

# HANWHA LLDPE 3322

Linear Low Density Polyethylene

Hanwha Chemical

## Message:

HANWHA LLDPE 3322 is manufactured by Spherilene process and designed for heavy duty film. LLDPE 3322 has well balanced property of mechanical property and processability.

| General Information |                             |  |  |
|---------------------|-----------------------------|--|--|
| Additive            | Anti-caking agent           |  |  |
|                     | Antioxidation               |  |  |
| Features            | Anti-caking property        |  |  |
|                     | Antioxidation               |  |  |
|                     | Workability, good           |  |  |
| Uses                | Films                       |  |  |
| Agency Ratings      | FDA 21 CFR 177.1520(c) 3.1a |  |  |
| Forms               | Particle                    |  |  |
| Processing Method   | Film extrusion              |  |  |
|                     | Blow film                   |  |  |

| Physical                                  | Nominal Value | Unit              | Test Method |
|-------------------------------------------|---------------|-------------------|-------------|
| Density                                   | 0.917         | g/cm <sup>3</sup> | ASTM D1505  |
| Melt Mass-Flow Rate (MFR) (190°C/2.16 kg) | 0.90          | g/10 min          | ASTM D1238  |

| Mechanical                 | Nominal Value | Unit | Test Method |
|----------------------------|---------------|------|-------------|
| Tensile Strength (Break)   | 20.6          | MPa  | ASTM D638   |
| Tensile Elongation (Break) | 930           | %    | ASTM D638   |

| Films                     | Nominal Value | Unit | Test Method |
|---------------------------|---------------|------|-------------|
| Film Thickness - Tested   | 190           | μm   |             |
| Tensile Strength          |               |      | ASTM D882   |
| MD: Fracture, 190 μm      | 43.1          | MPa  | ASTM D882   |
| TD: Fracture, 190 μm      | 35.3          | MPa  | ASTM D882   |
| Tensile Elongation        |               |      | ASTM D882   |
| MD: Fracture, 190 μm      | 500           | %    | ASTM D882   |
| TD: Fracture, 190 μm      | 700           | %    | ASTM D882   |
| Dart Drop Impact (190 μm) | > 500         | g    | ASTM D1709  |
| Tensile Tear Strength     |               |      | ASTM D1004  |
| MD : 190.0 μm             | 127.5         | kN/m | ASTM D1004  |
| TD : 190.0 μm             | 112.8         | kN/m | ASTM D1004  |

| Thermal | Nominal Value | Unit | Test Method |
|---------|---------------|------|-------------|
|---------|---------------|------|-------------|

|                             |               |      |                 |
|-----------------------------|---------------|------|-----------------|
| Brittleness Temperature     | < -76.0       | °C   | ASTM D746       |
| Vicat Softening Temperature | 99.0          | °C   | ASTM D1525      |
| Peak Melting Temperature    | 123           | °C   | Internal method |
| Optical                     | Nominal Value | Unit | Test Method     |
| Haze (190 μm)               | 8.0           | %    | ASTM D1003      |
| Extrusion                   | Nominal Value | Unit |                 |
| Melt Temperature            | 150 - 190     | °C   |                 |
| Extrusion instructions      |               |      |                 |

Blow-up Ratio: 2 to 3 Optimum Gage Range: 0.03 to 0.2 mm

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