



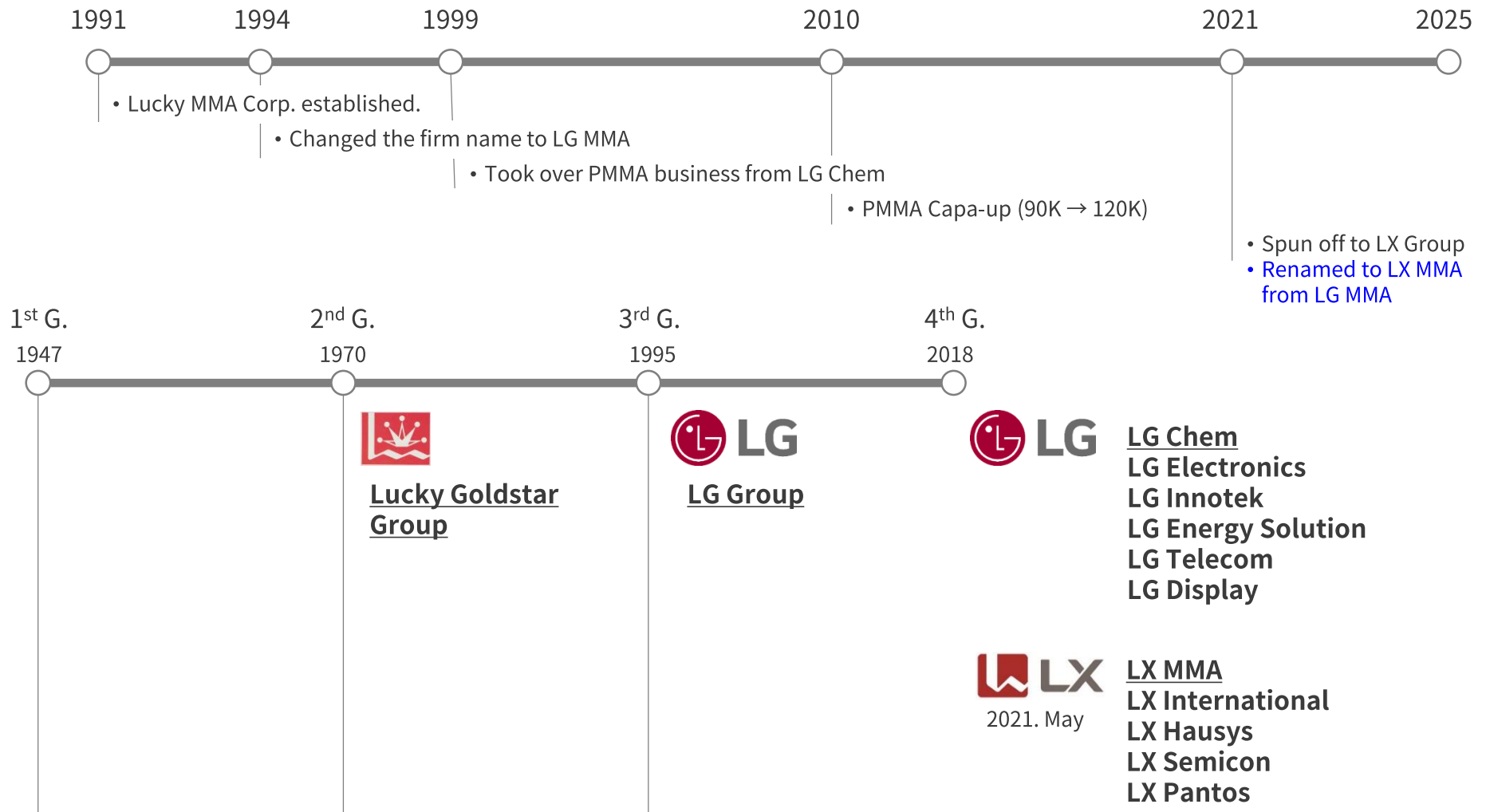
Introduction to **LX MMA Automotive**



Foundation of LX Group

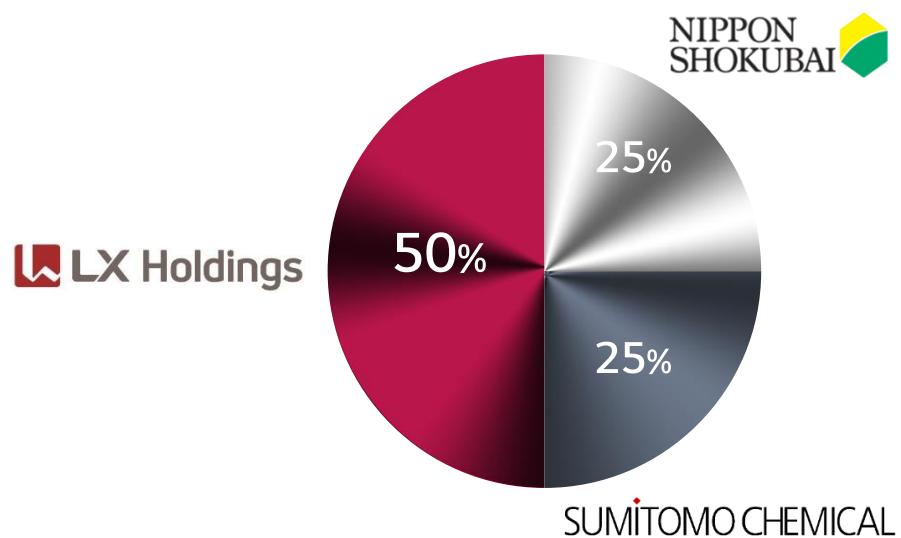


LG MMA changed its name to LX MMA in 2021 according to the separation of LX Group from LG Group.



Who we are

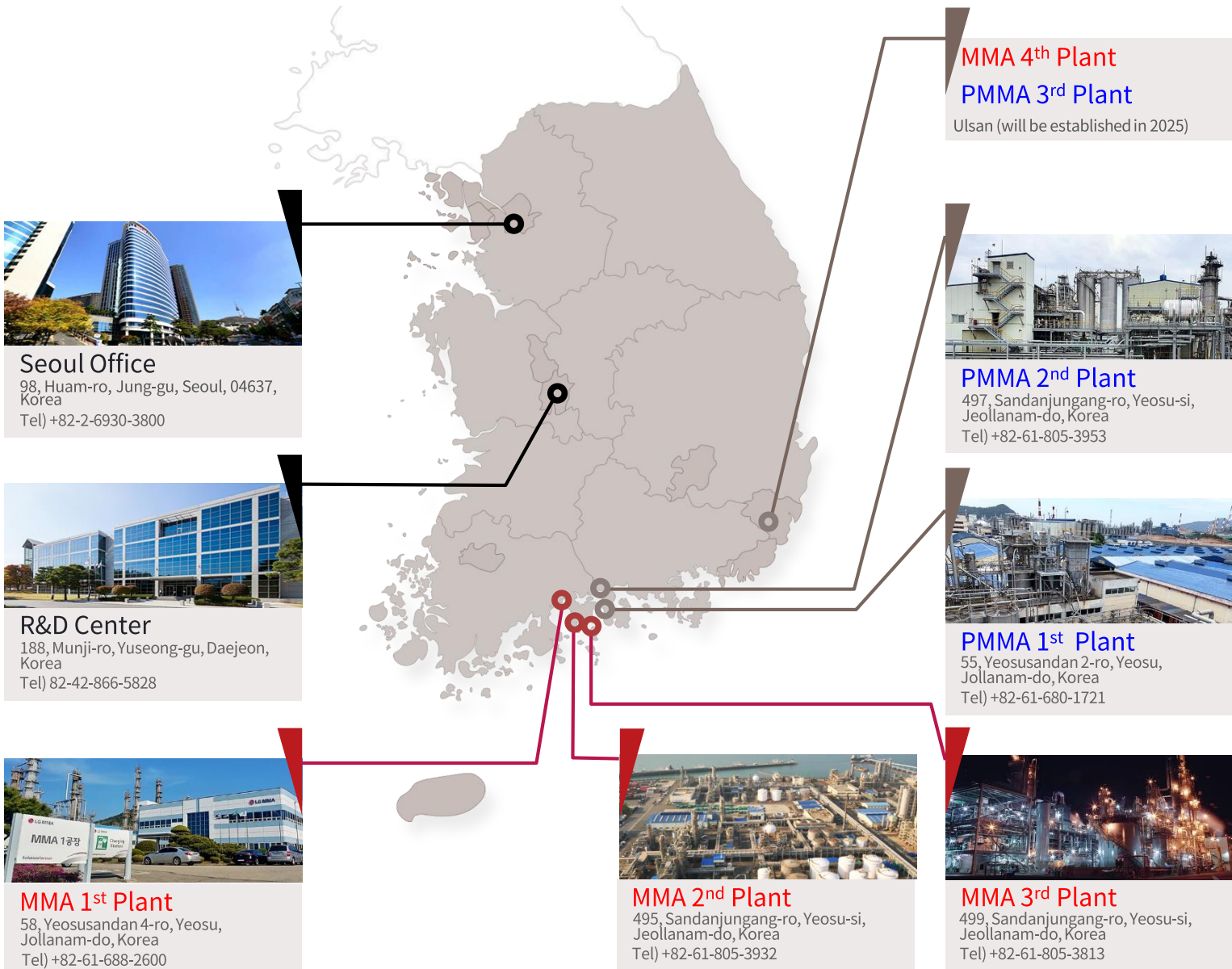
Stock Holders



Product Portfolio

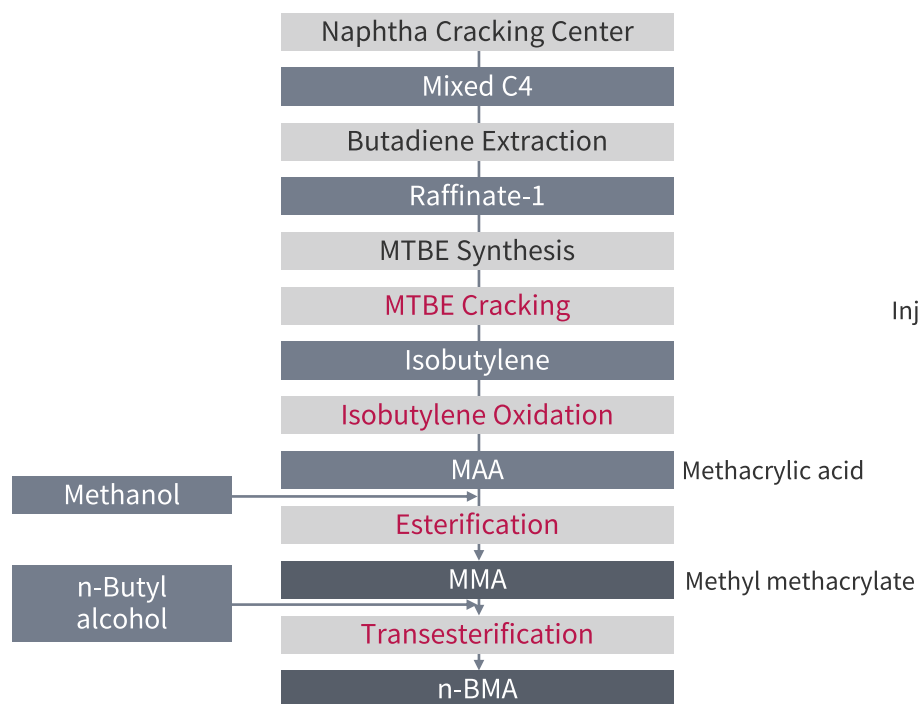
		[Unit : MT]
Monomer	MMA	260,000
	MAA	70,000
	BMA	35,000
Polymer	PMMA	120,000
	Acrylic Rubber	5,000

Business Location



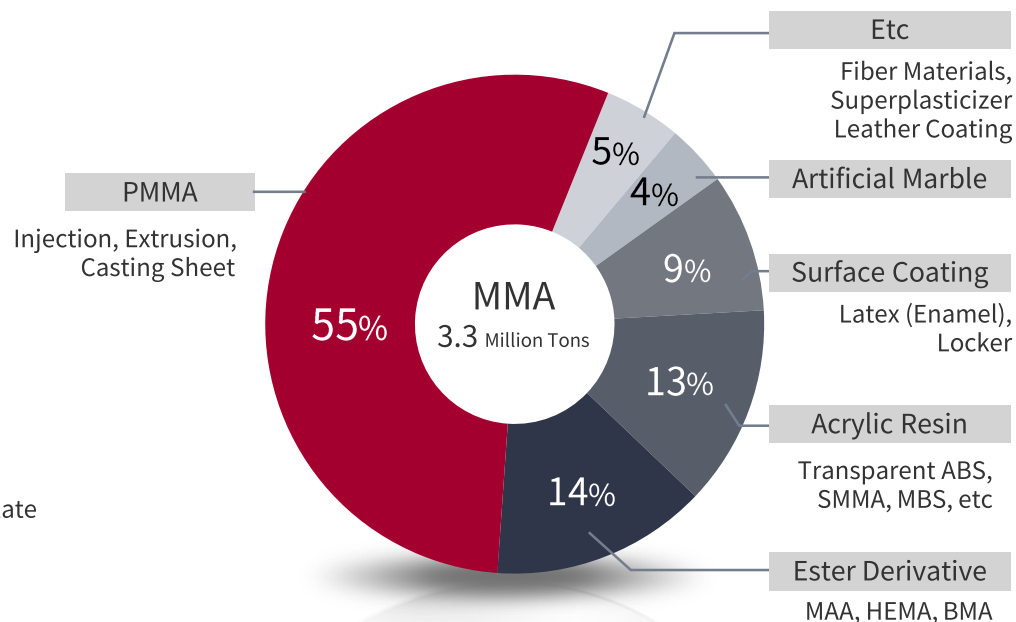
Manufacturing process of LG MMA uses Isobutylene vapor phase oxidation (C4 direct oxidation) developed and industrialized by Japanese Sumitomo Chemicals and Nippon Shokubai. Unlike conventional manufacturing process, Isobutylene vapor phase oxidation does not produce pollutants. It is a high-tech manufacturing process producing high quality MMA, which oxidizes Isobutylene in vapor phase extracted from C4 residue crude, produces Methacrylic Acid (MAA), and esterifies Methacrylic Acid with Methanol, MMA.

Manufacturing Process of MMA Derivate



Application of MMA

※ ref : Acrylic Resins and Plastics(Chemical Economics Handbook)



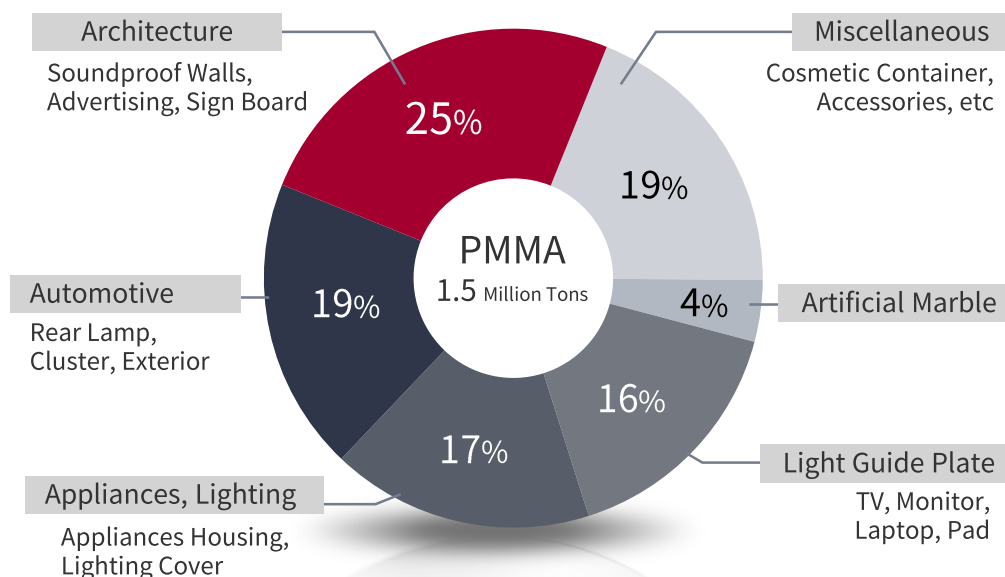
Manufacturing method of PMMA uses suspension polymerization and bulk polymerization industrialized by Sumitomo Chemicals. Suspension method needs dehydration process to control temperature and suitable for small quantity batch production. After the dehydration, it produces type of Bead and extruded Pellet. The bulk polymerization is suitable for continuous mass production and only produces type of extruded Pellet, it does not have dehydration process because of no water used.

Manufacturing Types of PMMA

	Process	Products	MT/Year
PMMA No.1	Suspension Batch	Bead Pellet	70,000
PMMA No.2	Bulk Continuous	Pellet	50,000
	Emulsion Batch	Pellet (Acrylic Rubber)	5,000

Application of PMMA

※ ref : Acrylic Resins and Plastics(Chemical Economics Handbook)



Characteristics of PMMA



High Transparency

The most excellent transparency among all plastics (Transmits more than 92% of the visible ray area)



Excellent Weatherability

The most excellent weatherability among plastics



High Scratch Resistance

Excellent scratch resistance with its high degree of surface hardness among plastics



General PMMA

Optical grade is of the best optical characteristics among our products. Applied to laptop displays and light guide panels inside LCD monitors, it is of high brightness and transparency



Impact Resistant PMMA

PMMA is excellent in impact resistance compared to general glasses, but relatively lower among plastics so it is demanded to be improved in this respect



Acrylic Coating Resin

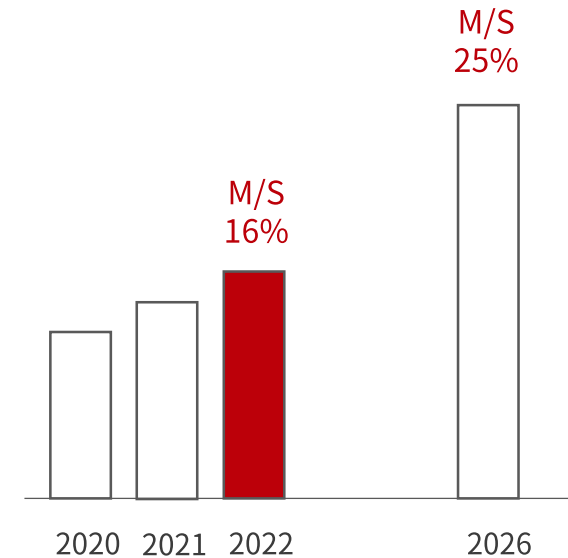
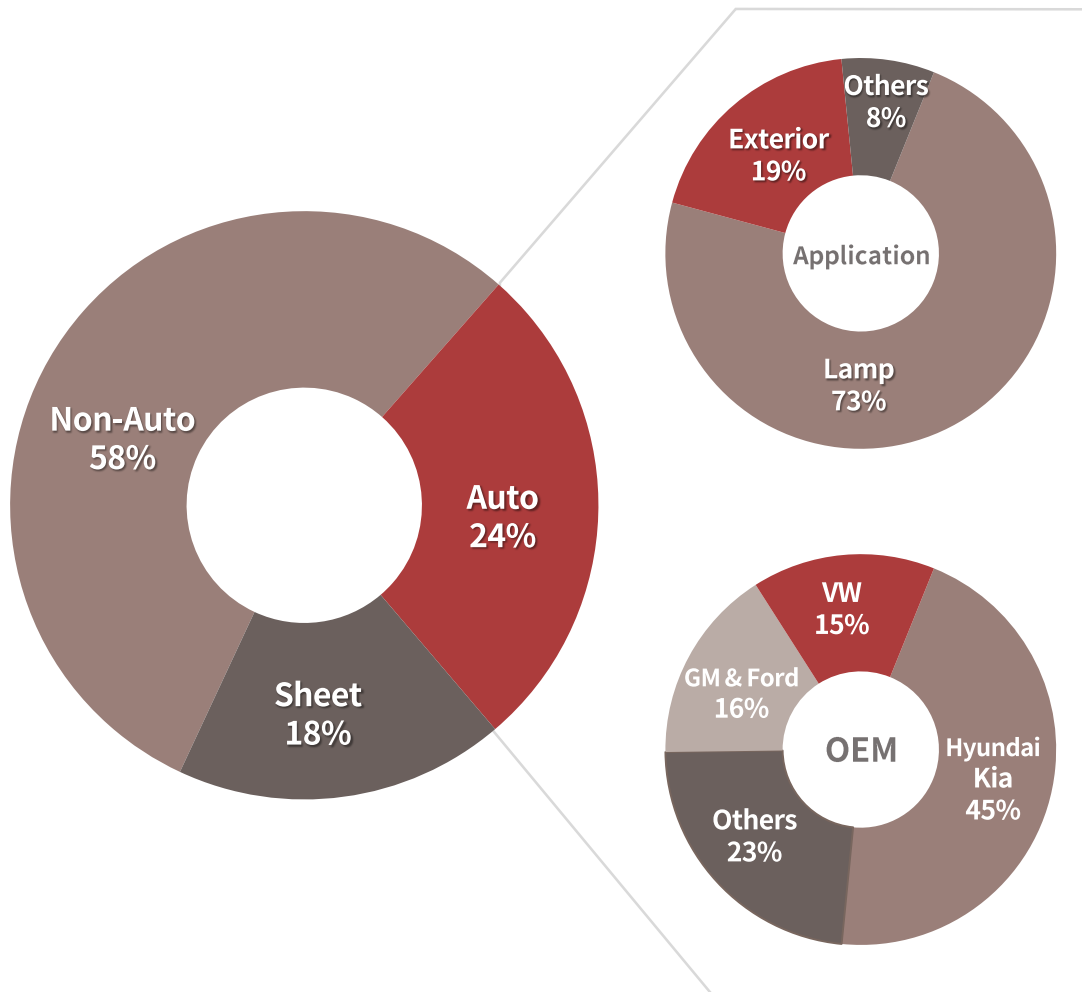
With its unique polymerization technology, LG MMA Corp. produces Bead Grades used for artificial marbles, acrylic coatings, acrylic adhesives and paints. Low Tg, high thermal expansion, excellent gloss, acid values required in some cases



Acrylic Impact Modifier

An acrylic impact modifier, has excellent weather resistance and a structure that has been specially designed to have the same refractive index as PMMA, so it helps maintain the high transparency of the existing PMMA.

Automotive Business



- **Competitiveness**
with high quality product
- **Stable supply**
by well-organized logistics
- **Good partnership**
with valuable customers
for mutual growth

Our Focus



Lamps

- Stable Supply
- Chemical Resistance

- Rear Lamp Lens
 - IH830C
 - IH830CA / IH830SR
- Side Turn Indicator
 - IH830C
- Aspherical Lens Light Guide
 - IH830L
 - IH830XT



Pillars / Spoiler

- No Crack During Assembly
- Scratch Resistance

- 1K Molding
 - HI542-S9678
 - 2K Molding
 - IH830-9678
-

- Side Spoiler
 - HI781-S9678
 - (PMMA+ASA)



Mirrors

- Needs for Paint-less

- 1K Molding
 - HI753-S9678
 - HI781-S9678
 - 2K Molding
 - IH830-9678
-

- Base Plate
 - HI835MS-9678
 - (t-PMMA)



Grilles

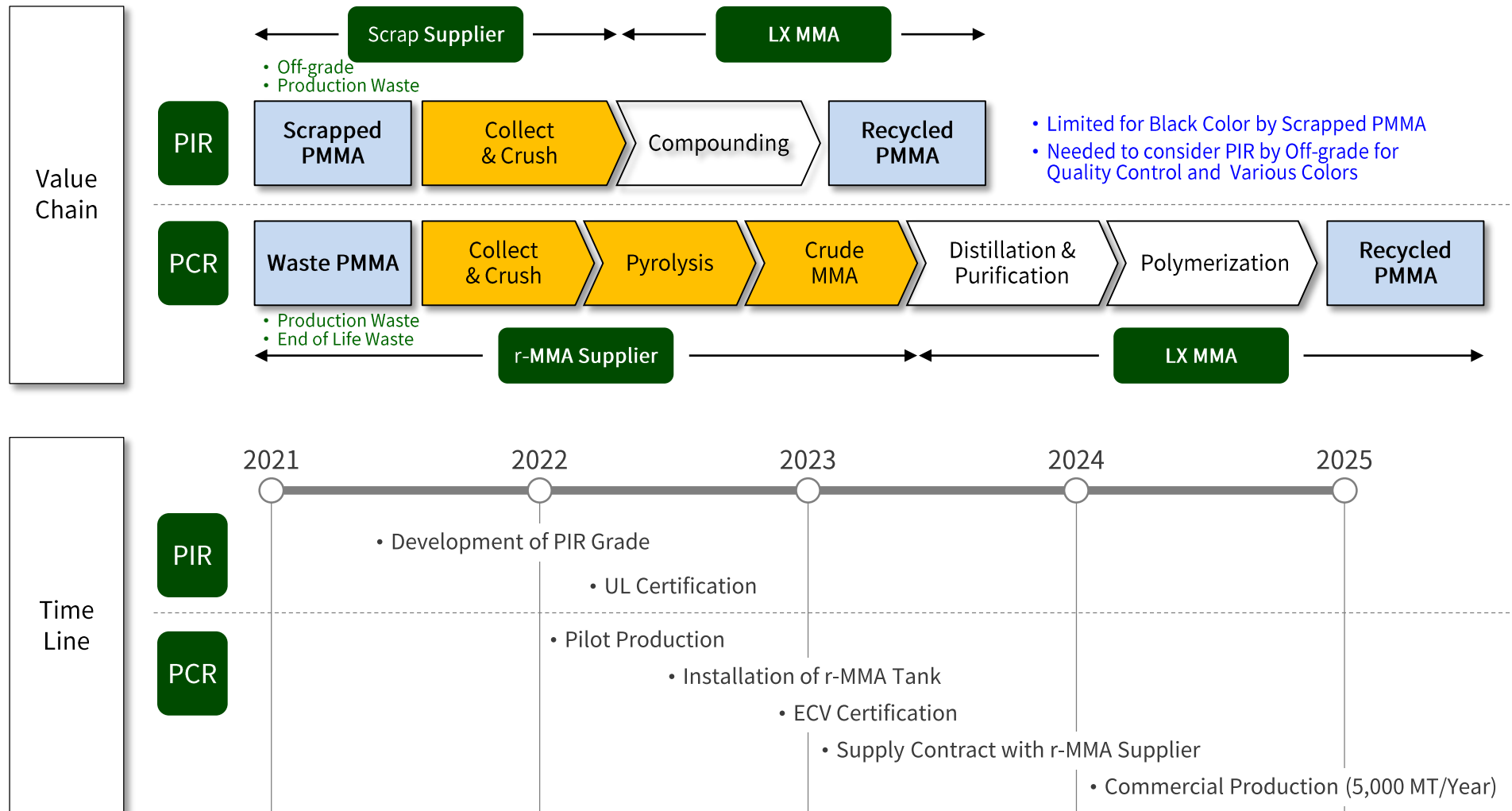
- High Impact
- High Heat

- High Impact
 - HI533-S9678
- High Heat
 - HI753-S9678
 - HI781-S9678

Grade Line-up

	<u>Applications</u>	<u>Features</u>	<u>Grade</u>	<u>Remark</u>
Optimized & Well-balanced	Rear combination lamp	Well balanced with Heat resistance	IH830C IH830	PMMA
	Cluster cover	High flow with High heat resistance	IH830HF	PMMA
	LED aspherical lens	Heat resistance / good optical property	IH830L	PMMA
	LED diffusing lens	High transmittance with High haze	ID Grade LF Grade	PMMA
High Gloss Piano Black	Deep black for pillar garnish	High gloss deep black Optimized for 2k molding	IH830-9678	PMMA
	Impact resistance for Pillar garnish	Medium Impact resistance With scratch resistance	HI835MS-9678 HI542-S9678	t-PMMA
	Medium-Impact resistance	Impact resistance High gloss deep black	HI543-9678 HI753-S9678	PMMA+ASA
	High-impact resistance	Impact resistance High gloss deep black	HI781-9678	PMMA+ASA
Special Grade	Light guide Aspherical lens	Superior heat resistance with good transparency	IH830XT IH830HT	PMMA PMI+PMMA
	CMHSL Trunk-Garnish Lamp	Good chemical resistance	IH830SR IH830CA	PMMA

Stable supply of r-MMA is under study and LX MMA plans commercial production by 2023.



Appendix - Homologations

Origin	OEM	Spec No	Type	Description	Approved	Equivalent
American	GM	GMW 16335P	T1	High Heat	IH830HR, IH830HT IH830C, IH830CA, IH830L IH830HF IH830A IH835MS	HI543 HI753-S9678
			T2	Medium Heat		
			T2HF	Medium Heat, High Flow		
			T3	General Purpose		
			T4	Impact Modified		
			T5	High Impact Modified		
			T1	High Heat		
	Ford	WSS-M4D776	T2	Medium Heat		
			B1	Optical Grade, Exterior	IH830C IH830-9678	IH830HF, IH830, IH830C IH830HF, IH830, IH830C IH830XT IH830XT
			B2	Optical Grade, Interior		
			B3	Optical Grade, High Heat, Exterior		
			B4	Optical Grade, High Heat, Interior		
			B5	Trim Grade, Exterior		
	Chrysler	MS.50006	4230	High Heat, UV Stabilized	IH830C, IH830 IH830	HI835MS HI835MS IH830HF, IH830, IH830C
			4232	High Heat		
			4234	Medium Heat		
			4236	Medium Impact, Medium Heat		
			4237	Light Impact, Higher Heat		
			4407	Medium Impact, Medium Heat, Color		
			4969	High Heat, Color		
	Tesla	TM-1009	201000DU1	Medium Impact		HI835MS IH830C
			201000HU1	Medium Heat		

Appendix - Homologations

Origin	OEM	Spec No	Type	Description	Approved	Equivalent	
European	Daimler	DBL 5416	90	PMMA	IH830-9678	IH830C-9678	
			94	Impact Resistacne		HI542-S9678	
			90	PMMA/ASA		HI753-S9678	
		DBL 5620	65 65	High Temperature Resistance Toughened		IH830C	
		DBL 5404				IH830XT IH830L	
	BMW	GS 93016	526 528	EasyFlow Impact Resistant Impact Resistant High Gloss Heat Resistant Blend Non-transparent Heat Resistant		IH830HF IH830-9678 HI533 HI527 IH830XT , IH830HT	
	VW	TL591 TL52671	A B	Glass, reflector, Exterior Light, Lighting 1K Molding 2K Molding	IH830, IH830C HI781-9678 IH830-9678, IH830HF-9678		
	Renault	EP10-1b EP10-2a EP15 DP02a DP02b		Rear Light Trim High Gloss Trims	IH830, IH830C, IH830C-40060 IH830-9678, HI835MS-9678 IH830-9678	IH830XT HI835MS HI835MS-9678, HI753-S9678	
		PSA	DT00102	0001			IH830HF, IH830C
		Volvo	STD 1211,8	91180	Standard		IH830C

Ver.
22.06

Appendix - Homologations

Origin	OEM	Spec No	Type	Description	Approved	Equivalent	Ver. 22.06
Korean	HKMC	MS235-01	A	General	IH830, IH830C, IH830HF	IH830L	
			B	Heat Resistance	IH830HR	IH830HT, IH830XT, IH830L	
			C	Chemical Resistance	IH830CA	IH830SR	
			D	Impact Resistance			
			E	High Glossy	HI835MS-9678		
			F	High Glossy, Anti-scratch	HI542-S9678		
			G	High Glossy (PMMA+ASA)		HI753-S9678	
			H	High Glossy (PMMA+ASA)		HI753-9678, HI781-9678	
Japanese	Toyota	TSM5517G	Class 1	Blended With Elastomer		IH830A	
			Class 2			IH830C	
			Class 3			HI835MS	
	Nissan					IH830C	
						HI781-9678	
	Honda						
	Mazda					IH830C	
Chinese	Chery	Q/SQR S1-68	A1	Grille Trim	IH830, IH830C	HI781-9678	
			A2	Rear Lamp Lens	IH830		
	Geely				IH830		

Thank you !!!



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