

INNOVATIVE PLASTICS

CONSISTENCY+ CAPABILITY

Specialized materials for the Healthcare industry



A SABIC COMPANY

Innovative Plastics is a strategic business unit of SABIC. Founded in 1976, SABIC is today the first public, global multinational enterprise headquartered in the Middle East. Its products range from bulk commodity chemicals to highly engineered plastics for demanding applications. It is a leading producer of polyethylene, polypropylene, glycols, methanol and fertilizers and the fourth largest polyolefin producer.

SABIC's businesses are grouped into Chemicals, Performance Chemicals, Polymers, Innovative Plastics, Fertilizers and Metals. It has significant research resources with dedicated Technology & Innovation centers in Saudi Arabia, the Netherlands, Spain, the USA, India, China and Japan.

INNOVATING FOR CUSTOMER SUCCESS

We believe that SABIC customers deserve the full benefit of every advantage our enterprise can offer. After all, our success is defined by our customers' success. And with more than 70 years of experience pioneering advanced engineering thermoplastics, SABIC's Innovative Plastics business is positioned to help create new opportunities for growth and breakthrough applications.

We offer expertise and experience to our customers in a variety of ways:

- Material solutions to help drive innovation and market leadership.
- Design, logistics and processing expertise to spark new ideas and better efficiencies.
- Unwavering commitment to build long-term relationships with ingenuity, trust and continuous improvement.

It's what we strive for and work to deliver... a mutual benefit.

Excellence and nothing less.

MATERIALS INNOVATION FOR TOMORROW'S HEALTHCARE DESIGNS

A world leader in engineering thermoplastics and specialty compounds, SABIC shares your commitment to innovation, quality and consistency. We are dedicated to enabling healthcare solutions that will help improve quality of life.

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LATEST INNOVATIONS FOR THE HEALTHCARE INDUSTRY

To support customers with changing requirements in the healthcare industry, SABIC continues to develop new materials and processing expertise.

Our recent innovations address important trends, including higher autoclave temperatures; improved compatibility with blood and proteins; enhanced processing for large parts and difficult geometries; and extended offerings for compliance with environmental regulations. Examples of these innovations include:

NEW MATERIALS

- LEXAN* HPX PC RESINS
enhanced processing and medium-use autoclave capability (at 121°C)
- LNP* THERMOCOMP* X-RAY SHIELDING COMPOUNDS
lead-replacement options for compliance with environmental regulation
- NORYL* HNA MODIFIED PPE RESINS
extended-use autoclave capabilities (at 134°C) and excellent chemical resistance
- CYCOLOY* CXXXXXME PC/ABS RESINS
thin-wall flame retardance (up to UL94 V0 at 0.75mm) supporting regulatory compliance with an FR system meeting chlorine- and bromine-free requirements; enhanced chemical resistance
- XYLEX* PC/POLYESTER RESIN BLENDS
water-clear and colorable, balance of chemical resistance and toughness
- XENOY* PC/PET, PC/PBT RESIN BLENDS
outstanding aesthetics, good chemical resistance, excellent impact resistance and toughness

PROCESSING SUPPORT

- CO-INJECTION BLOW-MOLDING FOR BARRIER APPLICATIONS
expertise and equipment to support development of customers' barrier applications with Lexan resins
- INJECTION-MOLDED SOLUTIONS VS. MACHINED/STAMPED LEAD
LNP Thermocomp x-ray shielding compounds enable injection molding for options of greater design flexibility, part consolidation, and elimination of secondary operations
- IMPROVED PROCESSING FOR COMPLEX PARTS
enhanced-flow and -release Lexan HPX resins facilitate molding of complex geometries and low draft angles

For more information on Innovative Plastics' offerings for the healthcare industry, please see the table of contents on page 3.



TURNING HEALTHCARE DESIGNS INTO CUSTOMER SUCCESSSES

SABIC offers a breadth and depth of resources that are a vital ingredient to customer success. Our network of global Manufacturing, Technology & Innovation and Application Development Centers stands ready to support our customers' programs.

WORLD-CLASS TECHNOLOGY, SUPPORT AND MATERIALS

Our emphasis on Six Sigma for over a decade enables us to achieve and maintain a track record of enhanced quality and improved productivity. This assists our customers with superior products and access to years of successful Six-Sigma implementation – experience we are pleased to share.

Ongoing investment in people, technologies and processes, including state-of-the-art manufacturing and application development, is aimed at helping customers solve their design and manufacturing challenges.

Innovative Plastics invented most of the high-performance materials that we sell, from polymers to blends and copolymerized solutions, and pioneered many more capabilities in polymer science.

Innovation continues to drive our culture throughout all industries that we serve, including healthcare. If the right material doesn't exist already, we may be able to custom-compound a solution to meet your application's precise demands.



HEALTHCARE INDUSTRY SUPPORT

MATERIALS EXPERTISE FOR DIVERSE HEALTHCARE SEGMENTS

Cardiovascular and blood care
Fluid delivery and IV therapy
Drug delivery
Surgical instruments
Orthopedics
Respiratory and sleep therapy

Monitoring and imaging
Lab ware and clinical diagnostics
Medical lighting
Medical trays
Animal research and care
Pharmaceutical manufacturing

PERFORMANCE MATERIALS TO SUPPORT A RANGE OF REQUIREMENTS

TYPICAL HEALTHCARE REQUIREMENTS

STERILIZATION DIVERSITY

- Gamma, E-beam, autoclave and EtO

BIOCOMPATIBILITY^A

- ISO 10993 or USP Class VI
- Advanced hemocompatibility^B
- Increased platelet retention
- Low protein binding^B

FOOD CONTACT COMPLIANCE

- US FDA, European Union food contact, others

CHEMICAL RESISTANCE

- Disinfectants, cleaners, lipids and IV solutions

WELDING AND BONDING

- Ultrasonic, adhesive and solvent

GENERAL MATERIAL CONSIDERATIONS

OPTICAL CLARITY, COLORABILITY

- View fluids/contents, rapid identification and visual appeal

IMPACT RESISTANCE

- Ductility for practical use conditions
- Low- and high-temperature performance

DIMENSIONAL STABILITY

- Tight tolerance/low creep

HIGH FLOW AND ENHANCED RELEASE

- Complex designs, low draft angles, thin wall and flow length capability

HIGH-PERFORMANCE SPECIALIZATION

- Added strength, lubricity, shielding and anti-stat

FLAME RETARDANCE

- UL 94 - HB, V2, V1, V0, 5VB, 5VA
- No bromine/no chlorine flame-retardant systems for compliance with environmental standards such as Blue Angel and TCO'99



A Biocompatibility: material evaluated based on ISO 10993 or USP Class VI protocol; supporting information available by Type I or Type II letter. Reference page 8.

B Advanced hemocompatibility and Low Protein Binding: Lexan® HPM resins demonstrate improved hemocompatibility vs standard polycarbonate across multiple biomarkers and test methods. Please contact SABIC Innovative Plastics for further information.

APPLICATION, POLYMER AND PROCESS DEVELOPMENT ASSISTANCE

SABIC application development specialists guide customers through the breadth of available materials and processing options to enhance application design and manufacturability. Specialists also connect customers to our technical and commercial innovation teams for novel solutions.

SABIC ColorXpress® centers offer an innovative setting to explore the power of color and effects in bringing new dimensions to applications and affecting how they are perceived.

Global Application Technology (GAPt) teams lead centers of excellence worldwide to serve our customers in the advancement of new product technologies... from assisting in new design concept development through manufacturability and commercialization.

INDUSTRIAL DESIGN

- Application tear-downs
- Concept designs

PREDICTIVE ENGINEERING

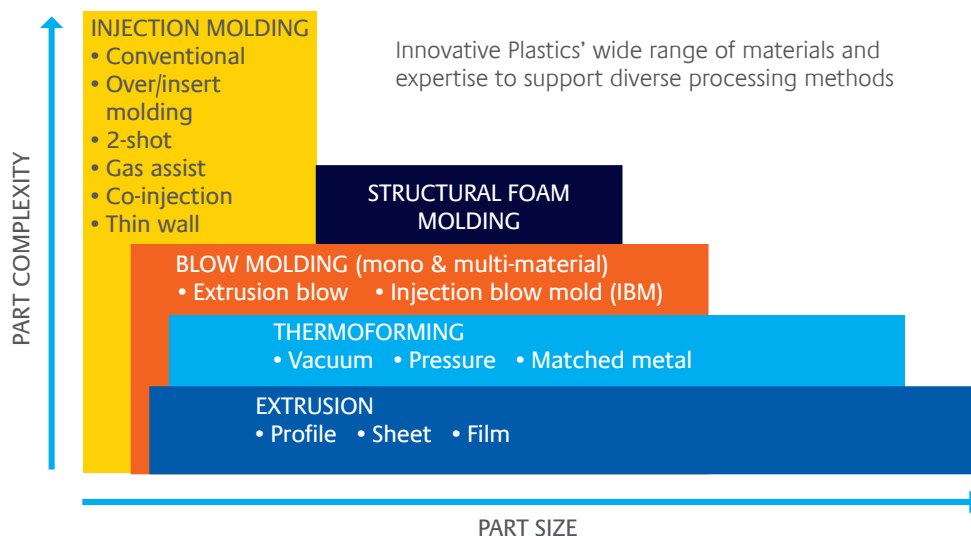
- Computer-Aided Engineering (CAE)
- Computer-Aided Design (CAD)

PROCESS DEVELOPMENT

- Most conversion methods
- Productivity improvements

APPLICATION PERFORMANCE

- Secondary operations
- Controlled laboratory part testing



ONLINE TOOLS AVAILABLE WHEN YOU NEED THEM... 24 HOURS A DAY, EVERY DAY

sabic-ip.com

- Material selectors
- Product data (e.g., data sheets, engineering design and chemical compatibility data, adhesive and solvent bonding data)
- Engineering calculators (e.g., thermal, structural, flow, fatigue, cost, etc.)
- Tutorials

SUPPORTING DATA AND REGULATORY

THE SABIC INNOVATIVE PLASTICS “HEALTHCARE PRODUCT” POLICY

- Easily identifiable “healthcare product” nomenclature
 - Cyclocac* HM resins
 - Cycloy* HC resins
 - Lexan* HP resins
 - Noryl* HN resins
 - Ultem* HU and HA resins
 - Valox* HX resins
 - Xenoy* HX resins
 - Xylex* HX resins
- Biocompatibility assessed (according to ISO 10993 or USP Class VI)
- Food contact compliance for most “healthcare products”
- FDA Drug Master File and/or device master file listing (letter of authorization provided as needed)
- SABIC Innovative Plastics “healthcare products” are subject to formula lock and stringent management of change process (ask your SABIC Innovative Plastics representative for more details)

IMPLANT POLICY

SABIC Innovative Plastics does not support applications that remain implanted beyond 29 days.

RESIN BIOCOMPATIBILITY

Typically, a set of tests performed on a resin to determine if the resin or its extractables will cause potential harm to the human body.

SABIC Innovative Plastics biocompatible grades have been tested and passed either USP/USP Class VI biological tests or tests from the ISO 10993 “Biological Evaluation of Medical Devices”, or similar grades have been so tested and passed.

SABIC Innovative Plastics does not knowingly support the use of grades not designated as “biocompatible supported” in healthcare applications requiring biocompatibility.

FOOD CONTACT COMPLIANCE

U.S. FDA (Food and Drug Administration): FDA grades comply with the requirements of the U.S. Food, Drug and Cosmetic Act, as amended, and the regulations put forth by the FDA, covering substances for use as basic components of food contact surfaces.

European Union (EU): EU FC grades comply with the compositional requirement of EU Directive 2002/72/EC, and subsequent amendments, for plastics used in food contact applications.

FDA DRUG MASTER FILE (DMF) AND/OR DEVICE MASTER FILE (MAF)

SABIC Innovative Plastics maintains U.S. FDA Drug Master Files and/or Device Master Files within the FDA’s documentation centers for our “healthcare products”. A Letter of Authorization (LoA) for customer’s reference of our Master Files and for the FDA’s review of our Master Files will be provided upon customer request.

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) — EU DIRECTIVE 2002/96/EC

WEEE requires OEMs and component and sub-assembly producers providing electrical/electronics (E/E) products to the EU to collect, recover and treat these products at the end of life.

Plastics using brominated flame retardants must be removed and treated separately. To help customers simplify recovery and recycling at end of life, SABIC’s Innovative Plastics business offers materials that are inherently flame-retardant or that do not contain brominated or chlorinated flame retardants.



RESTRICTION OF HAZARDOUS SUBSTANCES (ROHS) —EU DIRECTIVE 2002/95/EC

RoHS mandates the “restriction of the use of certain hazardous substances in electrical and electronic equipment,” which include lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs), except deca-bromine, for E/E products and components placed into the European market after July 1, 2006. Medical devices are not currently within the scope of the RoHS directive, though studies regarding the feasibility of including Categories 8 (Medical Equipment) and 9 (Monitoring and Control Instruments) are underway.

SABIC's Innovative Plastics business offers materials that allow manufacturers to avoid the use of these hazardous substances.

UL 94, EN 60695-11-10/20, IEC 60695-11-10/20

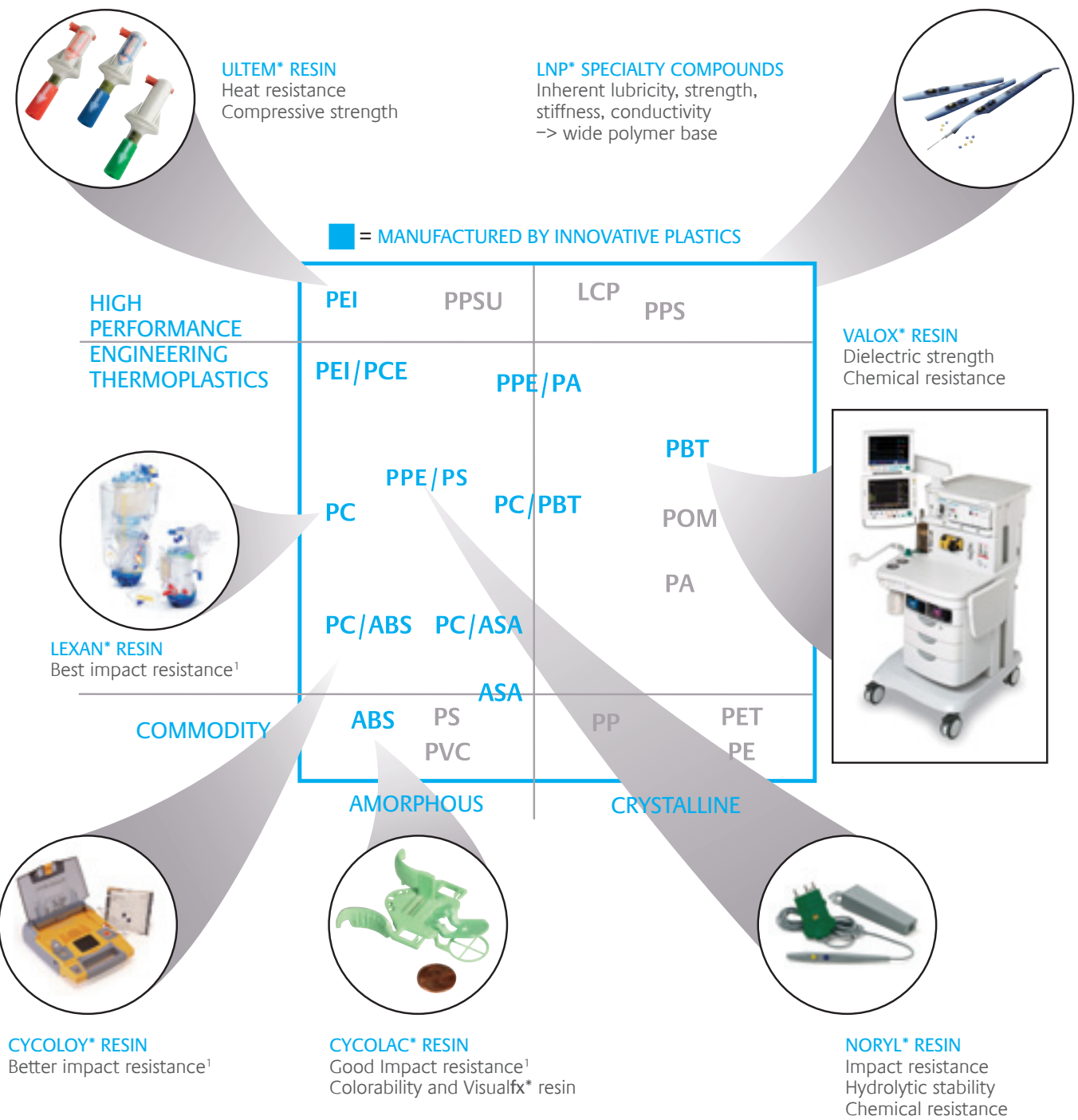
The most widely accepted flammability performance standards for plastic materials are UL 94 ratings. These are intended to identify a material's ability to extinguish a flame, once ignited. Several ratings can be applied based on the rate of burning, time to extinguish, ability to resist dripping and whether or not drips are burning.

Each material tested may receive several ratings based on color and/or thickness. When specifying a material for an application, the UL rating should be applicable for the thinnest wall section in the plastic part. The UL rating should always be reported with the thickness. Just reporting the UL rating without mentioning the thickness is insufficient. EN 60695-11-10 is the European equivalent of UL94; IEC 60695-11-10/20 is the international equivalent of UL 94.



THE INNOVATIVE PLASTICS RESINS PORTFOLIO

The broad and deep Innovative Plastics portfolio delivers diverse performance properties to support key healthcare requirements. The range of our materials and representative applications are shown below.



¹ based on a general performance comparison of ABS, PC/ABS and PC resins

HEALTHCARE PRODUCTS SUMMARY

CHEMICAL CATEGORY, PRODUCT FAMILY, RESIN SERIES AND GRADE	BIOCOMPATIBLE SUPPORTED (I) HEALTHCARE PRODUCT (I)	LIGHT TRANSMISSION	CLARITY / GENERAL COLOR	STERILIZATION				
				STEAM AUTOCLAVE (L)		GAMMA AND E-BEAM ^{2,3}		ETO ² RETENTION OF MECHANICALS AND COLOR ⁴
				AUTOCLAVE (TEMP °C)	EXPOSURE (CYCLES) ¹	RETENTION OF MECHANICALS	COLOR STABLE ⁴	
PC (POLYCARBONATE) BASED								
Lexan* PC resins								
HP series	✓	88	clear	121	Limited	✓		✓
HPS series	✓	88	clear / gamma blue	121	Limited	✓	✓	✓
HPX series	✓	82	clear / slight blue	121	Medium			✓
HPM series	✓	77	clear / slight blue	121	Limited	✓		✓
HPH series	✓	85	clear	134	Medium	✓		✓
Xylex* PC/Polyester resins								
HX8300HP	✓	88	clear			✓		✓
HX7409HP	✓	79	clear / slight blue			✓	✓	✓
Xenoy* PC/Polyester resins								
HX5600HP	✓	N/A	opaque			✓	✓-O	✓
HX6600HP	✓	N/A	opaque			✓	✓-O	✓
Cyclocol* PC/ABS resin								
HC1204HF	✓	N/A	opaque			✓	✓-O	✓
ABS (ACRYLONITRILE BUTADIENE STYRENE) BASED								
Cycolac* ABS resins								
HMGxxMD	✓	N/A	opaque			✓	✓-O	✓
PEI (POLYETHERIMIDE) BASED								
Ultem* PEI resins								
HU1xx0	✓		clear / amber	134	Extended	✓	✓-O	✓
HU1xx4	✓		clear / amber	134	Extended	✓	✓-O	✓
HU2xx0	✓	N/A	opaque	134	Extended	✓	✓-O	✓
Ultem PEI/PCE (polycarbonate ester) resin								
HATxxxx	✓	N/A	opaque			✓	✓-O	✓
PPE (MODIFIED POLY(PHENYLENE ETHER)) BASED								
Noryl* PPO* resins								
HNA033	✓	N/A	opaque	134	Medium	✓	✓-O	✓
HNA055	✓	N/A	opaque	134	Extended	✓	✓-O	✓
HN731A	✓	N/A	opaque			✓	✓-O	✓
PBT AND/OR PET (POLYBUTYLENE TEREPHTHALATE AND/OR POLYETHYLENE TEREPHTHALATE) RESINS								
Valox* resins								
HX215HP	✓	N/A	opaque			✓	✓-O	✓
HX312C	✓	N/A	opaque	134	Limited	✓	✓-O	✓
HX420HP	✓	N/A	opaque	134	Limited	✓	✓-O	✓
HX30x1HP	✓	N/A	opaque	134	Limited	✓	✓-O	✓
LNP* SPECIALTY COMPOUNDS (>20 DIFFERENT BASE RESINS)								
Due to wide range of base resins and additives used, capabilities will vary.								
LNP Colorcomp* compounds – small lot molded-in-color		varies	varies					
LNP Lubricomp* compounds – internally lubricated		options may be available	N/A	opaque	121 and 134 available; Limited-to-Extended available	options available		options available
LNP Thermocomp* compounds – internally reinforced		N/A	opaque					
LNP Stat-Kon*, Stat-Loy* and Faradex* compounds – electrically active								

N/A - Not Applicable

1 Retention of impact resistance after exposure to autoclave

Limited L = 1-10 cycles

Medium M = 1-350 cycles

Extended E = 1-2500 cycles

2 Gamma radiation; E-Beam (electron beam) radiation; EtO or EO (ethylene oxide).

3 After exposure to gamma radiation – general (80% or better) maintenance of mechanical properties; data available upon request.

4 Noted Lexan grades contain special color-stable package to support enhanced color stability for reduced YI or YI shift.

✓-O Typically, the influence of radiation on color of opaque grades is limited.

Additional footnotes listed on page 30.

PRODUCT PORTFOLIO OVERVIEW

LEXAN* PC RESINS

- Polycarbonate resins⁺, ⁺⁺
- Water-clear and colorable
- Excellent toughness and dimensional stability
- Flame-retardant and high flow/release grades
- Healthcare options
 - Biocompatible^A
 - Sterilization: EtO, γ -Ray, γ -Ray LC, A-121-M and A-134-M
 - Lipid resistance, advanced hemocompatibility^B and low protein binding^B

XYLEX* PC/POLYESTER RESIN BLENDS

- Polycarbonate/amorphous polyester resin blends
- Water-clear and colorable
- Balance of chemical resistance and toughness
- Dimensional stability
- Healthcare options
 - Biocompatible^A
 - Sterilization: EtO, γ -Ray, and γ -Ray LC
 - Lipid resistance

CYCOLOY* PC/ABS RESIN BLENDS

- Polycarbonate/acrylonitrile-butadiene-styrene resin blends⁺, ⁺⁺
- Excellent aesthetics colorable and UV-stable options
- Good balance of toughness/flow and chemical resistance
- Flame-retardant and high flow/release grades
- Healthcare options
 - Biocompatible^A
 - Enhanced resistance to certain disinfectants/cleaners

XENOY* PC/PET, PC/PBT RESIN BLENDS

- Polycarbonate/semi-crystalline polyester resin blends⁺⁺
- Outstanding aesthetics: high gloss and colorable
- UV-stable options
- Good chemical resistance
- Excellent impact resistance and toughness
- Healthcare options:
 - Biocompatible^A
 - Enhanced resistance to certain disinfectants / cleaners

GELLOY* ASA AND/OR PC/ASA RESINS

- Acrylic-styrene-acrylonitrile terpolymer resins⁺⁺
- Great aesthetics: bright whites and colorable
- UV-stable options
- Good chemical resistance
- Flame-retardant grades

CYCOLAC* ABS RESINS

- Acrylonitrile-butadiene-styrene resins⁺⁺
- Excellent aesthetics - high-gloss options
- Good processability and practical impact
- Flame-retardant grades
- Healthcare options:
 - Biocompatible^A
 - Sterilization: EtO, γ -Ray, and γ -Ray LC

ULTEM* PEI RESINS

- Polyetherimide resins⁺, ⁺⁺
- Transparent and colorable
- High tensile and compressive strength
- Stiffness and dimensional stability
- Inherent FR, high heat stability, and chemical resistance
- Healthcare options
 - Biocompatible^A
 - Sterilization: EtO, γ -Ray, and A-134-E



NORYL* MODIFIED PPE RESINS

- Modified poly(phenylene ether) resin blends⁺, ⁺⁺
- Good impact and resistance to acids and bases
- Thermal and electrical resistance
- Excellent hydrolytic stability
- Balanced strength, stiffness, and dimensional stability
- Healthcare options
 - Biocompatible^A
 - Sterilization: EtO, γ -Ray, and A-134-E

VALOX* PBT AND/OR PET RESINS AND BLENDS

- Polybutylene terephthalate (PBT) and/or polyethylene terephthalate (PET) resins⁺⁺
- Outstanding electrical properties
- Chemical and high-heat resistance
- Healthcare options
 - Biocompatible^A
 - Formaldehyde-free
 - Sterilization: EtO, γ -Ray, and A-134-L

LNP STAT-LOY*, LNP STAT-KON* AND LNP FARADEx* COMPOUNDS

- Electrically active compounds (>20 amorphous and crystalline base resins)
- Anti-stat (Stat-Loy), conductive (Stat-Kon), and EMI/RFI shielding (Faradex)
- Healthcare options - Sterilization: EtO, γ -Ray and A-134-E

LNP* LUBRICOMP* AND LUBRILoy* COMPOUNDS

- Internally lubricated thermoplastics (>20 amorphous and crystalline base resins)
- Improved wear resistance and no need for external lubrication
- Friction management: reduced 'slip-stick', efficiency loss, and heat build-up
- High-modulus, high-strength options
- Silicone- and PTFE-free options (LNP Lubriloy)
- Healthcare options - Sterilization: EtO, γ -Ray and A-134-E

LNP THERMOCOMP* COMPOUNDS

- Internally reinforced thermoplastics (>20 amorphous and crystalline base resins)
- Improved tensile strength and flexural modulus
- Heat and creep resistance
- High specific gravity selections
- Healthcare options
 - Sterilization: EtO, γ -Ray, and A-134-E
 - X-ray shielding compounds to replace lead

LNP COLORCOMP* COMPOUNDS AND VISUALFX* RESINS

- Addition of wide selection of pigments and effects to >20 amorphous and crystalline resins



KEY

+	FR (flame-retardant) package available without bromine or chlorine additives
++	RoHS-compliant options available
EtO	Ethylene Oxide
γ -Ray	Gamma / E-Beam radiation
γ -Ray LC	Gamma / E-Beam with clear Low Color Shift option
A-121-M	Steam Autoclave @ 121°C; options within 1-350 cycles
A-134-M	Steam Autoclave @ 134°C; options within 1-350 cycles
A-134-E	Steam Autoclave @ 134°C; options within 1-2500 cycles

A Biocompatibility: material evaluated based on ISO 10993 or USP Class VI protocol; supporting information available by Type I or Type II letter. Reference page 8.

B Advanced Hemocompatibility and Low Protein Binding: Lexan HPM resins demonstrate improved hemocompatibility vs standard polycarbonate across multiple biomarkers and test methods. Please contact SABIC Innovative Plastics for further information.

REPRESENTATIVE HEALTHCARE SEGMENTS

CARDIOVASCULAR AND BLOOD CARE

This area encompasses handling and management of blood, such as during cardiovascular and orthopedic surgeries, blood donations and kidney dialysis treatments. Applications include devices to support extracorporeal systems, blood collection and separation, as well as equipment to move, filter and hold blood.



FLUID DELIVERY AND IV THERAPY

This segment includes handling and management of fluids for use in IV (intravenous) therapy and enteral (gastrointestinal) fluid delivery systems. These systems often include various pumps to facilitate fluid delivery to the patient and connection devices that integrate the fluid bag/bottle, pump and tubing into a single system.



DRUG DELIVERY

Drugs come in diverse forms, requiring delivery devices to span a broad set of formats from injection to inhalation. Safety and patient compliance issues have led to needle-less techniques, improved accuracy/efficiency in drug transfer, as well as aesthetic, miniaturized, ergonomic designs for drug-type identification and consumer appeal/use.



SURGICAL INSTRUMENTS

Due to the breadth of surgical techniques, a variety of tools have been developed to support specific procedures. These range from access devices to hand/mechanical and powered instruments for open and minimally invasive surgeries. As devices become smaller and more complex, the need for miniaturized components calls for specialized materials to achieve strength, durability and freedom of design.



CASE STUDY

UNIMAX MEDICAL SYSTEMS, INC.

- Auto-locking trocar and suction irrigation set

Challenge: Upgrade to impact resistant and gamma-stable PC; optimize manufacturing system cost

Solution: Lexan® HPS resins for biocompatibility^A, clarity, gamma sterilization, impact-resistance, high flow and release for manufacturing complex part design

Benefits: Gamma-sterilizable instruments, faster production and reduced system costs



A Biocompatibility: material evaluated based on ISO 10993 or USP Class VI protocol; supporting information available by Type I or Type II letter. Reference page 8.

TYPICAL APPLICATIONS

- Blood oxygenators and reservoirs
- Blood collection and separation bowls
- Filters (leukocyte/arterial)
- Renal dialyzers
- Blood filter and membrane media

PERFORMANCE CONSIDERATIONS

- Biocompatible^A (devices and membranes)
- Clarity (devices)
- EtO, gamma/E-beam and autoclave sterilization (devices and membranes)
- Good flow for processing (devices and membranes)
- Chemical resistance (membranes)

RESIN SOLUTIONS

- Lexan[®] HP and HPS resins (devices)
- Lexan HPM resins (devices)
- Valox[®] HX30x1HP resins (membranes)

TYPICAL APPLICATIONS

- Stopcocks, luers, Y-sites and check valves
- Fluid filters
- Infusion sets
- Infusion and syringe pumps
- Enteral feeding pumps

PERFORMANCE CONSIDERATIONS

- Biocompatible^A (disposables)
- Clarity (disposables)
- EtO and gamma/E-beam sterilization (disposables)
- Chemical resistance (disposables and pumps)
- Impact resistance (pumps)

RESIN SOLUTIONS

- Lexan HPS and HPX resins (disposables)
- Xylex[®] HX resins (disposables and pumps)
- Cycoloy[®] CXxxxME resins (pumps)
- Ultem[®] HU resins (disposables)
- Valox HX resins (disposables)

TYPICAL APPLICATIONS

- Inhalers
- Insulin delivery devices
- Needle-less injection devices
- Nebulizers
- Syringes, bottles, tubes and vials

PERFORMANCE CONSIDERATIONS

- Biocompatible^A
- Clarity and colorability
- EtO, gamma and autoclave sterilization
- Impact and wear resistance
- Formaldehyde-free valves

RESIN SOLUTIONS

- Lexan HP, HPS, and HPX resins
- Cycoloy HC resins
- Xenoy[®] HX resins
- Cicolac[®] HM resins
- Valox HX resins
- LNP[®] Lubricomp[®] compounds

TYPICAL APPLICATIONS

ACCESS DEVICES

- Trocars, retractors and speculums

HAND INSTRUMENTS

- Staplers, forceps and clip appliers

POWERED INSTRUMENTS

- Electrosurgical, thermal ablation and directed energy devices

PERFORMANCE CONSIDERATIONS

- Biocompatible^A
- EtO, gamma and autoclave sterilization
- Strength and stiffness
- Ductility and toughness
- Precision fit and high dimensional tolerance
- Smooth part interaction and low wear

RESIN SOLUTIONS

- Lexan HP, HPS and HPX resins
- Cicolac HM resins
- Ultem HU resins
- LNP Lubricomp compounds
- LNP Thermocomp[®] compounds

CASE STUDY

INCISIVE SURGICAL, INC.

- INSORB[®] | 20 subcuticular skin stapler

Challenge: Ergonomic, lightweight design (metal replacement) and disposable

Solution: Ultem HU resins for biocompatibility^A, compressive strength, custom colors, EtO and gamma sterilization

Benefits: High performance, parts consolidation and award-winning design



^A Biocompatibility: material evaluated based on ISO 10993 or USP Class VI protocol; supporting information available by Type I or Type II letter. Reference page 8.

REPRESENTATIVE HEALTHCARE SEGMENTS

ORTHOPEDICS

Orthopedic devices support surgical and non-surgical techniques to preserve and/or restore the musculoskeletal system, limbs, etc. They include external fixators to immobilize the position of bones throughout the healing process, as well as short-term joint implant test devices (trial heads) to determine correct size for long-term joint implants^C.



RESPIRATORY AND SLEEP THERAPY

These devices and supporting equipment are used for treating respiratory-related illnesses in hospitals, clinics and at home. Respirators, ventilators, positive airway pressure devices and respiratory masks assist a growing number of patients with ongoing therapy needs.



MONITORING AND IMAGING

Monitoring and imaging devices comprise a very diverse range of applications from hand-held and small devices such as pulse oximeters, blood pressure and other patient monitors to larger transportable devices such as anesthesia delivery and ultrasound, to very large stationary equipment such as x-ray, CT, MRI and PET imaging machines.



LAB WARE AND CLINICAL DIAGNOSTICS

The segment encompasses instruments and accessories for the analysis and diagnosis of patient samples, as well as for pharmaceutical and biopharmaceutical research. They range from disposable vials and containers for sample collection, to hand-held instruments, such as pipettors, for sample preparation, to clinical diagnostic equipment for rapid processing/evaluation of many samples.



CASE STUDY

GE HEALTHCARE

- Voluson® E8 OB/GYN ultrasound system

Challenge: One-third smaller and lighter, balance of performance, aesthetic and chemical resistance for >30 components

Solution: Cycology* CX2244ME resins for impact-resistant thin-wall FR enclosures
LNP* Thermocomp* PB10010 compound for strength and stiffness of handle and cable holder

Benefits: Weight/system cost benefits of thin-wall molding with molded-in custom colors and effects; FR system meeting chlorine- and bromine-free standards



^C Implant Policy: SABIC Innovative Plastics does not support applications that remain implanted beyond 29 days.

TYPICAL APPLICATIONS

- Knee and hip trials
- External bone fixation devices
- Instrument handles
- Bone cement mixers
- Trays and cases

PERFORMANCE CONSIDERATIONS

- Biocompatible^A
- EtO, gamma and autoclave sterilization
- Impact and chemical resistance
- Dimensional stability
- Colorability

RESIN SOLUTIONS

- Lexan^{*} HPS and HPX resins
- Ultem^{*} HU resins
- Noryl^{*} HNA resins
- LNP^{*} Lubricomp^{*} compounds
- LNP^{*} Thermocomp^{*} compounds

TYPICAL APPLICATIONS

- Respirators and ventilators
- Positive Airway Pressure (PAP) devices
- Humidifier tanks
- Oxygen concentrators
- Respiratory masks and valves

PERFORMANCE CONSIDERATIONS

- Biocompatible^A (airflow pathways)
- Clarity (masks)
- EtO and autoclave sterilization (masks and tanks)
- Impact and chemical resistance (masks and equipment)
- Flame retardance and EMI/RFI shielding (equipment)

RESIN SOLUTIONS

- Lexan HP, HPX4 and HPH4504H resins (masks)
- Lexan EXL resins (equipment)
- Cycology^{*} CXxxxxME resins (equipment)
- LNP Faradex^{*} and Stat-Loy^{*} compounds (equipment)

TYPICAL APPLICATIONS

- Imaging equipment (MRI, CT, PET and x-ray)
- Anesthesia delivery and monitoring
- Patient monitors
- Blood glucose meters
- External defibrillators

PERFORMANCE CONSIDERATIONS

- Durability and impact resistance with light weight
- Chemical resistance to cleaners/disinfectants
- WEEE and RoHS compliance
- Flame retardance and EMI/RFI shielding
- Colorability and indoor UV stability

RESIN SOLUTIONS

- Lexan 9x5 and EXL resins
- Cycology resins
- Geloy^{*} resins
- Ultem HU and 2xxx resins
- LNP Faradex and Thermocomp compounds (equipment)

TYPICAL APPLICATIONS

- Vials, tubes
- Diagnostic vial transport trays
- Pipettors
- Diagnostic machines
- Cassettes, centrifuges and covers

PERFORMANCE CONSIDERATIONS

- Biocompatible^A (disposables)
- Clarity (disposables)
- Gamma and/or autoclave sterilization
- Impact and chemical resistance
- Light weight (equipment)

RESIN SOLUTIONS

- Lexan HP and HPS resins (disposables)
- Lexan EXL resins (equipment)
- Cycology CXxxxxME resins
- Ultem HU resins (equipment)
- LNP Lubricomp and Thermocomp compounds (equipment)

CASE STUDY

GE HEALTHCARE

- Aisys[®] Carestation[®] anesthesia delivery system

Challenge: Durability, light weight, chemical resistance, and cost-effectiveness

Solution: Ultem HU resins for autoclavable and chemically resistant gas reservoir
Noryl resins for panels and doors with structural stiffness with lightweight

Valox^{*} resins for work surfaces with resistance to cleaning chemicals

Benefits: Maintain structural integrity over life of system with easy maneuverability throughout hospital; resistance to wear and tear



A Biocompatibility: material evaluated based on ISO 10993 or USP Class VI protocol; supporting information available by Type I or Type II letter. Reference page 8.

REPRESENTATIVE HEALTHCARE SEGMENTS

MEDICAL LIGHTING

Focused lighting is critical in healthcare areas from general examination rooms to surgical theaters to dental offices. The generation or avoidance of heat from light sources is important in areas such as an operating room. In other cases, such as infrared therapy lighting, heat generation is desired. Lighting systems utilize a wide variety of components including housings, reflectors, handles and covers.



MEDICAL TRAYS

Trays are used to transport instruments after surgery and to hold them during sterilization. In manufacturing, trays are used to transport vials and other items throughout the facility. Common to all types of trays is impact resistance to withstand unintended drops.



ANIMAL RESEARCH AND CARE

Animal care requires tools and support devices similar to those for human healthcare, for use in assessing and treating health issues. In addition, there are various bins, cages and feeding devices used in laboratories. This equipment must be cleaned and sterilized on a regular basis to help ensure proper care of laboratory animals.



PHARMACEUTICAL MANUFACTURING

Devices and equipment such as connectors, filtration housings and filtration media are used in the manufacturing and processing of pharmaceuticals, including biopharmaceuticals. Many such devices are being created in disposable formats.



CASE STUDY

MERIVAARA OY

- Merilux X1 examination lamp

Challenge: Reduce excessive heat from surgical lamp

Solution: Ultem* 1000 resins combined with dichroic coating for heat management and lighter-weight reflector
Valox* resins for heat and chemically resistant housing; parts consolidation

Benefits: Improved patient and staff comfort from irradiation of IR heat upwards vs. into surgical area. Simplified housing design for manufacturability and improved appearance



TYPICAL APPLICATIONS

- Luminaire housings
- IR transparent housings
- Reflectors
- Handles
- Light source covers

PERFORMANCE CONSIDERATIONS

- Heat management
- Lightweight
- Durability and reliability
- Flame and chemical resistance
- Biocompatible^A and autoclave sterilization (handles)

RESIN SOLUTIONS

- Ultem^{*} 10x0 resins (reflectors)
- Noryl^{*} HNA055 resins (handles)
- Valox^{*} resins (housings)

TYPICAL APPLICATIONS

- Dental instrument trays
- Surgical instrument trays
- Microsurgery and scope trays
- Vial transport and storage trays

PERFORMANCE CONSIDERATIONS

- Biocompatible^A
- Autoclave sterilization
- Impact, crack, and craze resistance
- Chemical resistance
- Colorability

RESIN SOLUTIONS

- Lexan^{*} HPX and HPH4504 resins
- Ultem HU1000 resins
- Noryl HNA resins
- LNP^{*} Colorcomp^{*} compounds

TYPICAL APPLICATIONS

- Surgical tools
- Cages and bins
- Racks
- Water bottles

PERFORMANCE CONSIDERATIONS

- Clarity and colorability
- Lightweight
- Durability and impact resistance
- Chemical resistance
- Autoclave sterilization

RESIN SOLUTIONS

- Lexan HPX and HPH4504 resins
- Ultem HU1000 resins
- Noryl HNA resins
- LNP Colorcomp compounds

TYPICAL APPLICATIONS

- Connectors, couplings, and fittings
- Filtration and cassette housings
- Melt-blown membrane media

PERFORMANCE CONSIDERATIONS

- Gamma/E-beam and autoclave sterilization
- Advanced protein compatibility (housings and membranes)
- Clarity and low haze post-sterilization (housings)
- Chemical resistance (housings and membranes)

RESIN SOLUTIONS

- Lexan HPH, HPX4, and HPS resins
- Lexan HPM19x4 lower protein binding resins
- Ultem HU resins
- Noryl HNA resins
- Valox HX30x1HP resins

CASE STUDY

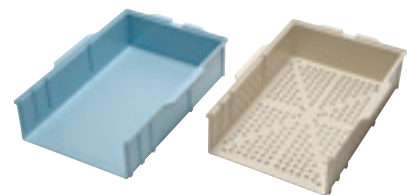
HURST CORP.

- Terminal sterilization vial tray

Challenge: Eliminate creation of ferrous, talc, resin, and glass particles from wear of fiberglass and metal trays

Solution: Noryl HNA resins for extended-duty, high-heat autoclave sterilization, impact resistance, colorability, and biocompatibility^A

Benefits: Reduced opportunity for particles to contaminate vials during transport and sterilization. Repeat-use trays, rigidity for reliable stacking



^A Biocompatibility: material evaluated based on ISO 10993 or USP Class VI protocol; supporting information available by Type I or Type II letter. Reference page 8.

SEGMENT AND MATERIAL SELECTION CONSIDERATIONS

PRODUCT FAMILY	BLOOD MANAGEMENT	FLUID DELIVERY AND IV THERAPY	DRUG DELIVERY	SURGICAL INSTRUMENTS	ORTHOPEDICS
Lexan* PC resins++	Disposables HP and HPS resins : clarity, impact resistance, EtO, γ-ray LC, A-121-L HPM resins: clarity, impact resistance, reduced protein binding (B), EtO, A-121-L	Disposables HPS7 resin: clarity, lipid resistance, EtO, γ-ray LC, A-121-L HPX resins: clarity, impact resistance, improved processing, EtO, A-121-M Pump housings HP resins: clarity, impact resistance, colorability, A-121-L	Disposables HP and HPS series resins: clarity, impact resistance, EtO, γ-ray (HPS-LC), A-121-L HPX resins: clarity, impact resistance, improved processing, EtO, A-121-M Device housings HP resins: clarity, colorability, impact resistance, A-121-L	Instrument handles HP and HPS series resins: clarity, impact resistance, EtO, γ-ray (HPS-LC), A-121-L HPX resins: clarity, impact resistance, improved processing, EtO, A-121-M HPH resins: clarity, A-134-M	External fixation HPS resins: clarity, impact resistance, EtO, γ-ray LC, A-121-L HPX resins: clarity, impact resistance, improved processing, EtO, A-121-M
Xylex* PC/ Polyester resin blends++		Disposables HX7409HP resin: clarity, lipid resistance, EtO, γ-ray LC Pump housings Xylex HX and X series resins: clarity, enhanced chemical resistance	Device Housings Xylex HX resins: clarity, enhanced chemical resistance		Cement mixer bowls Xylex HX resins: clarity, enhanced chemical resistance
Cycoloy* PC/ABS resin blends++		Pump housings CXxxxME and CY6xxx series resins: for balance of impact resistance and enhanced chemical resistance	Device housings HC biocompatible resins: for impact resistance, colorability		
Xenoy* PBT, PET/PC resin blends++		Pump housings Xenoy HX and X series resins: balance of impact resistance and enhanced chemical resistance	Device Housings Xenoy HX resins: balance of impact resistance and enhanced chemical resistance	Surgical Handles Xenoy HX resins: balance of impact resistance and enhanced chemical resistance, colorability	
Geloy* ASA resins					
Cycolac* ABS resins++			Device Housings HMxxMD resins: general balance of toughness and flow, excellent aesthetics, high gloss	Instrument handles HMxxMD resins: general balance of toughness and flow, excellent aesthetics	
Ultem* PEI resins++		Disposables HU series resins: enhanced chemical and lipid resistance, EtO, γ-ray	Disposables HU series resins: enhanced chemical and lipid resistance, EtO, γ-ray, A-134-E	Instrument handles and internal gears/latches HU series resins: tensile and compressive strength, enhanced chemical resistance, EtO, γ-ray, A-134-E	External fixation and temporary joint trials HU series resins: strength, stiffness, EtO, γ-ray, A-134-E
Noryl* modified PPE resins++				Internal components HNA resins: chemical resistance, EtO, γ-ray, A-134-E	Temporary joint trials HNA resins: chemical resistance, A-134-E
Valox* PBT and/ or PET semi-crystalline resins and blends++	Melt blown fibers HX30x1HP resins: melt blown membrane media	Disposables Valox HX series resins: enhanced chemical resistance EtO, γ-ray	Internal Components Valox HX resins: formaldehyde-free wear resistance, EtO, γ-ray		
LNP* compounds: >20 amorphous and crystalline base resins +,++. Sterilization options: EtO, γ-Ray, A-121 /134-L/M/E					
LNP Lubricomp* compounds – internally lubricated			Internal components / gears	Internal components / gears	
LNP Thermocomp* compounds - internally reinforced			Internal components	Internal components	Temporary joint trials Fixation devices
LNP Faradex* compounds - for electromagnetic and radio frequency interference (EMI/RFI) attenuation			Pump housings		
LNP Stat-Kon* compounds for surface resistivity from antistatic, through conductive, to electromagnetic interference (EMI) shielding. LNP Stat-Loy* compounds for permanent anti-static performance			Housings/Spacers		
LNP Colorcomp* compounds for added colors and/or special effects			Pump housings	Housings/handles	Surgical handles Handles

In the chart below, only materials listed with nomenclature beginning with "H" are biocompatible supported (I) by SABIC Innovative Plastics; other materials are not. See page 8.
 + : Grades available without bromine and/or chlorine additives (F). ++ : RoHS compliant grades available (H).
 EtO : Ethylene Oxide. γ-ray: Gamma / E-Beam. γ-ray LC: Gamma / E-Beam with clear Low Color Shift options.
 A-121-M: Steam Autoclave @ 121°C; options within 1-350 cycles. A-134-M: Steam Autoclave @ 134°C; options within 1-350 cycles.
 A-134-E: Steam Autoclave @ 134°C; options within 1-2500 cycles.

RESPIRATORY AND SLEEP THERAPY	MONITORING AND IMAGING	LAB WARE AND CLINICAL DIAGNOSTICS	MEDICAL LIGHTING	MEDICAL TRAYS	ANIMAL RESEARCH AND CARE	BIOPHARMACEUTICAL EQUIPMENT
Respiratory masks HP resins: clarity, impact resistance, EtO, A-121-L HPH resins: clarity, A-134-M Masks, humidifier tanks, enclosures HPX4 resin: clarity, improved processing, hydrolytic stability, chemical resistance, A-121-M EXL resins: impact resistance, toughness, enhanced processing, FR options	Equipment enclosures 9x5(A)(U) resins: FR, impact resistance, (Transparency and UV stable options) FL3000 resin: foamable FR EXL resins: impact resistance, toughness, enhanced processing, FR options	Equipment enclosures 9x5(A)(U) resins: FR, impact resistance, (Transparency and UV stable options) FL3000 resin: foamable FR EXL resins: impact resistance, toughness, enhanced processing, FR options Disposables HP and HPS series resins: clarity, impact resistance, EtO, γ-ray (HPS-LC) HPH resins: clarity, A-134-M	Reflector Cover SLX resins: enhanced UV stability, transparent and tinted colour options	Transport tts HPX4 resin: clarity, improved processing, hydrolytic stability, chemical resistance, A-121-M HPH resins: clarity, A-134-M	Cages and bins HPH resins: clarity, A-134-M Water/Feeding Bottles 1x4R resins: clarity, injection blow moulding, ductility	Connectors and filtration housings HPM resins: clarity, impact resistance, advanced hemocompatibility (B), EtO, A-121-L HPS resins: clarity, impact resistance, EtO, γ-ray LC, A-121-L HPH resins: clarity, A-134-M HPX resins: clarity, impact resistance, improved processing, EtO, A-121-M
Equipment enclosures CXxxxME and CY6xxx series resins: for balance of impact resistance and enhanced chemical resistance, FR	Equipment enclosures CXxxxME and CY6xxx series resins: for balance of impact resistance and enhanced chemical resistance, FR CM6210 resin: thermoformed panels, FR	Equipment enclosures CXxxxME and CY6xxx series resins: for balance of impact resistance and enhanced chemical resistance, FR				
	Equipment enclosures Xenoy resins: high gloss, balance of impact, chemical and UV resistance, FR options	Equipment enclosures Xenoy resins: high gloss, balance of impact, chemical and UV resistance, FR options				
	Equipment enclosures Geloy resins: bright whites, good UV stability, flow capability, lower heat resistance	Equipment enclosures Geloy resins: bright whites, good UV stability, flow capability, lower heat resistance				
	Equipment enclosures Cyclocac resins: excellent aesthetics, high gloss, FR options	Equipment enclosures Cyclocac resins: excellent aesthetics, high gloss, FR options				
Internal components / impellers HU resins: strength, stiffness, dimensional stability	Internal gears/latches and other components HU resins: strength, stiffness, dimensional stability (HU)2xxx series resins: reinforced strength	Internal gears/latches HU series resins: tight tolerance, strength, stiffness, EtO, γ-ray, A-134-E (HU)2xxx series resins: reinforced strength	Reflector 10x0 and XH6050 resins: light weight metal replacement, heat management options Removable Handles HU resins: chemical resistance and repeat autoclave sterilization (A-134-E)	Surgical and dental trays HU100x resins: transparency, chemical resistance, extended duty autoclave sterilization (A-134-E)	Cages and bins HU100x resins: transparency, chemical resistance, extended duty autoclave sterilization (A-134-E)	Connectors and filtration housings HU100x resins: transparency, chemical resistance, extended duty autoclave sterilization (A-134-E)
	Equipment enclosures FN series resins: foamable panels, FR	Equipment enclosures FN series resins: foamable panels, FR	Removable handles HNA resins: for chemical resistance and repeat autoclave sterilization (A-134-E)	Transport, surgical and dental trays HNA resins: chemical resistance and repeat autoclave sterilization (A-134-E)	Cages and bins HNA resins: chemical resistance and repeat autoclave sterilization (A-134-E)	Connectors and filtration housings HNA resins: chemical resistance and repeat autoclave sterilization (A-134-E)
	Work surfaces Valox resins: enhanced chemical resistance, FR options		Luminaire housing Valox resins: enhanced chemical resistance, FR options			Filter media HX30x1HP resins: for melt blown membrane media
Internal components	Internal gears/latches and other components	Internal gears/latches and other components				
Equipment enclosures	Equipment enclosures	Equipment enclosures				
Equipment enclosures	Equipment enclosures	Equipment enclosures				
Equipment enclosures	Equipment enclosures	Equipment enclosures		Surgical and dental trays	Cages and bins	

CHEMICAL RESISTANCE PERFORMANCE GUIDELINES

PRODUCT FAMILY	GRADE/SERIES	Exposure time (days)	Bleach sodium hypochlorite solution, 50%	Cidex® glutaraldehyde based disinfectant	Methyl ethyl ketone (MEK)	Virex® organic ammonium chloride based disinfectant	Betadine® microbicide; povidone-iodine solution	Ethanol (ethyl alcohol)	Hydrogen peroxide 3%	Isopropanol (isopropyl alcohol; ipa) 70%	Saline 10%	Lipid hydrocarbon-containing organic compounds; fatty acid derivatives	DEHP diethylhexylphthalate
LEXAN® PC RESINS													
Healthcare products													
	HP1R	3	+	+	■	●	+	●	+	+	+		
	HPS2R	3	+	+	■	●	+	+		+	+		
	HPS7	3	+	+	■	●	+	+	7 days +	+	+	●	5 days +
	HPX4	3	+	+	■	▲	+	+	+	+	+		
	HPM1914	3	+	+	■	▲	+	■	+	▲	+	+	
	HPM1944	3	+	+	■	+	+	+	+	+	+	+	
	HPH4404	3	+	+	■	+	+	+	+	+	+	+	
	HPH4704	3	+	+	■	+	+	+	+	+	+		
Standard products													
	925	7	+	●	■	●	+	+	+	+	+		
	945	7	+	▲	■	●	+	+	+	+	+		
	925A	7	+	●	■	+	+	+	+	+	+		
	945AU	7	+	+	■	+	+	+	+	+	+		
Standard Products — Enhanced flow / ductility resins													
	EXL1414	7	++	+	■	●	++	+	++	++	++		
	EXL9112	7	++	▲	■	●	++	+	++	++	++		
	EXL9330	7	++	+	■	+	++	+	++	++	++		
	EXL9335	7	+	+	■	+	+	+	++	++	+		
XYLEX® PC/POLYESTER RESIN BLENDS													
Healthcare products													
	HX7409HP	3	+	+	■	▲	+	+	++	+	++	●	
	HX8300HP	3	+	●	■	▲	++	■	+	++	++	■	
XYLEX® PC/POLYESTER RESIN BLENDS													
Healthcare products													
	HX5600HP	7	●	+	■	▲	+	+	+	●	+		●
	HX6600P	7	+	+	+	+	+	▲	+	+	+		+
CYCOLOY® PC/ABS RESIN BLENDS													
Healthcare Products													
	HC1204HF	7	●	▲	■	▲	■	■	++	+	●		
Standard products													
	C2950	7	●	■	■	■	■	▲	●	●	▲		
	C6600	7	●	■	■	■	++	■	●	■	++		
	CX2244ME	7	●	■	■	■	++	■	++	++	++		
	CX2142ME	7	●	■	■	■	++	■	++	●	●		
CYCOLAC® ABS RESINS													
Healthcare products													
	HMG47MD	7	++	●	■	●	■	■	▲	●	●		
	HMG94MD	7	++	■	■	■	■	■	+	■	●		
Standard products													
	MG37EPN	7	++	●	■	▲	●	■	++	■	++		
	XHMM1	7	++	▲	■	●	■	■	++	■	++		
	GRM2600L	7	++	●	■	++	●	■	++	●	++		

LEGEND FOR SYMBOLS

- Compatible at 0.5% strain
- ⊕ Compatible at 1.0% strain
- ⊕⊕ Compatible at 1.5% strain
- ▲ Marginal for one or both measures at 0.5% strain
- ▲ Marginal for one or both measures at 1.0% strain
- ▲ Marginal for one or both measures at 1.5% strain
- Not compatible

LAB BENCH COMPATIBILITY RATING:

Color rating	Retention tensile stress at yield, %	Retention tensile elongation at break, %
COMPATIBLE	≥ 90	80 - 139
MARGINAL	80 - 89	65 - 79
NOT COMPATIBLE	≤ 79	≤ 64 OR > 140

PRODUCT FAMILY	GRADE/SERIES	Exposure time (days)	Bleach sodium hypochlorite solution, 50%	Cidex® glutaraldehyde based disinfectant	Methyl ethyl ketone (MEK)	Virex® organic ammonium chloride based disinfectant	Betadine® microbicide; povidone-iodine solution	Ethanol (ethyl alcohol)	Hydrogen peroxide 3%	Isopropanol (isopropyl alcohol; ipa) 70%	Saline 10%	Lipid hydrocarbon-containing organic compounds; fatty acid derivatives
ULTEM® PEI RESINS												
Healthcare products												
	HU1010	7	+	+	+	+	+	+	+	+	+	
	HU2300	7	+	+	+	+	+	+	+	+	+	
	HATX100	7	+	+	+	+	+	+	+	+	+	+
NORYL® MODIFIED PPE RESIN BLENDS												
Healthcare products												
	HN731E	7	+	+	+	+	+	+	+	+	+	
	HNA033	7	+	+	+	+	+	+	+	+	+	+
	HNA055	7	+	+	+	+	+	+	+	+	+	+
Standard products												
	GFN2	3	+	+	+	+	+	+	+	+	+	
VALOX® PBT AND/OR PET RESINS AND BLENDS												
Healthcare products												
	HX215HPR	3	+	+	+	+	+	+	+	+	+	+
	HX420HP	3	+	+	+	+	+	+	+	+	+	+
Standard products												
	365	3	+	+	+	+	+	+	+	+	+	
	855	3	+	+	+	+	+	+	+	+	+	
LNP® LUBRICOMP® COMPOUNDS – Internally lubricated												
	AL003	7	+	+	+	+	+	+	+	+	+	
	DFL36	3	+	+	+	+	+	+	+	+	+	
	EL003	7	+	+	+	+	+	+	+	+	+	
	RFL36	7	+	+	+	+	+	+	+	+	+	
	WFL36	7	+	+	+	+	+	+	+	+	+	
	ZFL36CCX	7	+	+	+	+	+	+	+	+	+	
LNP THERMOCOMP® COMPOUNDS – Internally reinforced												
	DF006ER	3	+	+	+	+	+	+	+	+	+	
	EF006	7	+	+	+	+	+	+	+	+	+	
	LF006	7	+	+	+	+	+	+	+	+	+	
	RF006	7	+	+	+	+	+	+	+	+	+	
	UF008	7	+	+	+	+	+	+	+	+	+	
	WF006	7	+	+	+	+	+	+	+	+	+	

CHEMICAL RESISTANCE TESTING ACCORDING TO ISO 4599 (DETERMINATION OF RESISTANCE TO ENVIRONMENTAL STRESS CRACKING (ESCR) — BENT STRIP METHOD) OR ASTM D543 (EVALUATING THE RESISTANCE OF PLASTICS TO CHEMICAL REAGENTS).

This information should be used as indicative only: Accurate chemical compatibility can only be determined under final application conditions. Therefore, extensive testing of the finished part is strongly recommended. The performance and interpretation of end-use testing are the end producers responsibility.

STRAIN LEVEL <0.5%

Generally represents molded-in stress of actual part, when designed and molded in line with recommended guidelines

STRAIN LEVELS >0.5%

A material is generally more susceptible to chemical attack at higher strain levels. [e.g. chemically induced cracking will more readily occur at strain level 1.5% than at strain level 0.5%]

TEST TEMPERATURE - 23°C

PERFORMANCE PROPERTIES HEALTHCARE RESINS

Product family	LEVEL OF RELEASE ADDITIVE			Data provided for:	HEALTHCARE CONSIDERATIONS (D)					PHYSICAL PROPERTIES (E)			
	None	Standard	Higher		STANDARDS AND REGULATORY			Lipid resistance	Light transmission	Specific gravity	Melt flow rate	Mold shrinkage flow, 3.2 mm	
					RoHS compliant (H)	Biocompatible supported (I) healthcare product (J)	Food contact						
	Grade / series						FDA (K)	EU (K)	ASTM D 1003	ASTM D 792	ASTM D 1238	SABIC Method	
			%	-	g/10 min	%							
LEXAN® PC RESINS													
Standard													
	HP1HF		HP1HF	●	●	●	●		88	1.18	39	0.5 - 0.7	
	HP1	HP1R	HP1	●	●	●	●		88	1.2	25	0.5 - 0.7	
	HP2NR	HP2	HP2R	●	●	●	●		88	1.2	17.5	0.5 - 0.7	
	HP4NR	HP4	HP4R	●	●	●	●		88	1.2	10.5	0.5 - 0.7	
	HP6NR	HP6	HP6	●	●	●	●		88	1.2	7	0.5 - 0.7	
Gamma stabilized ²													
	HPS1	HPS1R	HPS1	●	●	●	Not listed		88	1.2	25	0.5 - 0.7	
	HPS2	HPS2R	HPS2	●	●	●	Not listed		88	1.2	17.5	0.5 - 0.7	
	HPS4		HPS4	●	●	●	Not listed			1.19	10.5	0.5 - 0.7	
	HPS6	HPS6R	HPS6	●	●	●	Not listed		88	1.2	7	0.5 - 0.7	
	HPS7	HPS7R	HPS7	●	●	●	Not listed	●	88	1.2	5	0.5 - 0.7	
LEXAN PC SPECIALTY CLEAR RESINS													
Enhanced processing													
		HPX8R	HPX8R	●	●	●	●		82	1.19	35	0.4 - 0.8	
	HPX4		HPX4	●	●	●	●		82	1.19	10	0.4 - 0.8	
Advanced hemocompatibility; Lower protein binding ^B													
	HPM1914		HPM1914	●	●	Not tested	Not listed		77	1.19	25 (3.8 kgf)	0.6 - 0.9	
	HPM1944		HPM1944	●	●	Not tested	Not listed			1.19	10	0.6 - 0.9	
High heat autoclavability													
	HPH4404		HPH4404	●	●	●	Pending		85	1.2	6	0.6 - 0.8	
	HPH4504H		HPH4504H	●	●	●	Pending		85	1.2	3	0.7 - 0.8	
	HPH4704		HPH4704	●	●	●	Pending		85	1.2	2	0.8 - 1.0	
XENOY® PC/POLYESTER BLENDS													
		HX5600HP	HX5600HP	●	●	●	●		Opaque	1.22	11	0.7-1.1	
		HX6600HP	HX6600HP	●	●	●	●		Opaque	1.21	11	1.2-1.6	
XYLEX® PC/POLYESTER RESIN BLENDS													
	HX8300HP		HX8300HP	●	●	●	Not listed		88	1.2	15	0.5 - 0.8	
	HX7409HP		HX7409HP	●	●	● ¹	●	●	79	1.2	3	0.6 - 0.8	
CYCOLOY® PC/ABS RESIN BLENDS													
	HC1204HF		HC1204HF	●	●	●	●		Opaque	1.15	19	0.5 - 0.7	
CYCOLAC® ABS RESINS													
		HMG47MD	HMG47MD	●	●	●	●		Opaque	1.04	5.6	0.5 - 0.8	
		HMG94MD	HMG94MD	●	●	●	●		Opaque	1.04	11.7	0.5 - 0.8	
ULTEM® PEI RESINS													
	HU1000	HU1000E	HU1000	●	●	●	●	●	75	1.27	9	0.5 - 0.7	
	HU1004		HU1004	●	●	●	●	●		1.28	10	0.5 - 0.7	
	HU1110		HU1110	●	●	●	●	●		1.36	16	0.5 - 0.7	
	HU2410		HU2410	●	●	●	Not listed	●		1.61	5.2	0.1 - 0.3	
ULTEM PEI/PCE RESIN BLENDS													
		HATX200	HATX200	●	●	● ¹	Pending	●	Opaque	1.26	24	0.5 - 0.7	
NORYL® MODIFIED PPE RESIN BLENDS													
		HNA033	HNA033	●	●	●	●	●	Opaque	1.08	8.3	0.7 - 0.9	
		HNA055	HNA055	●	●	●	●	●	Opaque	1.07	7.2	0.5 - 0.8	
		HN731A	HN731A	●	●	●	●	●	Opaque	1.06	9.2 (280°C)	0.5 - 0.7	
VALOX® PBT AND/OR PET RESINS AND BLENDS													
	HX215HP		HX215HP	●	●	● ¹	●	●	Opaque	1.31	80	0.9 - 1.6	
	HX312C		HX312C	●	●	● ¹	●	●	Opaque	1.31		0.9 - 1.6	
	HX420HP		HX420HP	●	●	● ¹	●	●	Opaque	1.53	26	0.3 - 0.8	
	HX3061HP		HX3061HP	●	●	● ¹	●	●	Opaque	1.31	50	1.5 - 2.0	
	HX3091HP		HX3091HP	●	●	● ¹	●	●	Opaque	1.31	21	1.8 - 2.2	

● Yes

^B Advanced hemocompatibility and low protein binding: Lexan HPM resins demonstrate improved hemocompatibility vs standard polycarbonate across multiple biomarkers and test methods. Please contact SABIC Innovative Plastics for further information.

¹ FDA food contact with use limitations

² LEXAN HPSxS resins - highest release level
Additional footnotes listed on page 30.

Some grades/series listed below have new nomenclature according to SABIC Innovative Plastics "Healthcare Product" policy; see page 8.

MECHANICAL PROPERTIES (E)								
	Tensile stress, yld	Tensile stress, brk	Tensile strain, yld	Tensile strain, brk	Flexural modulus	Izod impact, notched, 23°C	HDT unannealed	HDT unannealed
	ASTM D 638	ASTM D 638	ASTM D 638	ASTM D 638	ASTM D 790	ASTM D 256	ASTM D 648	ASTM D 648
	MPa	MPa	%	%	MPa	J/m	°C	°C
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 6.4 mm	1.82 MPa, 6.4 mm
	63	58	6	108	2410	687		125 (3.2 mm)
	62	65	6	120	2300	640	137	126
	62	68	7	125	2130	694	137	129
	62	68	7	130	2340	801	137	132
	62	68	7	135	2340	907	137	132
	62	65	6	120	2300	640	137	126
	62	68	7	125	2130	694	137	129
	62	74	6.5	140	2400	840	138	132
	62	68	6.5	135	2340	907	137	132
	62	72	6.5	125	2340	935	142	132
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 3.2 mm	1.82 MPa, 3.2 mm
	60	58	5.8	119	2360	702		120
	58	64	5.8	131	2220	890		124
	61	64	6	129	2380	762		123
	61	69	6	138	2310	968		126
	66	70	7	>50	2200	600	148	142
	65	71		122	2020	640		143
	65	77		78	2330	373		148
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 6.4 mm	1.82 MPa, 6.4 mm
	50	52	5	150	2000	750		80
	43	35	4	150	1900	800		60
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 3.2 mm	1.82 MPa, 3.2 mm
	47	46	5	150	1680	1120	79	75
	62	65	6	110	2280	1000	122	111
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 3.2 mm	1.84 MPa, 3.2 mm
	57	45	5	150	2340	587	126	109
	Type I, 5 mm/min	Type I, 5 mm/min	Type I, 5 mm/min	Type I, 5 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 3.2 mm	1.84 MPa, 3.2 mm
	44	33	2	24	2340	320	96	82
	46	35	2	18	2620	240	95	82
	Type I, 5 mm/min	Type I, 5 mm/min	Type I, 5 mm/min	Type I, 5 mm/min	1.3 mm/min, 100 mm span		0.45 MPa, 6.4 mm	1.82 MPa, 6.4 mm
	110		7	60	3510	53	210	201
	95	90	7	85	3000	70	214	204
	110	85	7	70	3720	56		198
	186	179	2.5	2.5	11430	112		212
	96		7	70	3170	53		190
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 3.2 mm	1.84 MPa, 3.2 mm
	71	57	5.3	30	2460	192	155	140
	66	55	4.5	12.5	2450	314	163	148
	58	49	7.2	28.1	2640	213	131	117
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 6.4 mm	1.82 MPa, 6.4 mm
	51	26	3.7	300	2340	53	154	54
	51			300	2340	53	154	54
	120 (5 mm/min)	120 (5 mm/min)	3 (5 mm/min)	3 (5 mm/min)	7580	85	215	207
	58	26	3.7	140	2400	37	120	49
	56	30	3.6	300	2400	55	112	49

PERFORMANCE PROPERTIES STANDARD RESINS

Product family	Grade/series	HEALTHCARE CONSIDERATIONS (D)						PHYSICAL PROPERTIES (E)				
		STANDARDS AND REGULATORY				Food contact		Light transmission	Specific gravity	Melt flow rate	Mold shrinkage, flow, 3.2 mm	
		No bromine/no chlorine flame retardant systems used in grade (F)	RoHS compliant (H)	UL 94 flame class ratings (G)	Biocompatible supported (I) healthcare product (J)	FDA (K)	EU (K)					ASTM D 1003
%	-	g/10 min	%									
LEXAN® PC RESINS											300°C/1.2 kgf	
	925	●	●	V2-0.8mm; V0-1.1mm	■	■	■	Opaque	1.19	14	0.6 - 0.8	
	945	●	●	V2-0.8mm; V0-1.1mm	■	■	■	Opaque	1.19	10	0.6 - 0.8	
	925A	●	●	V2-0.8mm; V1-1.5mm; V0-3.0mm	■	■	■	86	1.19	13	0.6 - 0.8	
	945AU	●	●	V2-0.8mm; V0-3.0mm	■	■	■	86	1.19	10	0.6 - 0.8	
	FL3000 (Foamable)	●	●	V0-3.0mm	■	■	■	Opaque	1.19	9.5	0.9 - 1.1	
LEXAN EXL® RESINS											300°C/1.2 kgf	
	EXL1414	●	●	HB-0.7mm	■	■	■	Opaque	1.18	10	0.4 - 0.8	
	EXL9112	●	●	V0-1.5mm; 5VA-3.0mm	■	■	■	Opaque	1.18	17	0.4 - 0.8	
	EXL9330	●	●	V0-1.5mm; 5VA-3.0mm	■	■	■	Opaque	1.18	10	0.4 - 0.8	
	EXL5689	●	●	V0-1.5mm; 5VB-3.0mm	■	■	■	Opaque	1.26	9	0.2 - 0.6	
CYCOLOY® PC/ABS RESIN BLENDS											260°C/2.16 kgf	
	C1200HF	●	●	HB-1.2mm	■	■	■	Opaque	1.15	19 (260°C/5.0 kgf)	0.5 - 0.7	
	C6600	●	●	V2-0.8mm; V0-1.5mm; 5VB-2.0mm	■	■	■	Opaque	1.19	21.5	0.4 - 0.6	
	CY6010	●	●	V0-0.8mm; 5VB-1.5mm; 5VA-3.0mm	■	■	■	Opaque	1.18	34	0.4 - 0.5	
	CY6110	●	●	V0-1.2mm; 5VB-2.0mm; 5VA-2.0mm	■	■	■	Opaque	1.18	23	0.4 - 0.6	
	CY6310	●	●	V0-0.8mm; 5VB-1.5mm; 5VA-3.0mm	■	■	■	Opaque	1.16	20	0.4 - 0.6	
	CY6414	●	●	V0-1.2mm; 5VB-2.0mm; 5VA-2.0mm	■	■	■	Opaque	1.18	6	0.4 - 0.8	
	CX2244ME	●	●	V0-0.8mm; 5VB-1.5mm; 5VA-3.0mm	■	■	■	Opaque	1.19	20	0.4 - 0.6	
	CX2142ME	●	●	V0-1.2mm; 5VB-2.0mm; 5VA-2.0mm	■	■	■	Opaque	1.19	22.5	0.4 - 0.6	
	CM6210	●	●	V0-1.5mm	■	■	■	Opaque	1.28	14.6 (260°C/5.0 kgf)	0.4 - 0.6	
XENOY® PC/POLYESTER RESIN BLENDS											266°C/5.0 kgf	
	6370	●	●	HB-1.5mm	■	■	■	Opaque	1.44		0.3 - 0.4	
	6620	●	●	HB-1.5mm	■	■	■	Opaque	1.2		1.6 - 1.8	
	X3108(UV)	●	●	V0-0.8mm; 5VA-2.5mm	■	■	■	Opaque	1.34	9.3 (250°C/5.0 kgf)	1.1 - 1.2	
	X3515	●	●	V0-1.5mm; 5VA-3.0mm	■	■	■	Opaque	1.3	26.7	0.8 - 1.0	
GEOLOY® ASA RESINS											220°C/10.0 kgf	
	XTWM206	●	●		■	■	■	Opaque	1.09	8.8	0.4 - 0.7	
	HRA222	●	●	V2-0.8mm; V0-2.0mm; 5VB-2.3mm	■	■	■	Opaque			0.4 - 0.6	
CYCOLAC® ABS RESINS											230°C/3.8 kgf	
	XHMM1	●	●		■	■	■	Opaque	1.13	3 (260°C/5.0 kgf)	1.0 - 1.2	
	FR15	●	●	V0-1.5mm; 5VA-2.5mm	■	■	■	Opaque	1.2	4	0.5 - 0.7	
ULTEM® PEI RESINS											337°C/6.6 kgf	
	1010	●2	●	V0-0.8 mm; 5VA-3.0mm	■	Available	Available		1.27	17.8	0.5 - 0.7	
	2100R	●2	●	V0-0.4mm; 5VA-1.9mm	■	Available	Available		1.34	7.8	0.5 - 0.6	
	2310	●2	●	V0-0.3mm; 5VA-1.2mm	■	Available	Available		1.51	7.6	0.2 - 0.4	
	4001	●2	●	V0-0.4mm; 5VA-1.5mm	■	Available	Available		1.33	9.5	0.5 - 0.7	
NORYL® MODIFIED PPE RESIN BLENDS											300°C/5.0 kgf	
	FN215X (Foamable)	●	●	V1-3.0mm	■	■	■	Opaque	1.1		0.6 - 0.8	
	GFN2(V1)	●	●	HB-1.5mm	■	●	●	Opaque	1.2	9	0.2 - 0.5	
GTX	GTX678	●	●	V1-1.5mm; V0-2.0mm; 5VA/B-2.0mm	■	■	■	Opaque	1.12	7	1.3 - 1.5	
PPX	PPX630(S)	●	●		■	●	●	Opaque	1.19	2.6 (260°C)	0.2 - 0.23	
VALOX® PBT AND/OR PET RESINS AND BLENDS											266°C/5.0 kgf	
	365	●	●	V0-0.8mm; 5VA-2.2mm	■	■	■	Opaque	1.33		0.8 - 1.0	
	855	●	●	V0-1.5mm	■	■	■	Opaque	1.54	81	0.4 - 0.6	
	3706	●	●	V0-1.5mm; 5VA-2.5mm	■	■	■	Opaque	1.3	23	1.2 - 1.4	
	357U	●	●	V0-0.6mm; 5VA-3.0mm	■	■	■	Opaque	1.34		0.8 - 1.1	

1 GFN2V in Europe
 2 Inherent flame resistance
 N/A: Not Applicable
 Additional footnotes listed on page 30.



MECHANICAL PROPERTIES (E)

	Tensile stress, yld	Tensile stress, brk	Tensile strain, yld	Tensile strain, brk	Flexural modulus	Izod impact, notched, 23°C	HDT unannealed	HDT unannealed
	ASTM D 638	ASTM D 638	ASTM D 638	ASTM D 638	ASTM D 790	ASTM D 638	ASTM D 638	ASTM D 638
	MPa	MPa	%	%	MPa	J/m	°C	°C
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 6.4 mm	1.82 MPa, 6.4 mm
	62	65	6	125	2340	801	137	126
	62	65	6	125	2340	801	137	126
	62	67	6	125	2370	801	137	126
	62	67	6	125	2370	801	137	126
	N/A	40	N/A	3.2	1890	N/A	131	120
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 3.2 mm	1.84 MPa, 3.2 mm
	56	50	6	98	2230	865	139	124
	58	58	5.8	103	2340	731	136	124
	58	61	6	130	2060	801	134	120
	55	44	4.4	15	3500	340		135
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 3.2 mm	1.84 MPa, 3.2 mm
	57	44	5	150	2340	587	129	112
	63	48	4	80	2620	587	97	90
	63	48	4	34	2790	92		81
	63	47	4	65	2760	475		88
	63	50	4	>50	2700	600	100	88
	64	62	6	85	2330	795		118
	66	57	4.2	98	2750	690		89
	64	54	4	90	2700	600	94	84
	64	50	4.9	80	3500	500		90
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 6.4 mm	1.82 MPa, 6.4 mm
		91 (5 mm/min)		4 (5 mm/min)	5370	170	204	148
	43			175	1720	801	98	60
	52	42	6	26	2020	522		88 (3.2 mm)
	52	42	4.3	44	1860	747	123	95
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 3.2 mm	1.82 MPa, 3.2 mm
	46	37	2.7	26	2450	210	97	84
	63	56	4.3	>100		385		
	Type I, 5 mm/min	Type I, 5 mm/min	Type I, 5 mm/min	Type I, 5 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 3.2 mm	1.84 MPa, 3.2 mm
	50	35	2	30	2930	128		82
	41	35	2.3	9	2720	213	82	70
	Type I, 5 mm/min	Type I, 5 mm/min	Type I, 5 mm/min	Type I, 5 mm/min	2.6 mm/min, 100 mm span		0.45 MPa, 6.4 mm	1.82 MPa, 6.4 mm
	110		7	60	109	32	207	198
	114	115		6	5170	85	210	208
	168	158		2	9230	85		210
	103			40	3400	117		200
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 3.2 mm	1.84 MPa, 3.2 mm
	29	N/A	N/A	12	1900 (6.4 mm, 100 mm span)	N/A	89 (6.4 mm)	77 (1.82 MPa, 6.4 mm)
		90 (5 mm/min)		2.6 (5 mm/min)	5800	119	140	135
	58	52	7	12	2600	100	195	
	77	77		7.7	5550	165	155	133
	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	Type I, 50 mm/min	1.3 mm/min, 50 mm span		0.45 MPa, 6.4 mm	1.82 MPa, 6.4 mm
	41	41		120	2240	640	129	121
		89 (5 mm/min)			4820	53	204	187
	48	39	6	50	1990	667	126 (3.2 mm)	85 (3.2 mm)
	48	48		110	2060	534	137	98

PERFORMANCE PROPERTIES LNP* SPECIALTY COMPOUNDS

THE SABIC LNP SPECIALTY COMPOUNDING BUSINESS OFFERS

extensive expertise in developing engineering thermoplastic custom compounds. LNP has demonstrated proven functionality across a diverse range of capabilities. A key area of functionality includes high performance, very high modulus, long fiber reinforced thermoplastics (LFRT). Other capabilities include radio-opaque, x-ray shielding, low wear/low COF (co-efficient of friction) and internally reinforced materials, to name a few. LNP compounds are offered for >20 different base resins.

LNP COLORCOMP* COMPOUNDS

LNP Colorcomp pre-colored unfilled resins offer the ability to combine a broad range of thermoplastic resins with pigments for critical color matches, fast service and small lots. Minimum lot sizes range from 110 lb - 4400 lb order sizes. Critical color matches may be available in 10 days for approval. Finally, fast order lead times at 15 business days, may offer flexibility and speed to our customers.

LNP THERMOCOMP* INTERNALLY REINFORCED COMPOUNDS

LNP Thermocomp materials represent a range of capabilities to reinforce resins and offer the potential for improved strength, stiffness or dimensional stability and x-ray shielding without the use of toxic lead. This family of products offers materials tailored for specialized mechanical and temperature performance, fatigue and creep resistance and also exceptional processing (EP) for thin-wall requirements. Depending on application requirements, LNP Thermocomp may also provide melt processable fluoropolymer compounds, and may facilitate chemical resistance or High Specific Gravity (HSG) options for custom weight and feel. LNP Thermotuf* compounds support the need for exceptional balance of strength and toughness.

			STANDARDS AND REGULATORY	PHYSICAL PROPERTIES (E)			
LNP THERMOCOMP INTERNALLY REINFORCED COMPOUNDS Grades listed demonstrate 30% loading of fiber additive.				Light transmission ASTM D 1003 %	Specific gravity ASTM D 792 -	Melt volume rate ASTM D 1238 cc/10 min	Mold shrinkage ASTM D955 %
GRADE/ SERIES	BASE RESIN	FIBER TYPE		FLOW, 3.2 MM			
AFO01	ABS	glass	Solutions for RoHS (H) compliant; no bromine/no chlorine flame-retardant systems (F); and healthcare considerations may be offered. Due to the specialization of our Speciality Compounding grades, please review specific healthcare standards and/or regulatory requirements with a SABIC Innovative Plastics representative.	N/A	1.28	4 (230C/3.8kg)	.002
DF006ER	PC	glass		N/A	1.42	25 (300C/2.16kg)	.001
ECO06	PEI	carbon		N/A	1.38	4.5 (345C/10kg)	.001 - .003
EF006	PEI	glass		N/A	1.52	11 (345C/10kg)	.002
GFO06	PSU	glass		N/A	1.48	15 (345C/10kg)	.002
HF1006	PA 11	glass		N/A	1.26	12 (235C/3.8kg)	.001
IF006	PA 6/12	glass		N/A	1.32	17 (235C/2.16kg)	.001 - .002
JFO06	PES	glass		N/A	1.58	11 (340C/5kg)	.003
KFO06	POM	glass		N/A	1.62	16 (190C/10kg)	.005
LCO06	PEEK	carbon		N/A	1.41	7.5 (400C/10kg)	.001
LF006	PEEK	glass		N/A	1.53	7.5 (400C/10kg)	
OFO06	PPS	glass		N/A	1.58	14 (315C/2.16kg)	.001 - .003
PF006	PA 6	glass		N/A	1.36	19 (235C/10kg)	.002
QFO06	PA 6/10	glass		N/A	1.30	15 (235C/10kg)	.002
RCO06	PA 6/6	carbon		N/A	1.27	15 (275C/5kg)	.002
RF006	PA 6/6	glass		N/A	1.40	18 (275C/6.7kg)	.004
SFO06	PA 12	glass		N/A	1.24	14 (235C/2.16kg)	.002 - .003
WFO06	PBT	glass		N/A	1.55	16 (250C/2.16kg)	.003

LNP LUBRICOMP* AND LUBRILLOY* INTERNALLY LUBRICATED COMPOUNDS

LNP Lubricomp compounds offer inherent lubricity by combining engineering resins with PTFE, silicone, aramid fiber or other fillers. These materials are utilized to help increase wear resistance, reduce COF (coefficient of friction) and reduce slip-stick effects of plastic parts moving over other surfaces, whether it's plastic-on-metal wear or plastic-on-plastic wear. They may also limit the need for external/topical lubricants. Options to include glass fibers for improved strength, rigidity and dimensional stability are also available. LNP Lubrilloy compounds offer PTFE- and silicone-free solutions.

				STANDARDS AND REGULATORY	PHYSICAL PROPERTIES (E)			
LNP Lubricomp and Lubrilloy internally lubricated compounds Grades listed demonstrate 30% fiber weight loading where fiber type is noted, and 15% lubricant weight loading.					Light transmission ASTM D 1003 %	Specific gravity ASTM D 792 -	Melt volume rate ASTM D 1238 cc/10 min	Mold shrinkage ASTM D955 %
GRADE/ SERIES	BASE RESIN	FIBER TYPE	LUBRICANT TYPE		FLOW, 3.2 MM			
ABL12 ¹	ABS	glass	PTFE	Solutions for RoHS (H) compliant; no bromine/no chlorine flame-retardant systems (C); and healthcare considerations may be offered. Due to the specialization of our Speciality Compounding grades, please review specific healthcare standards and/or regulatory requirements with a SABIC Innovative Plastics representative.	N/A	1.14		
ALO03	ABS		PTFE		N/A	1.13	18 (230C/6.7kg)	.006 - .008
DCL36	PC	carbon	PTFE		N/A	1.43	12 (300C/6.7kg)	.001
DFL36	PC	glass	PTFE		N/A	1.58	11 (300C/3.8kg)	.001 - .002
DL003	PC		PTFE		N/A	1.28	14 (300C/3.8kg)	.008 - .009
ECL36	PEI	carbon	PTFE		N/A	1.48	6 (345C/10kg)	.000
EFL36	PEI	glass	PTFE		N/A	1.62	12 (345C/10kg)	.002
EL003	PEI		PTFE		N/A	1.35	11 (345C/6.7kg)	.008 - .010
EX03599 ¹	PEI		PFPE		N/A	1.28		
EX03647H ¹	PEI	carbon	PFPE		N/A	1.39		
JFL36	PES	glass	PTFE		N/A	1.70	13 (345C/10kg)	.001 - .004
OCL36	PPS	carbon	PTFE		N/A	1.52	13 (315C/5kg)	.001
OFL36	PPS	glass	PTFE		N/A	1.69	24 (315C/5kg)	.001 - .002
QFL36	PA 6/10	glass	PTFE		N/A	1.46	19 (235C/5kg)	.002
RCL36S	PA 6/6	carbon	PTFE		N/A	1.38	9 (275C/6.7kg)	.001
RFL36	PA 6/6	glass	PTFE		N/A	1.51	19 (275C/10kg)	.003
RL004S	PA 6/6		PTFE		N/A	1.27	16 (275C/1.2kg)	.019 - .033
WFL36	PBT	glass	PTFE		N/A	1.68	15 (250C/3.8kg)	.001 - .003
ZFL36CCX	PPO	glass	PTFE		N/A	1.43	6 (280C/10kg)	.003

¹ Fiber and lubricant weight loading differ from 30% / 15% as noted above.

N/A: Not applicable
Blank cells: not tested

Additional footnotes listed on page 30.

LNP STAT-KON* AND STAT-LOY* ELECTRICALLY ACTIVE COMPOUNDS

LNP Stat-Kon compounds are made by compounding base resins with electrically conductive fillers or reinforcing agents, producing conductive and dissipative materials in the 10² to 10⁸ ohms/sq. resistivity range. In addition to protecting parts and components against static build-up and ESD electrostatic discharge events, this line of materials offers a range of mechanical, physical and thermal properties depending on the base resin selected.

LNP Stat-Loy alloy compounds combine an insulative base resin with an inherently conductive polymer to provide permanent anti-static performance. Stat-Loy compounds are non-sloughing and colorable. These compounds offer cost-effective solutions when products for anti-stat applications are required.

LNP FARADEX* CONDUCTIVE EMI/RFI ATTENUATION COMPOUNDS

LNP Faradex compounds provide electromagnetic and radio frequency interference (EMI/RFI) attenuation in applications from electronics to material handling. Conductive fibers form the conductive network required for EMI/RFI shielding. Faradex compounds can also be used in applications where ESD protection is required. These compounds provide mechanical properties, part weight and a design freedom similar to standard unfilled base resins. They help to avoid costly secondary steps, offering the potential for total system cost reduction.

MECHANICAL PROPERTIES (E)						
Tensile stress, yld ASTM D 638 MPa	Tensile stress, brk ASTM D 638 MPa	Tensile strain, yld ASTM D 638 %	Tensile strain, brk ASTM D 638 %	Flexural modulus ASTM D 790 MPa	Izod impact, notched ASTM D 256 J/m	HDT unannealed ASTM D 648 °C
TYPE I, 50 MM/MIN	TYPE I, 50 MM/MIN	TYPE I, 50 MM/MIN	TYPE I, 50 MM/MIN	1.3 MM/MIN, 50 MM SPAN	23°C	1.82 MPA, 6.4 MM
55	55		1.8	9170	58.7	102
132	132	2.7	2.7	8760	108	137
197	197	1.3	1.3	18200	42.7	218
188	188	2.4	2.4	11400	97	204
104	104	2.0	2.0	8270	74	181
134	134	5.3	6.2	6210	256	178
182	182	3.7	3.7	9310	139	198
143	143	2.2	2.2	9720	108	210
132	148	4.3	2.8	10300	85.4	162
225	225	1.4	1.5	20200	74.7	299
176	176	2.0	1.9	10800	117	299
145	130		1.2	11300	69.4	268
130	130	2.6	2.8	6960	117	206
150	150	3.6	3.6	7860	123	207
266	266	1.7	1.7	18800	96.1	262
165	165	2.4	2.4	9450	58.7	255
107	106	4.2	4.7	5860	149	164
137	137	2.9	2.9	9360	90.7	207

MECHANICAL PROPERTIES (E)							WEAR PROPERTIES	
Tensile stress, yld ASTM D 638 MPa	Tensile stress, brk ASTM D 638 MPa	Tensile strain, yld ASTM D 638 %	Tensile strain, brk ASTM D 638 %	Flexural modulus ASTM D 790 MPa	Izod Impact, notched ASTM D 256 J/m	HDT unannealed ASTM D 648 °C	Wear factor LNP WI-0687 10 ⁻¹⁰ in ³ -min/ft-lb-hr	COF static/ dynamic LNP WI-0687
TYPE I, 50 MM/MIN	TYPE I, 50 MM/MIN	TYPE I, 50 MM/MIN	TYPE I, 50 MM/MIN	1.3 MM/MIN, 50 MM SPAN	23°C	1.82 MPA, 6.4 MM	40 PSI, 50 FPM THRUST WASHER TEST	40 PSI, 50 FPM THRUST WASHER TEST
35.3			20.3	2401	84	79	125	0.39/0.44
35.9	35.9	2.3	15	2060	58.7		101	0.11/0.22
168	159	1.7	1.7	17900	123	146	38	0.34/0.43
117	117	2.5	2.5	9310	171	141	22	0.41/0.46
51.7	47.6	6.1	38	2190	272	128	36	0.12/0.25
163	179	1.7	1.7	19200	42.7		31	0.48/0.39
160	175	2	2.0	11300	123	202	35	0.43/0.46
88.3	84.8	6.5	10	2900	69.4	182	106	0.23/0.30
					41		PV failure	0.45/0.44
					67		30	0.68/0.49
	93.8	1.5	1.5	10300	85.4	208	60	0.36/0.46
177	168	1.4	1.4	21100	58.7	267	19	0.34/0.39
145	145	1.7	1.7	11000	85.4	269	33	0.35/0.44
149	149	2.6	2.6	8480	117	216	15	0.52/0.71
225	182	.9	.9	18400	101	255	15	0.30/0.36
139	139	2.1	2.1	9750	107	249	30	0.46/0.59
62.7	62.7	5.4	6.2	2280	42.7	70	16	0.11/0.23
117	117	2.3	2.3	10200	96.1	218	42	0.41/0.57
N/A	110	1.7	1.7	10000	123	124	45	0.46/0.50

FOOTNOTES TO PRODUCT CHARTS PP1 1, 24-29

- A Biocompatibility: material evaluated based on ISO 10993 or USP Class VI protocol; supporting information available by Type I or Type II letter. Reference footnote I below.
- B Advanced hemocompatibility and low protein binding: Lexan HPM resins demonstrate improved hemocompatibility vs standard polycarbonate across multiple biomarkers and test methods. Please contact SABIC Innovative Plastics for further information.
- C Implant policy: SABIC Innovative Plastics does not support applications that remain implanted beyond 29 days.
- D Healthcare Considerations: The material may offer capability of attribute shown; please consult with a SABIC Innovative Plastics representative for additional information.
- E Physical and Mechanical Properties: Information presented in parenthesis () after data indicates that different test conditions were applied.
- F No bromine, no chlorine flame-retardant systems used in grade formulation; however, final product assessment must include colorants (grade-color combination).
- G UL 94 Flame class rating: Representative information from UL Yellow Card provided; see UL (www.ul.com) for full Yellow Card data set.
- H RoHS compliant: Grade listed conforms to EU Directive 2002/95/EC Restriction of Hazardous Substances (RoHS); final assessment must include colorants (grade-color combination).
- I Biocompatibility: A representative lot of material evaluated based on ISO 10993 or USP VI protocol. Biocompatibility information available via Type I or Type II letter. Type I Letter: Issued for products that have been specifically tested for biocompatibility. Type II Letter: Issued when specific product has not been tested but similar products have been tested for biocompatibility.
- SABIC Innovative Plastics does not knowingly support the use of grades not designated as "biocompatible supported" in healthcare applications requiring biocompatibility.
- J The SABIC Innovative Plastics "Healthcare product" policy
- Easily identifiable "healthcare product" nomenclature
 - Cyclocac* HM resins
 - Cycloy* HC resins
 - Lexan* HP resins
 - Noryl* HN resins
 - Ultem* HU and HA resins
 - Valox* HX resins
 - Xenoy* HX resins
 - Xylex* HX resins
 - Biocompatibility assessed (according to ISO 10993 or USP Class VI)
 - Food contact compliance for most "healthcare products"
 - FDA Drug Master File and/or Device Master File listing (Letter of Authorization provided as needed)
 - SABIC Innovative Plastics "healthcare products" are subject to formula lock and stringent management of change process (ask your SABIC Innovative Plastics representative for more details)
- K Food Contact: Food contact status may be contingent on the color package used in combination with the base resin.
- L Steam sterilization: Though steam autoclave testing has been conducted, performance may vary by exact temperature, time and conditions of exposure. Design of device also influences duration of materials' ductility in use.



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