



BASF (Australia) Ltd.

12/28 Freshwater Place
VIC 3006 Southbank,
Australia
Tel: +61 3 88556600
Fax: +61 3 88556511

BASF (Bangladesh) Ltd.

Crystal Palace (7th Floor),
House # 22 SE (D), Road - 140,
Gulshan South Avenue, Gulshan-1,
Dhaka-1212, Bangladesh
Tel: +880 2 98519815
Fax: +880 2 9851980

BASF (China) Co. Ltd.

333 Jiangxinsha Road,
Pudong
Shanghai 200137
Tel: +86 21 20391000
Fax: +86 21 20394306

BASF India Limited

4th Floor, "A" Wing,
Commercial Plaza,
Radisson Hotel, Mahipalpur,
NH-8, 110 037 New Delhi
Tel: +91 11 41596400
Fax: +91 11 41596496

BASF (Indonesia) Ltd.

DBS Bank Tower, 27th Floor,
Ciputra World 1 Jakarta,
Jl. Prof. Dr. Satrio Kav 3-5,
Jakarta, Indonesia 12940
Tel: +62 21 29886000
Fax: +62 21 29885930

BASF Japan Ltd.

OVOL Nihonbashi Building 3F,
3-4-4 Nihonbashi Muromachi,
Chuo-ku, Tokyo 103-0022
Tel: +81 3 52903000
Fax: +81 3 52903333

BASF (Korea) Company Ltd.

16F, KCCI Bldg., 39 Sejong-daero,
Jung-Gu, Seoul South Korea, 100-743
Tel: +82 2 37073100
Fax: +82 2 37073269

BASF Lanka (Private) Ltd.

186, Vauxhall Street,
00200 Colombo 2,
Sri Lanka
Tel: +94 11 4799200
Fax: +94 11 2431400

BASF (Malaysia) Sdn. Bhd.

Lot 19.02, Level 19, 1 Powerhouse
No.1, Persiaran Bandar Utama
Bandar Utama, 47800 Petaling Jaya
Selangor Darul Ehsan, Malaysia
Tel: +60 3 76121888
Fax: +60 3 76121777

BASF Pakistan (Pvt) Limited

46-A, Block-6, P.E.C.H.S.
Karachi, 75400
Tel: +92 21 111550550
Fax: +92 21 34547815

BASF Philippines Inc

11F HHIC Building,
1128 University Parkway,
North Bonifacio, Global City,
1634 Taguig, Metro Manila, Philippines
Tel: +63 2 88118000
Fax: +63 2 88118099

BASF South East Asia Pte Ltd

7 Temasek Boulevard
#35-01 Suntec City,
Tower one, Singapore 038987
Tel: +65 63985000
Fax: +65 63370330

BASF (Taiwan) Ltd.

16F, No.87,
SungJiang Road,
104 Taipei, Taiwan
Tel: +886 2 25187600
Fax: +886 2 25187702

BASF (Thai) Ltd.

Emporium Tower, 622,
23rd Floor, Sukhumvit 24 Road,
Klongton Klongtoey,
Bangkok, Thailand 10110
Tel: +66 2 6241999
Fax: +66 2 6449221

BASF (Vietnam) Ltd.

Suite 1101, Level 11,
Saigon Trade Center,
37 Ton Duc Thang Street,
District 1, Ho Chi Minh City
Tel: +84 28 38243833
Fax: +84 28 38243832



BASF Robotic Solutions

“We didn't invent the Cobot,
but we are re-inventing it everyday.”

SIASUN
Create Infinite Value

BASF
We create chemistry



The 3 Key Pillars of Cobots

Robots have been in the assembly line for decades. However, as the world evolves, so must they. To drive economical competence and to address the needs of small and medium-sized companies, cobots or collaborative robots were introduced.

Over time, cobots have become engines of growth and created jobs. At BASF, we believe that there are three pillars to working with cobots and it is in our best interest to develop the most favorable conditions for maximum efficiency and productivity.



Safety

Safeguarding human safety in work environments is critical to establishing industry-wide confidence in cobots. BASF has gone through rigorous rounds of research and development to produce innovative and state-of-the-art plastics for cobots that will help reduce impact and insulate humans from electrical charges.



Lightweight and Mobile

Cobots are intended to be intuitive, energy-efficient, and mobile, to enhance overall operations and workflow, while meeting the growing need for flexible manufacturing. Replacing parts of the cobot with high-performance materials from BASF can reduce its total weight by at least 20%, resulting in greater mobility and energy efficiency.



Design Freedom and Adaptability

Cobots built with BASF's innovative and high-performance moldable plastics optimize material usage, increase maneuverability in tight spaces, and maximize versatility. These materials are also easy to process and color which enables design flexibility.

**“We didn't invent the Cobot,
but we are re-inventing it
everyday.”**

Cobot Material Solutions

TPU - Thermoplastic Polyurethane
PA - Polyamide

Elastollan® TPU (Reinforced)

- High impact resistance, with flexibility
- Low coefficient thermal expansion comparable with steel and aluminum

Ultramid® PA Structure LFX

- Extremely high modulus
- Good dimension stability

Elastollan® TPU

- Good flexibility
- Good haptics and durability
- Excellent mechanical properties and wear resistance

Ultrasint® PA6 X028

- Freedom of design
- Good mechanical performance



PlasCobot Material Solutions

TPU - Thermoplastic Polyurethane
PA - Polyamide

Ultramid® PA LFX

- Extremely high modulus
- Good dimension stability

Elastollan® TPU (Reinforced)

- High impact resistance, with flexibility
- Low coefficient thermal expansion comparable with steel and aluminum

Ultramid® PA LFX over-molded on Metal

- High impact resistance, with flexibility
- Low coefficient thermal expansion comparable with steel and aluminum

Ultramid® PA LFX with Metal Component

- Improved heat dissipation performance
- Extremely high modulus
- Good dimension stability



In collaboration with

SIASUN 新松

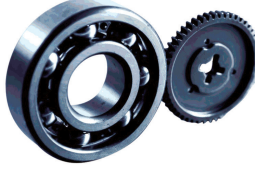
Quality Materials, Wide-ranging Applications

BASF's high-performance and innovative materials can be used for a comprehensive range of cobot-related applications.

Thermoplastic Polyurethane Component Solutions

Application	BASF Materials	Properties
	Bumper Elastollan® TPU (Reinforced)	<ul style="list-style-type: none"> • Good damping characteristic • Excellent mechanical properties and wear resistance • UV resistance
	Cable Sheathing Elastollan® TPU (Flame Retardant)	<ul style="list-style-type: none"> • Excellent flexural fatigue strength • Good electrical insulation • Outstanding oil and wear resistance
	Pneumatic Tubes Elastollan® TPU	<ul style="list-style-type: none"> • Excellent burst pressure • Outstanding oil and wear resistance • Good flexibility
	Wheels Elastollan® TPU	<ul style="list-style-type: none"> • Softness • High UV resistance • High adhesive strength of over-molding • High wet/dry grip • Low damaging to PVC floor

Engineering Plastics Component Solutions

Application	BASF Materials	Properties
	Bearing Cages Ultramid® PA 66 Ultramid® Advanced N PPA Ultraform® POM	<ul style="list-style-type: none"> • Excellent stiffness & dimensional stability • Very good heat resistance • Outstanding oil resistance • Very high temp application (PPA)

Application	BASF Materials	Properties
	Camera Ultramid® PA Ultradur® PBT (and it blends with ASA)	<ul style="list-style-type: none"> • Good flowability and surface finish • Impact resistance at wide temp range • Chemical resistance
	Connectors Ultramid® PA 6 Ultramid® PA 66 Ultramid® PA 6/66 Ultradur® PBT	<ul style="list-style-type: none"> • Excellent toughness & stiffness • Very good fatigue resistance • Very good heat resistance • Good flowability
	Lidar Ultramid® PA 66	<ul style="list-style-type: none"> • Good mechanical properties and flowability • High rigidity and impact strength • Good durability
	Motors in Robotic Arms Ultramid® PA 66	<ul style="list-style-type: none"> • Very good heat resistance • Excellent toughness & stiffness • Good electrical performance • Excellent chemical resistance
	Radar Ultradur® PBT (and it blends with ASA)	<ul style="list-style-type: none"> • Dimensional stability with low warpage • Good flowability and di-electrical performance • Laser weldability and laser marking ability
	Relays Ultramid® PA 66 Ultradur® PBT Ultradur® Petra PET	<ul style="list-style-type: none"> • FR V-0 performance • Good CTI / GWFI performance • Balanced mechanical properties
	Sensors Ultramid® PA 66 Ultradur® PBT Ultradur® Petra PET	<ul style="list-style-type: none"> • Very high dimensional stability • Good electrical performance • Good mechanical performance & flowability



At BASF Performance Materials: We turn your ideas into ideal solutions

We combine cutting-edge solutions with established expertise to make your ideas a reality

- You need more than just a product to solve your challenges. You need a variety of high-performance materials, applications, engineering, simulation and manufacturing know-how to get the job done.
- Backed by our global research and development network and our team of industry-leading experts, we can help you take your product to the next level.

Key capabilities of BASF

- Close collaboration with key customers in target industries worldwide
- Innovation in products, applications, processes and business models
- Technical, engineering and application competence
- Operational excellence ensuring reliability and consistent quality
- Focused specialty businesses

Focus of research and development

Our innovation focus is on developing new products and applications in key target industries, to improve existing solutions and address new unmet market needs, particularly in developing markets with strong market potential.

Metal Substitution with High-Performance Plastics

BASF's performance plastics offer decisive advantages over established metal structures in many areas. The range of applications for these intelligent plastic solutions includes automotive engineering, solar, robotics, automation and mining industries.

Vehicle construction is one particular area where BASF performance plastics have already replaced numerous metal components. BASF is now using the knowledge and know-how acquired from these projects in other markets, where plastic solutions offer prominent advantages as a metal substitute.

Metal Substitution: Our Service Package

1. Design and Construction

Parts design and construction, not only with engineering expertise but also with our Ultrasim® simulation software.

2. Manufacture and Processing

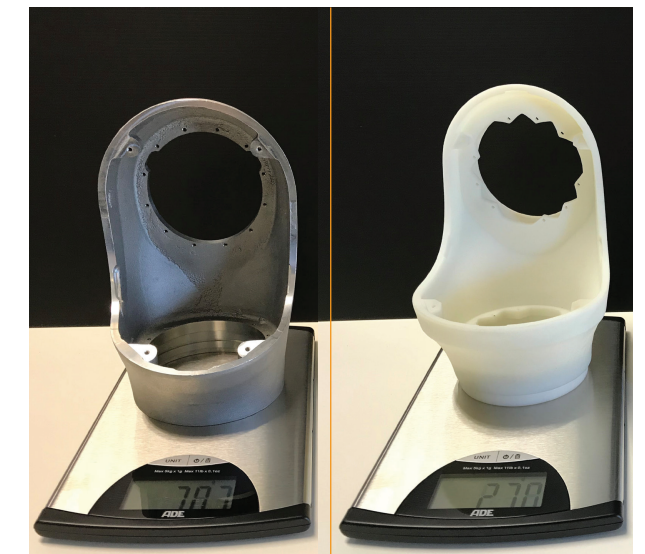
Achieving the required parts quality and establishing stable mass production.

3. Testing and Certification

Parts testing and necessary certifications to meet specific requirements and standards of each market.

4. Marketing

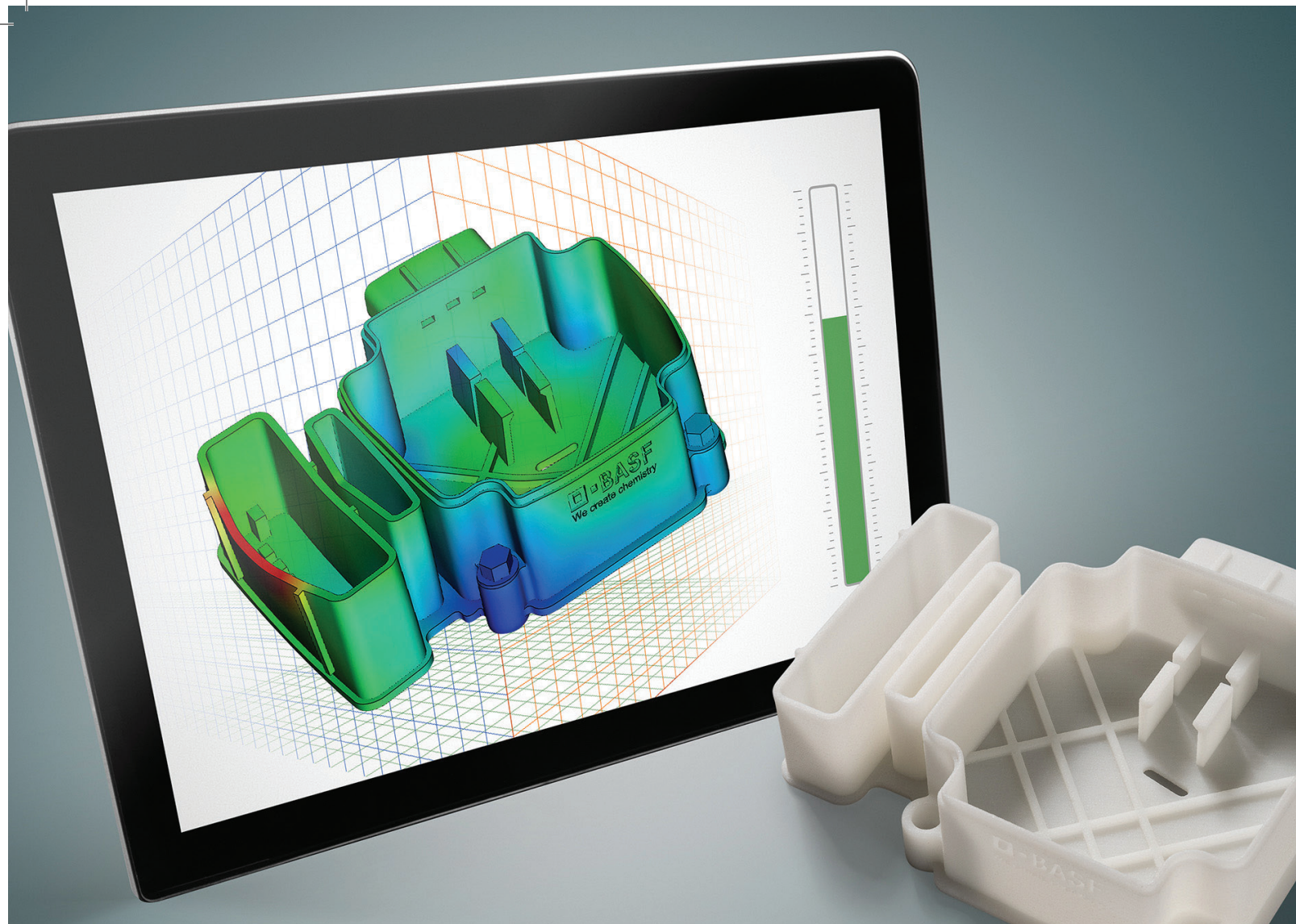
Support in marketing activities, leveraging on experience in automotive construction.



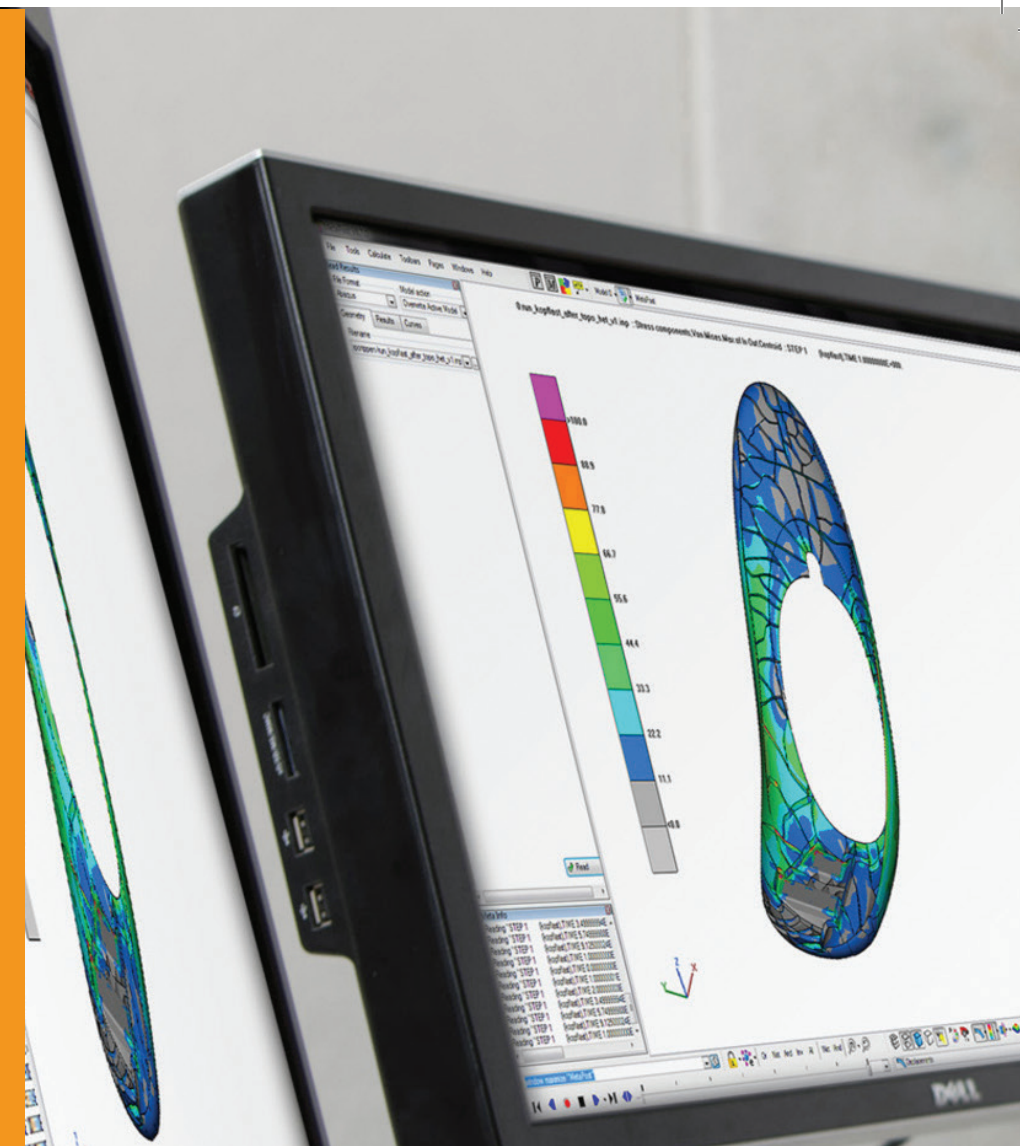
Weight of metal part 0.7kg

Weight of plastic part 0.3kg





- 1 | Integrative simulation, material modeling
- 2 | Thermo-mechanical modeling
- 3 | Fatigue models
- 4 | Mechanical material data
- 5 | Injection molding simulation
- 6 | Polyurethane foaming simulation



Ultrasim® – CAE Competence for Your Innovative Components

When it comes to freedom of design and cost savings, plastics are often the solution.

Ultrasim® is the versatile and flexible CAE competence for your innovations using BASF plastics. Our calculation of component concepts on a virtual basis starts with appropriate materials and adequate material models, ranging from the virtual prototype and ideal manufacturing process to the finished mass-produced component.

With Ultrasim®, we offer you a unique combination of core CAE tools so that each phase in the development of a component can be monitored virtually.



- 7 | Static mechanical simulation
- 8 | Dynamic mechanical simulation
- 9 | Rheological material data
- 10 | Mathematical parts optimization
- 11 | 3D printing simulation
- 12 | Creation Center