

Purell resins: safety, consistency, reliability

At LyondellBasell, we take your needs for product safety, consistency and reliability very seriously





We care – We listen – We respond

Benefits characterizing the *Purell* brand

- Compliance with pharmacopoeia regulations
- Long-term consistency of formulation
- Global production sites, global supply
- Excellent standards of production and logistic processes
- Effective risk management tools
- Experienced sales and technical support teams
- Access to innovative products developed in various Centers of Excellence across the globe



For more information, contact LyondellBasell's healthcare product group at medical@lyondellbasell.com

PE selection guide

This overview provides basic technical information about *Purell* polyethylene resins and their typical customer applications. For detailed information, please contact your technical service representative as indicated on the last page of this brochure.

| Properties | Physical | | Mechanical/Thermal | | Conversion Technology | | | Further description and typical applications |
|--|----------------|-------------------|--------------------|-------------------|-----------------------|-----|-----|--|
| | MFR (190/2.16) | Density | Tensile Modulus | DSC-Melting Point | | | | |
| Method | ISO 1133 | ISO 1183 | ISO 527 | ISO 3146 | | | | |
| Unit | g/10min | g/cm ³ | MPa | °C | IM | BM | FLM | |
| Low Density Polyethylene (LDPE) | | | | | | | | |
| <i>Purell</i> PE1810E | 0.4 | 0.920 | 200 | 108 | (X) | X | (X) | Good flexibility; used in pharmaceutical packaging, closures and seals |
| <i>Purell</i> PE1840H | 1.5 | 0.919 | 200 | 108 | (X) | X | (X) | Good flexibility; used in pharmaceutical packaging, closures and seals |
| <i>Purell</i> PE2420F | 0.75 | 0.923 | 260 | 111 | | (X) | X | Good flexibility; used in films for primary and secondary medical and pharmaceutical packaging |
| <i>Purell</i> PE3020H | 2.0 | 0.927 | 300 | 114 | | (X) | X | High rigidity, good opticals and good resistance to chemicals; used in films for primary and secondary medical and pharmaceutical packaging |
| <i>Purell</i> PE3020D | 0.3 | 0.927 | 300 | 114 | (X) | X | (X) | High rigidity, good opticals and good resistance to chemicals; used in pharmaceutical packaging, closures and seals |
| <i>Purell</i> PE3040D | 0.25 | 0.928 | 300 | 115 | (X) | X | (X) | High rigidity, good opticals and good resistance to chemicals; used in pharmaceutical packaging, closures and seals |
| <i>Purell</i> PE3220D | 0.4 | 0.930 | 430 | 117 | (X) | X | (X) | High rigidity, good opticals and good resistance to chemicals; improved temperature resistance; used in pharmaceutical packaging, closures and seals |
| <i>Purell</i> 33AC | 0.3 | 0.922 | 220 | 110 | X | | | High ESCR, good optical quality, good sealability; used in tube bodies |
| <i>Purell</i> 2007H | 1.5 | 0.920 | 200 | 108 | X | | (X) | Very Soft PE with antiblock additives; used in closures |
| <i>Purell</i> 2410T | 36 | 0.924 | 280 | 112 | X | | | Fast cycles; used in closures and seals |

| Properties | Physical | | Mechanical/Chemical | | Conversion Technology | | | Further description and typical applications |
|---|----------------|-------------------|---------------------|--|-----------------------|----|-----|--|
| | MFR (190/2.16) | Density | Tensile Modulus | Stress Crack Resistance (FNCT: 80°C; 2% Igepal BC/9) | | | | |
| Method | ISO 1133 | ISO 1183 | ISO 527 | ISO 16770 | | | | |
| Unit | g/10min | g/cm ³ | MPa | h | IM | BM | FLM | |
| High Density Polyethylene (HDPE) | | | | | | | | |
| <i>Purell</i> PE GF4750 | 0.4 | 0.950 | 1000 | 15 (3.5MPa) | (X) | X | | High ESCR; also used in the IBM process; used in pharmaceutical and diagnostics packaging, closures, seals and tube bodies |
| <i>Purell</i> ACP5231D | 0.3 | 0.952 | 1100 | 30 (3.5MPa) | (X) | X | | High ESCR combined with good rigidity; used in the IBM process; used in pharmaceutical and diagnostics packaging, closures, seals and tube bodies |
| <i>Purell</i> PE GF4760 | 0.4 | 0.956 | 1250 | 5 (3.5MPa) | (X) | X | | High rigidity; also used in the IBM process; used in pharmaceutical packaging, closures and seals |
| <i>Purell</i> ACP6031D | 0.3 | 0.960 | 1400 | 7 (3.5MPa) | (X) | X | | Very High rigidity combined with good ESCR; very good barrier properties and organoleptics; also used in the IBM process; used in pharmaceutical packaging, closures and seals in pharmaceutical packaging, closures and seals |
| <i>Purell</i> ACP6541A | 1.5 | 0.954 | 1100 | 30 (2.5 MPa) | X | | | High ESCR, good flowability (comparable to an MFR 15 grade), low warpage; used in closures, seals, tube shoulders |
| <i>Purell</i> GB7250 | 10 | 0.952 | 1000 | 2 (2.5 MPa) | X | | | High ESCR, good flowability, low warpage; used in closures, seals, tube shoulders |
| <i>Purell</i> GC7260 | 8 | 0.960 | 1350 | 1.5 (2.5 MPa) | X | | | High rigidity, good flowability, low warpage; used in closures, seals, syringe plungers |
| <i>Purell</i> GA7760 | 18 | 0.963 | 1350 | 1 (2.5 MPa) | X | | | High fluidity combined with very high stiffness; used in distortion-free moldings, such as syringe plungers |

Remark:

BM = Blow Molding IM = Injection Molding FLM = Film Extrusion IBM = Injection Blow Molding ISBM = Injection Stretch Blow Molding
 () mean that it is a conversion technology also used by customers but not the main one

PP selection guide

This overview provides basic technical information about *Purell* polypropylene resins and their typical customer applications. For detailed information, please contact your technical service representative as indicated on the last page of this brochure.

| Properties | Physical | Mechanical/Thermal | | Conversion Technology | | | Further description and typical applications |
|--|----------------|--------------------|---------------------------------------|-----------------------|-----|-----|---|
| | MFR (230/2.16) | Tensile Modulus | Vicat Softening Temperature (VST/A50) | IM | BM | FLM | |
| Method | ISO1133 | ISO527 | ISO 306 | | | | |
| Unit | g/10min | MPa | °C | | | | |
| Homopolymers (HOMO-PP) | | | | | | | |
| <i>Purell</i> HP570M | 7.5 | 1400 | 152 | X | (X) | | Good stiffness and impact resistance; used in medical applications and healthcare products such as containers, closures and diagnostics equipment |
| <i>Purell</i> HP371P | 18 | 1250 | 150 | X | | | Very good transparency combined with good impact resistance and stiffness; gamma-ray sterilisable; used in empty 3-part-syringes |
| <i>Purell</i> HP570R | 23 | 1500 | 153 | X | | | High flow and high stiffness; used in 3 part syringes, diagnostics applications, containers and drug delivery systems. |
| <i>Purell</i> HM671T | 60 | 1700 | 135 | X | | | Excellent flowability and very high stiffness, low warpage, high clarity, gamma-ray sterilisable; used in diagnostics applications |
| <i>Purell</i> HP570U | 75 | 1550 | 154 | X | | | High flow and high stiffness; used in diagnostics applications and other thin wall injection moulding that need to be free from antistatic agent. |
| Heterophasic Copolymers (HECO-PP) | | | | | | | |
| <i>Purell</i> EP274P | 15 | 1000 | 142 | X | | | Excellent balance of stiffness and low-temperature impact resistance; used in medical applications and healthcare products |
| Random Copolymers (RACO-PP) | | | | | | | |
| <i>Purell</i> RP271G | 1.8 | 950 | 134 | (X) | X | (X) | Good impact strength, clarity and resistance to chemicals; used in extrusion blow moulding and ISBM for pharmaceutical applications |
| <i>Purell</i> RP270M | 8 | 1100 | 132 | X | | (X) | Good impact strength, clarity and resistance to chemicals; used in ISBM for pharmaceutical applications |
| <i>Purell</i> RP373R | 25 | 950 | 130 | X | | | High transparency; used in empty disposable 2-part-syringes |
| <i>Purell</i> RP374R | 25 | 950 | 130 | X | | | High transparency; used in empty disposable 3-part-syringes |
| <i>Purell</i> RP378T | 48 | 1150 | 130 | X | | | High transparency, flowability and gloss; low warpage; used in medical applications and healthcare products, e.g. inhalers and diagnostic devices |

Remark:

BM = Blow Molding IM = Injection Molding FLM = Film Extrusion IBM = Injection Blow Molding ISBM = Injection Stretch Blow Molding
 () mean that it is a conversion technology also used by customers but not the main one



Purell resins used in healthcare applications

Cutting-edge products – Keeping pace with regulatory requirements

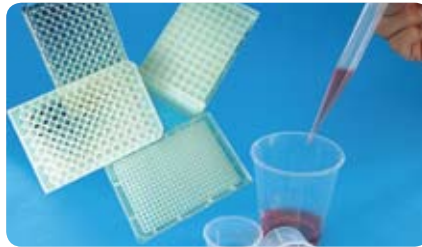
Expertise

Knowledge Exchange

Consistent Formulation

DMF Listing

Leading Technology



Expertise

Serving the healthcare industry for more than 15 years – **Profit from our experience!**

Knowledge Exchange

We support regular customer pharmaceutical audits, which provide a forum for learning and idea exchange – **Explore new opportunities with us!**

Consistent Formulation

With our knowledge of regulatory restrictions, we understand that product consistency is essential – **Count on us!**

DMF Listing

Purell resins are listed in Drug Master Files (DMF) with the U.S. Food and Drug Administration (FDA) – **Benefit from convenience and reliability!**

Leading Technology

Purell grades are produced using world-class PE and PP production technologies, based on the latest innovations by the global polyolefins leader – **Utilize industry-defining materials!**

Purell grades are available based on multiple PP and PE technologies

Purell Polypropylene

Purell Polyethylene

Purell Metocene PP

Purell Polypropylene

PP Homo, Heco, Raco

- Reduced cycle times for high productivity
- Potential for weight reduction
- Minimum warpage and wider design latitude
- Good impact resistance at low temperatures
- Excellent transparency and gloss
- Outstanding stiffness/impact balance
- Sterilizable (autoclave, hot steam, ETO, gamma, E-beam)
- High melt fluidity for extreme thin-wall injection molding

Purell Polyethylene

HDPE, LDPE

- LDPE grades for certain steam sterilisation processes
- Additive-free LDPE grades offering high degree of purity
- HDPE grades with excellent balance of stiffness and stress cracking resistance
- Used in Blow Fill Seal (BFS) processing
- Long-term market applications
- Broad processing window

Purell Metocene PP

- Unique balance of clarity, impact and stiffness
- Excellent aesthetics of final product
- Increased productivity (faster processing)

LyondellBasell Industries

Worldwide Headquarters

Groot Handelsgebouw
Weena 737
3013 AM Rotterdam
The Netherlands
Tel: +31 10 275 5500

Asia-Pacific

CHINA

Beijing Branch
Room 1108, West Tower, Twin Tower,
B-12 Jianguomenwai Avenue,
Chaoyang District,
Beijing 100022, China
Tel: + 86 10 8515 6888
Fax: + 86 10 8515 6899

Guangzhou Branch
Rm 2608 Peaceworld Plaza,
362-366 Huan Shi Road East,
Guangzhou 510060, China
Tel: + 86 20 2883 9000
Fax: + 86 80 2883 9099

Shanghai Branch
Rm 2208, The Centre,
No.989 Chang Le Road,
Shanghai 200031, China
Tel: + 86 21 6121 0288
Fax: + 86 21 6121 0188

Asia Pacific Regional Headquarters
12/F Caroline Centre
Lee Gardens Two, 28 Yun Ping Road
Causeway Bay, Hong Kong
Tel: + 852 2577 3855
Fax: + 852 2895 0905

INDIA

303/305, Delphi,
'B' Wing, Hiranandani Business Park,
Powai
Mumbai 400 076
India
Tel: + 91 22 6706 1111
Fax: + 91 22 6706 1100

INDONESIA

S Widjojo Centre 8th Floor
Jalan Jenderal Sudirman Kav 71
Jakarta 12190, Indonesia
Tel: + 62 21 252 4111
Fax: + 62 21 252 4112

MALAYSIA

2 Jalan U8/87 Seksyen U8
Bukit Jelutong, 40706 Shah Alam
Selangor Darul Ehsan Malaysia
Tel: + 60 3 5628 3991
Fax: + 60 3 7845 0468

THE PHILIPPINES

Unit 2004 Jollibee Plaza Bldg.
F. Ortigas, Jr. Road (formerly Emerald Ave.)
Ortigas Center, Pasig City 1605
The Philippines
Tel: + 63 2 631 4110 ext. 101
Fax: + 63 2 631 4110 ext. 105

VIETNAM

Central Plaza Office Building
Unit 902, 17 Le Duan Boulevard,
District 1
Ho Chi Min City
Vietnam
Tel: + 84 8 8235502 - 3
Fax: + 84 8 8241638

Africa and Middle-East

U.A.E.

Office 619, Building E6, Block A
Dubai Airport Free Zone (DAFZA)
Dubai, U.A.E.
Tel: +971 4 2045 970
Fax: +971 4 2045 969

EGYPT

Representative Office
18, Mostafa Refaat St.
Square 1138, Sheraton Bldgs.
Heliopolis
Cairo
Egypt
Tel.: + 20 2 267 1047/8
Fax: + 20 2 267 1049

Before using a LyondellBasell product, customers and other users should make their own independent determination that the product is suitable for the intended use. They should also ensure that they can use the LyondellBasell product safely and legally. (Material Safety Data Sheets are available from LyondellBasell at www.lyondellbasell.com) This document does not constitute a warranty, express or implied, including a warranty of merchantability or fitness for a particular purpose. No one is authorized to make such warranties or assume any liabilities on behalf of LyondellBasell except in writing signed by an authorized LyondellBasell employee. Unless otherwise agreed in writing, the exclusive remedy for all claims is replacement of the product or refund of the purchase price at LyondellBasell's option, and in no event shall LyondellBasell be liable for special, consequential, punitive, or exemplary damages.

Purell is a trademark owned or used by LyondellBasell group companies.

