

HUNTSMAN

Enriching lives through innovation

Shaping the future

TPU elastomers for
Molding applications





Experts in elastomers

Our polyurethanes business division is a leading developer of polyurethane (PU) and thermoplastic polyurethane (TPU) materials. Combining global reach with decades of experience in material innovation, we are experts in urethane-based elastomers and have in-depth knowledge of their application across a vast range of industries.

A flexible partner for plastics molders

We are a leading provider of TPU elastomers that can help meet the manufacturing challenges of a fast-paced world. Tough and reliable, yet incredibly versatile, our TPU elastomers can be easily injection molded or overmolded and are renowned for their extreme adaptability.

We offer:

- **IROGRAN® TPU elastomers** – a range of premium injection molding elastomers for demanding industrial applications
- **AVALON® TPU elastomers** – a portfolio of elastomers well suited to the manufacture of consumer products and general-purpose applications.

Shaping the future

Our IROGRAN® and AVALON® TPU elastomers for specialty molding applications range from 55 Shore A to 65 Shore D hardness and can be adapted to suit different production techniques.

Regardless of their application, our injection molding elastomers are renowned for their mechanical and physical properties including:

- Wear and tear strength
- Dimensional stability
- Hydrolysis and oil resistance
- Low compression set
- Dynamic load performance
- Elasticity and flexibility down to -50°C
- Processing consistency with perfect surface definition
- Processing speed with up to 30% quicker demolding than industry standard materials
- Excellent slip resistance (specialty grades)
- Transparency and translucency (specialty grades)
- Recyclability.





Key applications

Industrial

- Hydraulic and pneumatic seals and gaskets
- Wheels, pulleys, sprockets, castors, rollers
- Bladders
- Handles for industrial equipment
- Agricultural parts for sorting and sowing equipment
- Parts for construction tools and machinery
- Mineral extraction and mining screens.

Transportation & automotive

- Automotive dashboard parts
- Other interior components e.g., trays, gear knobs, cup holders, buttons
- Over-molded key cases
- Technical parts such as spring aids
- Stone protection parts
- Reusable automotive packaging or dunnage.

Consumer goods

- Soft-touch handles and wheels
- Protection cases for electrical equipment
- Sports equipment
- Nose pads for glasses / eyewear
- Durable furniture parts.

Product highlights

IROGRAN® TPU elastomers

IROGRAN® A 70 E 4675 TPU:

Exceptional performance in over-molding

IROGRAN® A 70 E 4675 elastomer is a unique, soft, plasticizer-free, polyester TPU for injection molding applications. Easily processed, and with an exceptionally short cycle time, IROGRAN® A 70 E 4675 TPU is used extensively across a wide range of industries including the production of specialized automotive, sports and consumer goods.

IROGRAN® A 95 E 4813 TPU:

Enabling high production rates of thick wall parts

IROGRAN® A 95 E 4813 TPU is a compelling elastomer choice for injection molding of thick parts. High crystallinity gives this polyester-based material the capability to be demolded faster than standard elastomer grades. This high performance TPU is used to mold technical parts for consumer goods, automotive and other industrial applications.

IROGRAN® A 95 K 4977 TPU:

High dynamic performance TPU

Within our injection molding product range, IROGRAN® A 95 K 4977 TPU is one of the best performing polycaprolactone-based elastomers available. With an increased degree of crystallinity, this elastomer grade is ideally suited for used in high-performance hydraulic seals that requires low compression set performance at a wide range of temperatures.



Product highlights

AVALON® TPU elastomers

AVALON® 6044 AG TPU:

A high grip TPU alternative to rubber

Part of the AVALON® GECKO range, AVALON® 6044 AG TPU is a polyester-based elastomer for injection molding applications. Offering a short cycle time compared to other soft TPU grades, this elastomer offers superior slip resistance in both wet and dry conditions and improved abrasion resistance at elevated temperatures.

AVALON® 95 ABR TPU:

A TPU elastomer with high abrasion resistance

This polyester-based TPU forms part of a family of products designed for applications that require the lowest possible abrasion loss. Offering good cut and scratch resistance, alongside low temperature performance and short cycle times, AVALON® 95 ABR TPU is widely used to produce objects including escalator wheels and sports shoe soles.

AVALON® 60 DB TPU:

A robust and durable engineered TPU

AVALON® 60 DB TPU combines excellent wear and abrasion resistance with great processing properties. This versatile elastomer is frequently used in the production of dunnage and other automotive and industrial parts, offering a long-lasting and cost effective solution to the market.

Infinite scope for innovation

IROGRAN® TPUs: Key products

Physical properties	Norm	Unit	A 70 E 4675	A 85 H 4508	A 87 H 4615R	A 92 E 4246L	A 95 E 4813	A 65 P 4324N
			IROGRAN® ester-based					
GENERAL								
Hardness	ASTM D 2240	Shore A	75	85	87	91	95	71
Hardness	ASTM D 2240	Shore D	25	39	41	47	44	22
Density	ASTM D 792	g/cm ³	1.15	1.16	1.19	1.21	1.21	1.12
MECHANICAL								
Tensile strength	ASTM D 412	psi	2200	4910	5290	6370	5400	3050
Elongation @ break	ASTM D 412	%	650	420	410	530	410	900
Tensile stress @ 100% elongation	ASTM D 412	psi	570	1070	1110	1050	1600	650
Tensile stress @ 300% elongation	ASTM D 412	psi	950	2370	2630	2370	3500	1000
Tear strength	ASTM D 624	pli	300	520	570	610	750	400
Compression set 24h @ 70°C	ASTM D 395	%	58	79	80	69	45	48
Mold shrinkage	ISO 294-4	%	1.6	0.9	0.8	1.0	0.8	1.2
Bayshore rebound resilience	ASTM D-2632	%	25	40	39	41	-	58
Abrasion	ISO 4649	mm ³	90	52	30	30	30	60
THERMAL								
TMA low melt range	Huntsman	°C	150	169	161	182	170	110
TMA high melt range	Huntsman	°C	190	185	173	204	200	165
OTHER FEATURES								
Transparent					x			x
Highly crystalline			x	x		x	x	
Presence of plasticizer								x

A 80 P 5039	A 85 P 4394	A 92 P 4207	A 92 P 4637	A 95 P 5044	A 98 P 4535	A 92 K 4107	A 95 K 4977	A 95 K 4640	A 92 K 5031
IROGRAN® ether-based						IROGRAN® Specialty			
81	85	92	91	95	96	91	94	95	92
33	40	46	45	48	56	47	48	45	46
1.10	1.12	1.13	1.14	1.14	1.15	1.18	1.20	1.19	1.13
5660	6850	6300	7100	8290	7410	5330	5800	6260	5660
620	560	510	500	480	440	540	510	560	580
680	930	1350	1300	1630	2370	1290	2000	2150	1660
1140	1730	2670	2860	4050	4780	2290	3250	3090	2610
380	470	570	550	620	760	550	760	870	740
80	80	77	83	82	79	26	25	23	26
0.9	0.9	0.9	0.9	0.7	1.0	0.7	1.3	1.4	1.0
53	42	40	35	35	41	43	29	38	41
34	31	40	33	31	38	29	30	30	20
141	157	165	167	175	191	194	210	220	180
156	170	188	181	187	204	205	220	225	195
x	x		x	x					
		x			x	x	x	x	x

Further technical data about individual products plus best practice advice for handling and processing our elastomers is available by contacting your local sales representative or by visiting our online product finder tool:

<http://www.huntsman-tpu.com/>

Infinite scope for innovation

AVALON® TPUs: Key products

Physical properties	Norm	Unit	6044 AG	6053 AG	65 AB	65 AK
GENERAL						
Hardness	ASTM D 2240	Shore A	67	60	67	65
Hardness	ASTM D 2240	Shore D	-	-	-	-
Density	ASTM D 792	g/cm ³	1.20	1.16	1.18	1.18
MECHANICAL						
Tensile strength	ASTM D 412	psi	3500	4300	4300	3000
Elongation @ break	ASTM D 412	%	814	630	700	750
Tensile stress @ 100% elongation	ASTM D 412	psi	460	275	360	510
Tensile stress @ 300% elongation	ASTM D 412	psi	950	580	730	1200
Tear strength	ASTM D 624	pli	500	500	550	500
Compression set 70h @ 23°C	ASTM D 395	%	-	-	25	20
Compression set 24h @ 70°C	ASTM D 395	%	-	-	45	-
Abrasion	ISO 4649	mm ³	50	30	50	90
OTHER FEATURES						
Improved abrasion resistance version						
UV protected version available					X	X
Presence of plasticizer			X	X	X	X

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70 AE	75 AE	80 AB	85 AB	90 AB	95 AB	60 DB	65 DB
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AVALON® ester-based

70	75	80	85	90	95	97	97
-	28	30	40	44	50	63	65
1.21	1.22	1.20	1.21	1.21	1.22	1.23	1.23
4300	4500	4891	5700	5200	5400	7000	6304
800	700	439	420	550	500	450	328
435	686	834	1107,0	1350	1750	2500	3707
870	918	2608	3292	2400	3000	3600	5969
500	500	530	652	730	750	1050	1223
30	30	20	16	25	30	35	35
-	56	30	32	45	50	60	65
35	35	30	25	25	30	30	35
		X	X	X	X		
	X		X	X	X		X
X	X						

Global elastomers experts

Committed to customers: We build partnerships with our customers and work across an international network of R&D and manufacturing locations to help solve complex challenges and deliver the highest levels of technical support and customer care.

Committed to quality: Wherever we are, whatever we are doing, we prioritize environmental, health and safety protection, and we are always rigorous about quality control and assurance.

Committed to innovation: We keep pace with the most innovative trends in plastics processing by using the latest equipment and making regular investments in our formulation, manufacturing and R&D capabilities.

Committed to sustainability: We create solutions that contribute to a more sustainable society by helping to conserve energy, preserve natural resources and reduce our overall carbon footprint.



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About Huntsman:

Huntsman Corporation is a publicly traded corporation headquartered in The Woodlands, Texas, in the United States of America. Huntsman is a global downstream, differentiated, and specialty chemicals company. For more than 50 years, we have been using science and ingenuity to innovate and create products that enable more sustainable and comfortable lives for millions of people around the world. In 2023, Huntsman had more than 6,000 associates working in nearly 60 manufacturing, research and development (R&D), and operations facilities in 25 countries. Through our three divisions, we produce approximately 6,250 products to serve a broad and diverse range of consumer and industrial end markets including aerospace, transportation, building and construction, consumer goods, energy and fuels, and food preservation.

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