

INNOVATIVE SOLING SOLUTIONS: **DALTOPED® *DUAL DENSITY*** **TECHNOLOGY**

Combining design flexibility
and excellent shoe performance

Huntsman Polyurethanes' DALTOPED® **DUAL DENSITY** polyester and polyether technology delivers a highly effective compromise between a hardwearing outsole and a low density cushioning midsole. With multiple color finishing effects, the technology can be used to create fashionable and high performance soling solutions for safety and casual shoes, boots and trekking shoes.

Employing DALTOPED® **DUAL DENSITY** solutions can also help footwear manufacturers eradicate any consumer concerns about sustainability: longer wearing footwear and low VOC consumption are all easily achievable.

Like all other DALTOPED® polyurethane systems, the DALTOPED® **DUAL DENSITY** product range is water-blown without the use of harmful tin catalysts, and can be based on polyether and / or polyester chemistry – depending on customer preferences.

Benefits

Hard wearing outsoles

- Density range 1.2 down to 0.7 kg/m³ depending on design
- Rubber-like grip and feel
- Non-floor marking
- Excellent abrasion resistance
- Good surface definition
- Improved sole flexibility (Bata belt / Bennewardt).

Lightweight comfortable midsole

- Better cushioning
- Multiple colors possible (fashion oriented).

Productivity

- Compatible with standard polyurethane injection and casting machines; cumbersome stick on processes can be avoided.



Typical technical properties

Polyether	DALTOPED® <i>DUAL DENSITY</i> *			
Density (kg/m³)	Outsole 1000 kg/m³	Outsole 800 kg/m³	Midsole 450 kg/m³	Midsole 300 kg/m³
Hardness (Shore A)	60	50	45	40
Trouser tear (N/mm)	9.0	8.5	5.5	4.0
Tensile strength (MPa)	5.5	5.0	3.0	2.0
Elongation (%)	450	400	350	300
Flex life Bennewardt 30 / 60 kcycl	0-0-0	0-0-0	N/a	N/a
Abrasion (mg loss)	40-80	60-100	N/a	N/a

* DALTOPED® *DUAL DENSITY* system based on polyether technology

Polyester	DALTOPED® <i>DUAL DENSITY</i> *			
Density (kg/m³)	Outsole 1200 kg/m³	Outsole 800 kg/m³	Midsole 450 kg/m³	Midsole 400 kg/m³
Hardness (Shore A)	65	55	45	40
Trouser tear (N/mm)	12.0	10.0	6.0	5.0
Tensile strength (MPa)	9.5	8.0	4.0	3.0
Elongation (%)	600	550	400	350
Flex life Bennewardt 30 / 60 kcycl	0-0-0	0-0-0	N/a	N/a
Abrasion (mg loss)	40-80	60-100	N/a	N/a

* DALTOPED® *DUAL DENSITY* system based on polyester technology

Committed to sustainable soling solutions

Adding DALTOPED® *DUAL DENSITY* products to the existing Huntsman Polyurethanes footwear range demonstrates the company's dedication to creating sustainable innovations for the polyurethane soling materials market and our ability to anticipate industry trends. Responding to demands for ever lighter soling solutions – free from harmful substances – we are helping footwear manufacturers deliver on their commitment to customers, without compromising quality.

Committed to customers

Alongside an extensive range of polyurethane soling materials, our highly skilled, technical footwear team can help optimize customer production processes for success. Working in-house – on the very latest injection molding and casting equipment – we can replicate real world manufacturing conditions. This considerable investment in our research and development capabilities, means our footwear products are well suited to the needs of our customers and can be processed extremely efficiently. It also enables partnerships with customers who have a specific brief to fulfill or a complicated manufacturing challenge to overcome.

- Dedicated to sustainable innovation
- Supporting customers with tailor-made solutions
- Committed to long-term partnerships
- In-house customer prototyping both in Everberg, Belgium and Pune, India
- Helping footwear manufacturers stay one step ahead.

For more information

Phone: +49 991 2704 230
www.huntsman.com/pu/footwear
footwear@huntsman.com

HUNTSMAN

Enriching lives through innovation

About Huntsman

Huntsman Corporation is a publicly traded global manufacturer and marketer of differentiated chemicals with 2013 revenues of over \$11 billion. Our chemical products number in the thousands and are sold worldwide to manufacturers serving a broad and diverse range of consumer and industrial end markets. We operate more than 80 manufacturing and R&D facilities in over 30 countries and employ approximately 12,000 associates within our 5 distinct business divisions. For more information about Huntsman, please visit the company's website at www.huntsman.com

Disclaimer

Huntsman Polyurethanes warrants only that its products meet the specifications agreed with the buyer. Typical properties, where stated, are to be considered as representative of current production and should not be treated as specifications.

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Products may be toxic and require special precautions in handling. The user should obtain Safety Data Sheets from Huntsman Polyurethanes containing detailed information on toxicity, together with proper shipping, handling and storage procedures, and should comply with all applicable safety and environmental standards.

Hazards, toxicity and behavior of the products may differ when used with other materials and are dependent on the manufacturing circumstances or other processes. Such hazards, toxicity and behavior should be determined by the user and made known to handlers, processors and end users.

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