

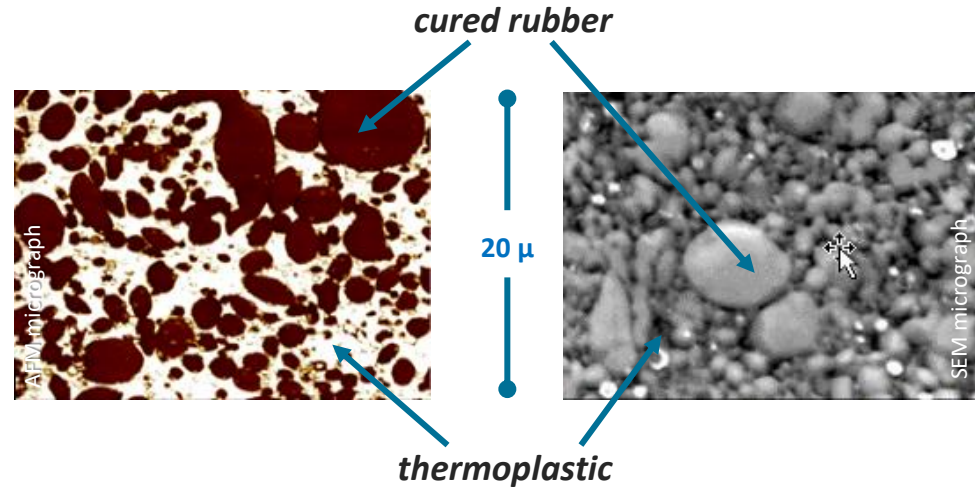
Santoprene™ High Resilience TPV

Step out elastic recovery for next generation seals

External

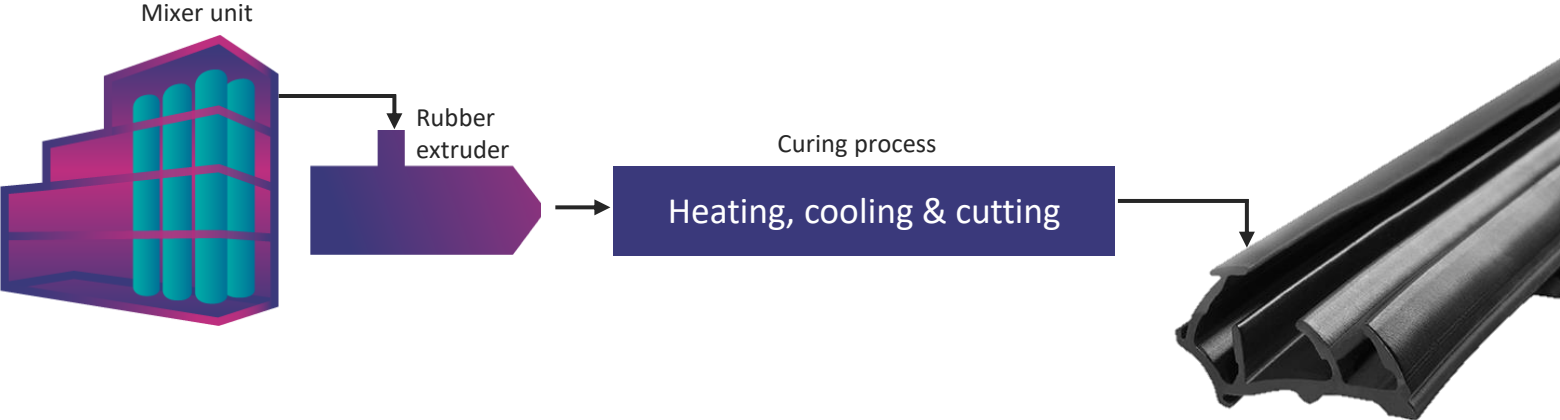


- ▶ Chemically cross-linked (vulcanized) rubber encapsulated in thermoplastic matrix
- ▶ Properties like thermoset rubber but melt-processable like a thermoplastic
- ▶ Homogeneous dispersion of small particle-size rubber provides good tensile strength
- ▶ Locked-in morphology provides stable physical properties

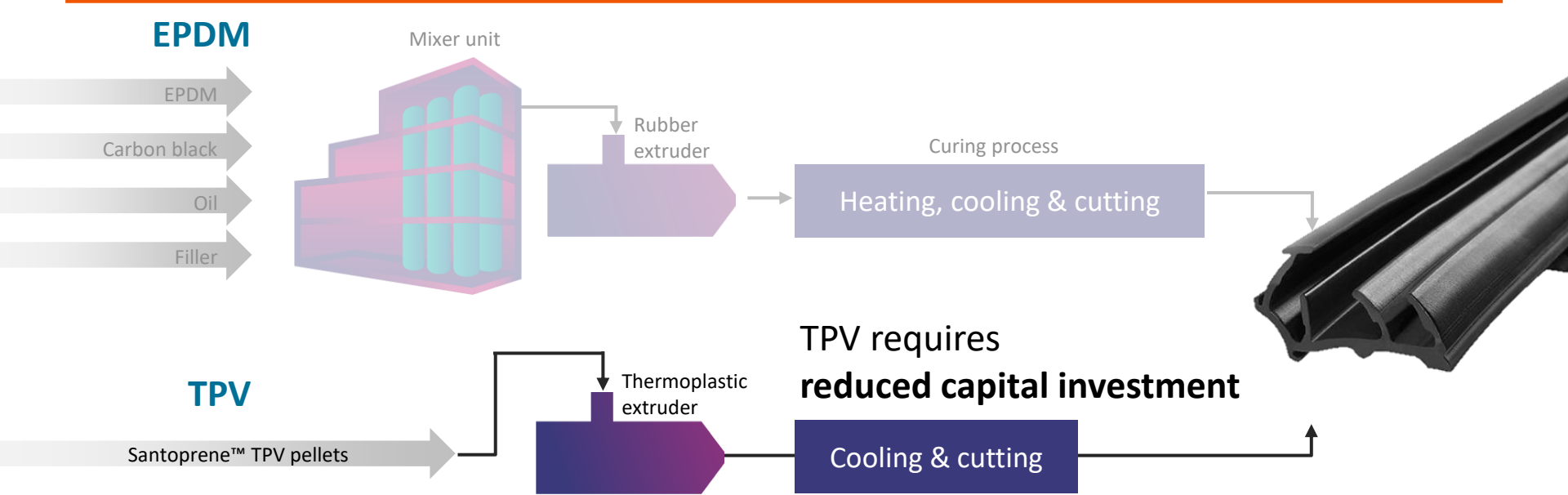


EPDM

- EPDM
- Carbon black
- Oil
- Filler



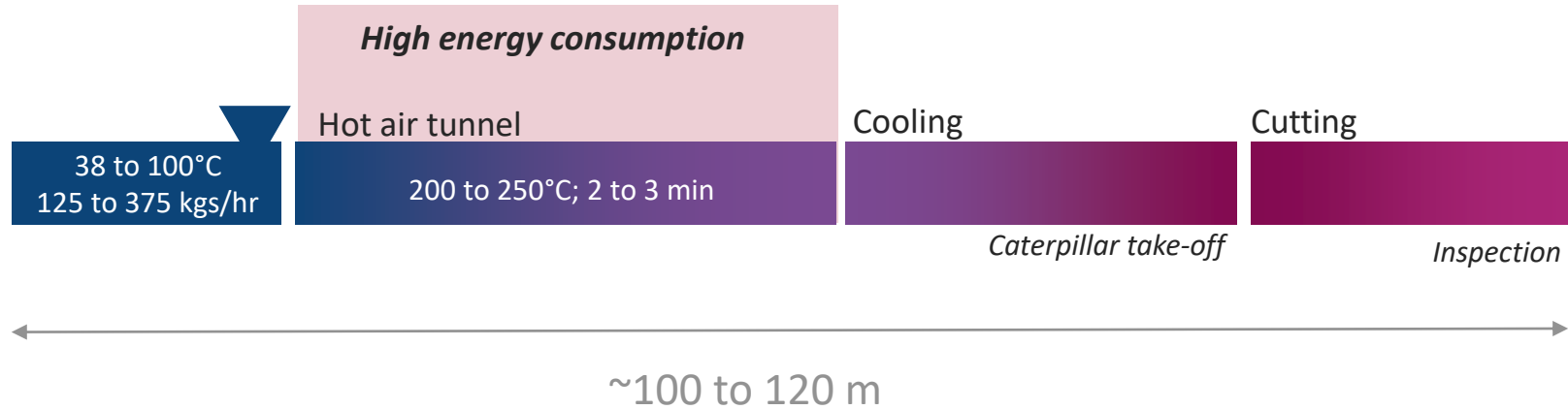
Source: Company assessment.



	TPV line vs. EPDM line		
Investment:	1	X	~ 3 (excl. mixer)

Source: Company assessment.

EPDM extrusion length



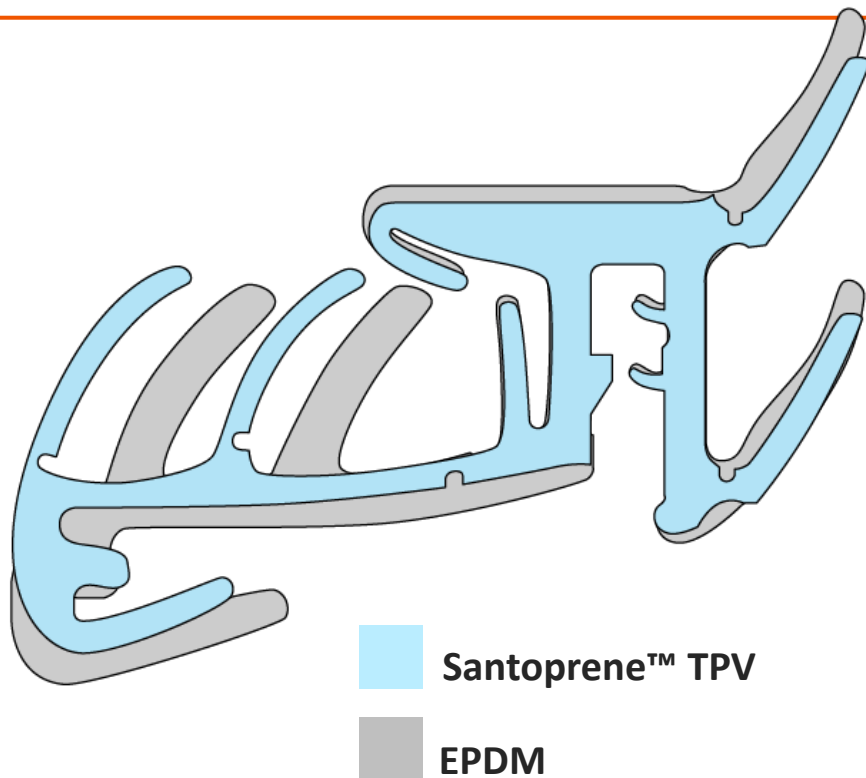
Source: Company assessment based on GRC roof profile production during customer conversion phase

TPV extrusion length



TPV's smaller footprint reduces capital and energy use

Source: Company assessment based on GRC roof profile production during customer conversion phase

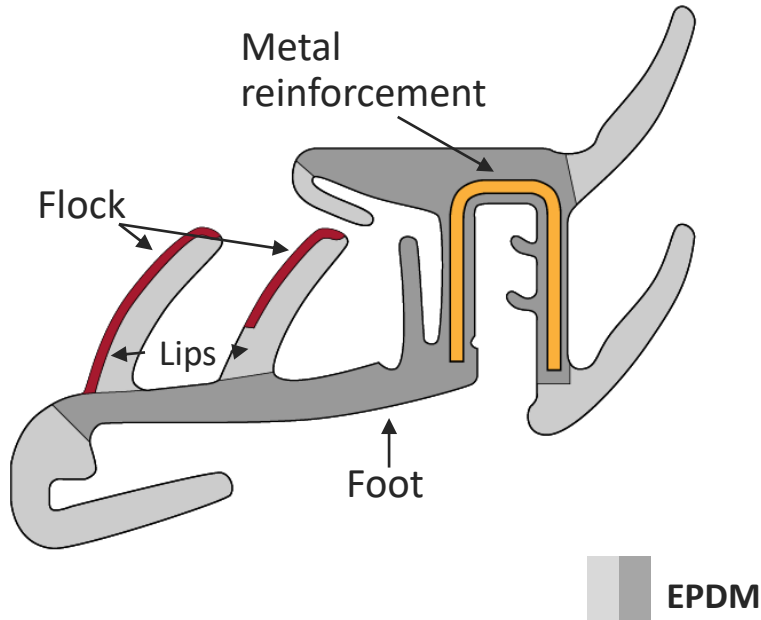


Up to **55%***

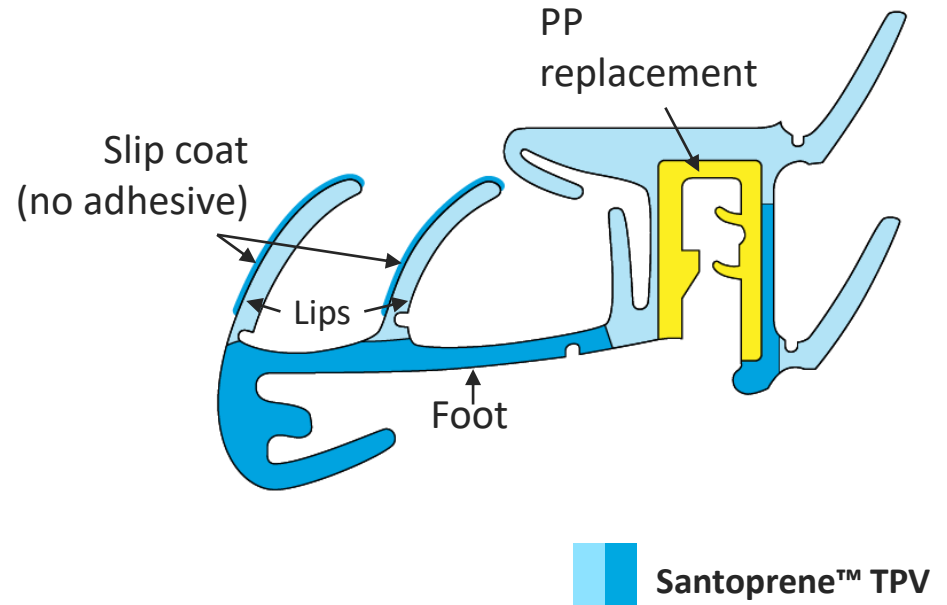
weight reduction
through design optimization
vs. original EPDM design

*Indicative directions

EPDM



Santoprene™ TPV



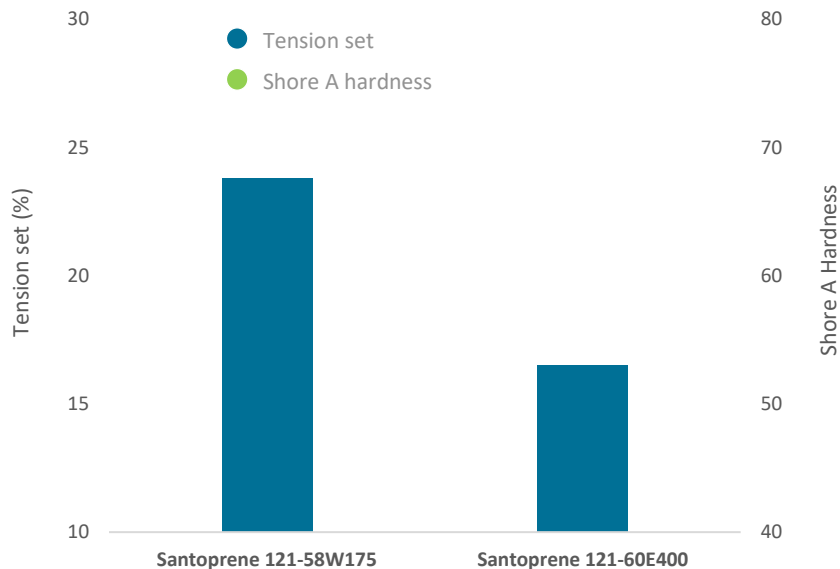
Source: Company assessment.

Why it matters

- ▶ More demanding sealing requirements in terms of noise and weather conditions
- ▶ Increased sealing performance
 - Hardness target: 60 Shore A
 - Lower compression set for enhanced performance
- ▶ Good “Class A” surface
- ▶ Can be expanded to automotive dynamic seals



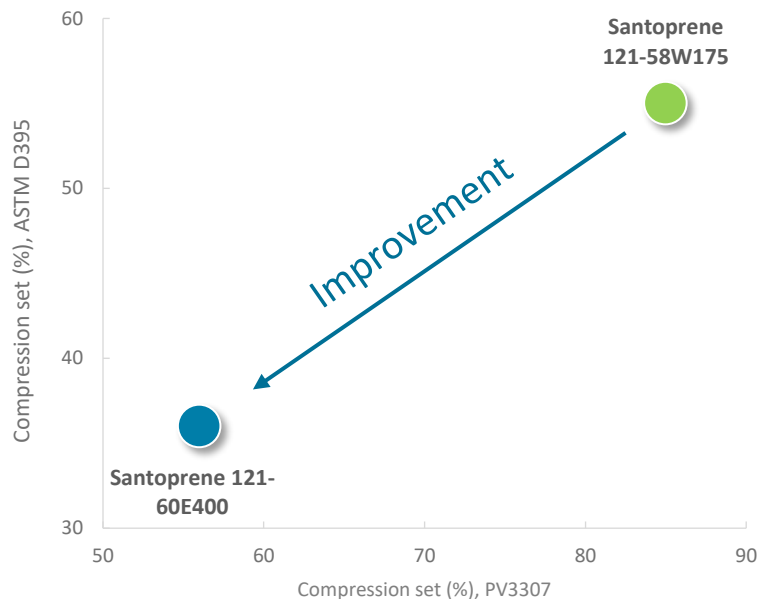
Exhibits **step-out improvement in tension set** at higher overall hardness



Testing conducted as per modified TPE-0053 Method, 50% strain, 22h at 70C. Cool under stress for 2h and release for 30min before measurement

Step-out
improvement in
elastic recovery

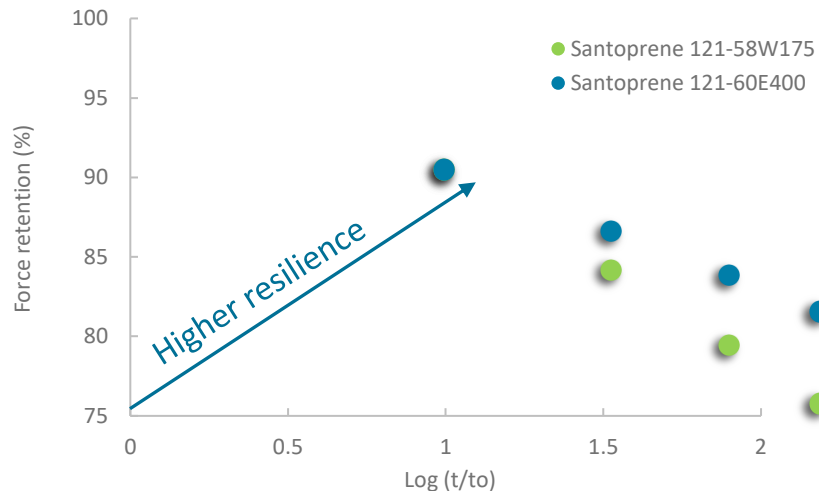
Exhibits **step-out improvement in sealing compression set** under demanding conditions



Step-out
improvement in
elastic recovery

Compression set conducted on injection molded buttons according to, ASTM D395B – 70°C 168h, 25% strain PV3307 – 70°C, 94h, 50% strain, measured 5 seconds after release

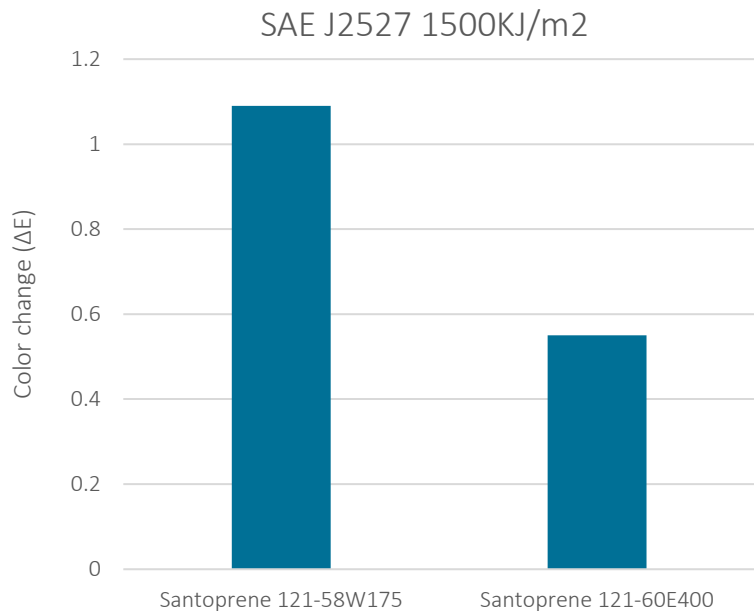
Exhibits superior stress relaxation / force retention over commercial TPVs



% force retention	Santoprene 121-58W175	Santoprene 121-60E400	
30 minutes	58.3	72.3	+24%
24 hours	78.8	86	+9.1%

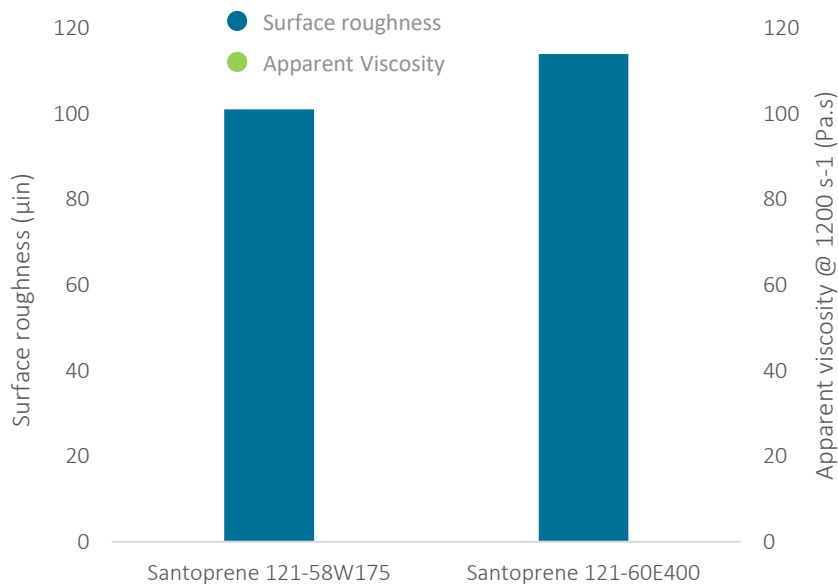
Step-out
improvement in
force retention

Shows **excellent UV resistance** over commercial TPVs



Step-out
improvement in
UV resistance

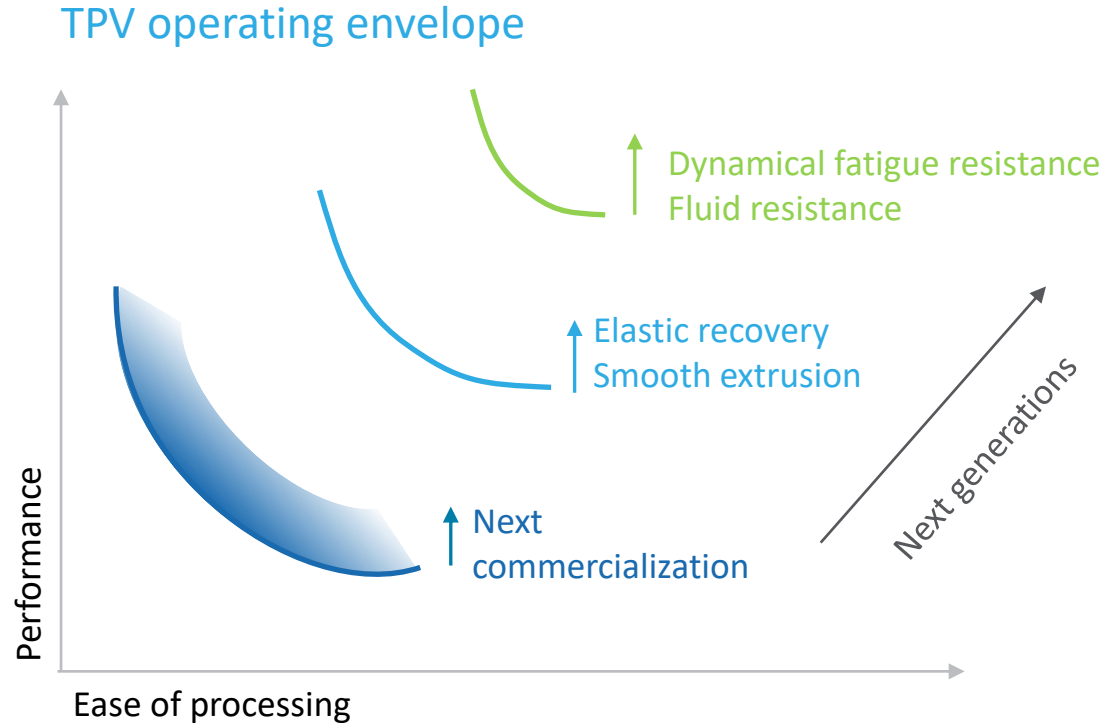
Shows good surface appearance



Extrusion surface roughness was measured on a 1" extruded strip according to TPE-0106
Viscosity was measured in a capillary rheometer at 204°C according to TPE-0200

Comparable
extrusion performance





Santoprene™ High Resilience TPV is an innovative platform:

- ▶ To meet increasing sealing requirements (glass run channel, cowl vent grille): up to 30% improvement
- ▶ To expand its sustainability benefits to dynamic sealing (dynamic seals, bulb seals, foam)
- ▶ For successful collaboration across the value chain





Thank you

santoprene.com

Physical properties

Physical property	Test method, based on	Units	Santoprene 121-58W175	Santoprene 121-60E400
Hardness	ASTM D2240	Shore A	61	65
Tensile strength at break	ASTM D412	MPa	4.4	5.9
Modulus, 100%	ASTM D412	MPa	2.1	2.5
Elongation at break	ASTM D412	%	350	350
Compression set, RT 22h at 25% strain	ASTM D395B	%	21	17
Compression set, 70°C 24h at 25% strain	ASTM D395B	%	41	31

Santoprene™ 121-60E400 TPV exhibits **superior tensile properties and better oil resistance**

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External

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