# CERTENE™ PHO-2

#### Polypropylene Homopolymer

#### Muehlstein

#### Message:

PHO-2 is a certified prime grade Polypropylene designed for high speed cast-extrusion of high clarity Biaxially Oriented films. PHO-2 combines very good processability and thermal stability with excellent cleanness, homogeneity and stability of melt minimizing potential film thickness variations and die "plate-out". PHO-2 films exhibit outstanding opticals, excellent balance of mechanical properties, good stiffness, high barrier to fats and oils, and good chemical resistance. PHO-2 applications include films for high quality textile packaging: shirts, blankets and hosiery, packaging of bakery products and snacks, and heat sterilization packaging. PHO-2 complies with FDA regulation 21CRF 177.1520 and most international regulations concerning the use of Polypropylene in contact with food.

| General Information  |                             |          |             |  |  |
|--|-----------------------------|----------|-------------|--|--|
| Features   | Rigid, good                 |          |             |  |  |
|  | Optical                     |          |             |  |  |
|  | High melt stability         |          |             |  |  |
|  | Homopolymer                 |          |             |  |  |
|  | Workability, good           |          |             |  |  |
|  | Good chemical resistance    |          |             |  |  |
|  | Oil resistance              |          |             |  |  |
|  | Definition, high            |          |             |  |  |
|  | Thermal stability, good     |          |             |  |  |
|  | Compliance of Food Exposure |          |             |  |  |
|  | Barrier resin               |          |             |  |  |
|  |                             |          |             |  |  |
| Uses   | Food packaging              |          |             |  |  |
| Agency Ratings   | FDA 21 CFR 177.1520         |          |             |  |  |
| Forms  | Particle                    |          |             |  |  |
| Processing Method  | Extrusion                   |          |             |  |  |
| Physical   | Nominal Value               | Unit     | Test Method |  |  |
| Density  | 0.904                       | g/cm³    | ASTM D1505  |  |  |
| Melt Mass-Flow Rate (MFR) (230°C/2.16 kg)                    | 2.0                         | g/10 min | ASTM D1238  |  |  |
| Mechanical   | Nominal Value               | Unit     | Test Method |  |  |
| Flexural Modulus - 1% Secant <sup>1</sup> (Injection Molded) | 1520                        | MPa      | ASTM D790   |  |  |
| Films  | Nominal Value               | Unit     | Test Method |  |  |
| secant modulus <sup>2</sup>                                  |                             |          | ASTM D882   |  |  |
| 1% secant, MD: 32 μm   | 138                         | MPa      | ASTM D882   |  |  |
| 1% secant, TD: 32 μm   | 138                         | MPa      | ASTM D882   |  |  |
| Tensile Strength   |                             |          | ASTM D882   |  |  |
| MD: Broken, 32 μm  | 89.6                        | MPa      | ASTM D882   |  |  |
| TD: Broken, 32 µm  | 41.4                        | MPa      | ASTM D882   |  |  |

| Tensile Elongation                       |                              |      | ASTM D882   |
|--|------------------------------|------|-------------|
| MD: Broken, 32 μm                        | 470                          | %    | ASTM D882   |
| TD: Broken, 32 µm                        | 800                          | %    | ASTM D882   |
| Dart Drop Impact (32 μm, Cast Film)      | 45                           | g    | ASTM D1709A |
| Optical                                  | Nominal Value                | Unit | Test Method |
| Gloss (45°)                              | 85                           |      | ASTM D2457  |
| Haze (31.8 μm, Cast Film)                | 1.7                          | %    | ASTM D1003  |
| Additional Information                   |                              |      |             |
| All specimens were injection molded acco | ording to ASTM D2146 Type 1. |      |             |
| Extrusion                                | Nominal Value                | Unit |             |
| Melt Temperature                         | 230 - 250                    | °C   |             |
| NOTE                                     |                              |      |             |
| 1.                                       | 1.3 mm/min                   |      |             |
| 2.                                       | 1.3 mm/min                   |      |             |

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