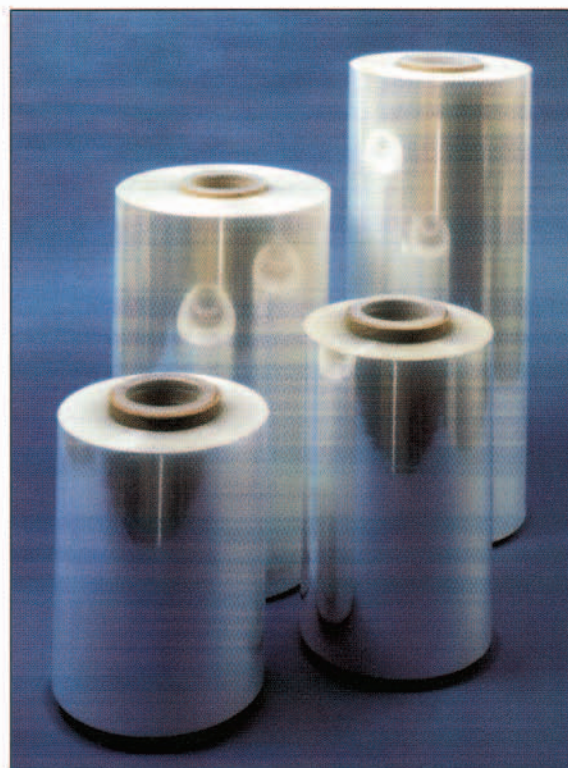




Vanguard™ 100

High performance shrink films

Vanguard 100 is a tough, clear biaxially oriented copolymer shrink film produced using a tubular extrusion method developed and patented by Okura Industrial Co., Ltd. V100 shrink film is used on all types of trim sealing equipment and performs exceptionally well on high speed horizontal form/fill/seal wrappers. Typical applications include printed items, toys & games, housewares, cds & cassettes, frozen foods and pharmaceuticals.



VANGUARD PACKAGING FILMS DIVISION

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Vanguard 100 Highlights:

- ◆ High clarity and gloss for retail display merchandising
- ◆ Quick sealing cycles with no corrosive fumes or wire buildup
- ◆ Strong seals that remain secure throughout the distribution channel
- ◆ Excellent electrostatic sealing capability
- ◆ Superior gauge control and sheet flatness for consistent high speed performance
- ◆ High percentage of available shrinkage for a tight wrap
- ◆ High tensile strength and impact resistance allows for downgauging in many applications
- ◆ Complies with FDA and USDA regulations governing direct contact food packaging
- ◆ Available in 50G, 60G, 75G, 100G and 120G thicknesses

| Typical Properties | ASTM Test Method | 50G | 60G | 75G | 100G |
|--|------------------|---------|---------|---------|---------|
| Minimum use temperature (F) | | -30° | -30° | -30° | -30° |
| Haze (%) | D1003 | 2.2 | 2.6 | 2.8 | 3.8 |
| Gloss (%) | D2457 | 140 | 140 | 135 | 130 |
| Tensile strength (psi) | D882 | 22,000 | 22,000 | 22,000 | 22,000 |
| Elongation at break (%) | D882 | 140 | 140 | 150 | 150 |
| Stiffness modulus (psi) | D882 | 130,000 | 130,000 | 130,000 | 130,000 |
| Tear strength (gms/ply) | D1922 | 4 | 5 | 6 | 7 |
| Coefficient of friction (film to film:kinetic) | D1894 | 0.3 | 0.3 | 0.3 | 0.3 |
| WVTR (gms/100si/24hrs) | F1249 | 1.1 | 1.0 | 0.7 | 0.6 |
| Unrestrained shrink (%) @ 260°F | D2732 | 60 | 60 | 60 | 60 |

This information represents our best judgement based on tests performed, but neither Okura USA nor Okura Industrial Co., Ltd. assumes any liability whatsoever in connection with the use of this information or suggestions contained herein. They are given and accepted at the user's risk. We urge purchasers to conduct independent tests to determine final suitability for their specific application.