

# Alathon® M4612

High Density Polyethylene Copolymer  
LyondellBasell Industries

## Message:

ALATHON M 4612 is a copolymer that provides outstanding stress crack resistance and low temperature impact strength. Typical applications include food containers, seat hinges, tube headers and parts requiring high ESCR.

| General Information                       |                                   |                   |                 |
|-------------------------------------------|-----------------------------------|-------------------|-----------------|
| Features                                  | Copolymer                         |                   |                 |
|                                           | Food Contact Acceptable           |                   |                 |
|                                           | High ESCR (Stress Crack Resist.)  |                   |                 |
|                                           | Low Temperature Impact Resistance |                   |                 |
| Uses                                      | Containers                        |                   |                 |
|                                           | Food Containers                   |                   |                 |
| Agency Ratings                            | FDA 21 CFR 177.1520               |                   |                 |
| Forms                                     | Pellets                           |                   |                 |
| Processing Method                         | Injection Molding                 |                   |                 |
| Physical                                  | Nominal Value                     | Unit              | Test Method     |
| Density                                   | 0.946                             | g/cm <sup>3</sup> | ASTM D1505      |
| Apparent Density                          | 0.59 to 0.63                      | g/cm <sup>3</sup> | ASTM D1895      |
| Melt Mass-Flow Rate (MFR) (190°C/2.16 kg) | 1.2                               | g/10 min          | ASTM D1238      |
| Spiral Flow                               | 19.6                              | cm                | Internal Method |
| Environmental Stress-Cracking Resistance  |                                   |                   | ASTM D1693      |
| 10% Igepal                                | 33.6                              | hr                |                 |
| 100% Igepal                               | 552                               | hr                |                 |
| Mechanical                                | Nominal Value                     | Unit              | Test Method     |
| Tensile Modulus <sup>1</sup>              |                                   |                   | ASTM D638       |
| --                                        | 807                               | MPa               |                 |
| 1% Secant                                 | 636                               | MPa               |                 |
| Tensile Strength <sup>2</sup>             |                                   |                   | ASTM D638       |
| Yield                                     | 23.1                              | MPa               |                 |
| Break                                     | 23.9                              | MPa               |                 |
| Tensile Elongation <sup>3</sup>           |                                   |                   | ASTM D638       |
| Yield                                     | 12                                | %                 |                 |
| Break                                     | 550                               | %                 |                 |
| Flexural Modulus <sup>4</sup>             |                                   |                   | ASTM D790       |
| --                                        | 1010                              | MPa               |                 |
| 1% Secant                                 | 931                               | MPa               |                 |

| 2% Secant                                                | 772                | MPa  |             |
|----------------------------------------------------------|--------------------|------|-------------|
| Impact                                                   | Nominal Value      | Unit | Test Method |
| Notched Izod Impact (23°C)                               | 75                 | J/m  | ASTM D256   |
| Unnotched Izod Impact (-18°C)                            | No Break           |      | ASTM D4812  |
| Thermal                                                  | Nominal Value      | Unit | Test Method |
| Deflection Temperature Under Load (0.45 MPa, Unannealed) | 62.0               | °C   | ASTM D648   |
| Brittleness Temperature                                  | < -76.0            | °C   | ASTM D746   |
| Vicat Softening Temperature                              | 124                | °C   | ASTM D1525  |
| Peak Melting Temperature                                 | 128                | °C   | ASTM D3418  |
| Peak Crystallization Temperature (DSC)                   | 113                | °C   | ASTM D3418  |
| Injection                                                | Nominal Value      | Unit |             |
| Rear Temperature                                         | 232                | °C   |             |
| Middle Temperature                                       | 243                | °C   |             |
| Front Temperature                                        | 246                | °C   |             |
| Nozzle Temperature                                       | 246                | °C   |             |
| NOTE                                                     |                    |      |             |
| 1.                                                       | Type I, 50 mm/min  |      |             |
| 2.                                                       | Type IV, 50 mm/min |      |             |
| 3.                                                       | Type IV, 50 mm/min |      |             |
| 4.                                                       | 13 mm/min          |      |             |

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