

# POLYURETHANE FOR FOOTWEAR (PU SYSTEMS)

The polyurethane systems by Elachem are fully customised in order to obtain a product of the required characteristics and to ensure compatibility with any polyurethane machine, thereby optimising the production process. The polyurethane systems by Elachem are formulated to guarantee “trouble free” use, great tolerance and versatility.

ISO 9001 certification provides a further guarantee of the excellence of our processes.



The vast range of polyurethanes for footwear by Elachem is available in six main families.

## POLYETHER SYSTEMS

For the production of soles for sandals and for very flexible men's and women's footwear with excellent physical/mechanical resistance with hardness ratings ranging from 45 to 85 Shore A and densities from 0.40 to 0.65 g/cm<sup>3</sup>.

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## HARD/SEMI-HARD SYSTEMS

For the production of soles for sandals, particularly suitable for wedge heels for women, with hardness ranging from 55 to 75 Shore A and with densities from 0.24 to 0.40 g/cm<sup>3</sup>. Excellent workability and demoulding time. In order to meet certain needs, the systems can be set up for the production of soles that are particularly hard and rigid (85/95 Shore A).

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## INTERMEDIATE SYSTEMS

For the production of flexible, soft and light soles particularly suitable for city, casual and sports shoes with hardness ratings ranging from 40 to 60 Shore A and densities from 0.35 to 0.55 g/cm<sup>3</sup>. These systems provide excellent resistance to abrasion as well as great comfort.

## SUPER-LIGHT SYSTEMS

For the production of particularly light intersoles with hardness ratings ranging from 35 to 45 Shore A and with densities from 0.22 to 0.34 g/cm<sup>3</sup>. These systems are particularly suitable for expanded intersoles on sports shoes combined with treads in compact PU, TPU or rubber. The great flexibility of these systems ensures excellent resistance to compression. Systems particularly suitable for the production of pool/beach sandals are also available

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## INSOLE SYSTEMS

For the production of all types of insoles (including covered insoles) with hardness ratings ranging from 10 to 40 Shore A and densities from 0.22 to 0.32 g/cm<sup>3</sup>.

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## HIGH QUALITY SYSTEMS

Medium and high molecular weight systems for the production of soles with optimum resistance to multiple flexing at both low and very low temperatures with hardness ratings ranging from 50 to 60 Shore A and with densities from 0.45 to 0.65 g/cm<sup>3</sup>. These systems are particularly suitable for the soles on safety shoes whether they are single or double density. They are also ideal for trekking shoes and all other types of footwear requiring high resistance to flexing and hydrolysis.





These are the six main families that make up the range of polyurethane systems for footwear by Elachem. Elachem can tailor each product in these families to specific production and design needs. **FOR MORE INFORMATION, VISIT [WWW.ELACHEM.IT](http://WWW.ELACHEM.IT)**

TECHNICAL CHARACTERISTICS	STANDARD	INSOLE		SOLES		HARD / SEMI-HARD			INTERMEDIATE		SUPER-LIGHT			HIGH QUALITY		
		ET ME 025/030	ET ME 030/035	ET ME 51/19	V354	ET ME 75	V333	V203	ET ME 41	V200-12	V200-18	V354-LM	LIGHTEL	V355	V355-50	V355-100
Ester/Ether		Ether	Ether	Ether	Ester	Ether	Ester	Ester	Ether	Ester	Ester	Ester	Ester	Ester	Ester	Ester
Free density	>>>	0,14 - 0,16	0,19 - 0,21	0,25 - 0,27	0,25 - 0,27	0,20 - 0,22	0,19 - 0,21	0,20 - 0,2	0,22 - 0,23	0,22 - 0,23	0,18 - 0,20	0,17 - 0,19	0,13 - 0,14	0,31 - 0,33	0,27 - 0,29	0,27 - 0,29
Density in the mould g/cm³	ISO 845:2006	0,25 - 0,30	0,25 - 0,30	0,50 - 0,55	0,50 - 0,55	0,38 - 0,44	0,25 - 0,30	0,37 - 0,42	0,44 - 0,48	0,40 - 0,44	0,28 - 0,31	0,33 - 0,38	0,24 - 0,28	0,57 - 0,62	0,50 - 0,55	0,50 - 0,55
Hardness on the shore A scale	DIN 53505	25 +- 3	30 +- 3	58 +- 3	60 +- 3	70 +- 5	30 +- 3	65 +- 5	58 +- 3	60 +- 3	58 +- 3	43 +- 3	53 +- 3	60 +- 3	630 +- 3	630 +- 3
Load at break kN/m	DIN 53504	N/D	N/D	>10,0	>12,0	>5,0	>5,0	>7,0	>8,0	>9,0	>6,0	>8,0	>6,0	>15,0	>13,0	>13,0
Elongation %	DIN 53504	N/D	N/D	>350	>450	>300	>300	>350	>350	>350	>300	>350	>350	>550	>500	>500
"Bennewart" res. to cut growth	DIN 53522	N/D	N/D	< 4 mm	< 4 mm	< 4 mm	< 4 mm	< 4 mm	< 4 mm	< 4 mm	< 4 mm	< 4 mm	< 4 mm	< 4 mm	< 4 mm	< 4 mm
"Ross flex" res. room T+20°c 30.000 cycles	DIN 53543	N/D	N/D	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm
"Ross flex" res. cold T-20°c 30.000 cycles	EN ISO 7854	N/D	N/D	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm	< 6 mm
Flex resistance alter hydrolysis	EN ISO 7854	N/D	N/D	150.000	150.000	150.000	150.000	150.000	150.000	150.000	150.000	150.000	150.000	150.000	150.000	150.000
Abrasion	DIN 53516	N/D	N/D	<150 mg	<150 mg	<250 mg	<250 mg	<250 mg	<200 mg	<200 mg	<150 mg	N/D	<250 mg	<150 mg	N/D	<250 mg
Antistatic	EN ISO 20347/EN ISO 20345	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL							OPTIONAL	OPTIONAL		OPTIONAL	OPTIONAL
Electrostatic discharge (ESD)	ESD CEI EN 61340-5-1	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL							OPTIONAL	OPTIONAL		OPTIONAL	OPTIONAL
Compression resistance	ISO 815-1	<15%	<15%										<20 mm			
<b>APPLICATIONS/TYPES</b>																
Soles				●	●	●	●	●	●	●			●	●	●	●
Sandal/slipper									●	●	●		●			
Hard/wedge heel																
Semi-hard																
Casual				●	●									●	●	●
Safety						●								●	●	●
Compact				●	●									●	●	●
Intersoles									●			●	●		●	●
Intermediate									●	●						
Super-light											●	●	●			
Boot					●										●	●

