

Webinar:

European Green Deal: Innovation opportunities using thermoplastic elastomers

11 March 2021, 10:00 CET

Q&A Session:

1. Is Santoprene™ TPV resistant to the chemicals used in hydroalcoholic gel?

Yes. Santoprene™ TPV is well known for its resistance toward alcohol species like methanol, ethanol, isopropanol to name few.

2. What is the premium for Santoprene TPV vs other elastomers/SEBS?

This depends largely on which thermoset rubber (TSR) or thermoplastic elastomer (TPE) is considered as well as on the specific application requirements. Once these are defined, we can drive the best choice of Santoprene TPV grade offering the appropriate added value in the application.

3. What is pre-consumer waste? And what is the difference versus post-consumer recycled (PCR) and post-industrial recycled (PIR)?

Pre-consumer waste is waste generated during the production process of the product; meaning a material that was discarded before it was ready for consumer use. It excludes the re-utilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process.

Pre-consumer and post-industrial are different names for a similar type of waste.

Post-consumer waste is waste produced by the end customer, hence generated from the product after it has served its intended purpose at the consumer (in other words, after the end of its use life).

ISO 14021 is the main reference for recycle definitions.

4. What measures or quality recommendations have been set up to manage your pre-consumer/post-consumer recycle feed in your new materials?

The new Santoprene R² TPV platform incorporates at least 15% and up to 30% post-consumer recycled (PCR) material. Those PCR raw materials are meeting key specifications to be eligible for use in Santoprene R² TPV.

5. Which percentage of post-consumer waste does Santoprene R² TPV?

Santoprene R² TPV is made with at least 15% and up to 30% post-consumer recycled (PCR) material.

6. What impact do you have on you part when you recycle up to 30% on the manufacturing waste?

It will mostly depend on the hardness we are talking about, yet also the type of manufacturing waste we are considering. ExxonMobil made several studies where manufacturing wastes (also called post-industrial recycled) were put back up to 50% into the extrusion process.

For soft grades around 65-70 Shore A, post-industrial recycling up to 20% did not show strong influence on key properties like surface aspects and sealing performances for example. For harder grades, typically at hardnesses above 80A, in-process recycling up to a 30% was proved to be feasible.

As an example, thanks to its excellent consistency through multiple processing cycles, it is common practice within the automotive industry today to have an acceptance of up to 5% in-process recycling.

7. What are the current Santoprene TPV grades and hardness available for 3D printing?

Typically, Santoprene TPV with a hardness from 87 Shore A has demonstrated to be easily printable. Today, the main process used is fused deposition modeling (FDM) - filament. In case you would be interested at testing Santoprene TPV in 3D, you can please contact NANOVIÀ (France) that can deliver the required filament for you or make a demo. <https://nanovia.tech/en/>

8. Do you have the IATF registration and will it apply to the recycled grades?

Santoprene R² TPV containing the post-consumer recycling stream as raw material will also receive the IATF registration. Today production sites are moving through the IATF certification process for an approval planned in May 2021.

9. Do you have some success stories applied in renewables, for example in windmills?

Santoprene TPV is commercially used for cable used on the wind turbine. We are currently working on several projects where Santoprene TPV is tested for different components of the wind turbine.

10. Where can I find hardnesses for Opti-Pren™ TPV 6900 series range?

[Customized Compound Solutions A/S \(CCS\)](#), a Bjørn Thorsen company, currently has 4 grades in this series, ranging from 65A to 40D.

11. Can Opti-Flex™ TPO replace EVA materials?

This will highly depend on each application, where the CCS product can address current EVA deficiencies; for instance, lower hardness, elasticity, as well as transparency when needed.

12. Could you give us examples of targeted applications for Opti-Flex TPO option for PVC replacement?

Standard polyolefin materials cannot replace soft, flexible PVC. Where end-users want fully recyclable option for environmental reasons, our offering represents a viable alternative that can both meet expected mechanical properties while remaining affordable.

13. What is the time frame of the EU Green Deal for the recycling regulation? How much % in the final product? By when?

In Europe, in the context of the Circular Economy Action Plan¹, the EU Commission has announced it will explore the introduction of (mandatory) recycled content targets for plastics in a number of applications, including for packaging, vehicles, construction and batteries, part of the ongoing review of respective product regulations, which are ongoing and expected to be finalized in 2022.

These new requirements will apply to both products manufactured in the EU and imported into the European territory and across all EU member states.

¹ <https://ec.europa.eu/environment/circular-economy/>

14. What is the difference between Santoprene R² TPV and Opti-Pren TPV 6900 series?

Santoprene R² TPV uses a PCR stream as raw material constituent of the formulation that offers an opportunity for customers to introduce PCR's into their product design.

On the other hand, Opti-Pren TPV 6900 series by CCS is based on pre-consumer waste TPV from the ExxonMobil manufacturing process. It comes with intrinsically different, yet complementary properties, which will make it suited for other types of end-uses. Within the territories covered by BT, we will be able to identify and propose the best of these two options to interested customers and prospects.

15. Do you have post-consumer grades for medical applications?

ExxonMobil has recently developed Santoprene TPV B100 bonding grades for medical applications.

16. Are Opti-Flex TPO, Opti-Pren TPV or Opti-Soft™ TPE food approved?

None of the current CCS TPVs or TPEs are currently food-approved with very limited possibilities to achieve such compliance. While none of the existing Opti-Flex TPO grades is food-approved, this is likely to be the only CCS product family with potential for such approval for food applications.

17. Are you generally working on making Santoprene TPV more environmentally "correct" and halogen free material types? Today we use two different types, including Santoprene 251-80W232 and this has a high halogen content.

In the CCS product portfolio, there is first the Opti-Pren™ HFFR 7300-82, which is more of a TPE than a TPV, with a hardness around 87A. CCS also developed a true *Zero Halogen Free Flame Retardant TPV* platform, Opti-Pren 6400xx ZHFR series, available for sampling today, in hardnesses from 60 to 90A.

18. Are you thinking of developing adhesion grades (gluing) - NOT 2K adhesion grades?

All depends on which adhesion we are talking about. Talking about metal adhesion, we have one grade, which is available, called Santoprene TPV 8291-85TL. The grade is used as tie layer in co-extrusion process to "glue" Santoprene onto metal. We can support with additional info and processing guidelines if needed. We are currently working on developing new adhesion grades for other type of surfaces. Please contact us in case you would be interested to receive more information.

Polycarbonate and PC/ABS adhesion grades are also available for instance ExxonMobil's Santoprene TPV B150 grades for 2K molding applications for interior use and CCS' Opti-Pren TPV 6500 series that are suited for exterior applications and/or for insert molding.

19. What is the highest level of insulating properties possible at shore 70A'ish (dielectric strength IEC 60243-1)

These will of course be different for black grades relative to natural grades. Below are few typical values:

Santoprene TPV grade	Color	Hardness (Shore A)	Dielectric Strength (ASTM149 - kV/mm)	Dielectric constant (IEC 60250 – 23C / 1.93mm)
121-67W175	Black	72	26	2.6
121-73W175	Black	78	27	2.7
201-64	Nat	70	30	2.4
201-73	Nat	78	30	2.3

20. Do you have any recommendation to achieve good welding of TPV profiles?

Santoprene TPV can be welded through many different welding methods:

- Hot plates
- Multi-points
- Hot Air
- Spin/linear vibration
- Radiofrequency
- Electromagnetic induction or ultrasonic (for 87A and above)

All those welding techniques and associated recommendations for Santoprene TPV are found in the ExxonMobil technical literature that is available upon request.

21. Do you have recycled TPV in Santoprene TPV towards vehicle application, for instance, 123-40/121-75 M100?

Santoprene TPV has decided to move down the path of introducing post-consumer recycling streams through its Santoprene TPV R² platform. The first grade launched, Santoprene R² TPV 121-80E100, includes above 15% of post-industrial waste. The platform will continue its enlargement through the development of additional grades including higher recycling stream content.

In addition to this new ExxonMobil option, CCS, working in close partnership with ExxonMobil, is valuing Santoprene TPV pre-consumer recycled waste streams in the Opti-Pren TPV 6900 series range. Contact CCS or BT directly for more information on this complementary offering.