‘TORAY’

Innovation by Chemistry

ENGINEERING RESINS

CONTENT

01 COMPANY

Toray Group, founded in 1926

Toray Resin North America is a subsidiary of Toray Industries. We specialize in the production of high-quality engineering resin compounds for a wide range of industries, including aerospace, automotive, electronics, and more.

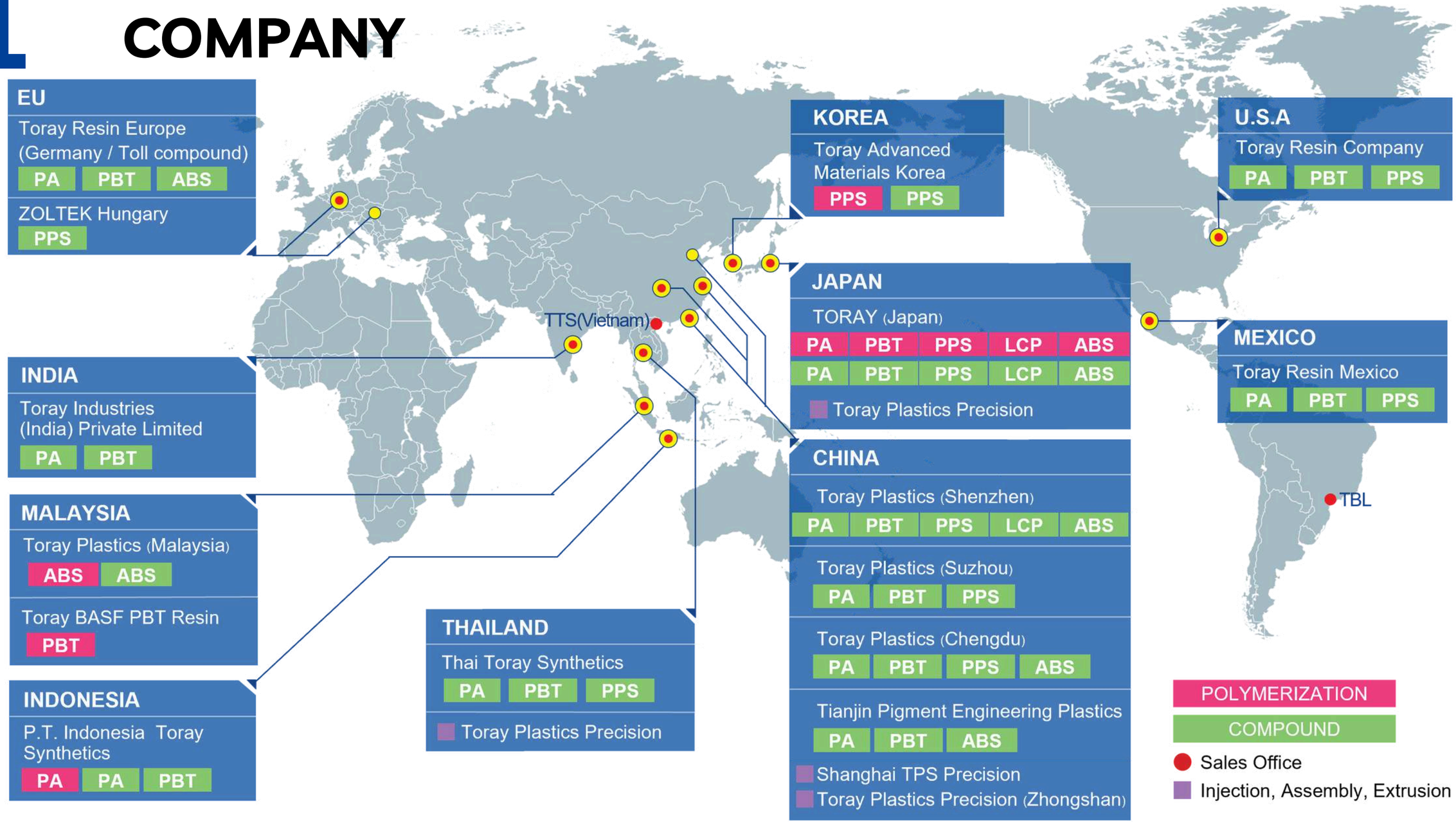
The Toray Group is an integrated chemical industry group operating in 25 countries and regions around the world. It integrates nanotechnology into its operations, using organic synthetic chemistry, polymer chemistry, and biotechnology as its core technologies.

Over 48,000 employees work across more than 290 subsidiaries!

CERTIFICATIONS

- **IATF 16949**
- **ISO 14001**
- **VPP Star (USA)**

01 COMPANY


EU
Toray Resin Europe
(Germany / Toll compound)
PA PBT ABS
ZOLTEK Hungary
PPS
KOREA
Toray Advanced
Materials Korea
PPS PPS
U.S.A
Toray Resin Company
PA PBT PPS
JAPAN
TORAY (Japan)
PA PBT PPS LCP ABS
PA PBT PPS LCP ABS
Toray Plastics Precision
TTS(Vietnam)
MEXICO
Toray Resin Mexico
PA PBT PPS
INDIA
Toray Industries
(India) Private Limited
PA PBT
CHINA
Toray Plastics (Shenzhen)
PA PBT PPS LCP ABS
Toray Plastics (Suzhou)
PA PBT PPS
Toray Plastics (Chengdu)
PA PBT PPS ABS
Tianjin Pigment Engineering Plastics
PA PBT ABS
Shanghai TPS Precision
Toray Plastics Precision (Zhongshan)
TBL
MALAYSIA
Toray Plastics (Malaysia)
ABS ABS
Toray BASF PBT Resin
PBT
THAILAND
Thai Toray Synthetics
PA PBT PPS
Toray Plastics Precision
INDONESIA
P.T. Indonesia Toray
Synthetics
PA PA PBT
POLYMERIZATION
COMPOUND
Sales Office
Injection, Assembly, Extrusion

01

BUSINESS LINES

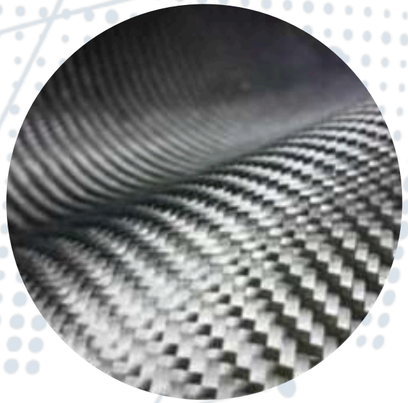
*Resins Division

CHEMICAL PRODUCTS

ENVIRONMENT AND ENGINEERING

FIBERS AND TEXTILES

CARBON FIBER COMPOSITES



LIFE SCIENCES

'TORAY'

AMILAN™

NYLON 6

PA6 resin, or polyamide 6, is a versatile thermoplastic polymer valued for its strength, durability, and ability to withstand a wide range of temperatures.

Ideal for industrial applications and engineering components, this resin offers exceptional molding properties and resistance to moisture.

AMILAN™

NYLON 66

PA66 resin, or polyamide 66, is a versatile thermoplastic that stands out for its superior strength and durability compared to PA6.

Its polymer structure provides greater thermal and chemical resistance, making it the ideal choice for high-performance industrial applications.

PRODUCTS

02

TORAYCON™

PBT

PBT, or polybutylene terephthalate, is a thermoplastic resin valued for its excellent heat resistance and dielectric properties.

Ideal for electrical, electronic, and automotive components, PBT offers durability and precision.

TORELINA™

PPS

PPS (polyphenylene sulfide) is a high-performance thermoplastic resin known for its impressive chemical and thermal resistance.

Unlike PBT, PPS offers even greater resistance, making it the ideal choice for extremely demanding applications.

AMILAN™

Grade	ISO	US	MX	Description
CM1011G-15	>PA6-GF15<	•	•	Nylon 6/Reinforced, Standard, GF15%
CM1011G-30	>PA6-GF30<	•	•	Nylon 6/Reinforced, Standard, GF30%
CM1011G-45	>PA6-GF45<		•	Nylon 6/Reinforced, Standard, GF45%
CM1012G-45 N	>PA6-GF45<		•	Nylon 6/Reinforced, Heat stabilized, GF45%
CM1016G-30	>PA6-GF30<	•	•	Nylon 6/Reinforced, Heat stabilized, GF30%
CM1016G-50	>PA6-GF50<		•	Nylon 6/Reinforced, Heat stabilized, GF50%
CM1016RM-B	>PA6-MD30<	•		Nylon 6/Reinforced, Mineral filler 30%
CM1017	>PA6<	•	•	Nylon 6/Unreinforced, Standard
CM1017XL2	>PA6<	•		Nylon 6/Unreinforced, High cycle
CM1026	>PA6<	•	•	Nylon 6/Unreinforced, Medium viscosity, heat stabilized
CM3001G-15	>PA66-GF15<		•	Nylon 66/Reinforced, Standard, GF15%
CM3001G-30	>PA66-GF30<	•	•	Nylon 66/Reinforced, Standard, GF30%
CM3001G-33	>PA66-GF33<	•	•	Nylon 66/Reinforced, Standard, GF33%
CM3001G-45	>PA66-GF45<	•	•	Nylon 66/Reinforced, Standard, GF45%
CM3001-N	>PA66<	•		Nylon 66/Unreinforced, Standard
CM3004G-30	>PA66-GF30FR(17)<		•	Nylon 66/Flame retardant, Halogen, GF30%
CM3004-V0	>PA66-FR(30)<		•	Nylon 66/Flame retardant, Unreinforced, Non-halogen
CM3006	>PA66<	•	•	Nylon 66/Unreinforced, Heat stabilized
CM3006G-15	>PA66-GF15<	•		Nylon 66/Reinforced, Heat stabilized, GF15%
CM3006G-30	>PA66-GF30<	•	•	Nylon 66/Reinforced, Heat stabilized, GF30%
CM3006G-33	>PA66-GF33<	•	•	Nylon 66/Reinforced, Heat stabilized, GF33%
CM3006G-50	>PA66-GF50<		•	Nylon 66/Reinforced, Heat stabilized, GF50%
U121	>PA6-I<		•	Nylon 6/High impact, Standard
U310	>PA66-I<	•		Nylon 66/High impact, Standard
U328 TL	>PA66-I<	•	•	Nylon 66/High impact, Super high impact, low temperature high impact

Note: If a specific resin grade you require is not shown, please ask our sales team for confirmation.

TORAYCON™

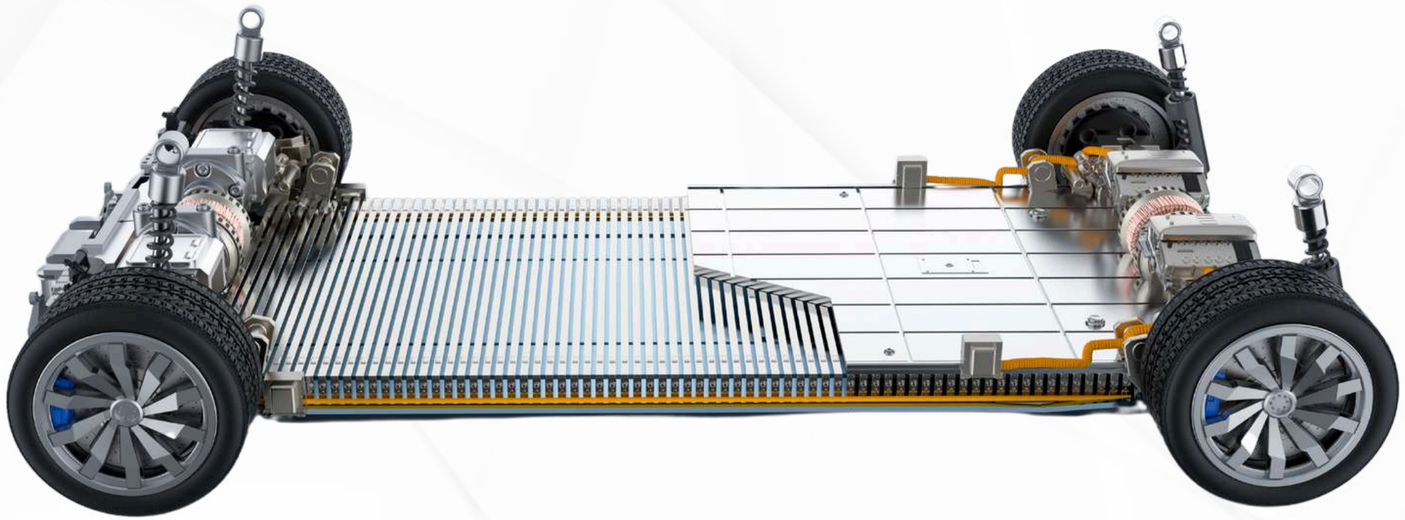
Grade	ISO	US	MX	Description
1101G-15 U	>PBT-GF15<	•	•	PBT/Reinforced, Lubricate GF15%
1101G-20FB	>PBT-GF20<		•	PBT/Reinforced, GF20% High Flow, Good Laser-marking
1101G-30	>PBT-GF30<	•	•	PBT/Reinforced, Standard, GF30%
1101G-M45	>PBT+PET-GF45<		•	PBT/Reinforced, Good appearance, GF45%
1101G-M55	>PBT+PET-GF55<		•	PBT/Reinforced, Good appearance, High rigidity, GF55%
1101G-X50	>PBT+PET-GF30<		•	PBT/Reinforced, Good appearance, GF30%
1101G-X54	>PBT-I-GF30<	•		PBT/Reinforced, High impact, Heat cycle resistance, GF30%
1164G-30 T2	>PBT-GF30FR(17)<		•	PBT/Flame retardant reinforced, Standard, V-0, GF30%
1201G-15	>PBT-GF15<	•	•	PBT/Reinforced , Standard, GF15%
1401 X06	>PBT<	•	•	PBT/Unreinforced, Standard
1401 X34	>PBT<		•	PBT/Unreinforced, Standard
1401 X45	>PBT<	•		PBT/Unreinforced, High flow, high cycle
5101G-15	>PBT-I-GF15<	•		PBT/Reinforced, High impact, GF15%
5201 X11	>PBT-HI<	•		PBT/Unreinforced, Soft, High impact
5201G-20 BM	>PBT-I-GF20<		•	PBT/Reinforced, Impact modified GF20%
5201-X10	>PBT-I<	•		PBT/Unreinforced, High impact
5207G-20 BM	>PBT-I-GF20<	•		PBT/Reinforced, High impact, GF20%
7151G-30	>PBT+SAN-GF30<	•	•	PBT/Reinforced, Low warpage, Hydrolysis resistance, GF30%
7151G-F03 B	>PBT+SAN-GF30<	•		PBT/Reinforced, Low warpage, High flow, GF30%
7151G-X02	>PBT+SAN+PET-GF30<	•	•	PBT/Reinforced, Low warpage, Hydrolysis resistance, Good appearance, GF30%
7157G A30 B	>PBT+ABS-I-GF30<		•	PBT/Reinforced, Low warpage, Heat cycle resistance, GF30%
7164G-X02	>PBT+SAN+PET-GF30FR(17)<		•	PBT/Flame retardant reinforced, Low warpage, Hydrolysis resistance, Good apearance, V-0, GF30%
8207X01 B	>PBT+PC-I<	•		PBT/Unreinforced, High impact, Low warpage
VX10 X01	>PBT+ABS<	•	•	PBT/Unreinforced, High impact, Low warpage

Note: If a specific resin grade you require is not shown, please ask our sales team for confirmation.

TORELINA™

Grade	ISO	US	MX	Description
A310MX04	>PPS-(GF+MD)65<	•		PPS/GF+Mineral filler reinforced, High filler, Standard
A504 CX1	>PPS-GF40<	•	•	PPS/GF reinforced, GF40%,Coolant resistance
A504X90	>PPS-GF40<	•	•	PPS/GF reinforced, GF40%, Standard
A604 CX1	>PPS-GF40<	•		PPS/GF reinforced, GF40%, Toughness, Coolant resistance
A604X97	>PPS-GF40<	•		PPS/GF reinforced, GF40%, Low flash, High flow
A673M T	>PPS-I-GF30<	•	•	PPS/GF reinforced, Elastomer modified, GF30%, High toughness, Hydrolysis resistance
A675 GS1	>PPS-I-(GF+MD)50<	•	•	PPS/GF+Mineral filler reinforced, Elastomer modified, Heat cycle resistance, High weld strength

Note: If a specific resin grade you require is not shown, please ask our sales team for confirmation.



APPLICATION EXAMPLES

03

AMILAN™ PA6 and PA66

Automotive: Fuel system components, engine parts, intake manifolds, gears, clips and brackets, transmission components, covers.

Electronics: Electronic device housings, connectors, plugs, coils, switches, and insulating components.

Household Appliances: Appliance housings, internal parts of washing machines, dryers, blenders, and other appliances.

Textile Industry: Filaments for brushes, textile machinery parts, weaving equipment components.

Renewable Energy: Components for wind turbines, gears in solar energy systems, and structural parts in renewable energy equipment.

Water Industry and Wastewater Treatment: Valves, fittings, pump parts, and components for water treatment systems.

Lighting Industry: Lamp and luminaire housings, mounts, and components for lighting systems.

APPLICATION EXAMPLES

03

TORAYCON™ PBT

Automotive: Electrical connectors, switch housings, lighting components, exhaust system parts, engine parts, and cooling system components.

Electronics: Electronic device housings, connectors, plugs, coils, and electrical system components.

Household Appliances: Appliance housings, components for washing machines and dryers, electrical connectors, and parts for small appliances.

Electrical Industry: Insulators, switch components, electrical connectors, and parts for electrical equipment.

Lighting Industry: Lamp and luminaire housings, mounts, and components for lighting systems.

Water Industry and Wastewater Treatment: Valves, fittings, and components for water treatment systems.

Energy Management Systems: Components for electric meters, circuit breakers, and connectors for energy systems.

APPLICATION EXAMPLES 03

TORELINA™ PPS

Automotive: Headlight and taillight housings, exhaust system components, electrical connectors for engines, and fuel system components.

Electronics: Electrical connectors, electronic device housings, battery system parts, and electrical components.

Braking Systems Industry: Components in braking systems, such as sensor housings and parts exposed to high-temperature conditions.

High-Pressure Pumps and Valves Industry: Components in high-pressure pump and valve systems operating under demanding conditions.

Heating, Ventilation, and Air Conditioning (HVAC) Industry: Parts for HVAC systems, such as thermostat housings and components exposed to temperature variations.

Water Industry and Wastewater Treatment: Valves, fittings, and components for water treatment systems requiring chemical and thermal resistance.

Engineering resins are essential in the automotive industry, enabling the creation of lightweight, durable, and efficient components. They help reduce vehicle weight, improve fuel economy, and withstand harsh conditions, driving innovation and sustainability in modern automobiles.

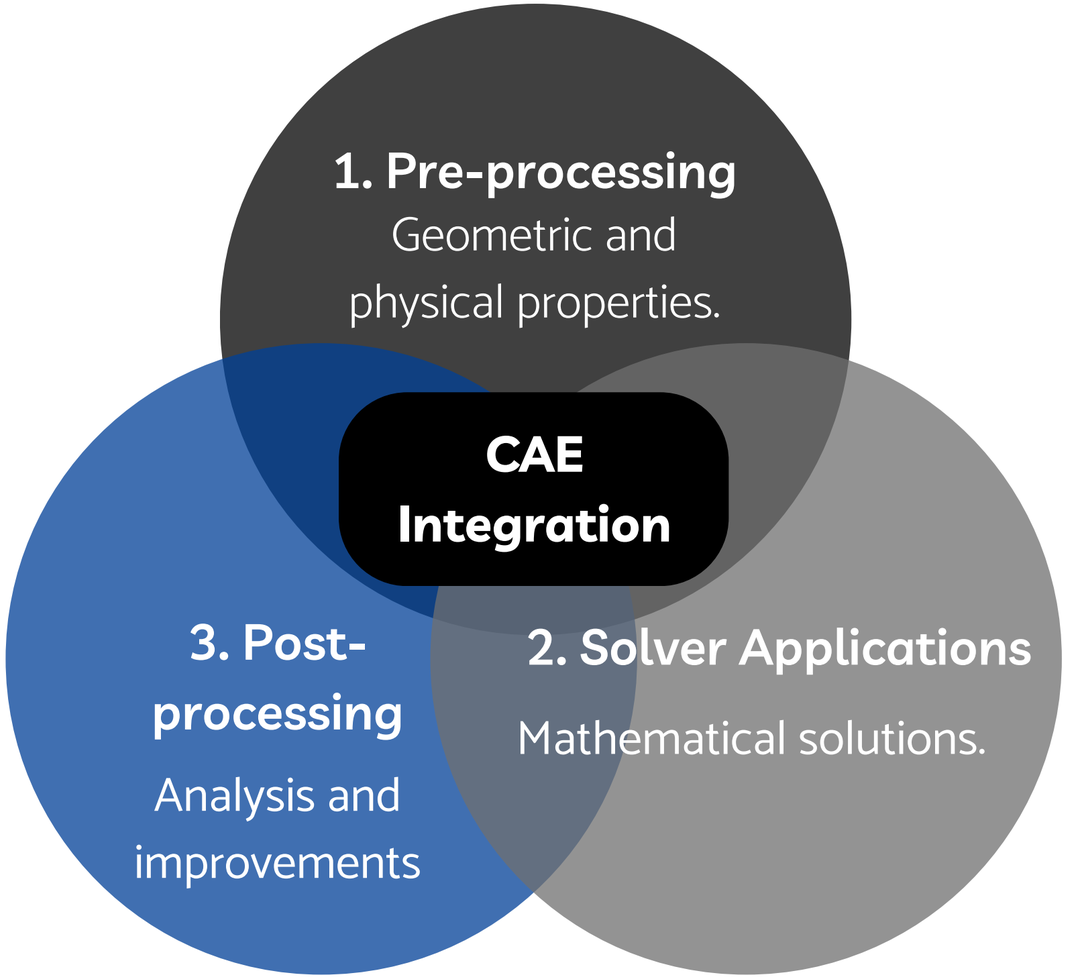
TECHNICAL SUPPORT

CAE Analysis

Computer-Aided Engineering (CAE)

Using CAE, Toray Resin North America provides assistance to customers to enhance products and/or collaborate on solving problems during their development.

By conducting structural, thermal, and injection molding simulations, among others, we can validate material improvements in each product development.



ORIGINAL PART

Determine the part and boundary conditions to be analyzed.

CAD Modeling

Obtain the client's model or create it.

CAE ANALYSIS

Conduct structural analyses of proposals and compare them with original designs.

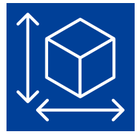
CAE Analysis

COST ESTIMATION

It may include prototype, tooling, process, and test material to determine the feasibility of the project.

APPROVAL AND PROTOTYPE

Presentation to the client of the best design proposal for the product and recommendations for tooling design.



FINAL PRODUCT

Analysis and results will be provided with the intention of enabling Toray materials to be used in the production of the part.

Technical Centers

USA

Mexico

Toray Resin North America operates two technical centers, located in Shelbyville, Indiana, USA, and El Salto, Jalisco, Mexico. These centers enhance Toray's ability to develop various grades of resins.

The technical centers are equipped with advanced technology, enabling the measurement of physical properties, durability testing, and other specialized analyses.

This significant advancement not only strengthens Toray's position in the resin industry but also has a substantial impact on the sector, facilitating and supporting the application of these resins in key areas such as electric vehicles and advanced driver-assistance systems (ADAS).

The innovation emerging from our technical centers helps to further elevate standards in performance, durability, and quality, establishing Toray Resin North America as a leading provider of advanced solutions for the industry's evolving demands.

Evaluation Equipment
(Measurement of physical properties/durability testing)

Injection molding machine

Tensile / Bending Test Equipment

Impact test equipment

Aging test (constant temperature / humidity chamber / PCT)

Thermal Test Equipment

Analytical instruments

DSC –Thermal Analysis
-Melting point
-Glass Transition Temperature

FT-IR
-Component Analysis

SEM (Scanning Electron Microscopy)
-Morphological observation (high magnification)

Microscope
-Morphological observation

X-ray fluorescence
-Elemental analysis

FT-IR, Microscopic FT-IR, TGA
-Component Analysis

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05

Materials Change our Lives

THANK YOU

For more information or assistance,
please contact us.

www.plastics.toray