X EDIZIONE
SMART PLASTICS
'TECNOPOLIMERI A CONVEGNO'
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MUSEO STORICO ALFA ROMEO

Glass fibre Polypropylene Sustainable compounds for lightweight applications

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plast PLAST:DESIGN

Presentation Outline

Sumika at a glance

Market driver

Sumika lightweight & sustainable solutions

Conclusions

Sumika Polymer Compounds – Worldwide network

370,000 Tonnes/Year of Polypropylene Compounding Capacity

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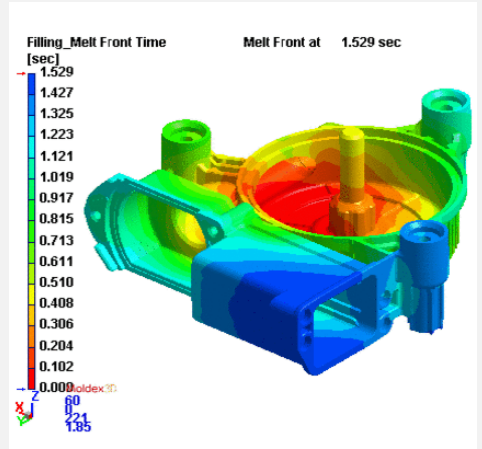
How to achieve Carbon neutrality ?

Lightweight material and Low carbon materials are the keys

Digitalization of material could support



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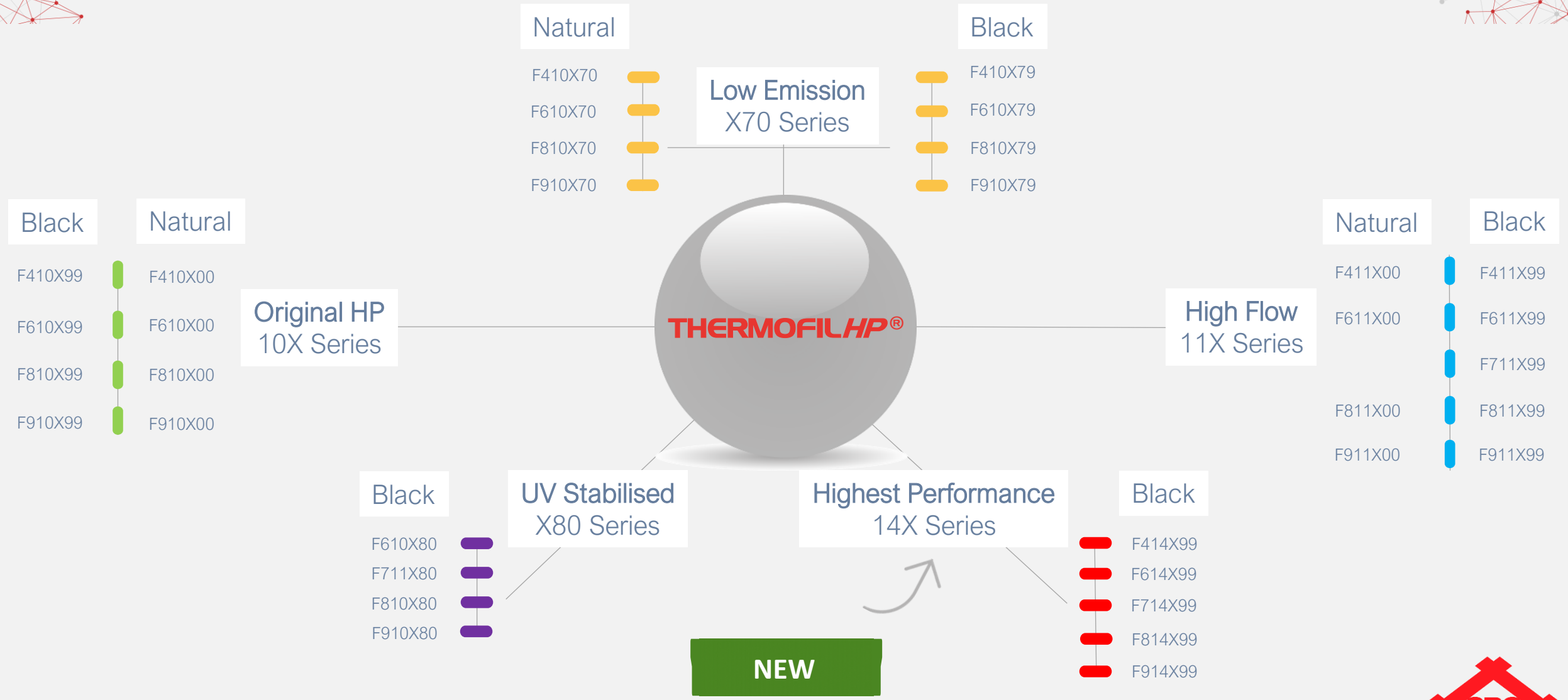
THERMOFILHP® Family



THERMOFIL*HP* ®

Metal replacement

Windows lifter regulator rail

THERMOFIL*HP* ® F611X99 & THERMOFIL*HP* ® F610X99

Running in EUROPE and CHINA

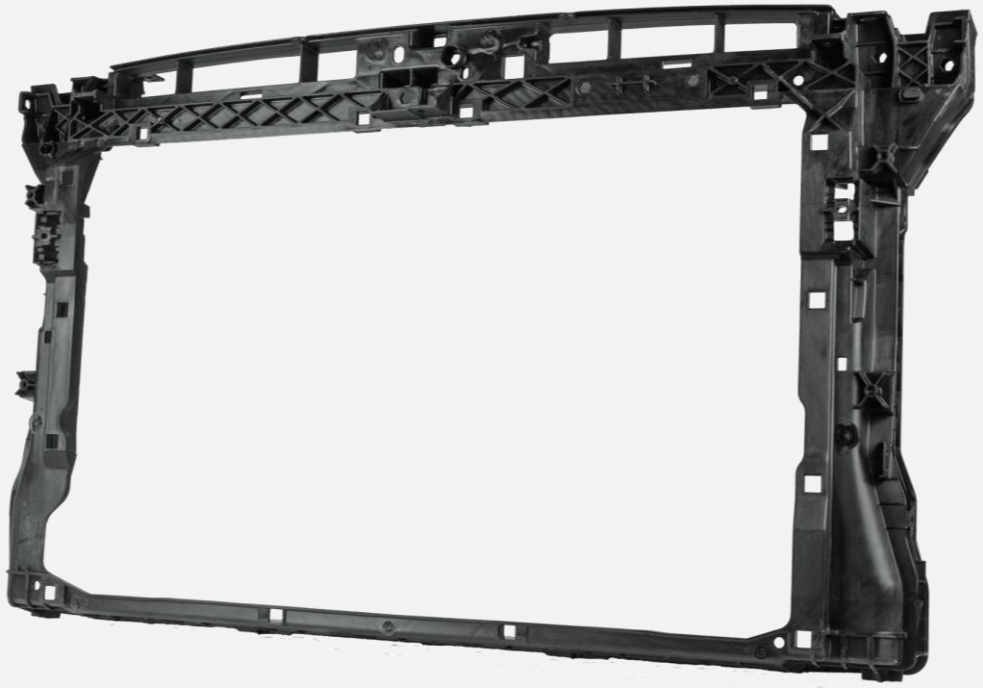
Main features of THERMOFIL*HP* ® solutions:

- ✓ **High module and tensile strength**
- ✓ **High fatigue and creep resistance**
- ✓ **Performance of a steel solution with Aluminium weight**

38% weight reduction using THERMOFIL*HP* ® technology

Around 10 % cost reduction

THERMOFIL HP®: success stories



PA6-GF replacement

Front end module without metal insert

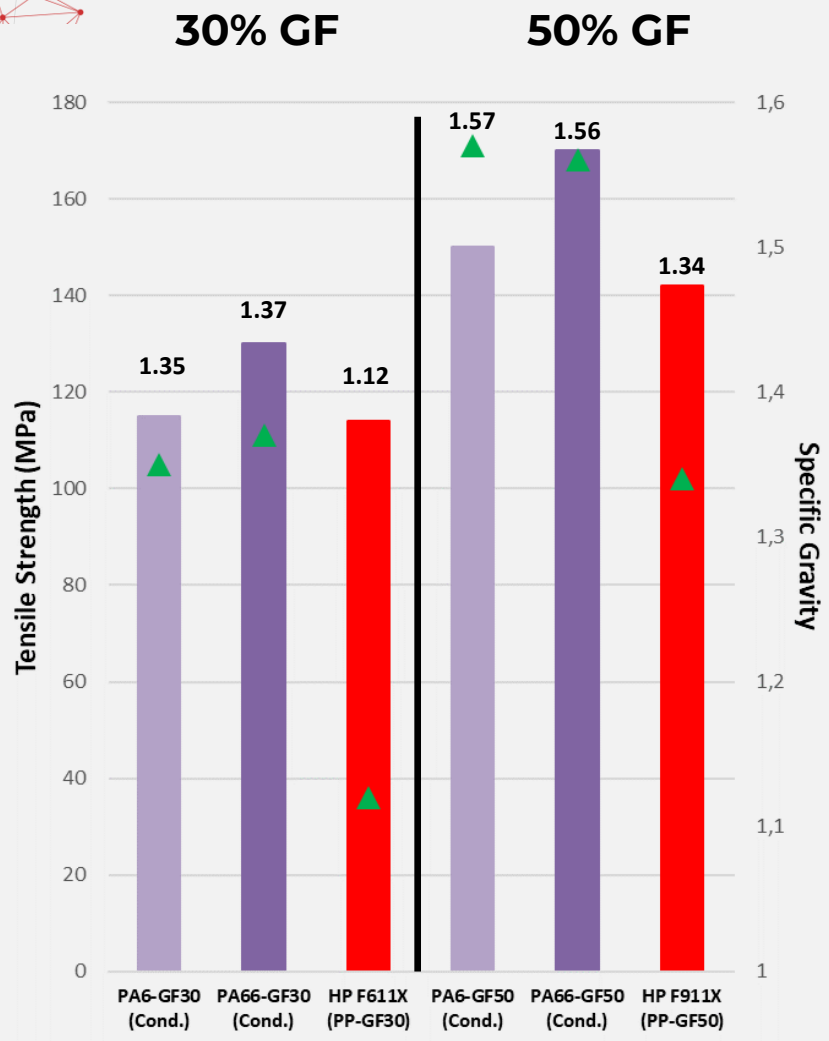
THERMOFIL HP® F911X (PP-GF50)
Running in Europe, India & China

Main features of THERMOFIL HP® solution:

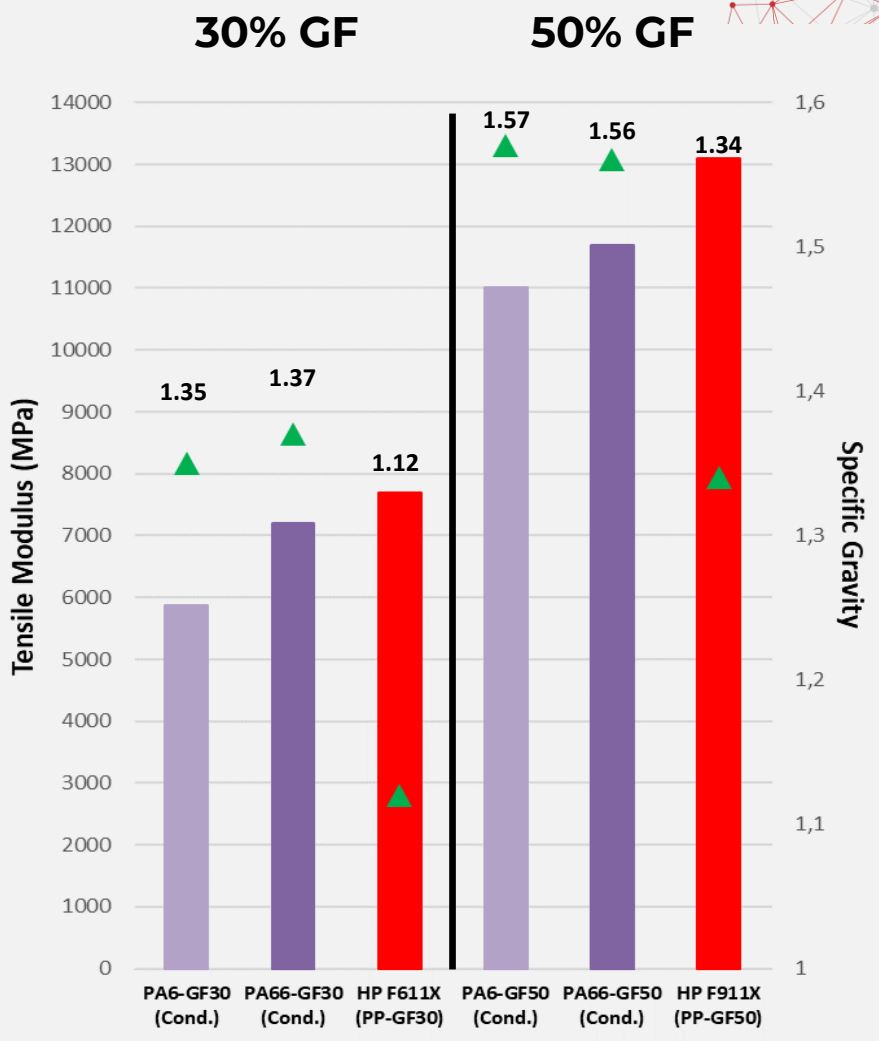
- ✓ High mechanical properties at working temperatures
- ✓ Good property retention after heat ageing
- ✓ No compromise with safety (crash test, pedestrian impact, …)

6% weight reduction and 83% CO_2 emissions equivalent reduction through THERMOFIL HP®

THERMOFILHP ® Vs PA-GF



Comparable performance to PA-GF at lower specific gravity



Sustainable future

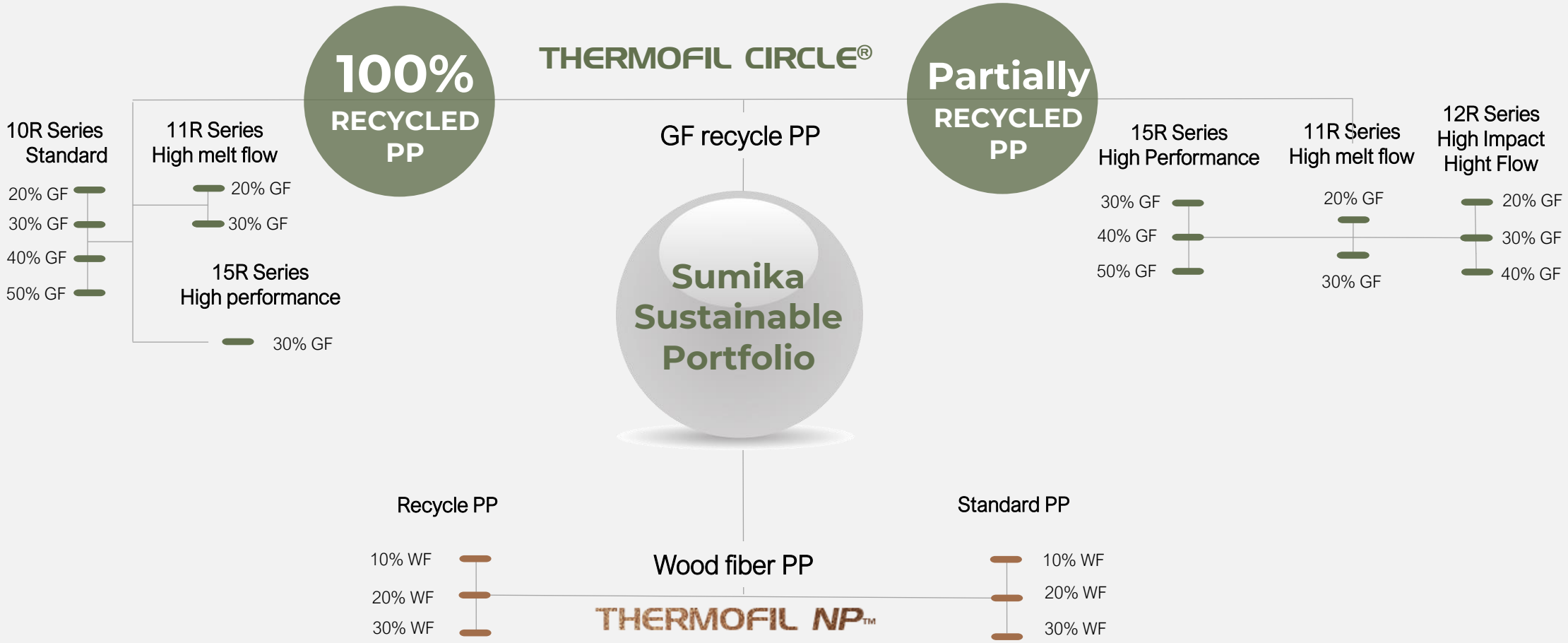
THERMOFIL CIRCLE®

Short glass fibre recycle PP

Circular Polypropylene

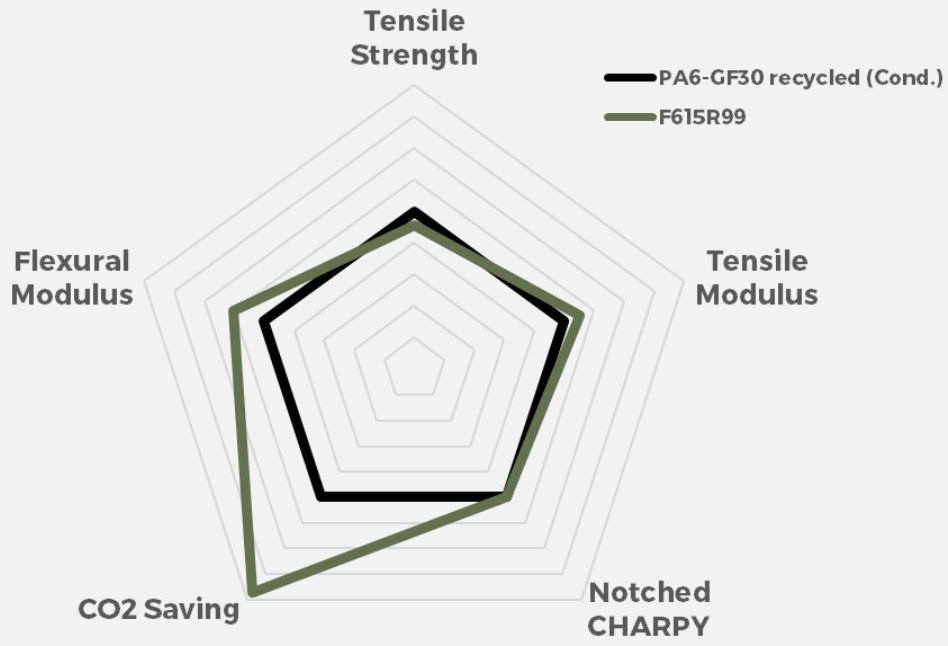
Mechanical recycling

Sumika Sustainable Portfolio

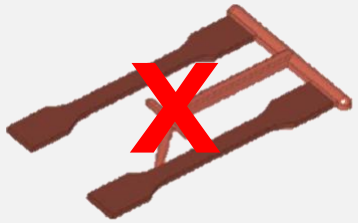


THERMOFIL CIRCLE® F*15R series

Properties	Unit	F615R99	F615R59	F815R59	F915R59
GF content	%	**30**	**30**	**40**	**50**
GHG emissions (Greenhouse Gas)	Ton CO_2 eq.	**0,88**	**1,35**	**1,40**	**1,45**
Specific Gravity	-	1,14	1,13	1,24	1,34
Total recycled content (according to ISO 14021)	%	**>60**	**>30**	**>25**	**>20**
MFR	g/10min	12	12	10	10
Tensile Strength	MPa	78	88	108	118
Tensile Modulus	MPa	6 300	6 500	9 400	11 900

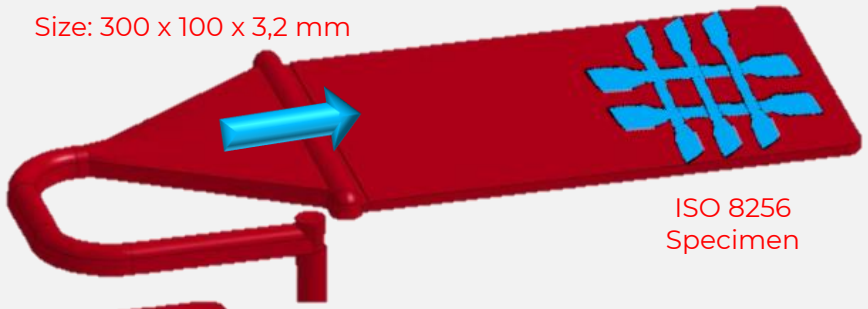


Material card



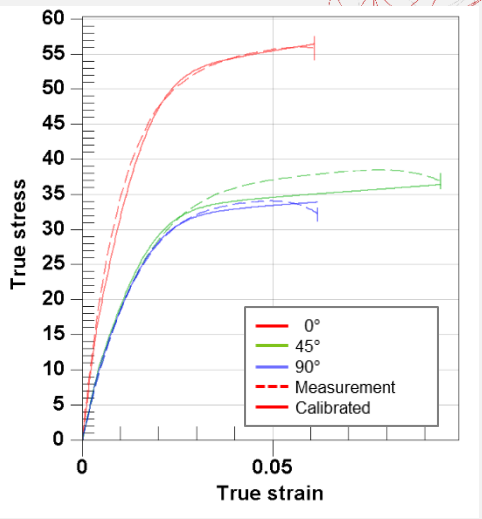
Dumbbell bars

Size: 300 x 100 x 3,2 mm

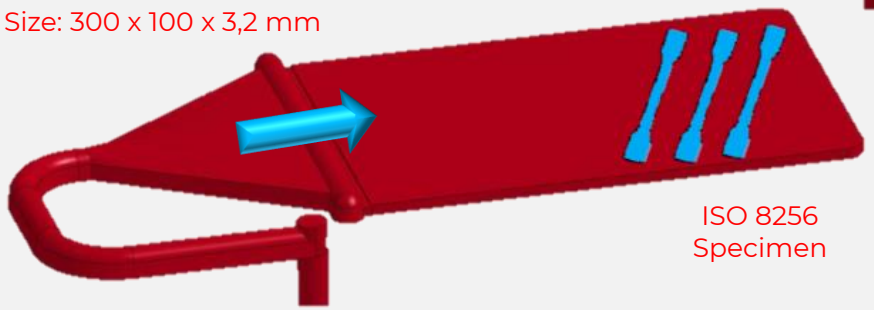


ISO 8256
Specimen

Dumbbell bars at 0°and 90° GF Orientation



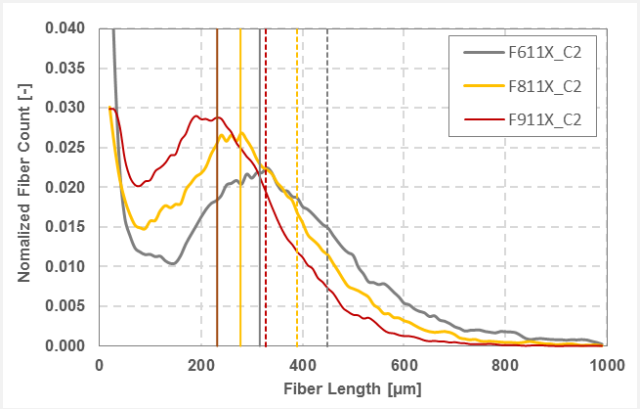
Size: 300 x 100 x 3,2 mm



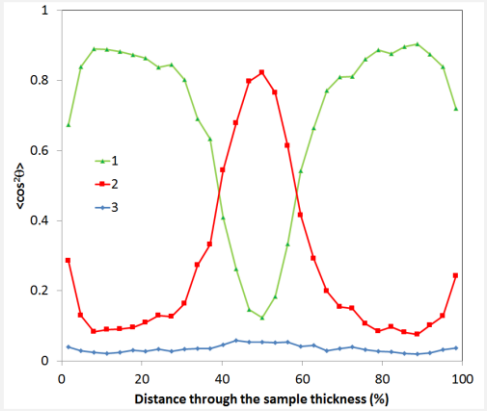
ISO 8256
Specimen

Dumbbell bars at 45° GF Orientation

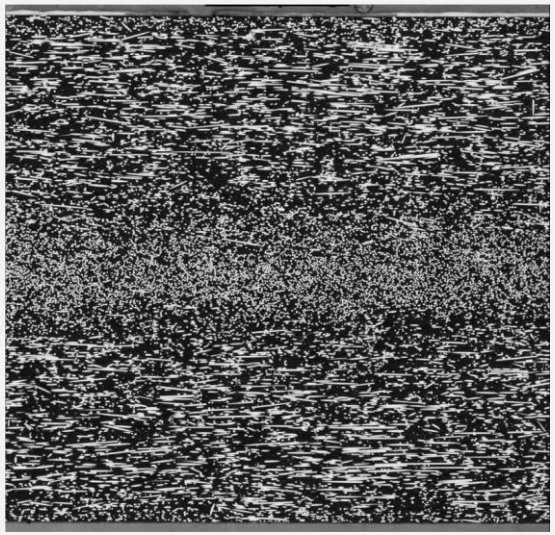
Calibration using DIGIMAT MX and RE (-40°C up to 130°C)



Fibre length contribution

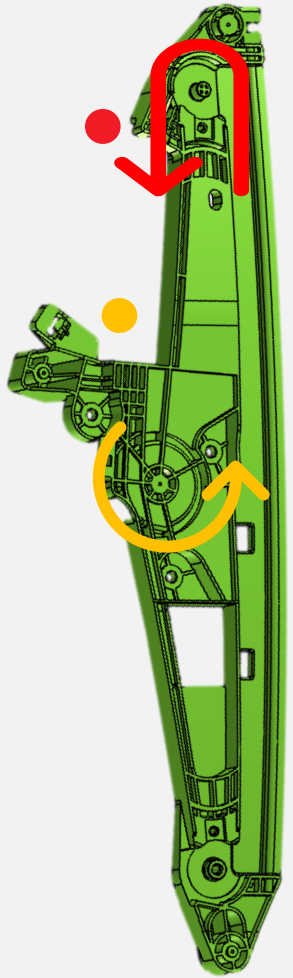


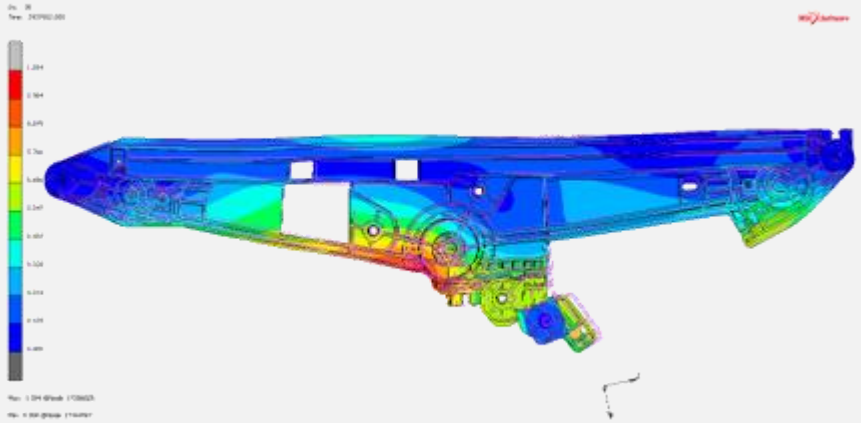
Contribution of fibre orientation into the thickness

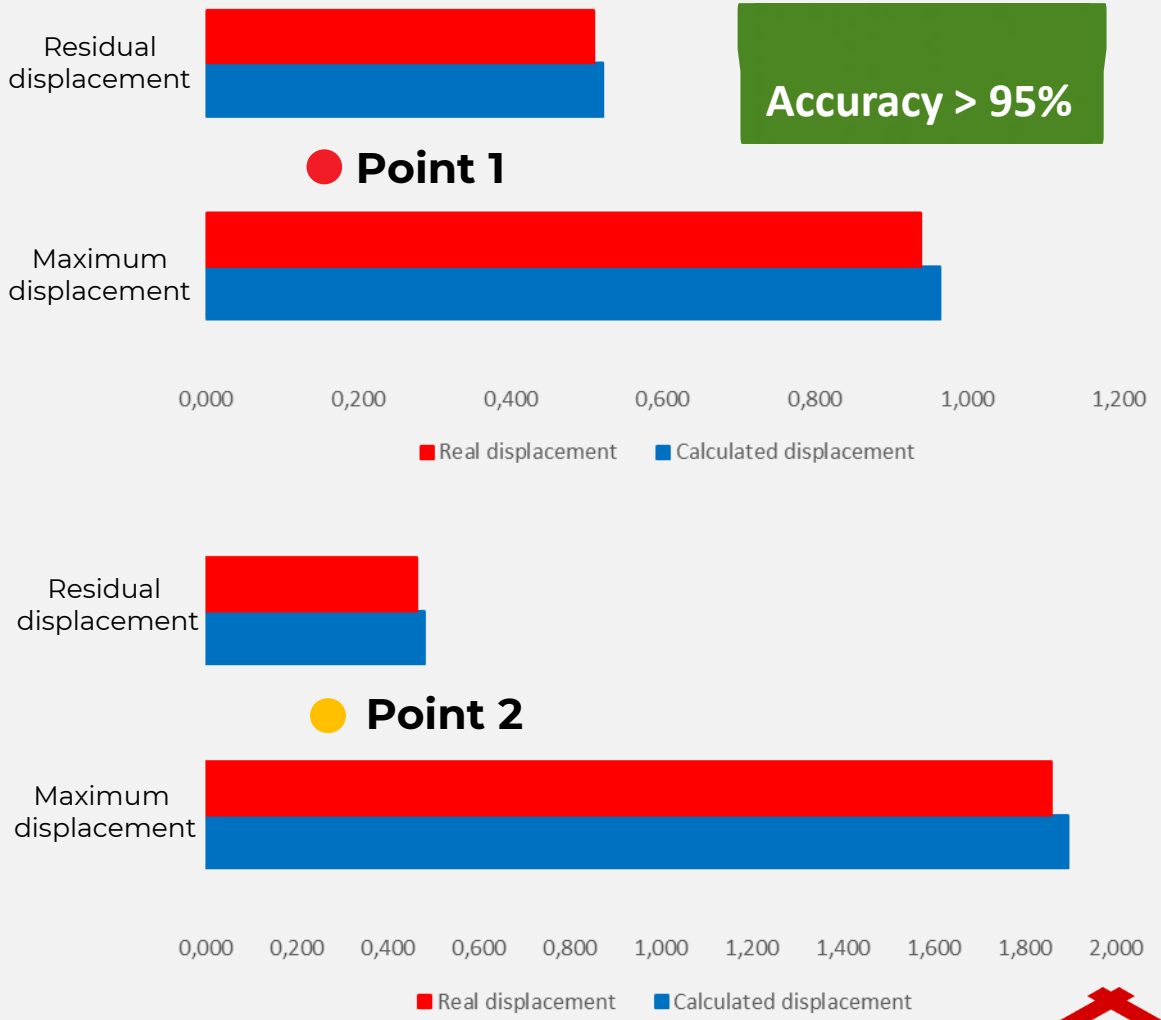


FOT profile analysis by 3D µCT scan

Physical test Vs FEA prediction



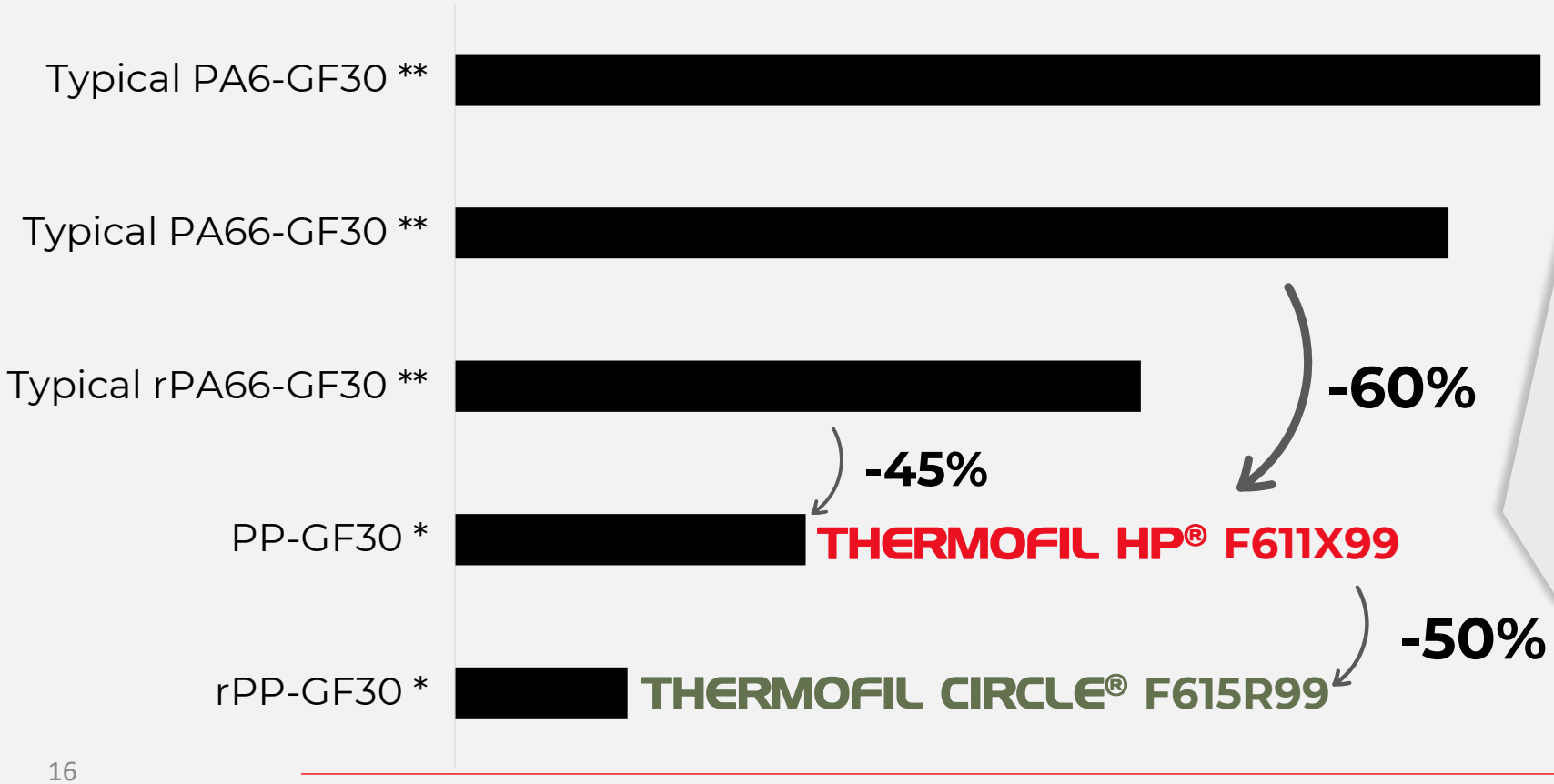


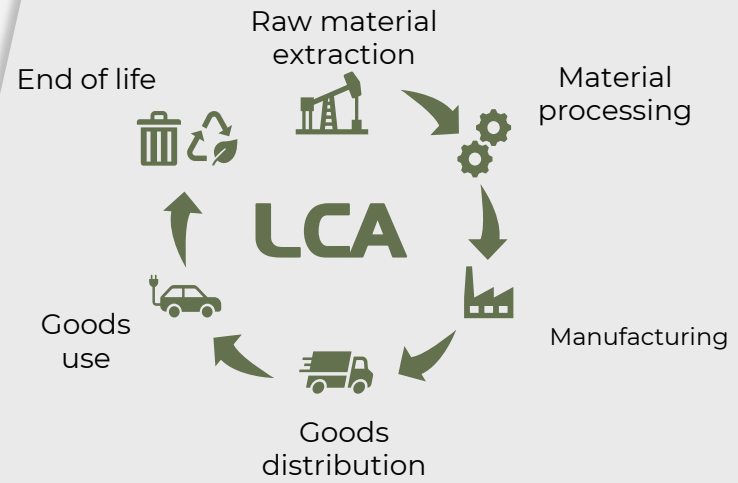


THERMOFIL CIRCLE ® CO_2 footprint

Life Cycle Assesment (LCA) data available

Material CO_2 eq Impact (Ton Co_2 eq.)





LCA analysis based on ISO 14040 standard

* SPC internal calculation according to the ISO14040 standard.

* Based on data provided by suppliers

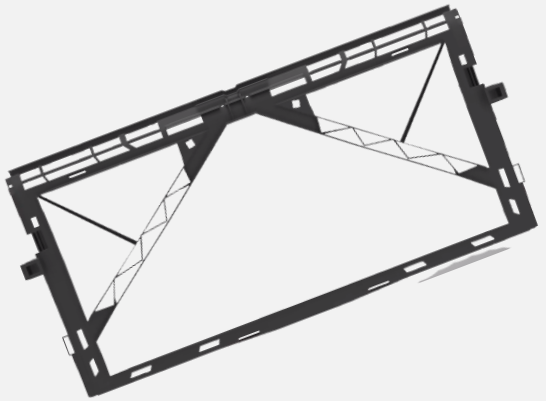
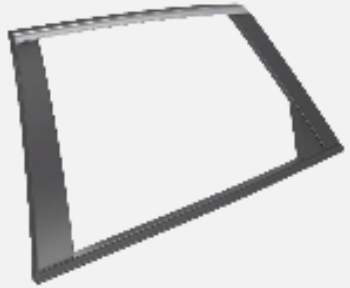
THERMOFIL CIRCLE®

Applications :

- **Gear box base**
- **Gear box support**
- **E or Fuel tank housing**
- **Pump body**
- **Fem**
- **Stretch bent glass runs and seals**
- **Air filter housing**
- **Battery tray**





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Summary

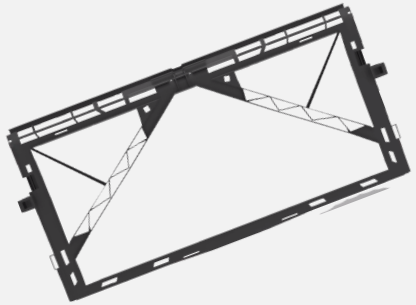
THERMOFIL HP ® shows excellent mechanicals properties Vs engineering plastics or metal.

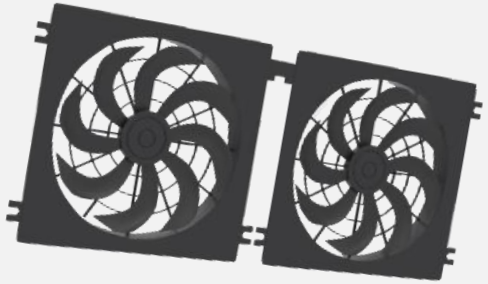
THERMOFIL HP ® can deliver substantial weight and cost savings due to lower raw material volume costs and process costs (around 15-40%).

THERMOFIL CIRCLE ® F*15R series shows excellent properties Vs recycled engineering plastics,

THERMOFIL CIRCLE ® F*15R series are best in class in C02 showing a low carbon footprint without any compromise in performances.

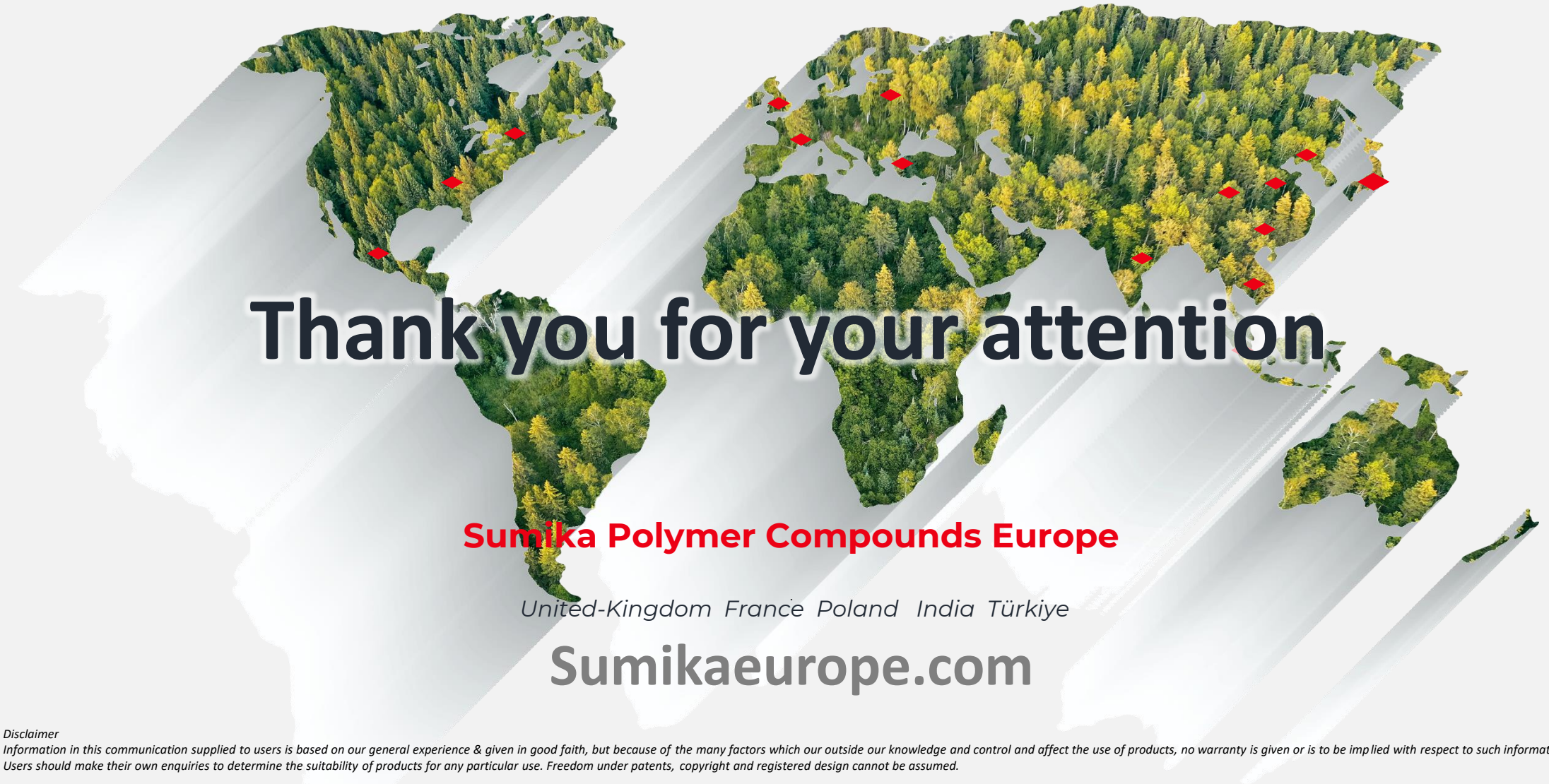
THERMOFIL HP ® and THERMOFIL CIRCLE ® family are fully supported with advanced material card, this latest technological edge could unlock new opportunities and applications for reducing time to market by developping faster, safer and cheaper.





Sumika Polymer Compounds

Sumitomo Chemical Group



Thank you for your attention

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