



**ADAPTIVE3D™**



# ELASTIC TOUGH**RUBBER™**

A Tough Printable  
Elastomer For All Seasons

## CHALLENGE

In the past, it has been nearly impossible to additively manufacture elastomeric materials with rubber and polyurethane-like performance. FFF and SLS printing of elastomeric thermoplastics result in poor properties and parts that are only good for prototyping. DLP and SLA printing requires viscous materials with low tear elasticity, poor tear strength and little strain. Until now!

## SOLUTION

Elastic ToughRubber™ (ETR) unlocks the benefits of additive manufacturing to those in the rubber, polyurethane and foam industries. Elastic ToughRubber™ is simply the toughest AM elastomer on the market. With a tear strength of 38 kN/m, 190% elongation and ultimate tensile strength of 14 MPa, ETR mimics leading injection molded thermoplastic polyurethanes like PEBAX® and Elastollan®. If you make parts from technical foams, rubbers or polyurethanes, ETR is your solution to additive manufacturing end parts and products.

## USES AND APPLICATIONS

Elastic ToughRubber™ can already be found in parts and products that are sold on store shelves. It is perfect for shoe midsoles and heel cups, seals, door boots, bellows, foam-like lattice structures and impact parts.

## MANUFACTURING, PROCESSING AND QUALITY

Unlike similar materials in DLP printing, Elastic ToughRubber™ is a one part one pot polymer system. This means there is no mixing of two materials in the proper ratios, which can lead to poor quality if not done correctly. ETR is also pot stable so there is no wasted resin at the end of the print. You simply use the left over resin to print your next part!

## Key Features & Benefits

- Flexibility and simplicity in design
- New design geometries and wow factor
- Modulus and performance comparable to foamed TPU
- Stable performance in all weather
- Durable and long lasting for end use

## Applications & Use Cases

- Midsoles
- Heel cups
- Foam-like lattice structuring
- Lifestyle running shoe
- High performance hiking boot
- Casual sneaker



**ADAPTIVE3D™**

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Visit [adaptive3d.com](https://adaptive3d.com) for more information.



# ETR90 PROPERTIES

## HARDNESS

SHORE A 90

## BAYSHORE RESILIENCE

43%

## TEAR STRENGTH

38 kN/m

## ELONGATION

190%

## TOUGHNESS

17.9 MJ/m<sup>3</sup>

## ULTIMATE TENSILE STRENGTH

14MPa

## GLASS TRANSITION TEMPERATURE

-62°C to +86°C

Test	Test Result	Grade	Test Site
Cytotoxicity	ISO - 10993-5	Pass	NAMSA
Irritation	ISO - 10993-10	Pass	NAMSA
Sensitization	ISO - 10993-10	Pass	NAMSA



## GET IN TOUCH TODAY!

Contact us today to see what Adaptive3D and **Elastic ToughRubber** can do for you and your business! **469.573.0024**



Size US 13 Men's Midsole



Bellow, O-Rings, Bushing, Lattices



Automotive door boot surviving flex and strain



Automotive door boot



## Elastic ToughRubber™ 90

### ETR90-TD-385-B

TYPE	STANDARD	PARAMETER	UNIT	VALUE
Liquid	ASTM D2196	Viscosity	cP	7900
Liquid	ASTM D792	Liquid Density	g/mL	1.038
Print	ASTM D2240	Hardness - 0 s	Shore A	92
Print	ASTM D2240	Hardness - 10 s	Shore A	89
Print	ASTM D2240	Hardness - 0 s	Shore D	28
Print	ASTM D2240	Hardness - 10 s	Shore D	28
Print	ASTM D4065	Glass Transition (DMA) - Low	°C	-62
Print	ASTM D4065	Glass Transition (DMA) - High	°C	86
Print	ASTM D4065	Storage Modulus @ 25 C	MPa	59
Print	ASTM D638 Type V	Fracture Toughness	MJ/m <sup>3</sup>	17.9
Print	ASTM D638 Type V	Elongation at Break	%	190
Print	ASTM D638 Type V	Ultimate Tensile Strength	MPa	14
Print	ASTM D624 Die C	Tear Strength	kN/m	38
Print	ASTM D395 Method B Type 1	Compression Set - 25 C/25%/22hrs	%	25
Print	ASTM D395 Method B Type 1	Compression Set - 70 C/25%/22hrs	%	53
Print	ASTM D2632	Bayshore Resilience	%	49

#### Passed Bio-Compatibility Testing

Test conducted at NAMSA Testing Labs (namsa.com) and test procedure was followed as per ISO 10993 standards

	ISO 10993-5	ISO 10993-10	ISO 10993-10
Material	Cytotoxicity	Irritation	Sensitization
ETR 90	Pass	Pass	Pass

The data provided are typical values when following the described testing parameters and recommended processing and post processing steps on standard prints. 3D Printing materials properties can change based on any changes to the above.