

Chemical webinar series

European Green Deal: Innovation opportunities using thermoplastic elastomers

Welcome
the session will begin shortly



European Green Deal Innovation opportunities using thermoplastic elastomers

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Technical Expert
ExxonMobil Chemical

March 11, 2021

Energy lives here™

BJØRN THORSEN
Local distributor... and truly global solution provider!

ExxonMobil

European Green Deal: Innovation opportunities using thermoplastic elastomers



Mikko Långström
Bjørn Thorsen



Vincent Rerat
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Questions & Answers

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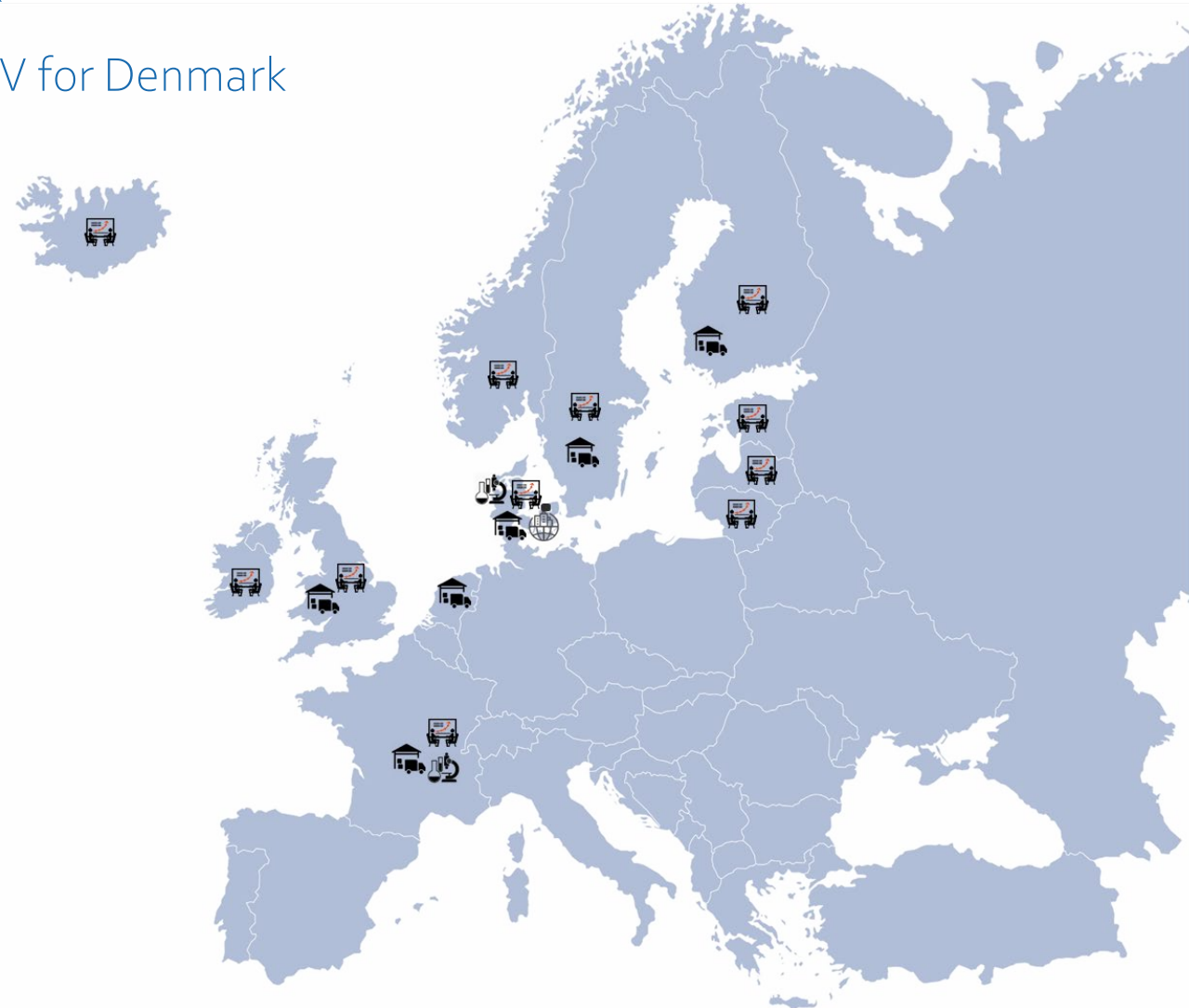
Scan and email your
private questions



Bjørn Thorsen's distribution development journey

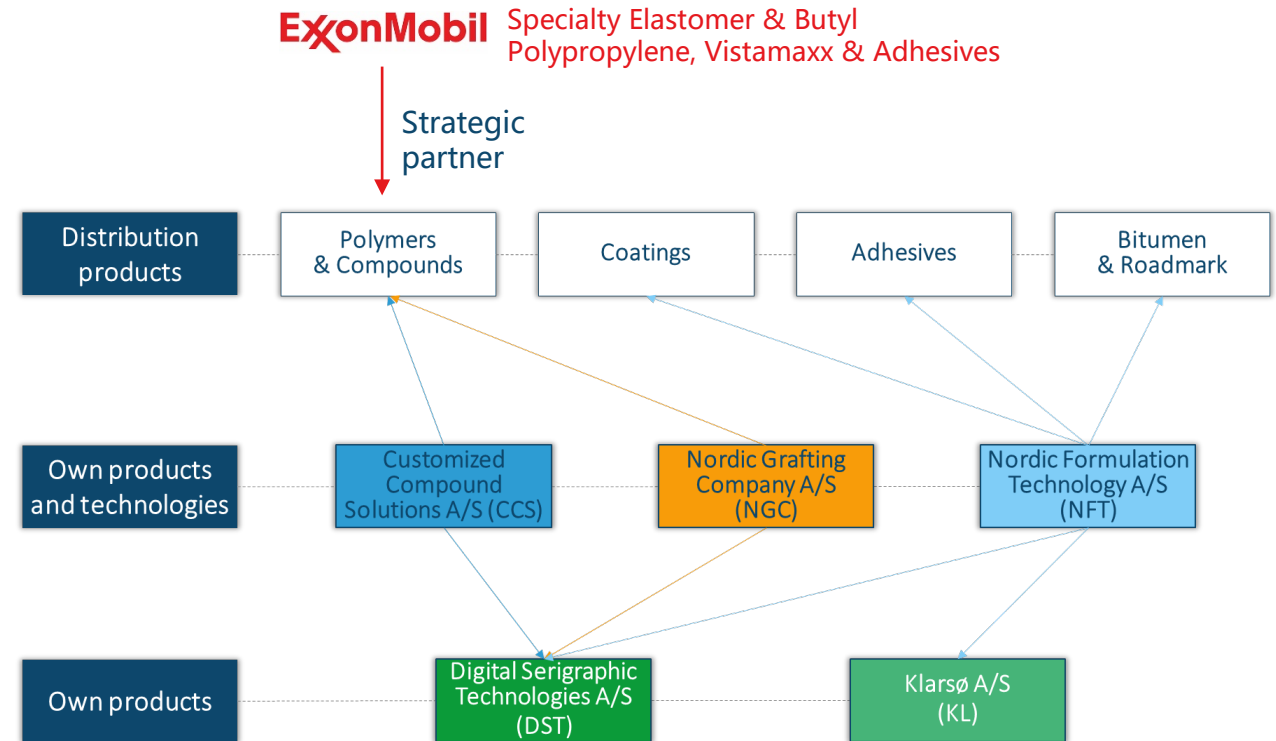
- 1952 - Bjørn Thorsen A/S (BT) was founded in Denmark
- 1988 - BT appointed as distributor for Santoprene™ TPV for Denmark
- Expansion of BT distribution areas followed:
 - 2005 - Sweden, Norway & Iceland (adm. office in Göteborg)
 - 2009 - Finland & Baltics (local sales representatives)
 - 2018 - China (adm. office in Zhuhai)
 - 2019/2020 - France (adm. office in Lyon)
 - 2020 - UK & IE

-  Headquarters in Copenhagen
-  Local warehouses
-  Sales
-  Laboratories in Denmark & France



BTG - ExxonMobil combined offering

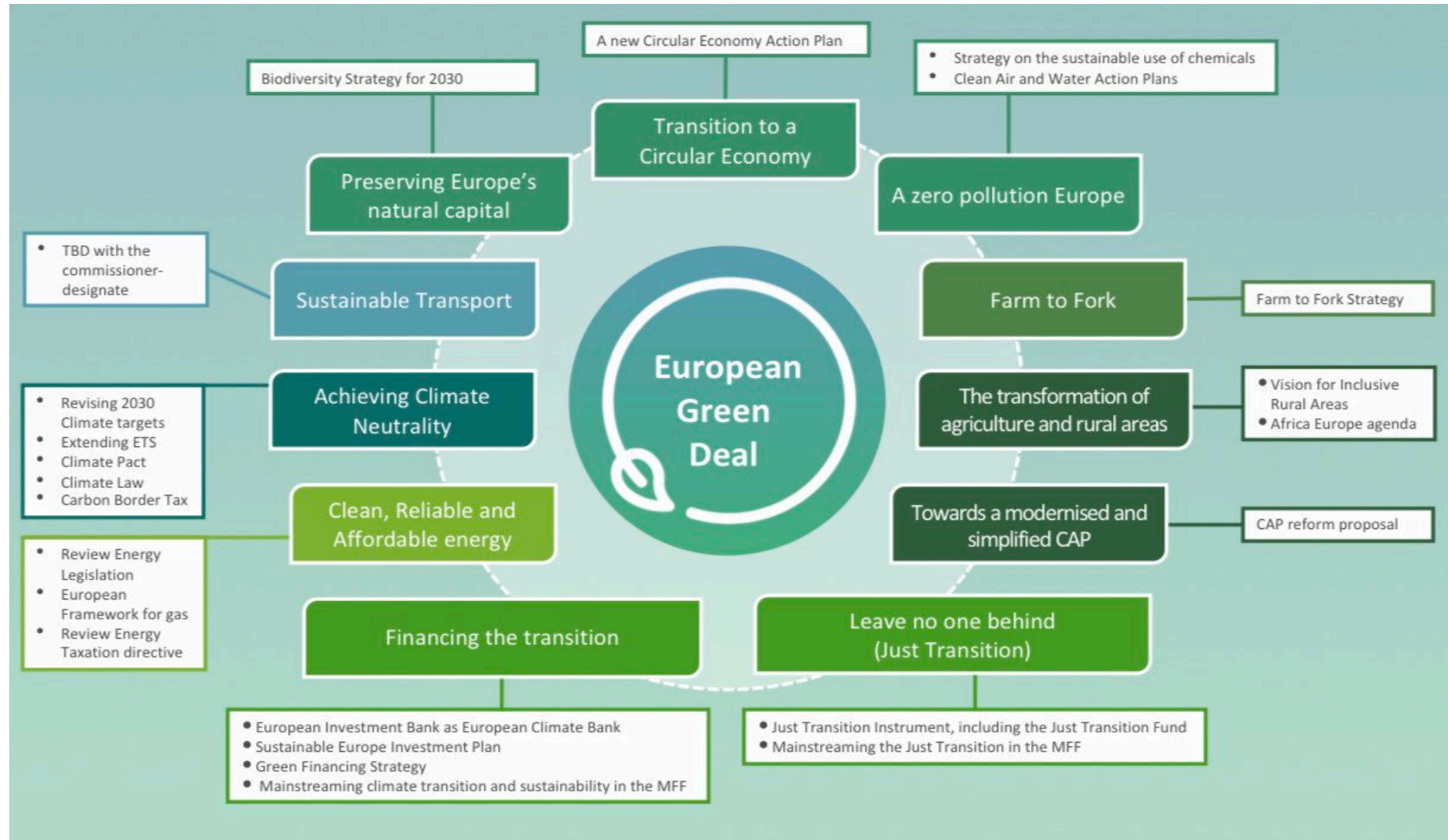
- Bjørn Thorsen Group (BTG) & ExxonMobil (EM)
 - ~30 years partnership in distribution & material development
- BTG affiliates (CCS & NGC) proprietary products using technologies licensed by EM
 - **OPTI-PREN™ TPV**: Enhanced TPV solutions
 - **ACTI-TECH™ compatibilizer**: Grafted Vistamaxx™ Performance Polymer



Objective for today:

- *Understanding how Santoprene™ TPV can support product innovation and sustainable product designs*

EU Green Deal: "Carbon neutrality by 2050"



(1): https://ec.europa.eu/clima/policies/transport/vehicles_en
 (2): https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf
 (3): <https://ec.europa.eu/environment/waste/elv/index.htm>

MARKET
TRENDS

Less is more > Design flexibility

Longevity > Differentiated
High quality/Durability

Circular economy model > Recycling
Waste reduction

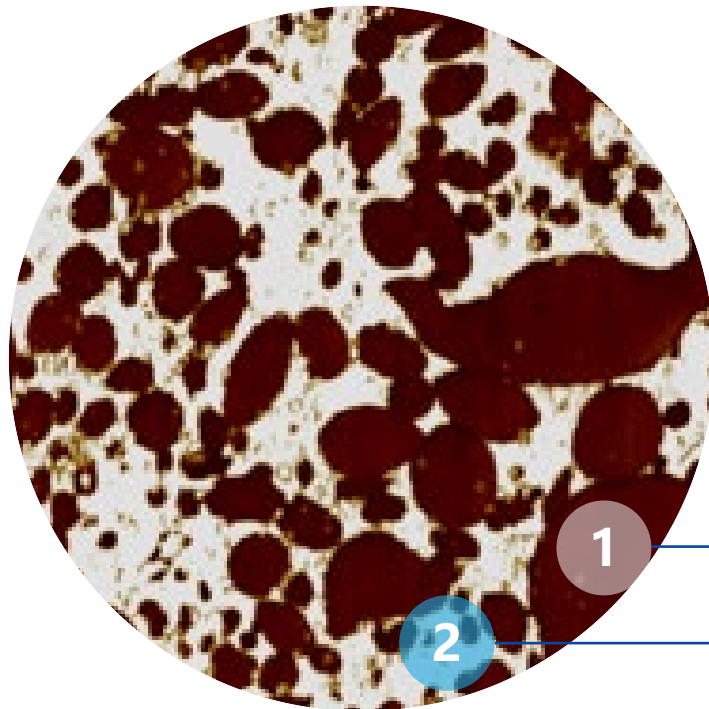
SOLUTIONS

There is a material that can help: *Santoprene*TM TPV **ExxonMobil**

AFM
micrograph

Performs like a rubber,
processed like a plastic

- Broad range of hardness 35A to 50D
- Temperature resistance -40 to 125°C



1 — Rubber (cross-linked EPDM)

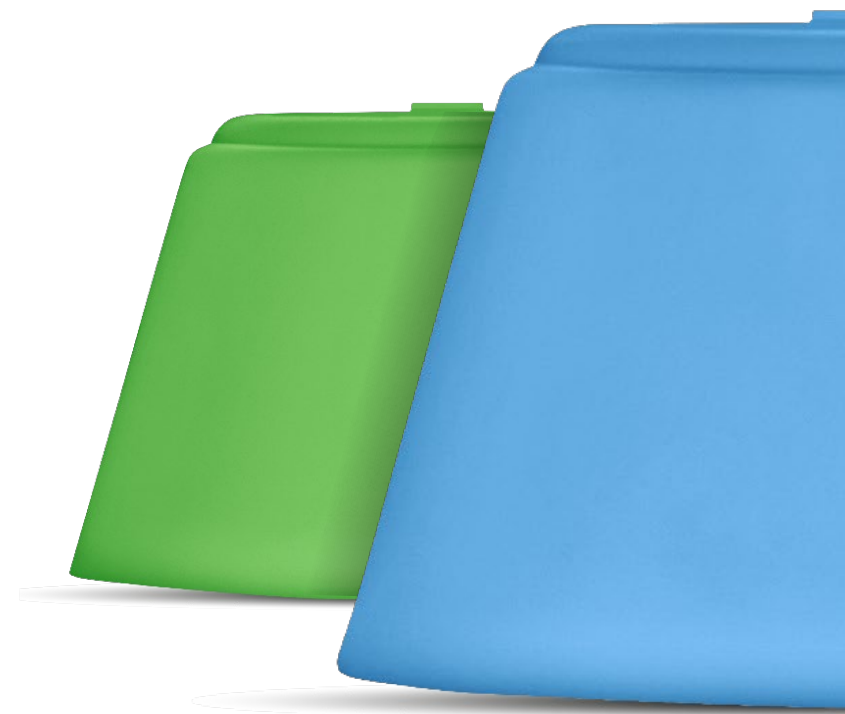
2 — Thermoplastic (polypropylene)

20 μ

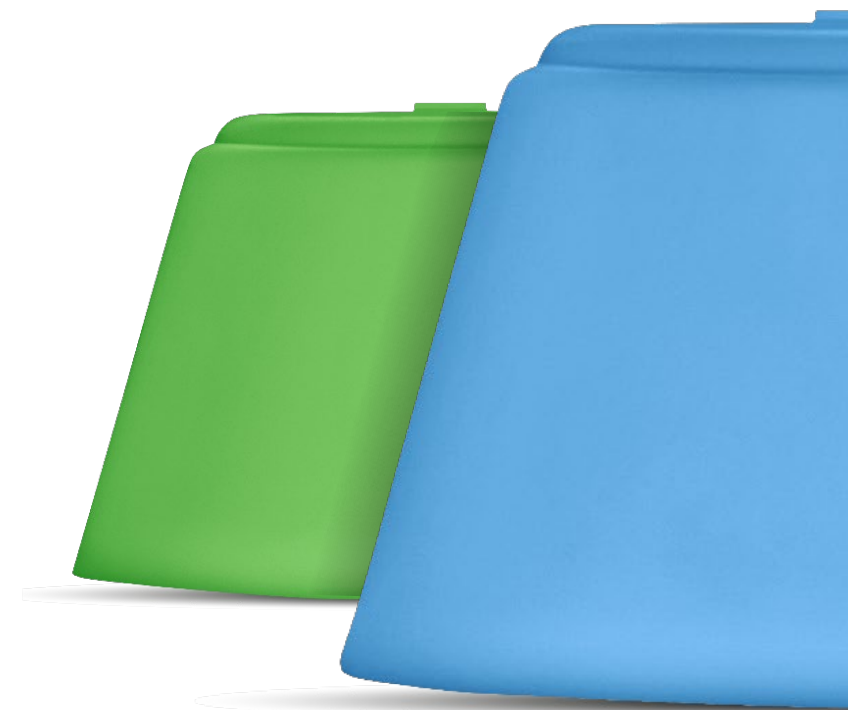
Freedom of design



From parts assembly...



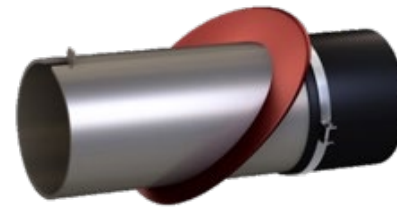
...to poly-olefinic ecosystem

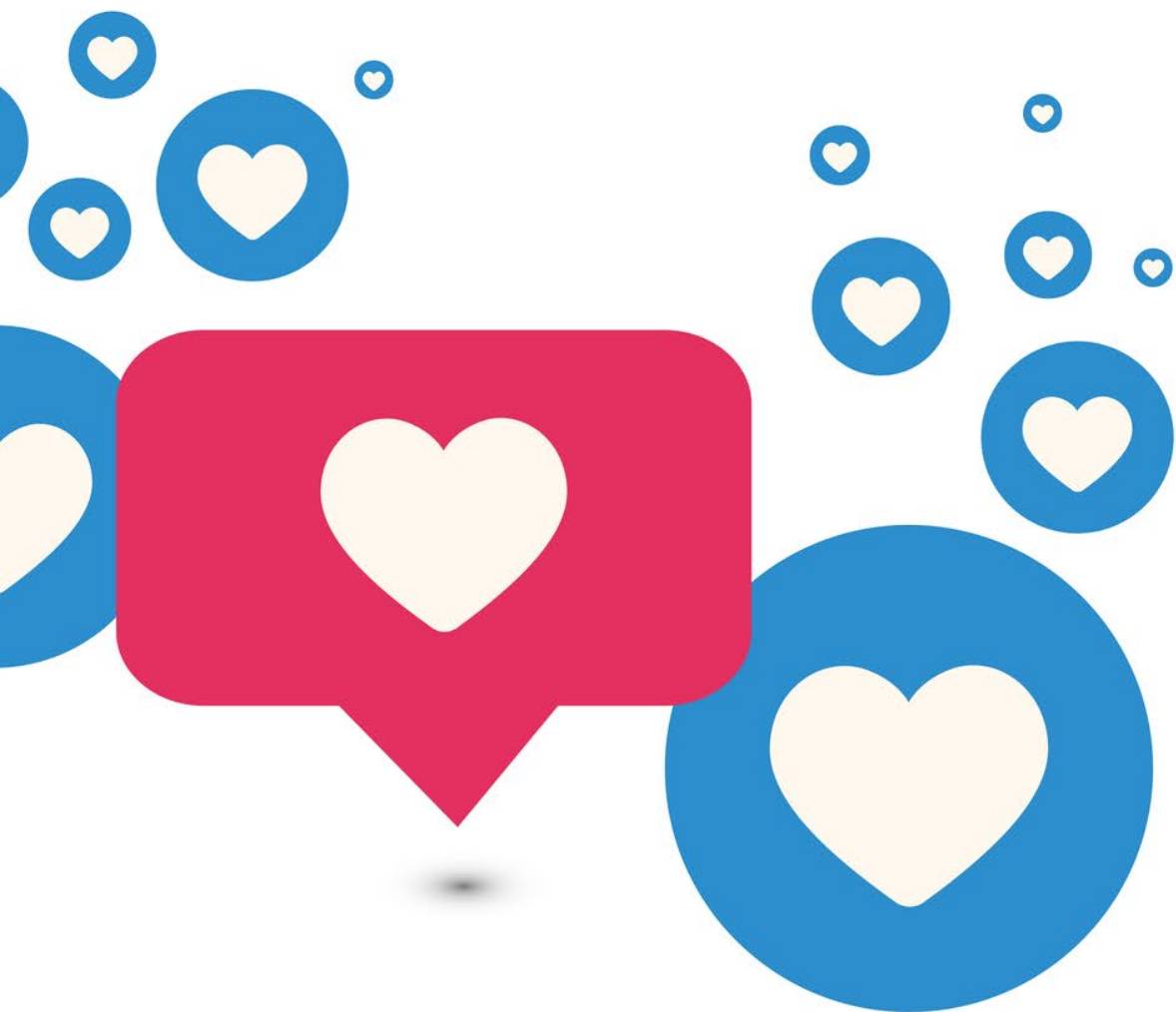


New design for cost and weight reduction



	Original design	Optimized design with Santoprene™ TPV
Parts	4	1
Assembly steps	6	1
Installation time (s)	200	8
Recyclable*	No	Yes





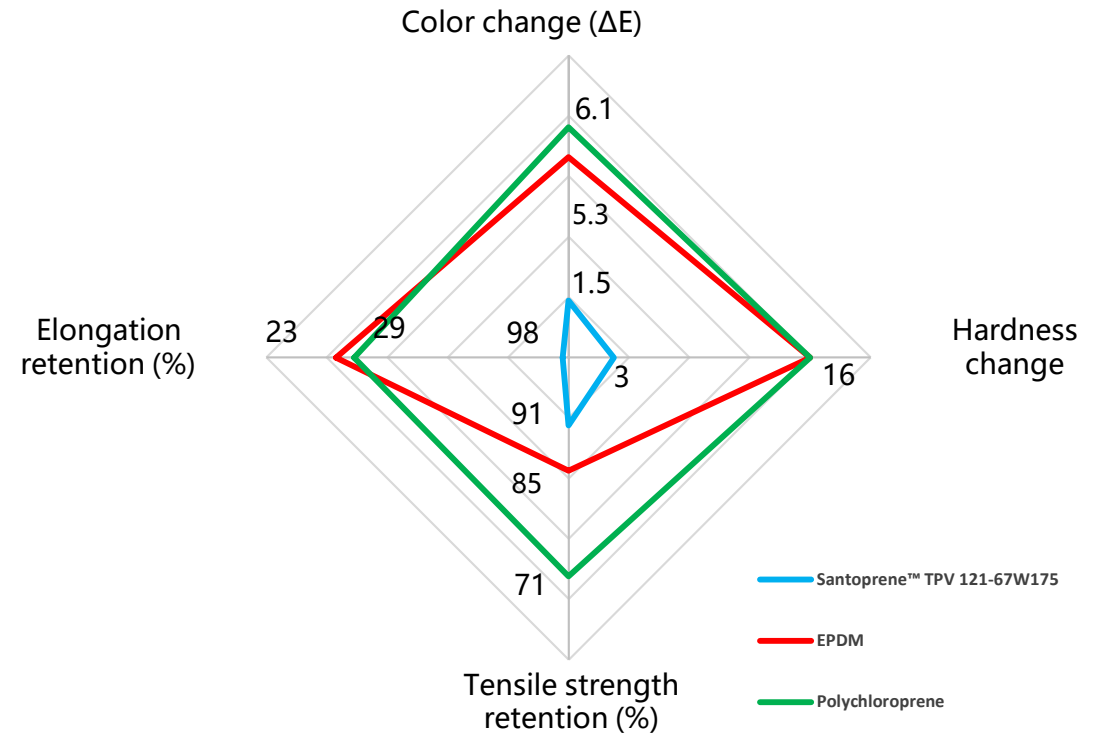
People buy
from brands
they trust

Quality over time: Aging

Excellent weathering resistance



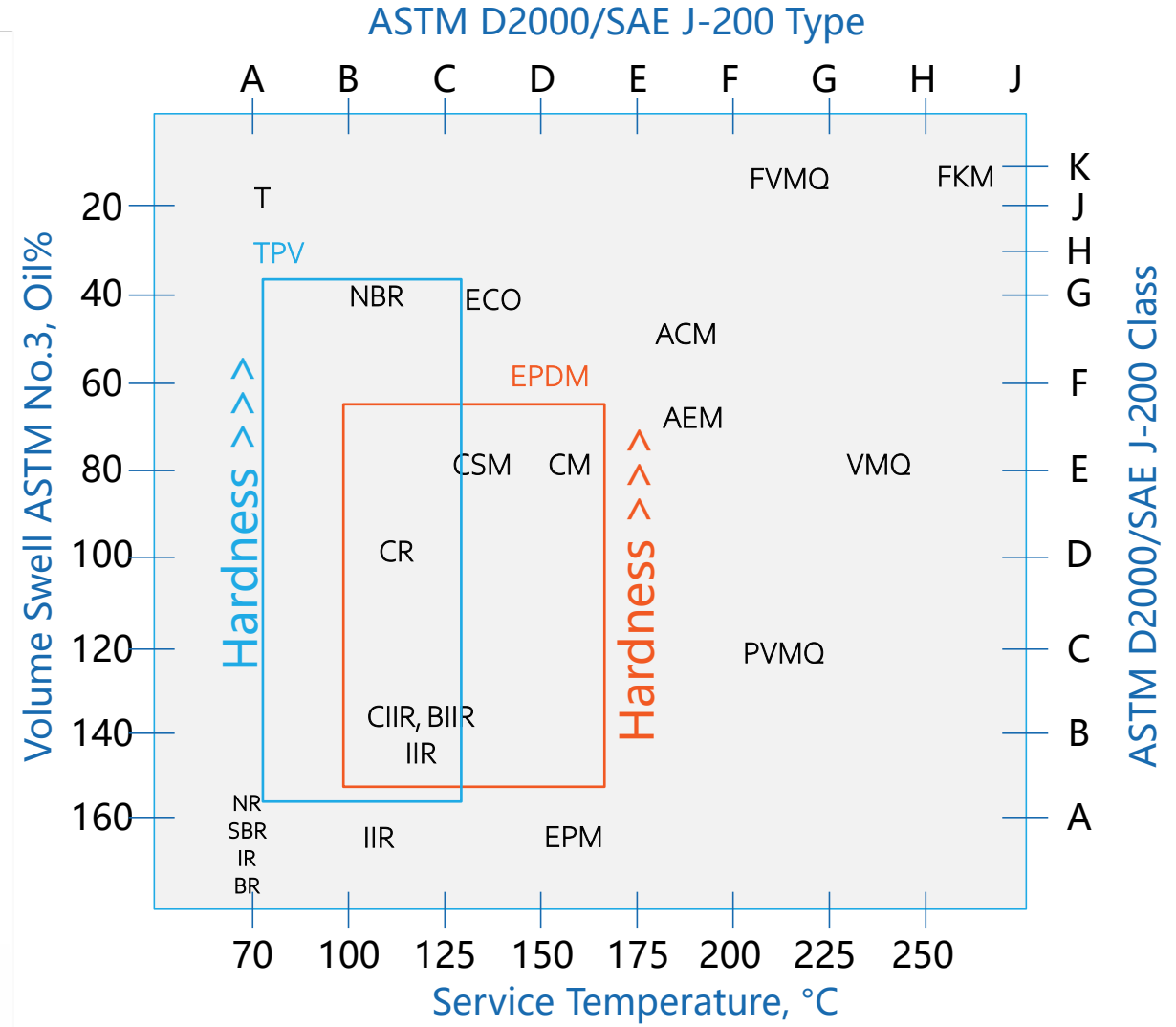
Xenon Arc weathering test*



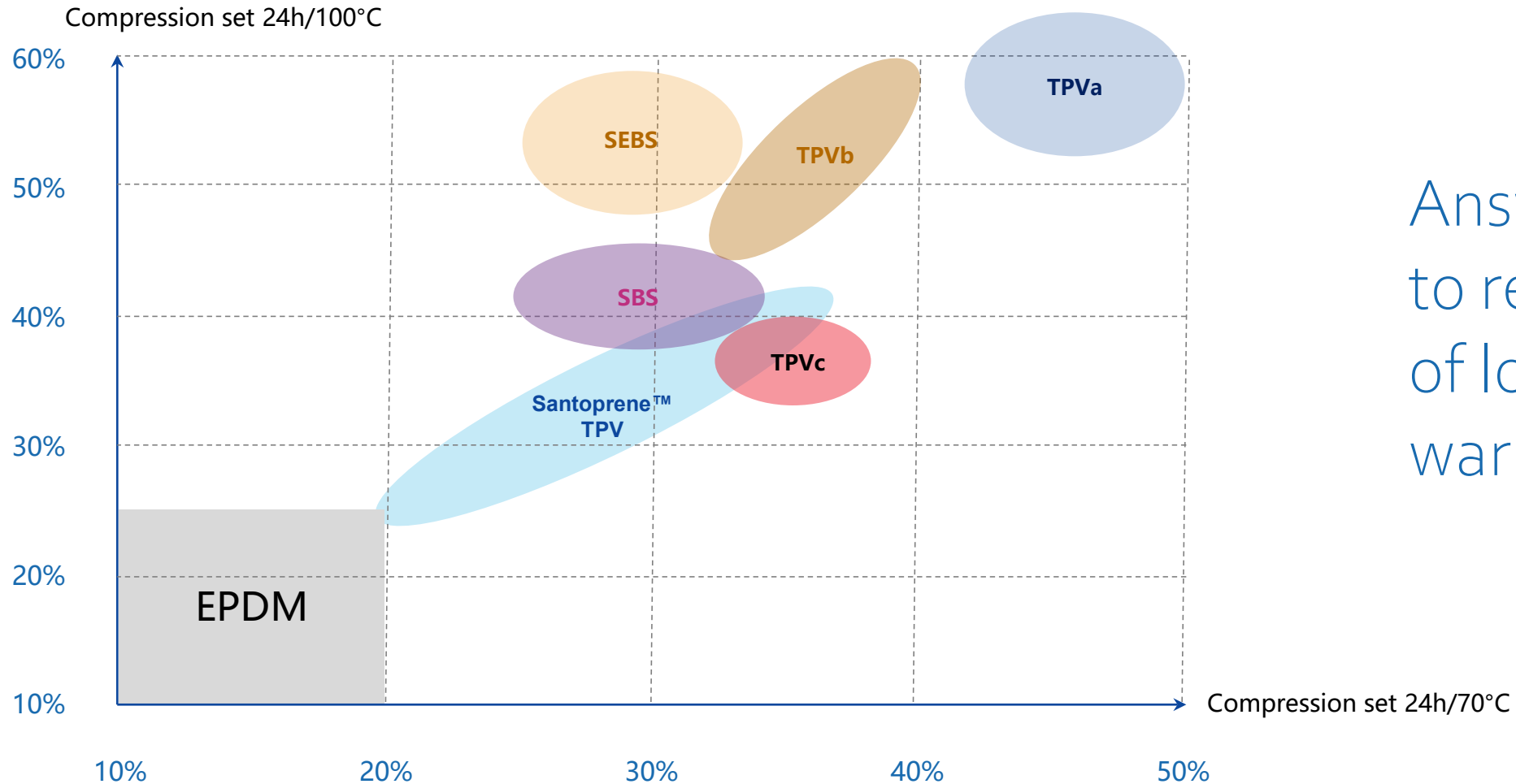
Xenon Arc test methods: 3000hrs (4730 KJ/M2 - 340 nm)

- Color change: SAE J1545
- Hardness change: ASTM D2240
- Tensile strength retention: ASTM D412
- Elongation retention: ASTM D412

Quality over time: Strong chemical resistance



Santoprene™ TPV - Sealing over time

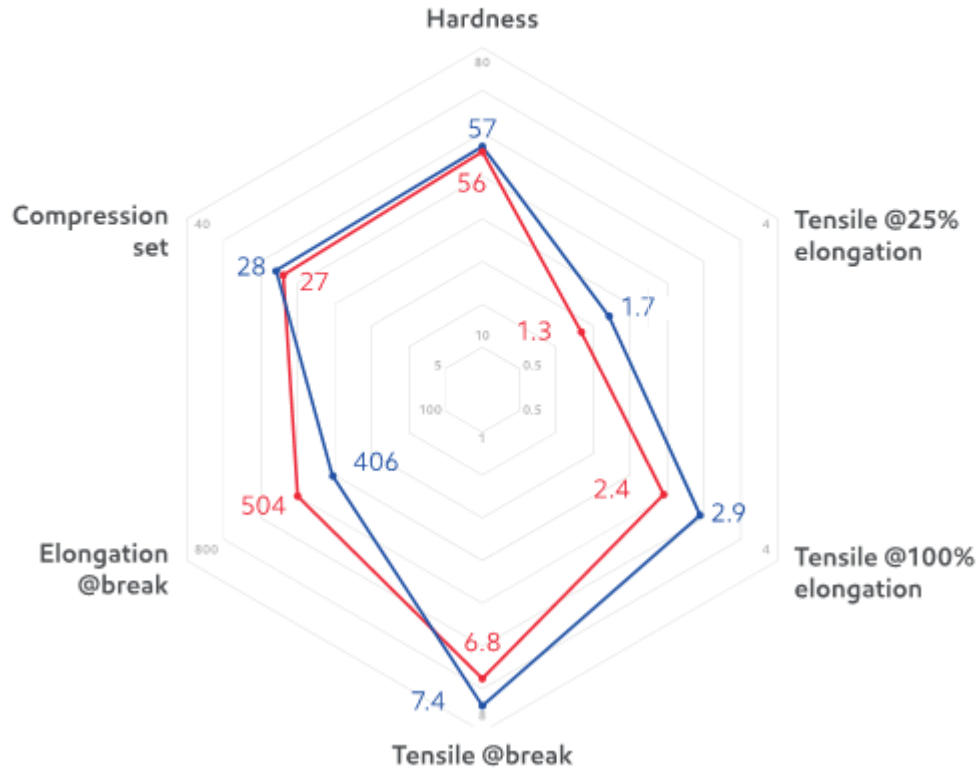


Answer
to requirement
of long-term
warranty

22 year old construction seals made with Santoprene™ TPV



— Old UOB Profile — New Santoprene TPV 121-67W175



The test confirms the original UOB profiles are remarkably similar to the new Santoprene™ TPV 121-67W175 profiles - even after 22 years exposure to the elements

Test Method Based on:

- *1 EM method
- *2 ISO 37, Type 1

Source: ExxonMobil analysis



22-years old UOB profiles from customer

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Circularity by design

Sustainability awareness

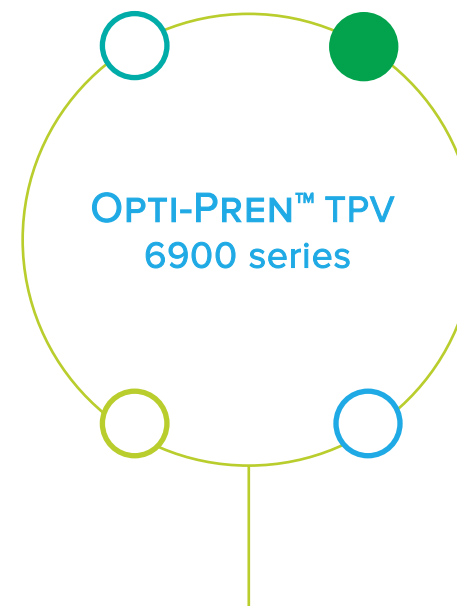


ZERO 

waste journey

ZER

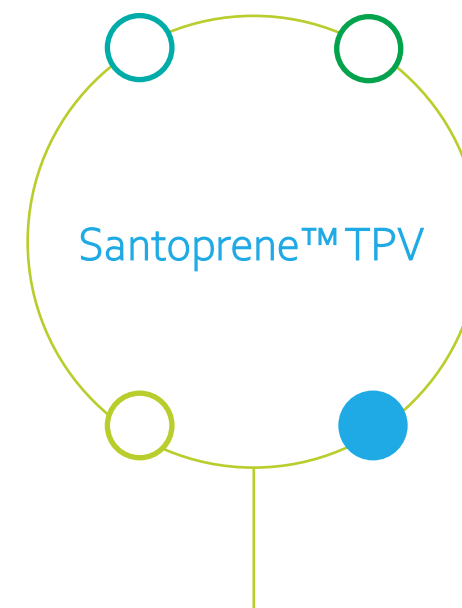
waste journey



Santoprene™ TPV
with
PRE-CONSUMER WASTE*

ZER

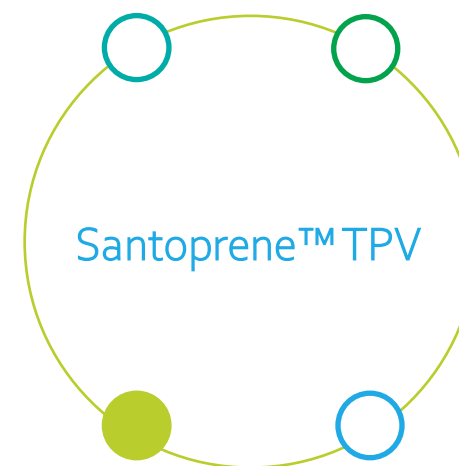
waste journey



Manufacturing
In-process recycling
up to 30%* less waste

ZER

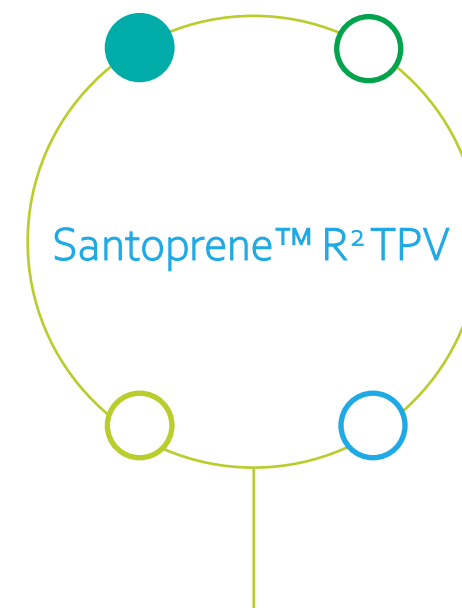
waste journey



End of life
Potential for recycling

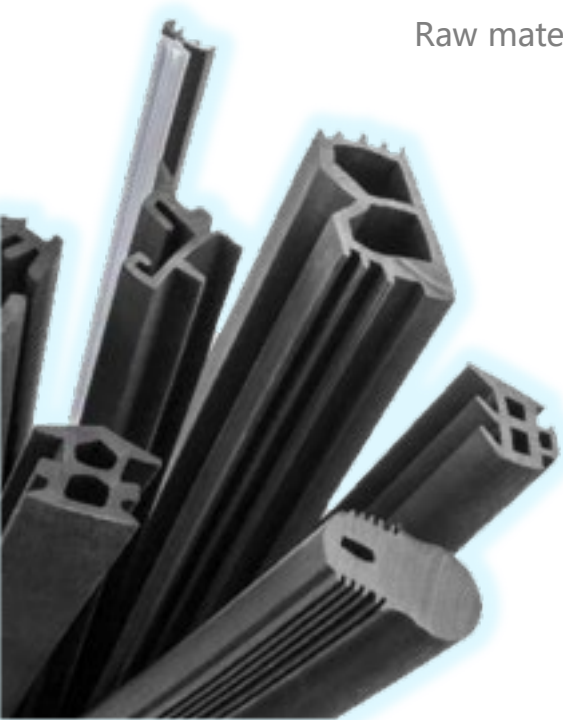
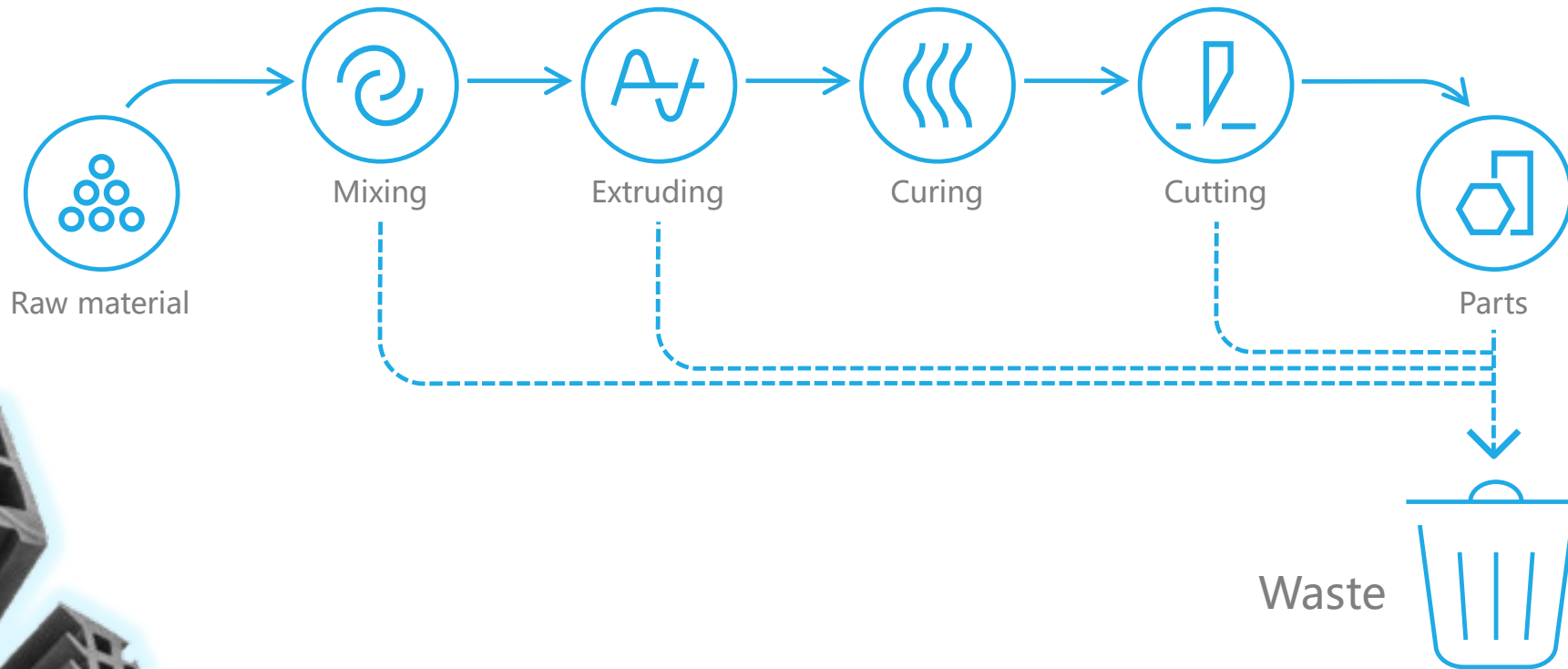
ZER

waste journey

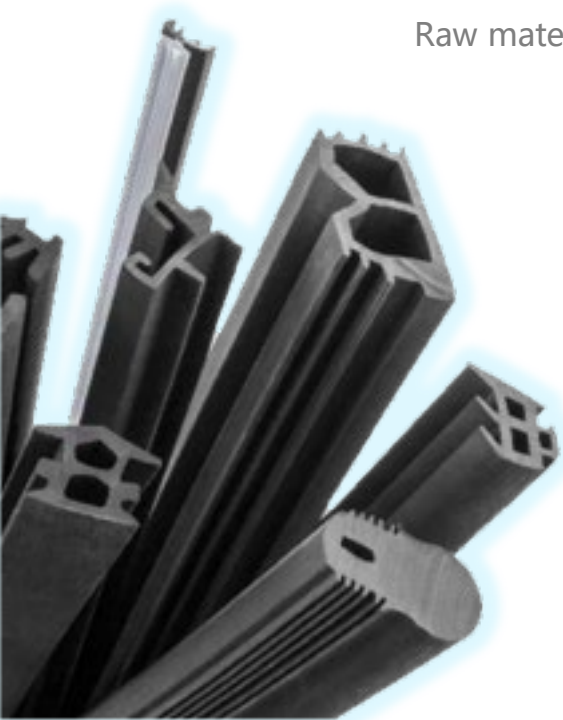
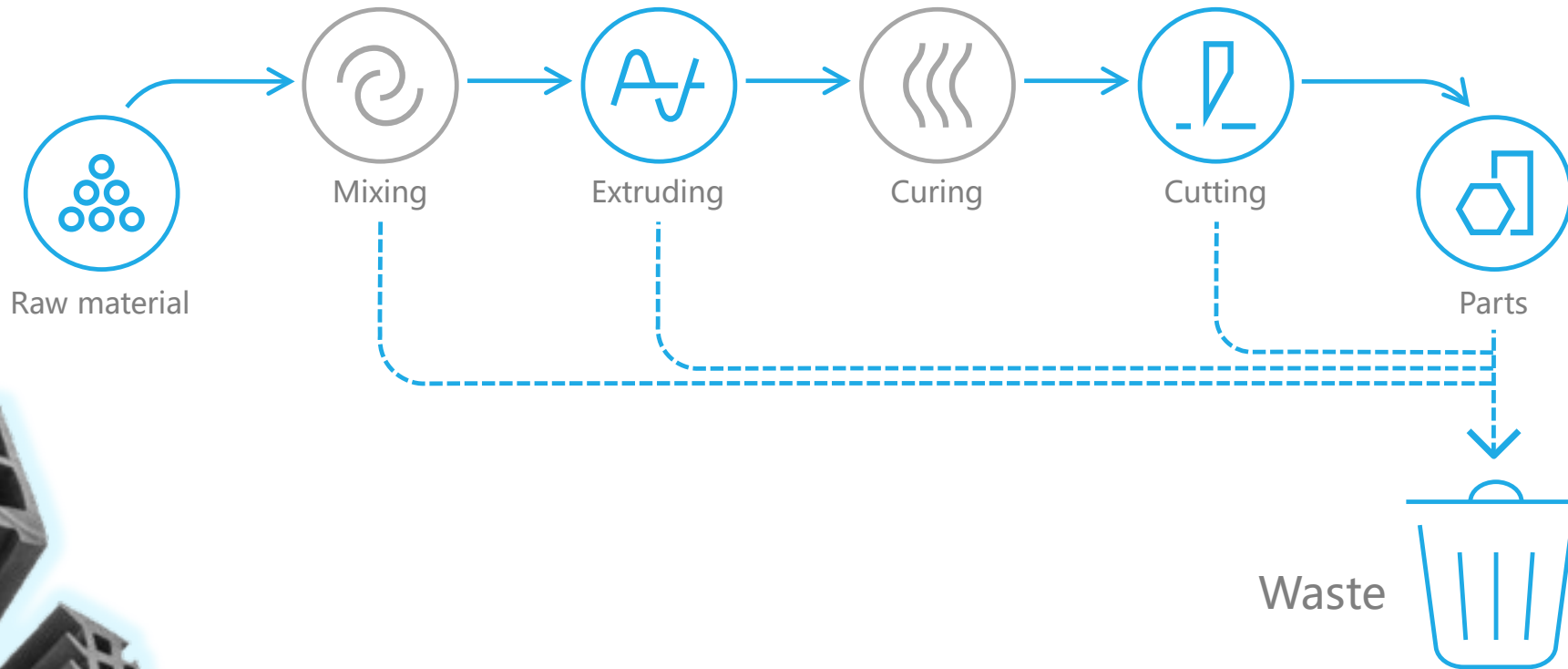


Raw material
with
POST-CONSUMER RECYCLED CONTENT*

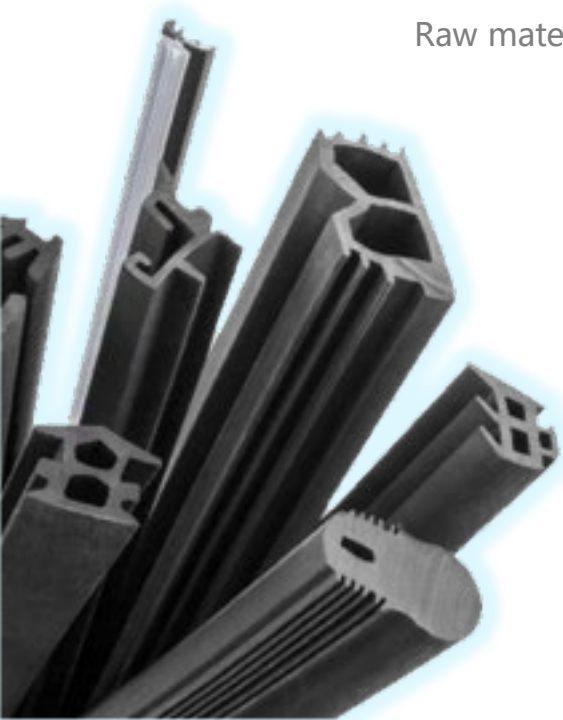
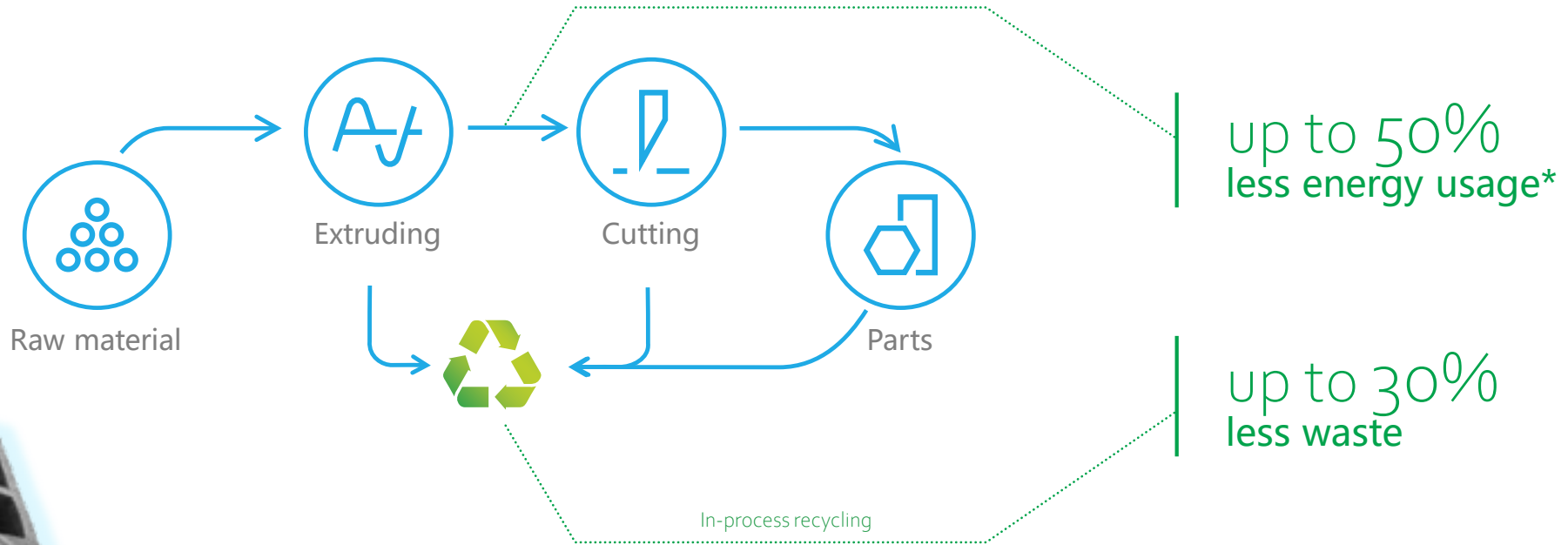
Recyclability performance | Thermoset rubber production



Recyclability performance | Thermoset rubber production



Recyclability performance | Santoprene™ TPV vs. EPDM



Santoprene™ TPV: 3D printed parts

3D printing is one of the routes for improving the product life cycle:

3D printed parts versus replacing entire appliance with a new one:

- Extends life of existing appliance
- Reduces obsolescence of product
- Reduce waste volume with slower renewal rate
- Offers customized and affordable solution for final consumer



A solution for multiple applications



Construction applications

- Excellent air, water and noise infiltration barrier
- Helps architects reach green building label standards (e.g. LEED credits)
- Onsite heat welding of corners without adhesion or molding
- CSTB certificate for window & door seals



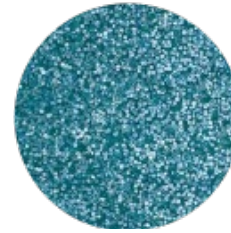
Renewable energy applications

- Excellent quality consistency
- Long term durability (>20 years)
 - UV resistance
 - Weathering resistance
- Flame retardant

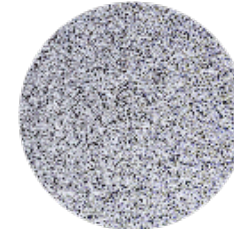


Consumer goods haptics

- Superior aesthetics
- Colorability:
 - Photochromic effect
 - Thermochromic effect
- Surface textures can improve appearance, feel and functionality
- 5G signal compatibility



Metallic and speckled effect



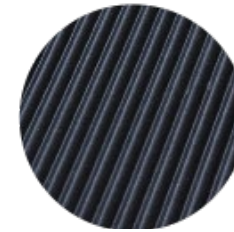
Stone effect



Leather Look



Dimpled Surface

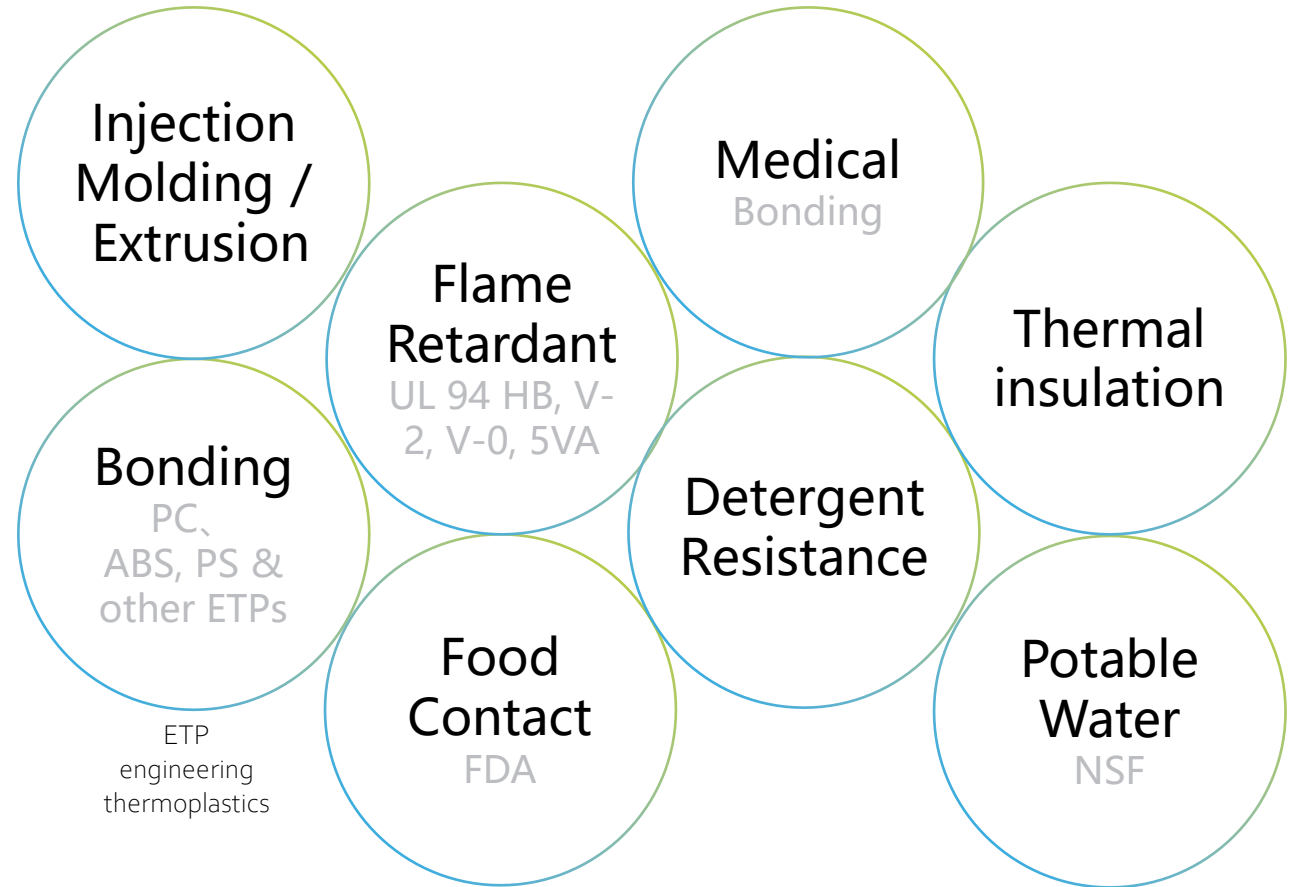
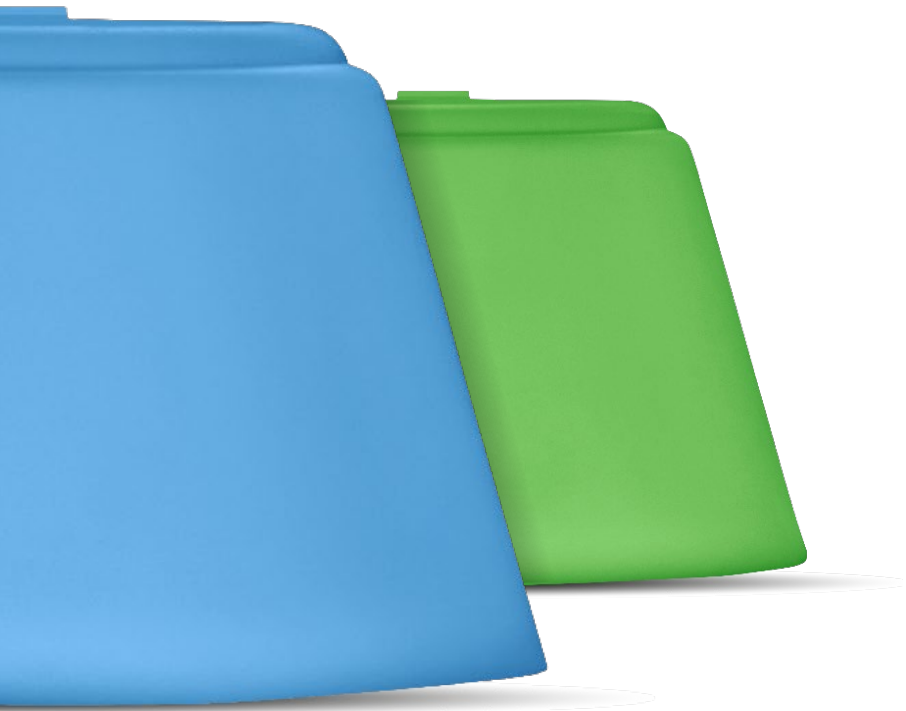


Grooved Surface

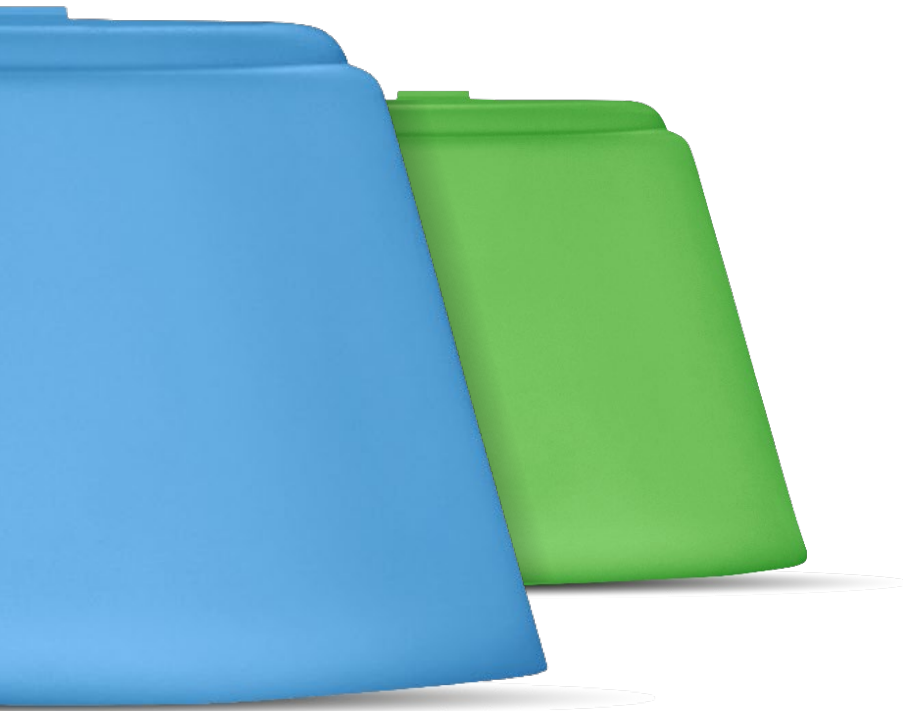


Raised Geometry

Santoprene™ TPV complete portfolio



BTG complementary sustainable solutions



OPTI-SOFT™ TPE

Where aesthetics & good haptic properties matter!

- Dry, soft touch, low-density PO-based TPE alternative to styrenics

OPTI-PREN™ TPV

What you've been looking for in TPVs & could not find to-date

- High tensile and abrasion resistance
- HFFR & ZHFR
- Pre-consumer TPV waste-based products

OPTI-FLEX™ TPO

Great looks & durability can be economically attractive!

- Value-added TPO option to styrenics- or PVC compounds
- Latex-, styrene-, plasticizer-, oil- and halogen-free

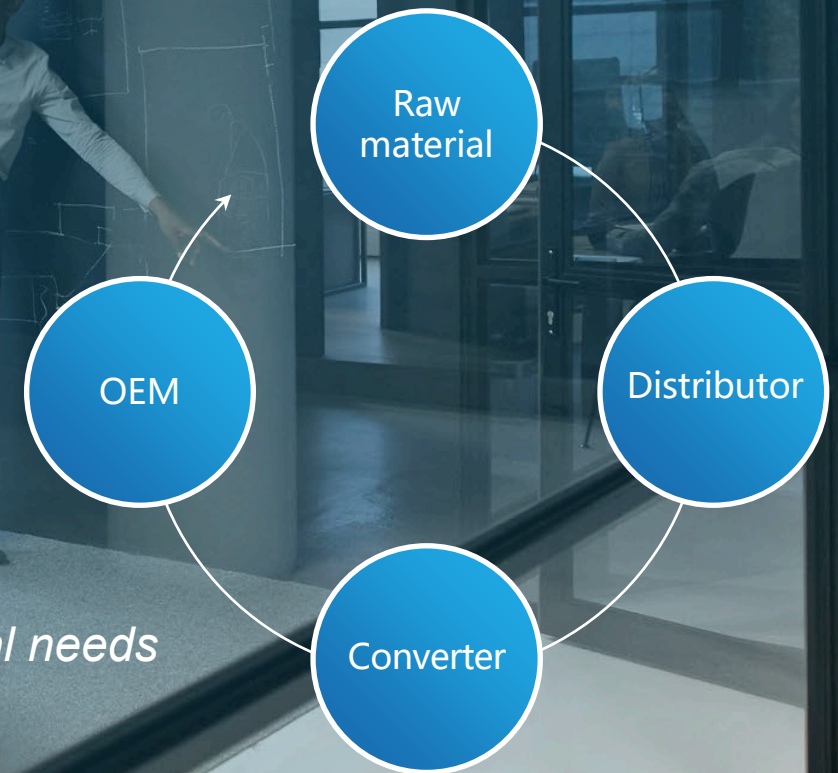
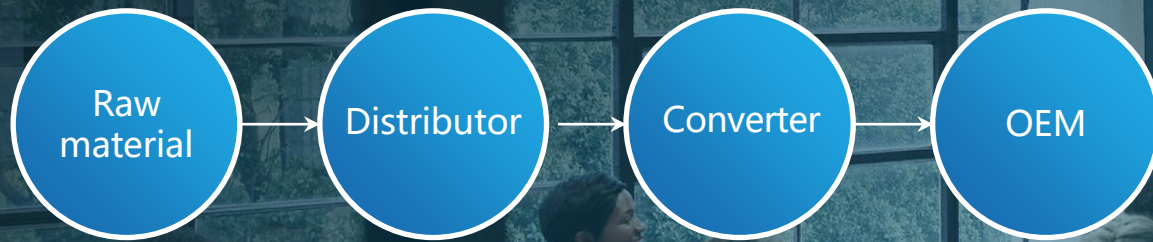
Collaboration
makes the difference



Collaborative solution

From silos

To cooperation



BTG partnership with ExxonMobil provides ability to tailor to individual needs

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our expert.



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Thank you for attending





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