Celanese
The chemistry inside innovation™

SOLUTION SHOWCASE

CIRCULARITY BY DESIGN: SANTOPRENE® TPV ECO-R

A CELANESE SUSTAINABLE SOLUTION

REDUCE CARBON FOOTPRINT BY USING SANTOPRENE® TPV ECO-R THAT INCORPORATES POST-CONSUMER RECYCLATE (PCR)

Reasons to specify Santoprene® TPV ECO-R

Incorporates post-consumer-recyclate (PCR)

- Contains a minimum of 15% and 25% PCR
- Maintains quality and lot-to-lot consistency

Easy to recycle

- In-house recycling (regrind) with ~30% less scrap versus EPDM
- High level of regrind addition possible with very strong property retention
- At end of life Santoprene® TPV parts are easier to recycle than thermoset rubber parts

Lower CO_2 emissions

- Potential for up to ~59% CO_2 footprint reduction versus EPDM in extruded seals
- Rubber-like performance with up to 30% less material density
- Weight reduction potential to reduce fuel consumption in vehicles or increase battery range
- CO_2 footprint calculation values available on request

Global availability

- Available in all regions
- Local support from Celanese technology and application experts

As industry and consumers increasingly drive demand for more sustainable solutions, high performance materials like Santoprene® TPV are well positioned to make a significant contribution.

Creating products that can contribute to a circular economy is key at Celanese and several approaches, including the use of recycled materials as feedstock, bio-based feedstock and eco-design, are considered when solutions are being developed. Several Celanese engineered materials, labeled ECO-R, incorporate recycled content.

There are two Santoprene® TPV grades that incorporate post-consumer recyclate (PCR), building on a 40-year legacy of enabling customers to create sustainable solutions for the value chain. Now, with the introduction of Santoprene® TPV ECO-R grades, the potential for even more sustainable benefits is enhanced.

Santoprene® TPV ECO-R grades

- Contain a minimum of 15% and 25% PCR, while maintaining quality and lot-to-lot consistency
- Can reduce the carbon footprint of a finished part by up to 59%, compared to a similar part made from EPDM rubber
- Are processed like a thermoplastic and are easier to recycle than thermoset rubber
- Enable lighter-weight parts compared to rubber due to up to 30% less density

"Sustainability has been part of the Santoprene® TPV DNA since it was first introduced more than 40 years ago. For decades it has replaced carbon-intensive and hard-to-recycle thermoset rubber with a more sustainable solution. The Santoprene® TPV ECO-R platform is the next step to enabling further carbon footprint reductions and provides plastic waste with a second life as part of the Santoprene® TPV ECO-R formulation."

—

BY OLIVER KLOTH, SUSTAINABILITY LEADER

The Santoprene® TPV ECO-R platform starting point

The first two Santoprene® TPV ECO-R grades can support customers in a broad range of industries and applications including – automotive and electric vehicles (EVs), 5G connectivity, electronics and electrical, industrial, consumer goods, medical and healthcare. The grades can be processed on the same injection molding and extrusion equipment as all other Santoprene® TPV grades.

Physical property	Test method based on	Units	Santoprene® TPV 101-80 ECO-R	Santoprene® TPV 101-87 ECO-R
PCR content	-	%	minimum 15	minimum 25
Color			black	black
Specific Gravity	ASTM D792	g/cm³	0.97	0.96
Hardness (15s)	ISO 868	Shore A	80	92
LCR App Viscosity 204 °C	TPE-0200	Pa.s @ $200s^{-1}$	330	317
	TPE-0200	Pa.s @ $1200s^{-1}$	88	90
Tensile stress at 100% elongation	ASTM D412	MPa	3.7	6.7
Tensile strength at break	ASTM D412	MPa	6.5	8.6
Elongation at break	ASTM D412	%	620	520
Compression set, RT 22h, 25% strain	ASTM D395B	%	30	38
Compression set, 70°C, 22h, 25% strain	ASTM D395B	%	44	56

Typical product properties. These Santoprene® TPV ECO-R grades are available for sampling globally.
Please contact your local Celanese representative to get more information.

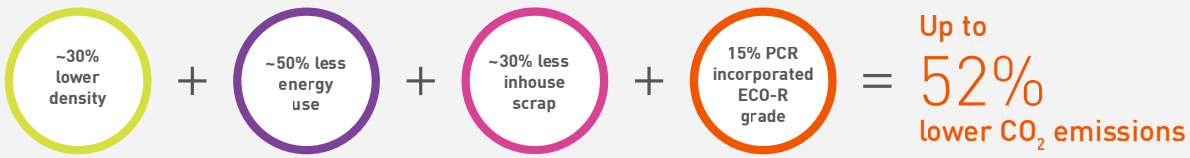
Reducing the CO_2 footprint of finished parts

Santoprene® TPV can reduce the carbon footprint of a finished part, especially when it replaces thermoset EPDM rubber. Compared to an extruded automotive glass-run channel (GRC) weatherseal made with EPDM rubber, Santoprene® TPV enables up to 38% carbon footprint reduction potential. The new Santoprene® TPV ECO-R platform even increases the reduction potential:

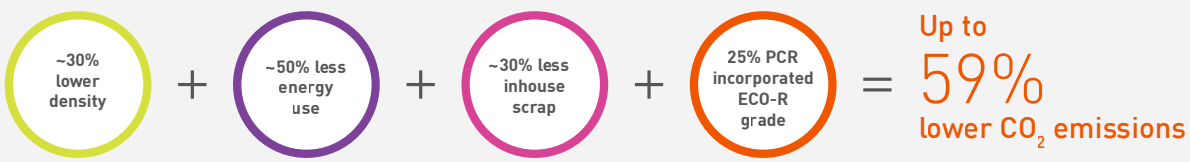
CALCULATED CO_2 FOOTPRINT REDUCTION | SANTOPRENE® TPV VS EPDM

Santoprene® TPV standard grades

Santoprene® TPV 101-80 ECO-R grade



Santoprene® TPV 101-87 ECO-R grade



Compared to using EPDM rubber, Santoprene® TPV ECO-R can deliver

up to 59% carbon footprint reduction potential.

Calculated carbon footprint results are based predominantly on industry average carbon footprint values and may not contain Celanese primary data.

Values provided herein are general estimates based on approximate reference values for specific materials and processes. Values are intended for use as part of high-level screening only and should not be construed as exact measurements of CO_2 or other values for specific products. The contents of this document may be updated or modified by Celanese at any time.

Available ECO-R products	Recycle sources
Celanex® PBT/PET ECO-R	PIR & PCR PET
Ecomid® PA ECO-R	PIR PA Fibers
Frianyl® PA ECO-R	PIR PA Fibers
Impet® PET ECO-R	PIR & PCR PET
Rynite® PCR resin	PCR PET
Santoprene® TPV ECO-R	PCR PP
Tecnoprene® PP ECO-R	PIR PP
Zytel® ECO-R resin	PIR PA

A CELANESE SUSTAINABLE SOLUTION

Sustainability at Celanese

Celanese is uniquely positioned to improve the world through the power of chemistry. Embracing this opportunity demonstrates our deep sense of responsibility and commitment to helping keep people safe and protecting our planet. Using chemistry to accelerate innovative solutions is what sustainability means at Celanese.

Contact us for more information:
www.santoprene.com

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