

LEONA™ S - series

Innovative Polyamide solutions for light weighting, paint removal exterior application

22 Feb 2022

Asahi**KASEI**

Webinar Program



Executive Summary of Leona™ S - Series

Portfolio

- New addition to Asahi Kasei Polyamide Portfolio

Segment

- Three segments – Structural, Exterior, Flame retardants
- Webinar focus: Exterior application

Features

- Light weighting
- Paint-less
- Excellent surface and UV Protection

Benefits

- Fuel efficiency
- Secondary process reduction
- Cost reduction



Asahi**KASEI**

At a Glance

About Asahi KASEI

Asahi Kasei Corp.

Homes



Health Care

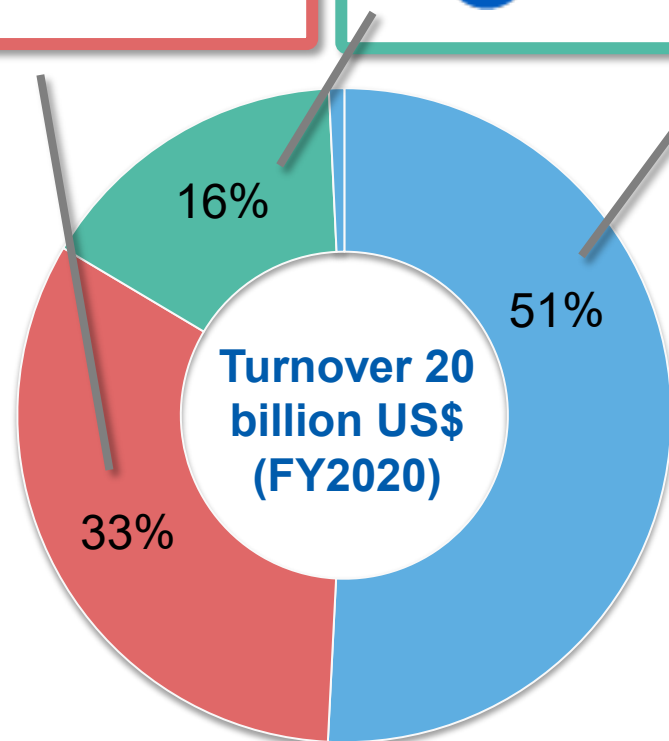


Material

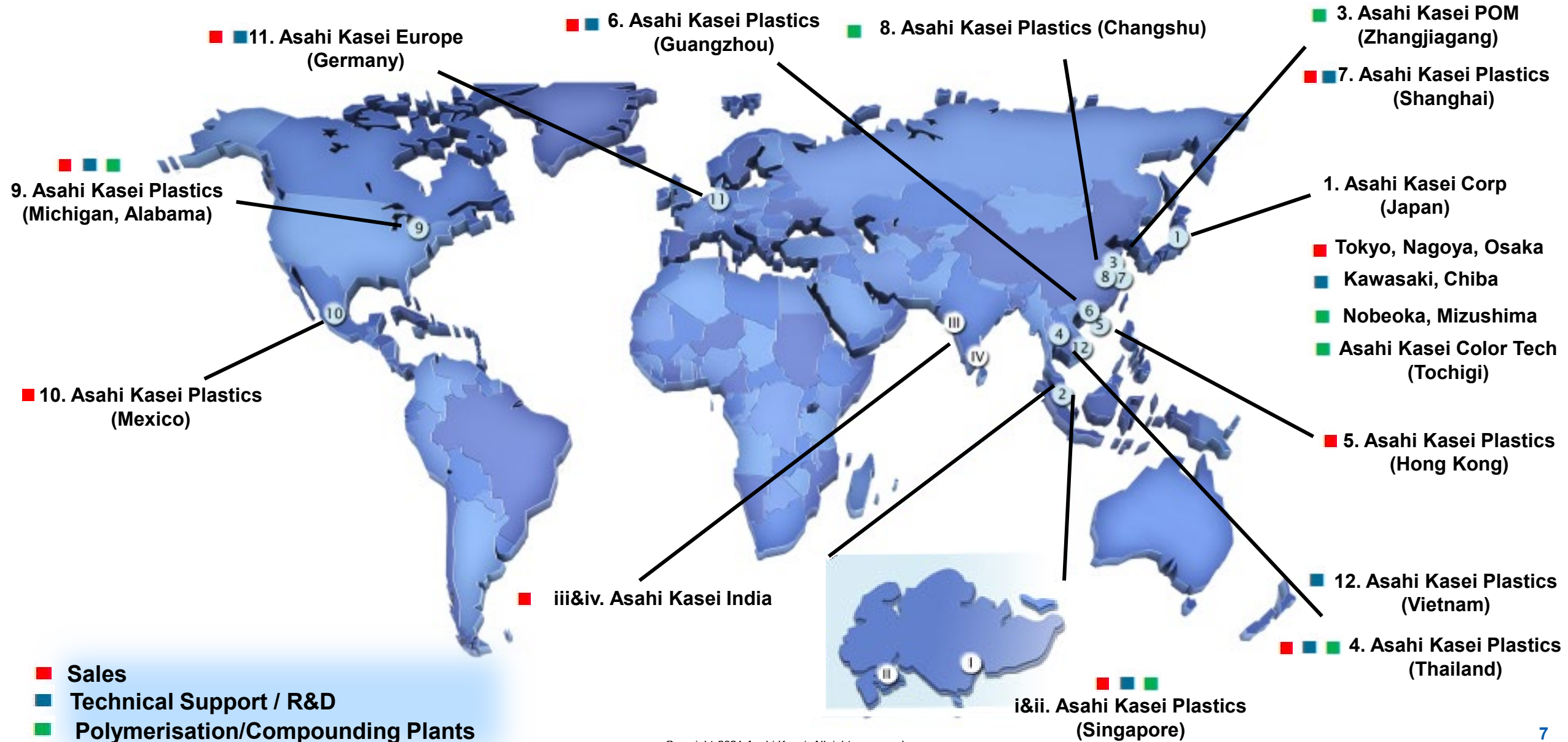


Synthetic Resins and Engineering Plastics of Asahi-kasei

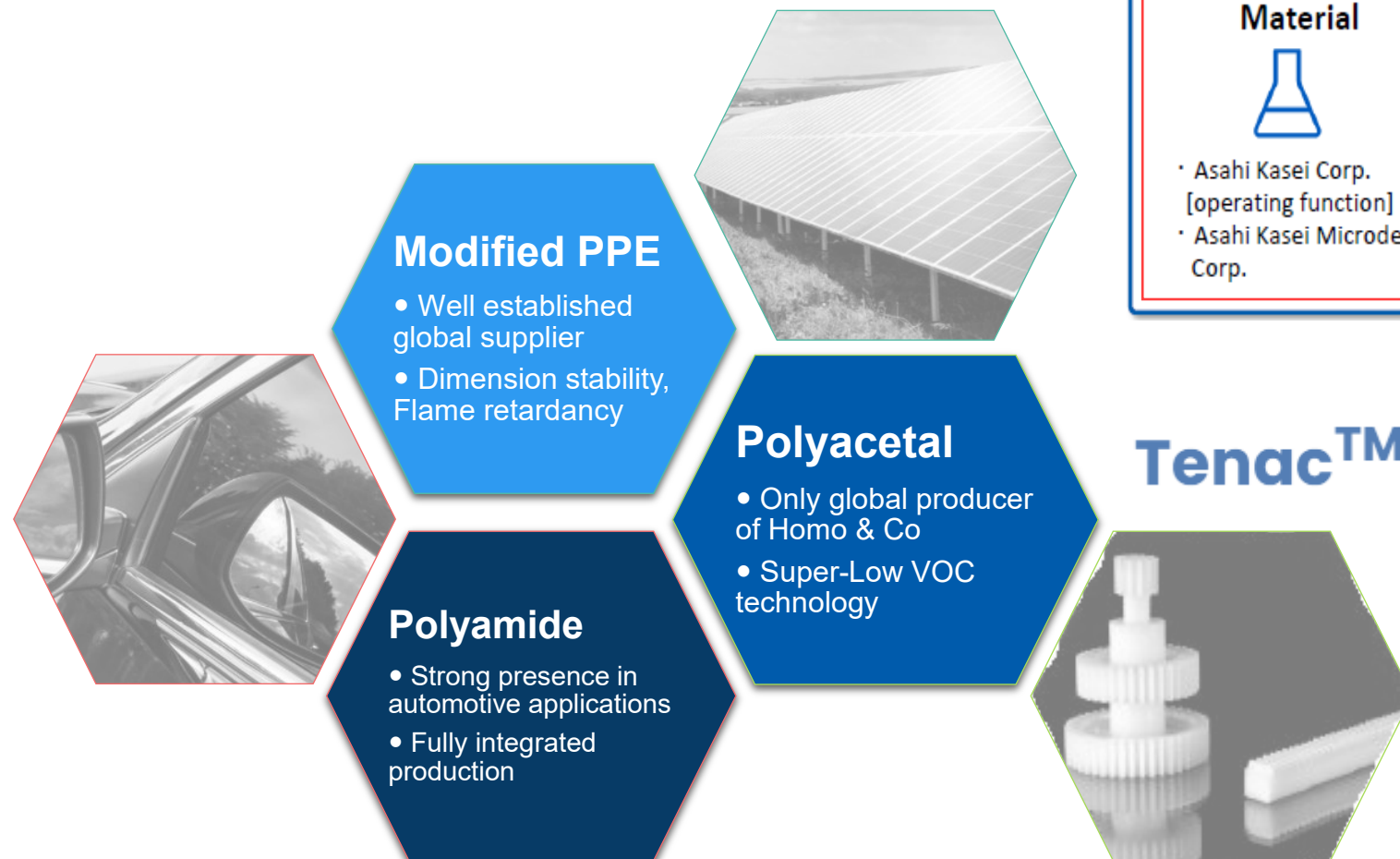
Product information and physical properties information are being offered of Synthetic Resins and Engineering Plastics for Plastics product from product lineup of AsahiKasei Corporation.






Performance Polymers Global Capability



Asahi Kasei Engineering Plastics



Asahi Kasei Corp. [holding company function]		
Material	Homes	Health Care
 <ul style="list-style-type: none">• Asahi Kasei Corp. [operating function]• Asahi Kasei Microdevices Corp.	 <ul style="list-style-type: none">• Asahi Kasei Homes Corp.• Asahi Kasei Construction Materials Corp.	 <ul style="list-style-type: none">• Asahi Kasei Pharma Corp.• Asahi Kasei Medical Co., Ltd.• ZOLL Medical Corporation

Asahi Kasei Engineering Plastics

Xyron™

Modified PPE

- Well established global supplier
- Dimension stability, Flame retardancy



Polyacetal

- Only global producer of Homo & Co
- Super-Low VOC technology



Polyamide

- Strong presence in automotive applications
- Fully integrated production



Asahi Kasei Corp. [holding company function]

Material



- Asahi Kasei Corp. [operating function]
- Asahi Kasei Microdevices Corp.

Homes



- Asahi Kasei Homes Corp.
- Asahi Kasei Construction Materials Corp.

Health Care



- Asahi Kasei Pharma Corp.
- Asahi Kasei Medical Co., Ltd.
- ZOLL Medical Corporation

Asahi Kasei Engineering Plastics

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Leona™

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Health Care



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- ZOLL Medical Corporation



ADDRESSING POLYAMIDE MARKET & GLOBAL TRENDS

Polyamide Market & Trends

POLYAMIDE

Continual growth in aliphatic Polyamide
– Innovation for alternatives

Continual growth in semi aromatic / PPA
segment

Continual improvements to address
polyamide shortfalls
- Moisture absorption



INDUSTRIAL

Metal replacement and light weighting
solutions

Secondary processes reduction
- Paint less solutions

Rise in E-mobility

Sustainable works

ASAHI KASEI NEW POLYAMIDE PORTFOLIO

Leona™ S-Series





NEW OPPORTUNITY AWAITS: INTRODUCING LEONA™ S - series

New Portfolio: LEONA™ S - series

- Over **45 years** of polyamide solutions and developments
- **Fully integrated** from monomer to PA66 compounds



Radiator end tanks trials

Commercializes
Leona 1300G & 13G (PA66)

Performance Enhancements:
Leona 5300G launched (PA66/612)



Thermal improvements:
Leona 14G (PA66) + 53G (PA66/612) Series



Sustainability grade:
Leona BG Series

High Temperature
PA66/610

Leona™ S - series

1975

1978

1990

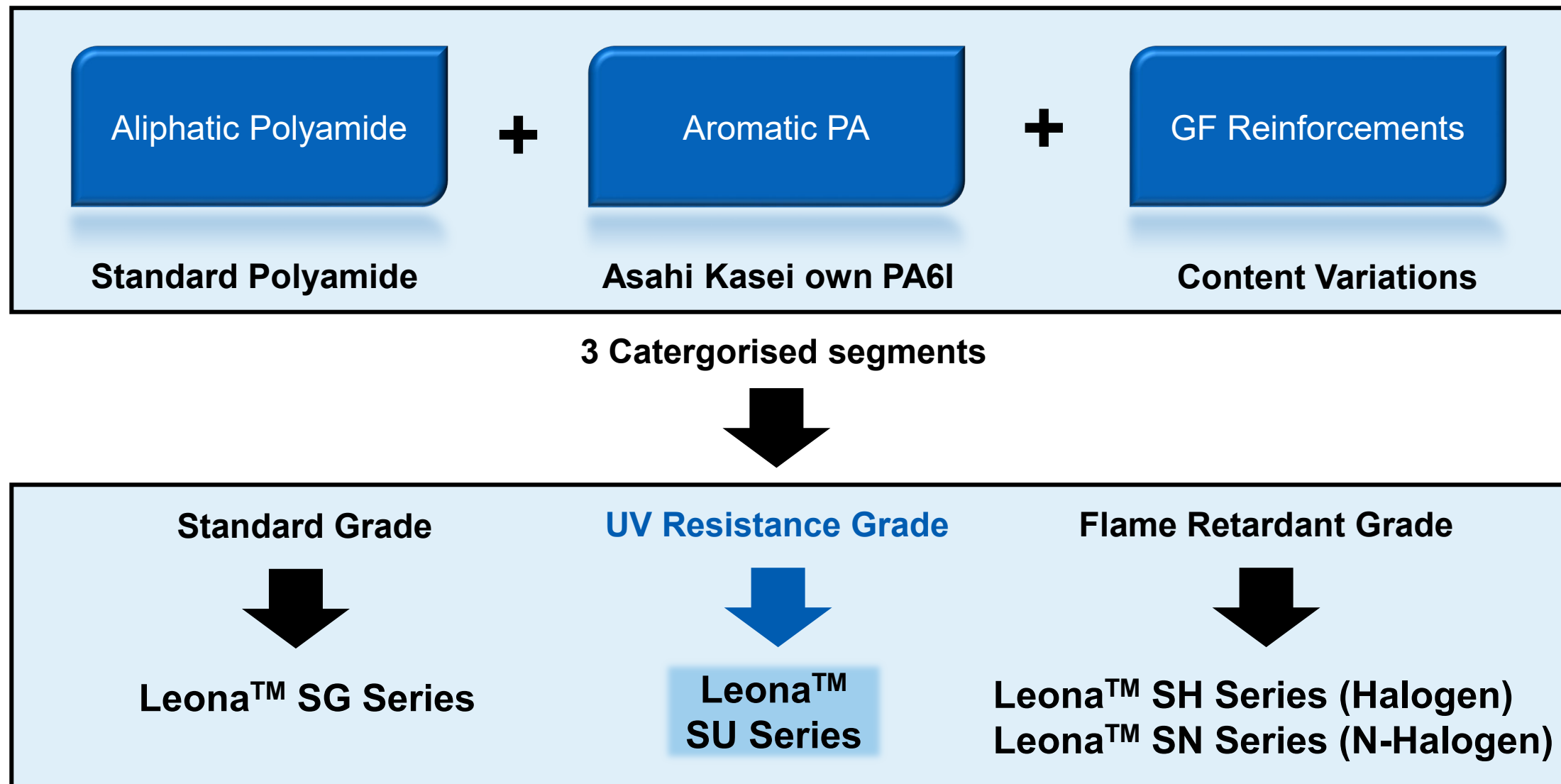
2001

2013

2015

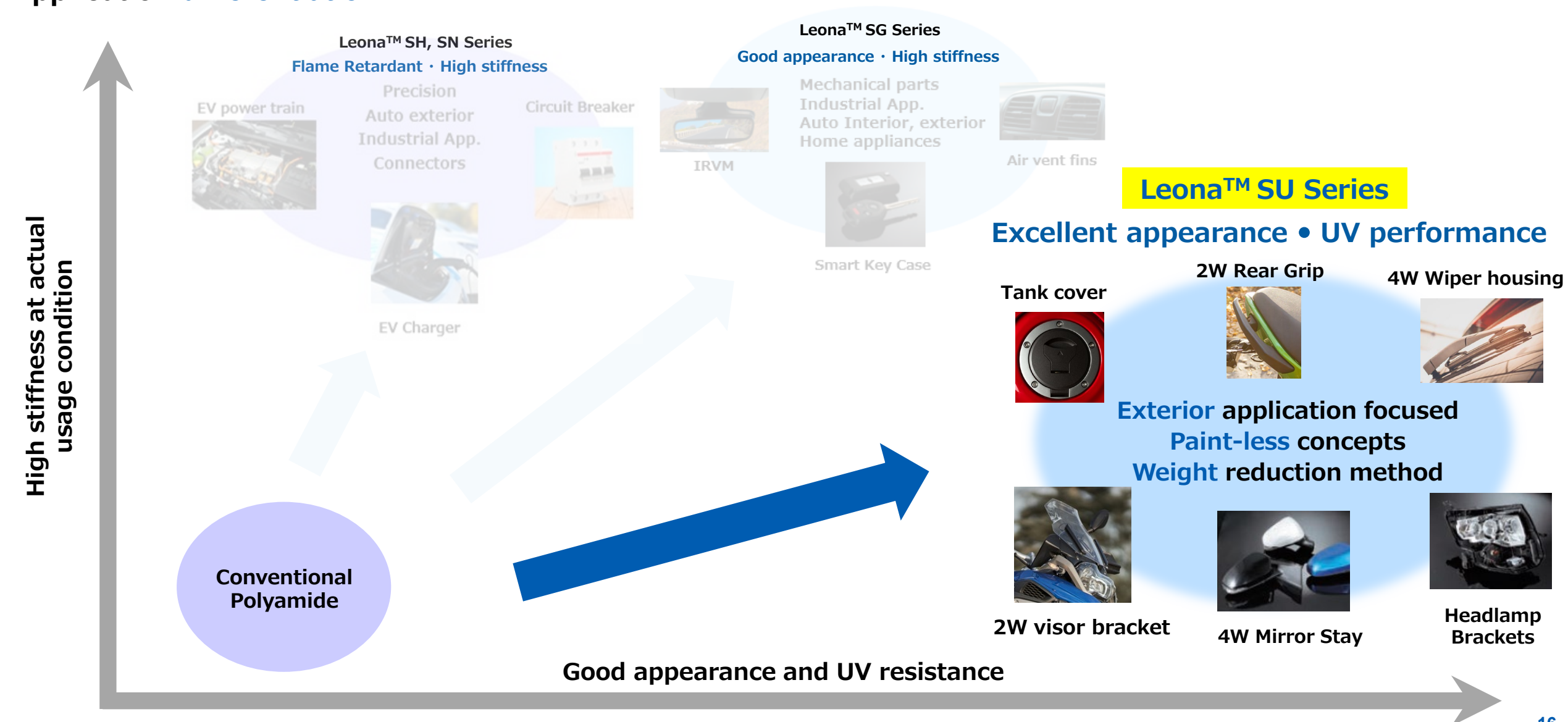
2021

Asahi Kasei LEONA™ S - series



Performance Focused • Diverse Applications

Application differentiation



LEONA™ SU – series Features

HIGH AESTHETICS

SU
Series

PA6 + 6I
GF35 – GF60



Well balanced strength
& stiffness



Excellent



Excellent post
molded surface



Exterior
Metal
replacement

HIGH STRENGTH STRUCTURAL

SG
Series

PA66 + 6I
GF 40 – GF 60



Excellent strength
& stiffness



Moderate



Good post
molded surface



Interior
metal
replacement

FLAME RETARDANT

SN
Series

PA66 + 6I
GF 25 – GF 50



Excellent strength
& stiffness



Excellent Laser
printing clarity



V-0



Interior
Metal
replacement

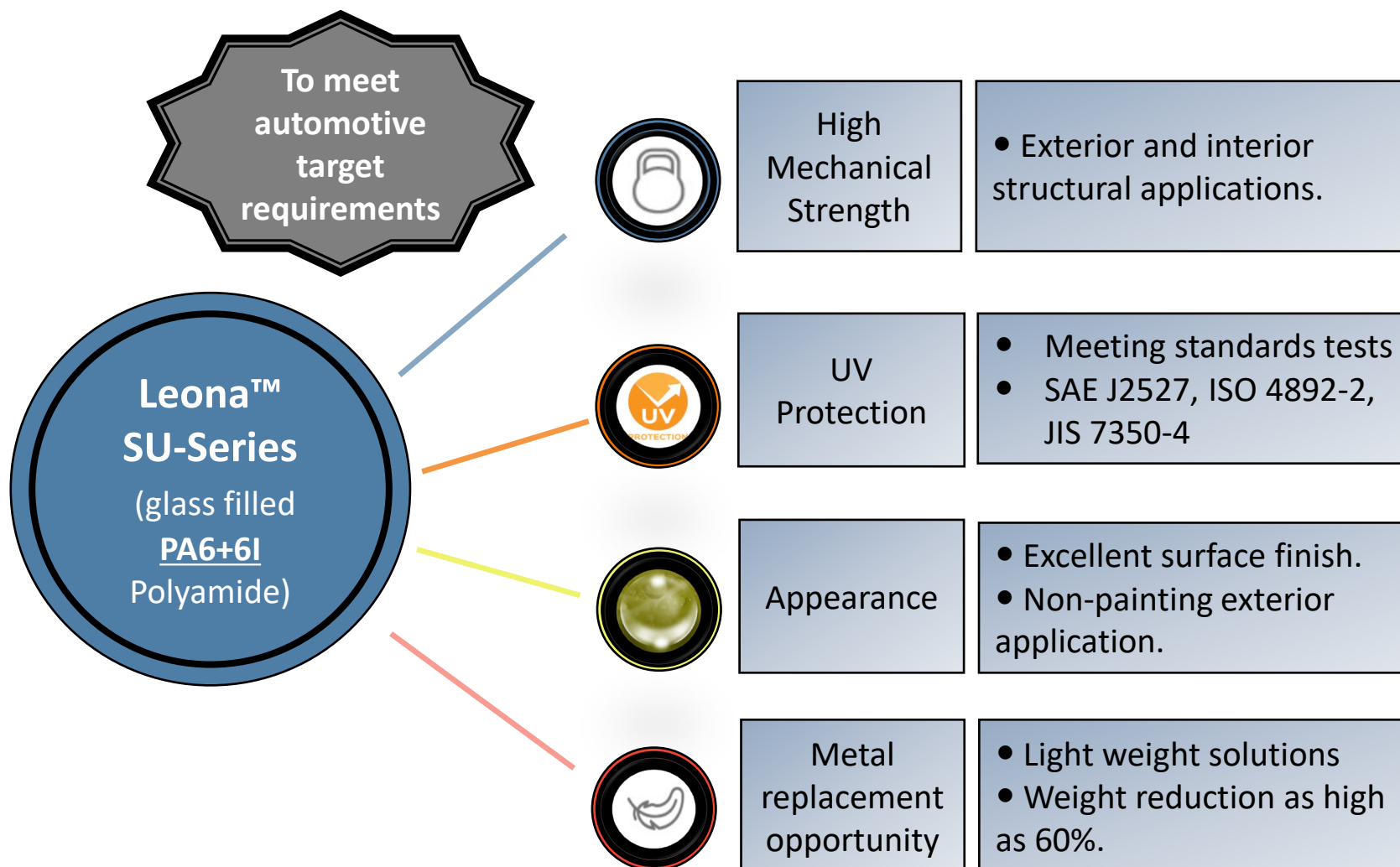
SH
Series

PA66 + 6I
GF 55



LEONATM SU series FEATURES & BENEFITS

Why LEONA™ SU - series



Benefits to Industry

- **Structural** application where conventional PA struggle to meet
- **Exterior** products with **UV demanding** requirements
- **Paint less** part options & **cost down** benefits
- Sustainable **energy efficient** water-cooled tooling is possible

Excellent Aesthetical Finish

- Tooling Dimension : 120mm*80mm*3mmt
- Barrel Temp: 260°C - 285°C
- Tooling temp: **90°C**
- Injection Speed: Low

Leona™ SU206 (**60% GF**) PA66 (**50% GF**)

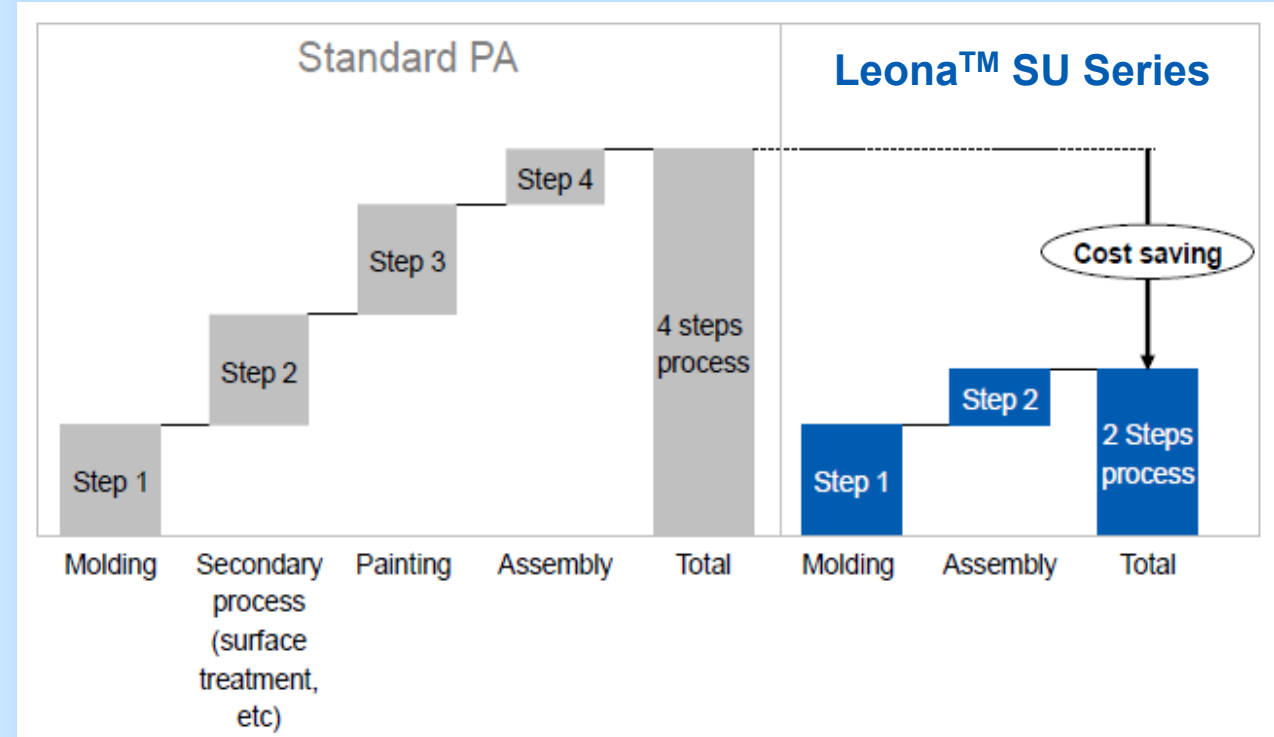


Flat Plate (Gloss Tooling)

Highlights

1. Excellent surface finish

2. Cost saving benefits

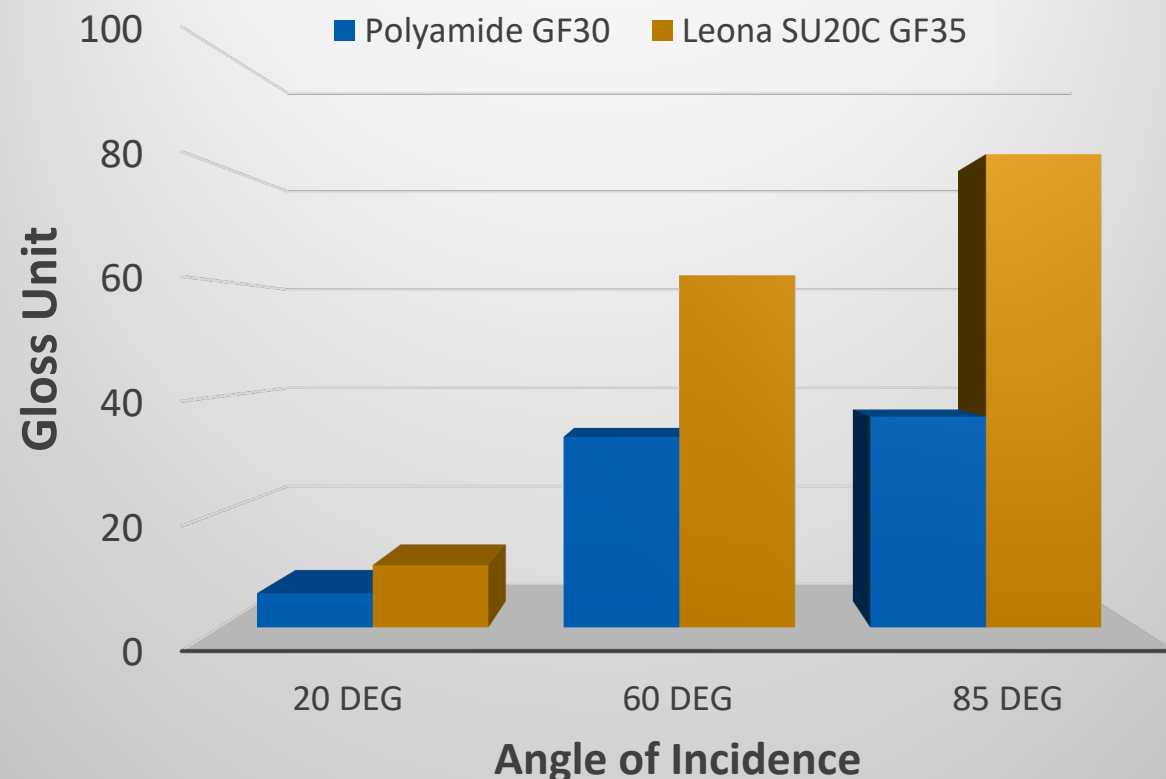


*Applicable for black only

LEONA™ SU - series Gloss Finish

Gloss performance at part level

Post molding gloss data - Industrial part

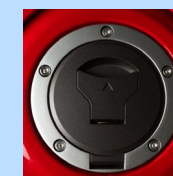


Highlights

1. **Resin rich surface** enables excellent gloss finish
2. Successful adoption of **paint-less** concept



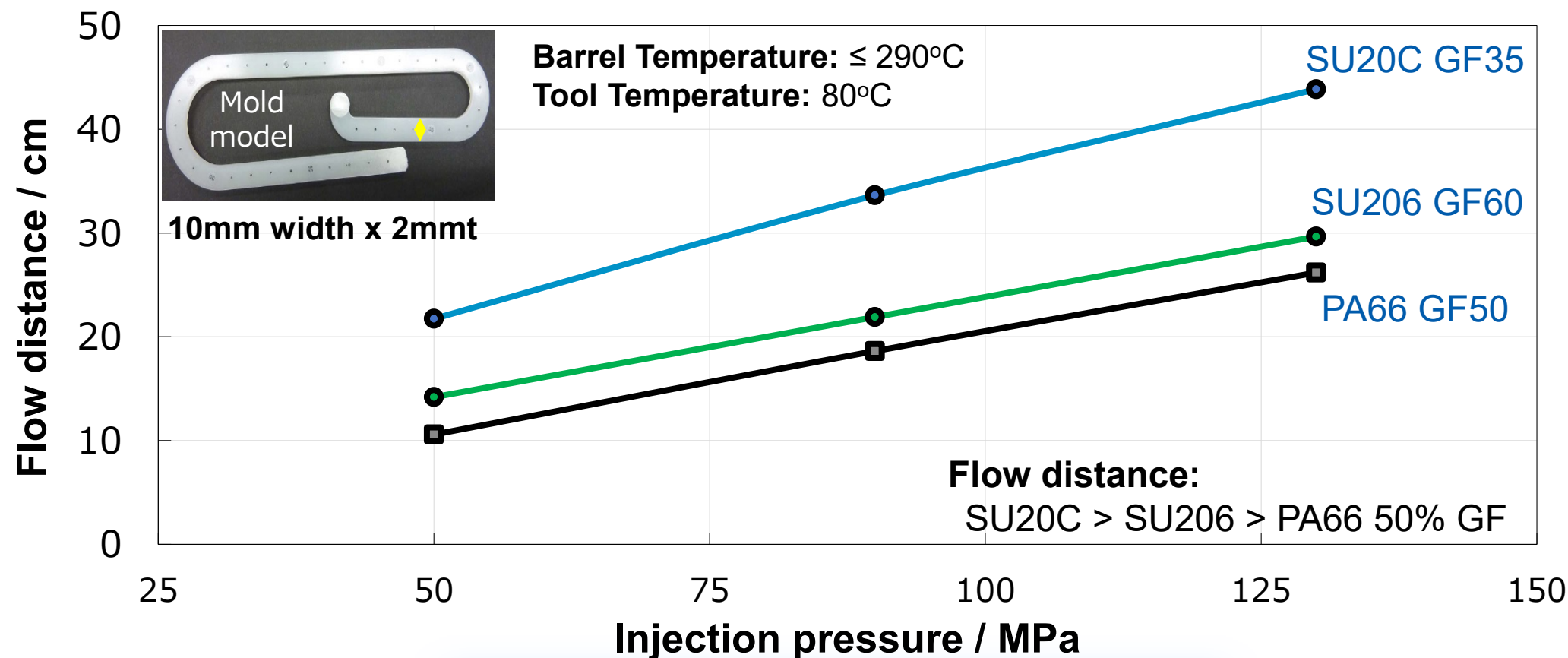
Direct Molding



Automotive exterior application example

Injection molding of actual part to review surface finishing

Good Flowability = Easy Processing

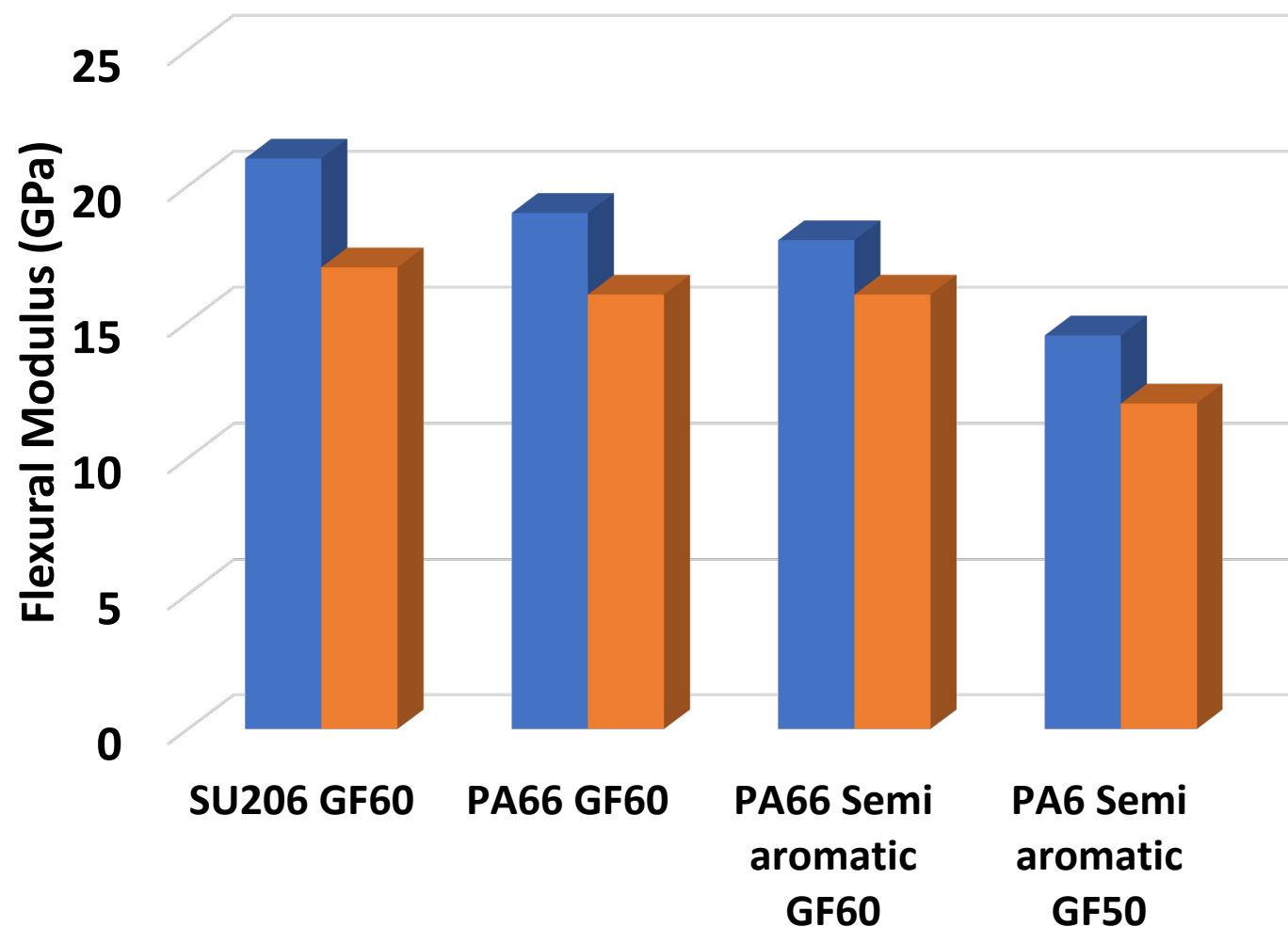


Highlights

1. Excellent **flowability**
2. **Flexible design** possible

Enhanced Mechanical Performances (I)

How SU Series perform against other Polyamides



Highlights

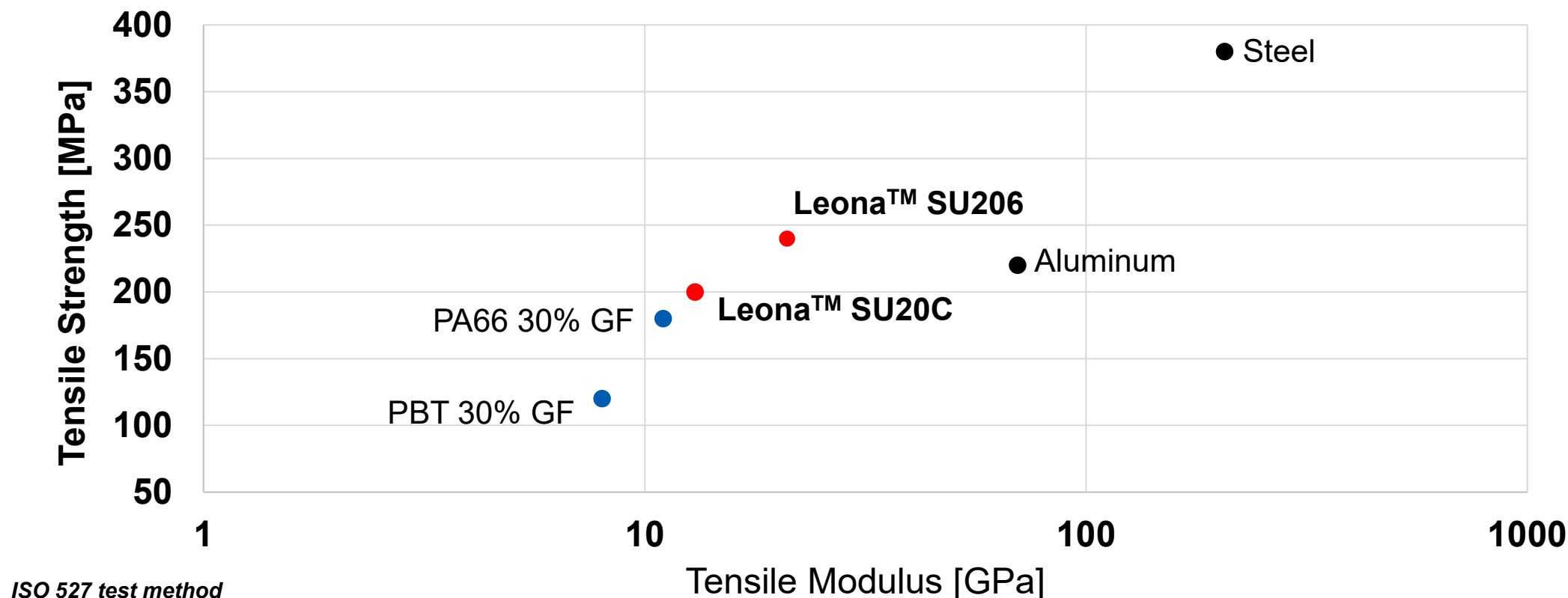
1. Enhanced **wet properties** mechanical performance
2. Achieve **structural demanding** applications

ISO 178 test method

■ Dry ■ Wet Conditioned

Enhanced Mechanical Performances (II)

Tensile Properties Positioning



Highlights

1. Leona™ SU Series having **well-balanced** mechanical performance

SU - series Performance Validation

Existing part evaluation using Leona™ SU20C (GF 35)



Load displacement	Validation requirements (KN)	Leona SU20C Validation (KN)	Part Validation
Individual loading at opposite directions	$F_{\text{upwards}} > \text{"X"}$	3 times higher than requirements	
	$F_{\text{downwards}} > \text{"X"}$	2.5 times higher than requirements	

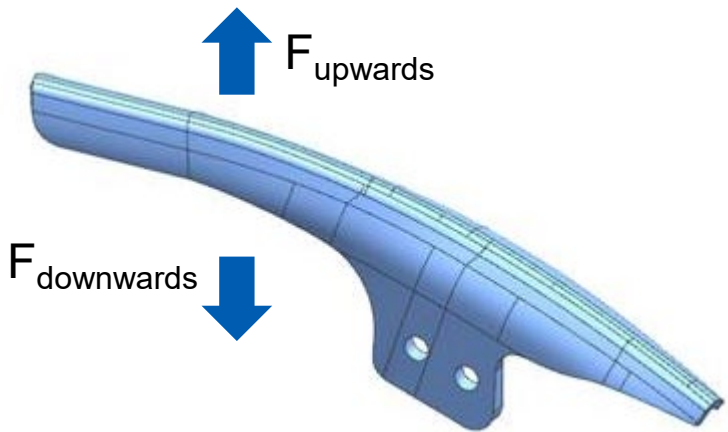


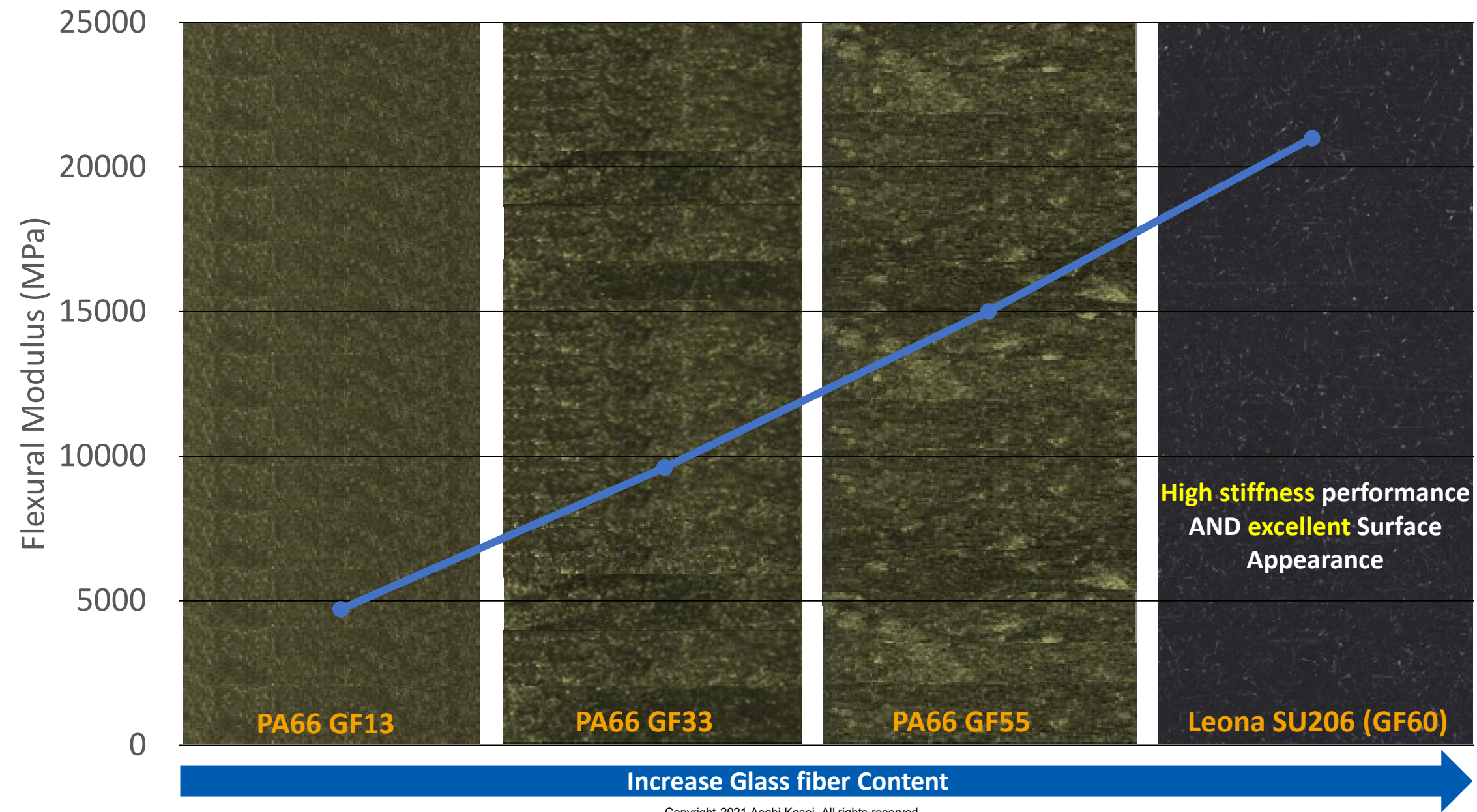
Image for illustration only

Highlights

- 1. Leona™ SU series can fulfil requirements with lower GF content
- 2. Possibilities for existing tooling trials

Factors	Existing	SU20C GF35
Molding		No issues
Structural Test		Pass

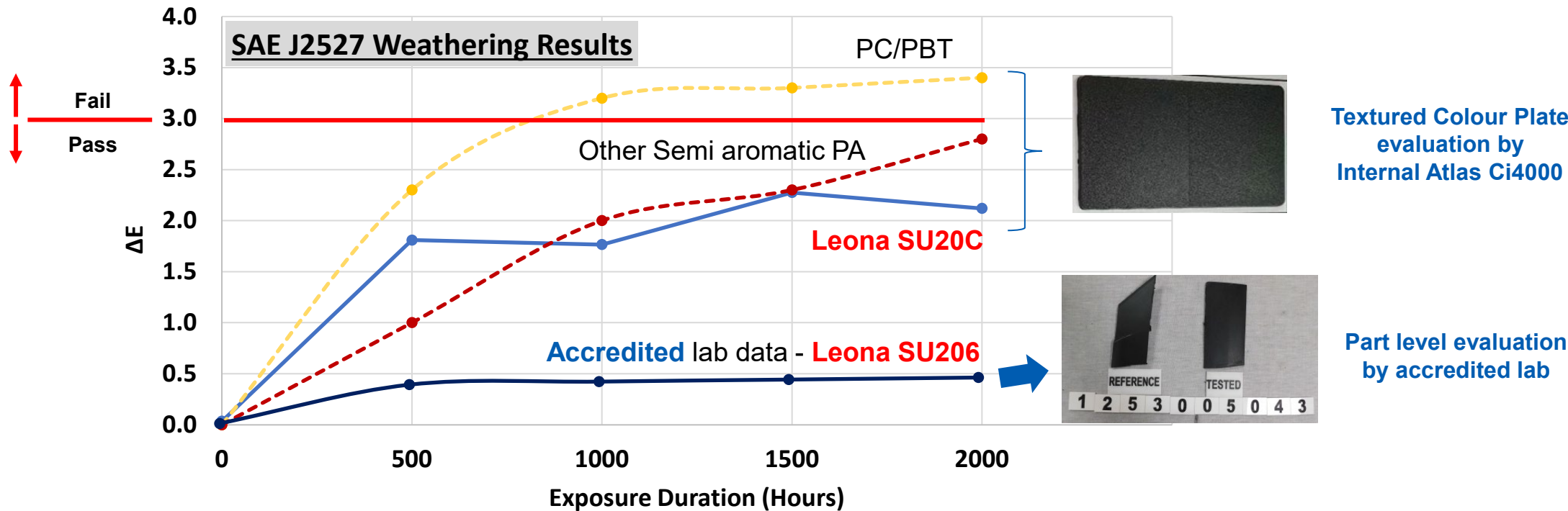
Integrating Stiffness and Aesthetics



Excellent Outdoor Protection

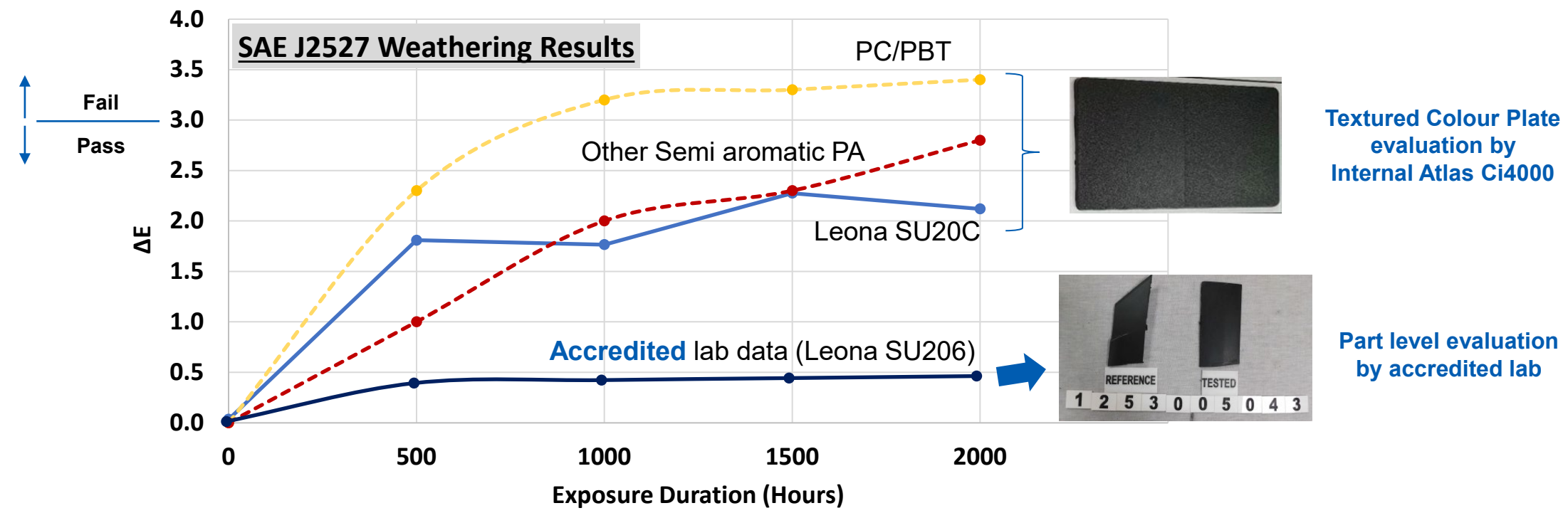
Actual Part Evaluation	Properties	Evaluation (Hours)				General Requirements (after 2000 Hours)	Validation
		500	1000	1500	2000		
						$\Delta E < 3.0$	
						> 80% gloss (Grained test Piece)	
						> 4 at a scale of 5 (Grey Scale)	
						Chalking and/or cracking not permissible	

Excellent Outdoor Protection



Actual Part Evaluation	Properties	Evaluation (Hours)				General Requirements (after 2000 Hours)	Validation
		500	1000	1500	2000		
	Delta E	0.38	0.41	0.43	0.45	$\Delta E < 3.0$	
						> 80% gloss (Grained test Piece)	
						> 4 at a scale of 5 (Grey Scale)	
						Chalking and/or cracking not permissible	

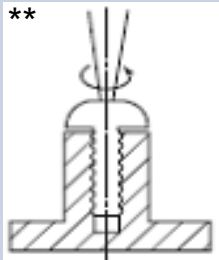
Excellent Outdoor Protection



Actual Part Evaluation	Properties	Evaluation (Hours)				General Requirements (after 2000 Hours)	Validation
		500	1000	1500	2000		
	Delta E	0.38	0.41	0.43	0.45	$\Delta E < 3.0$	
	Gloss Retention %	114	110	126	131	$> 80\%$ (Grained test Piece)	
	Grey Scale	4/5	4/5	4/5	4	> 4 at a scale of 5	
	Visual	No deformation, no cracking or chalking				Chalking and/or cracking not permissible	

Secondary Process removal – Actual Part

Mounting boss actual part self tapping assembly evaluation conclusion

Mounting Boss	Material	Annealing Process	Assembly failure
M3 and M4 Self tap Screws 	Leona SU206	Yes	No
		No	No
	Existing Semi aromatic PA	Yes	No
		No	Yes (NG)

Highlights

1. Option to **omit annealing** process

- Opportunity to **reduce** unnecessary secondary process

2. Optimum crystallization achievable with water cooled tooling

- **Low energy** consumption (Long term environmental benefit)

Leona SU - series Possible Applications



Tank Cover/Fuel Lid

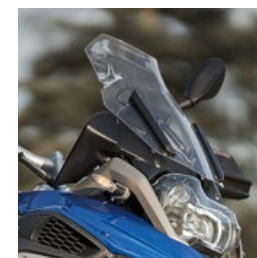
Speedometer Fairing

Mirror Stay Bracket



Inner Rear View Mirror

Rear Seat Grip



Screen Visor Bracket



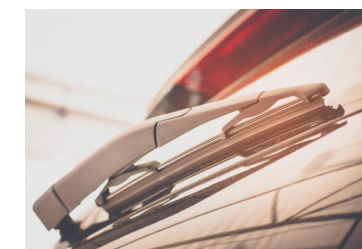
Outer Rear View Mirror

Fender Stay



Foot rest

Head Lamp Holder



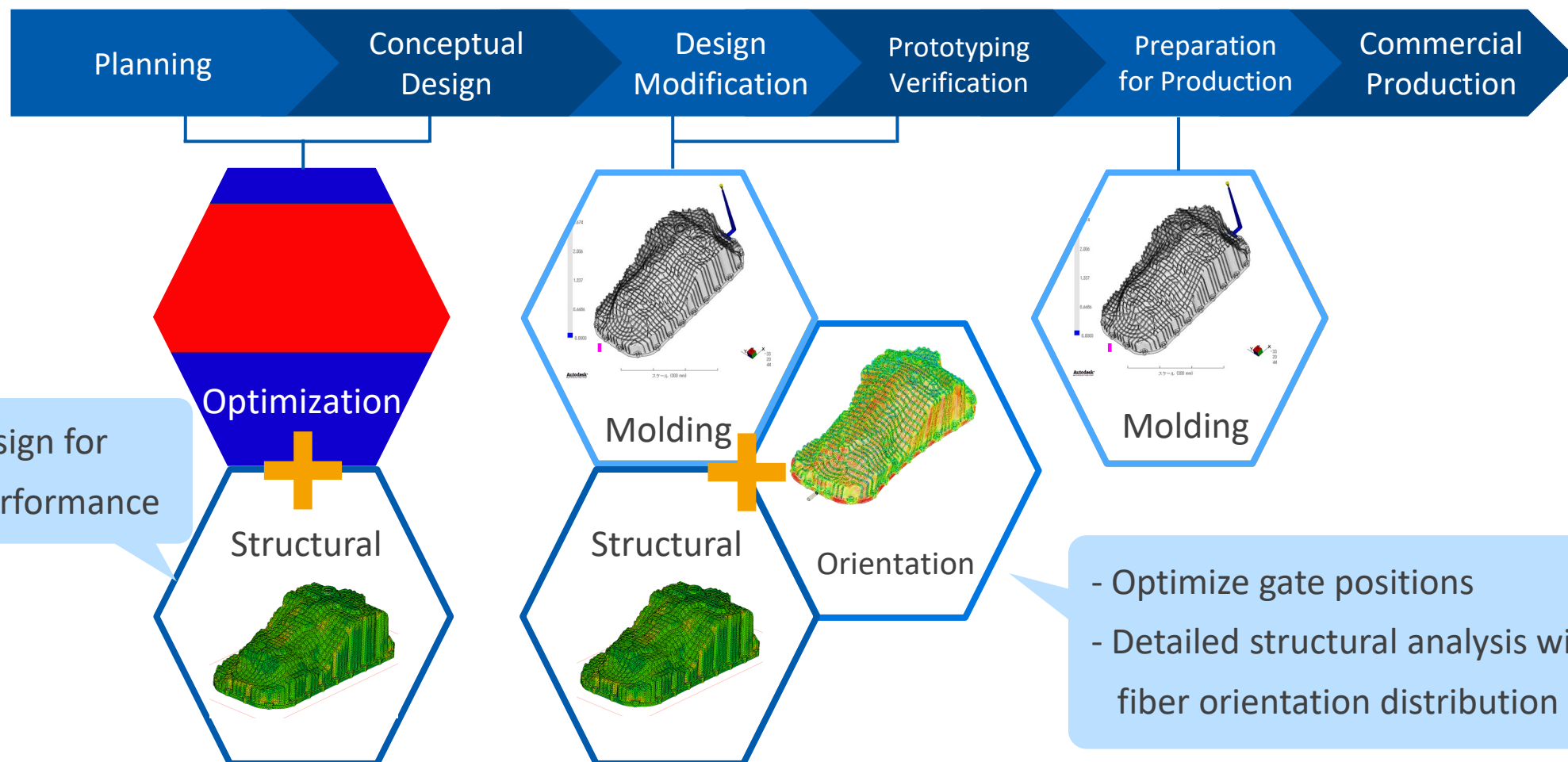
Rear window wiper cover



Asahi Kasei CAE Solutions

Metal replacement solutions

Support in every step!



Reaping benefits from light weighting

Take advantage of Leona SU Series

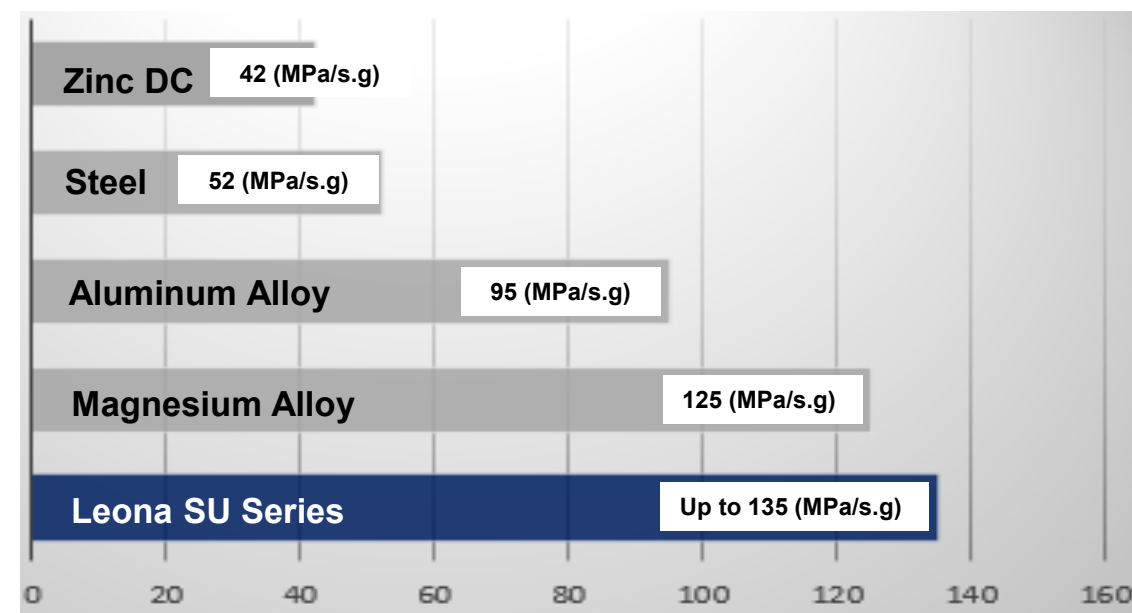
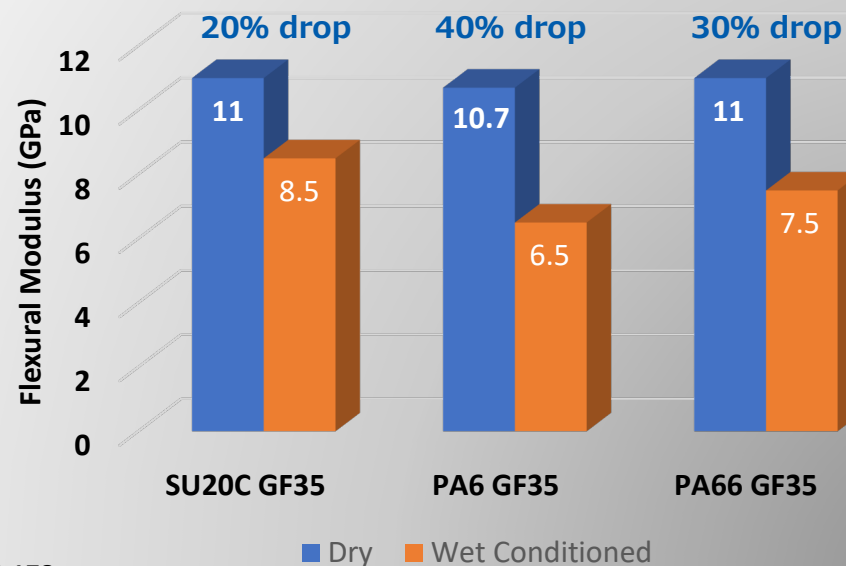
Industry	BENEFITS OF METAL REPLACEMENTS					
	Cost reduction	Enhance Productivity	Shipment cost saving	More design flexibility	Fuel/Energy Saving	Ease of handling
Automotive	✓	✓	✓	✓	✓	
Consumer, Appliances, Industrial						

Reaping benefits from light weighting

Take advantage of Leona SU Series

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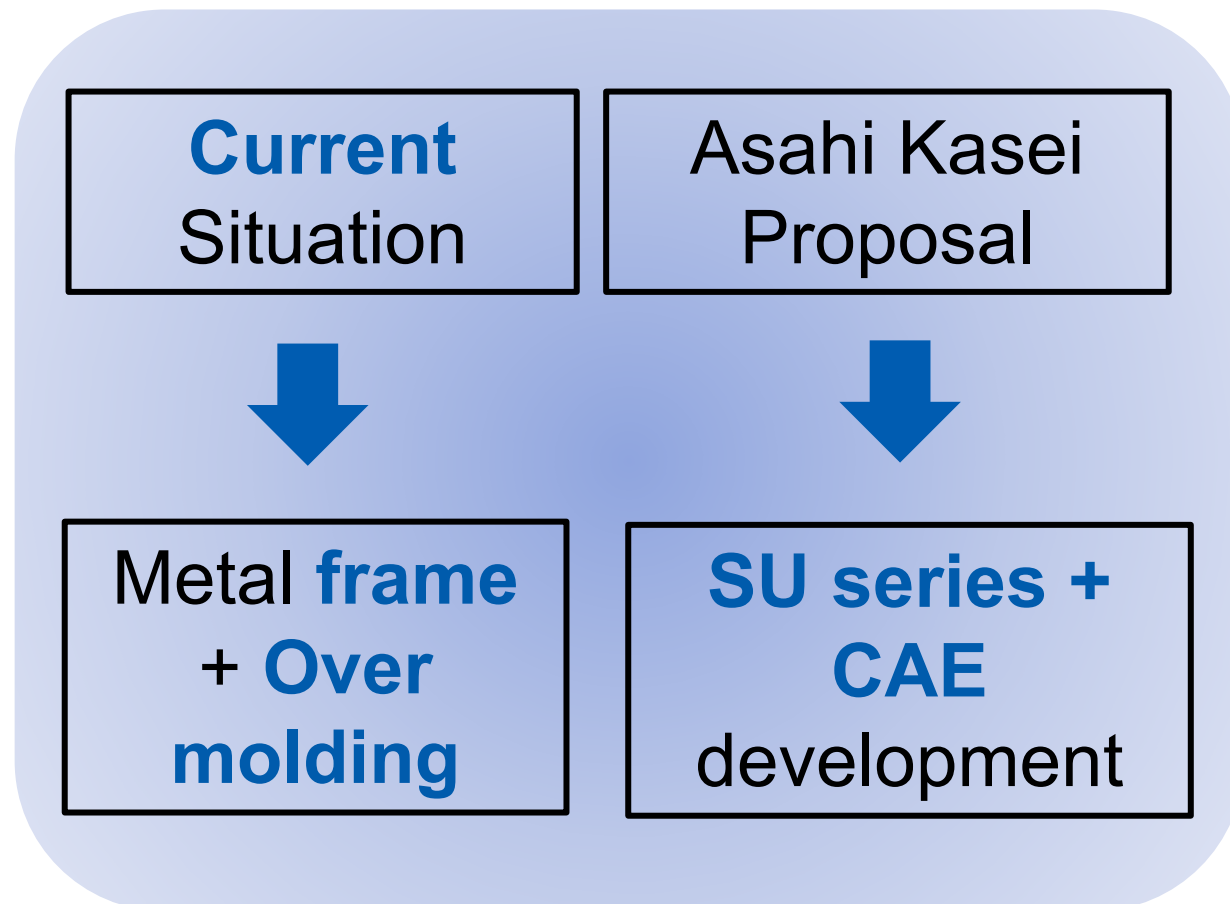
Mechanical performance [Dry & Wet]



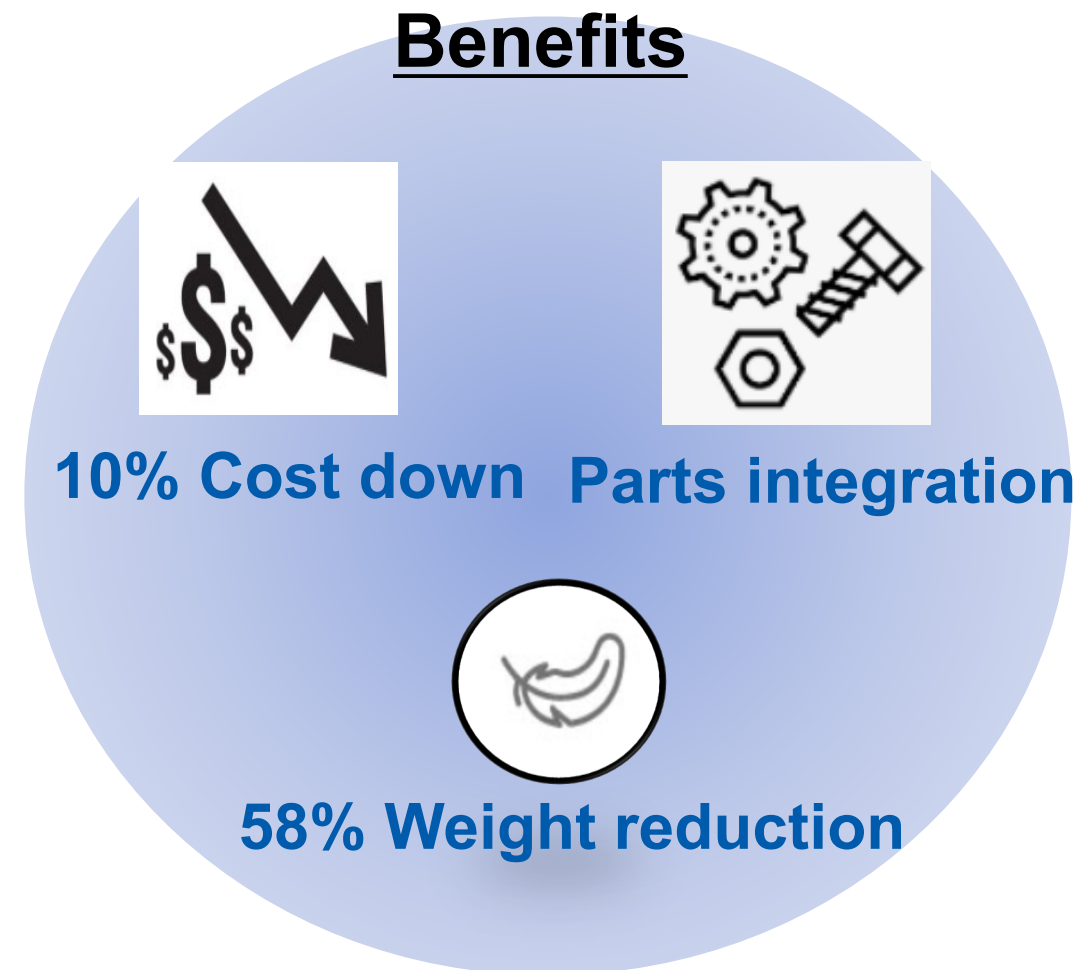
Specific Tensile Strength (MPa/s.g)

Benefits of light weighting solutions

Metal replacement + Part Integration



Benefits



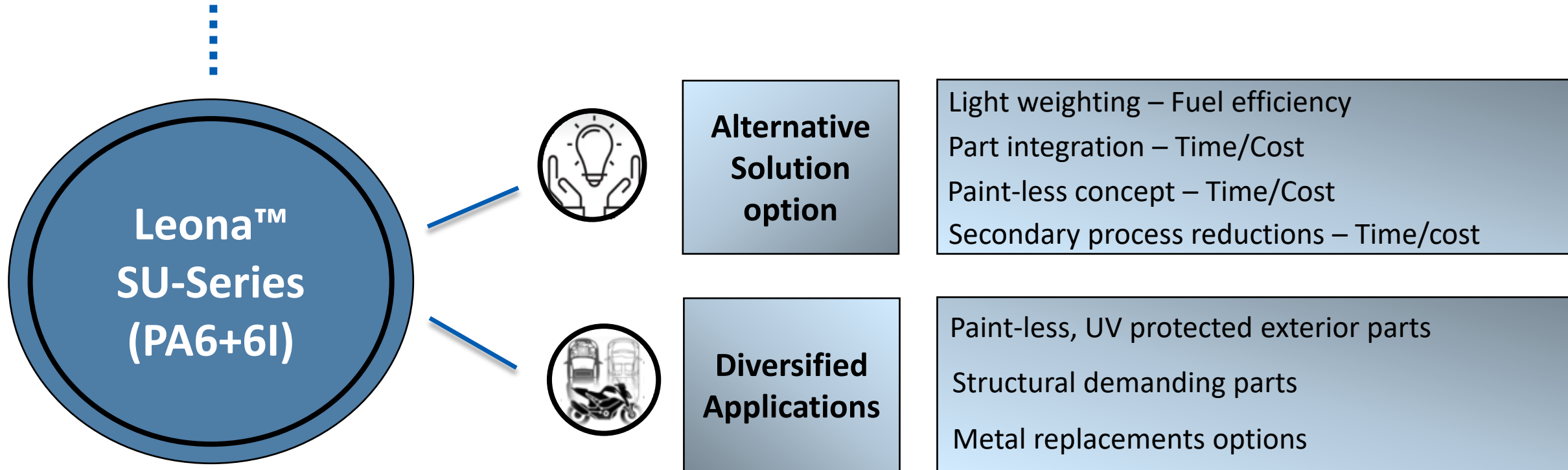


LEONA™ S series

KEY TAKEAWAYS

Summary and Conclusion

Aesthetics	UV Protection	Mechanical
Excellent surface	Excellent	Enhanced strength and rigidity (even at wet condition)



AsahiKASEI

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Q&A and Feedback

Scan me



Your feedback is
greatly appreciated!

- The information provided is based on studies and data Asahi Kasei believes to be reliable to the best of its knowledge
- Data shown are typical values obtained by proper testing methods and should not be used for specification purpose. Please use these data for selecting the most appropriate grade suitable for specific usage.
- These data may be changed because of improvement in properties.
- Any descriptions, pictures, data and drawings etc shown may change without prior information and do not constitute the agreed contractual quality of product
- Be sure to read the relevant SDS before handling and use, and always follow the important precautions.
- Do not use plastics in any of the following orally- or medically-related applications.
- Orally-related application: any part, device or component which may come into direct oral contact or into direct contact with drinking foods or beverages.
For drinking water application, please consult Asahi Kasei representatives