics. When face milling, use either high positive or high shear geometry cutter bodies.

Turning

Operations require inserts with positve geometries and ground peripheries. Ground peripheries and polished top surfaces generally reduce material build-up on the insert, improving the attainable surface finish. A fine grained C- 2 carbide is generally best for turning operations.

Drilling

The insulating characteristics of plastics require consideration during drilling operations, especially when hole depths are

greater than twice the diameter.

Threading and Tapping

Threading should be done by single point using a carbide insert and taking four to five 0.001" passes at the end. Coolant usage is suggested. For tapping, use the specified drill with a two flute tap. Remember to keep the tap clean of chip build-up. Use of a coolant during tapping is also suggested.

Coolant Recommendations

Coolants are generally not required for most plastic machining operations (not including drilling and parting off). However, for optimum surface finishes and close tolerances, non-aromatic, water soluble coolants are suggested. Spray mists and pressurized air are very effective means of cooling the cutting interface. General purpose petroleum based cutting fluids although suitable for metals and some plastics, may contribute to stress cracking of amorphous plastics such as ABS, PMMA Acrylic, PC Polycarbonate PPE+PS Noryl, PSU Polysulfone, PPSU Polyphenylsulfone, and PEI Polyetherimide. Trident recomends using Premier Polycut™ from Tullco Inc. https://tullco.com/ for these sensitve materials.