

## Clysar LLG

### Description

Clysar® LLG is a strong, clear, biaxially oriented, heat-shrinkable, nonirradiated polyolefin film. LLGS is a hot slip version of the film.

### Uses

Clysar® LLG is used when outstanding optics and a tough, durable wrap with strong seals and excellent shrinkage are required. LLG is functional on manual, semi-automatic and many automatic-packaging machines.

### Significant Features

#### *Sealing*

- Compatible with all sealing systems. Especially suited for continuous, automatic side seals.
- Wide sealing temperature range.
- Requires no cooling dwell.
- Excellent seal integrity with virtually no pinholes.

#### *Shrinking*

- Best when used on tunnels with good temperature control.
- Average available shrinkage.
- Medium shrink force.

#### *General*

- Good tear resistance.
- High gloss, clarity and sparkle.
- Cleans up well on package.

### Standard Put-Ups

- Clysar LLG is available in five gauges: 50, 60, 75, 100 and 150 as either single-wound or center-folded film.
- Flat film is available as Clysar LLG, or surface treated for improved hot slip as LLGS.
- Flat film is available in widths from 5-68 inches in ¼ inch increments
- Folded film is available as LLGF, or surface treated for improved hot slip as LLGFS.
- Folded film is available in widths from 5-47 inches in ½ inch increments
- Folded film will have approximately half the linear footage of flat film for same gauge and roll dimensions.
- Available in standardized pre-perforated pattern or as plain film
- Film is wound on 3- and 6-inch cores to the standard roll sizes as shown in Table 1.

**Table 1**  
**Clysar® LLG**  
**Linear Footage -- Flat Film**

Core I.D., in.	Roll O.D., in.	Gauge				
		50	60	75	100	150
3	9 ½	10,500	8,750	7,000	5,250	3,500
3	13	21,000	17,500	14,000	10,500	7,000
6	11	10,500	8,750	7,000	5,250	3,500
6	14	21,000	17,500	14,000	10,500	7,000
6	18 ¾	42,000	35,000	28,000	21,000	14,000

## FDA/USDA Status

Clysar films sold for food packaging use comply with U.S. Food and Drug Administration (FDA) requirements under the Federal Food, Drug, and Cosmetic Act as amended. Bemis complies with FDA regulation 21 CFR 177.1520 -- Olefin polymers, allowing use for articles that contact food, except for articles used for packing or holding food during cooking. This FDA compliance and a continuing guarantee from Bemis Clysar will meet USDA requirements needs for packaging meat and poultry products.

## Use

Bemis does not recommend heating or cooking foods in Clysar. High temperature, high-speed heat-sealing of Clysar films will release small amounts of "smoke," which should be removed by adequate ventilation in normal commercial practice.

## Disposal

Preferred options for disposal are: (1) recycling, SPI Code—Class 4; (2) incineration with energy recovery, and (3) landfill. The high fuel value of this product makes option 2 very desirable for material that cannot be recycled.

## Storage

Storage below 32°C (90°F) is recommended. Prolonged exposure to temperatures moderately above 32°C (90°F) or brief exposure to temperatures well above 32°C (90°F) may cause difficulty in unwinding film.

For more detailed information on the safe handling of Clysar films a "Safety in Handling and Use" guide is available.

**Table 2**  
**Typical Properties of Clysar® LLG**

Property	ASTM Test Method	Unit	Gauge				
			50	60	75	100	150
Haze (avg)	D1003	%	2.0	2.5	2.5	3.0	3.0
Gloss at 20° (min)	D2457	(photocell)	135	135	135	130	130
COF, Kinetic	D1894		0.20	0.20	0.15	0.15	0.15
Shrinkage, 102°C (216°F)* 10 min	D1204	% (area)	50	50	50	50	50
Shrink Force	D2838	g/in @100°C	90	130	145	160	240
Stiffness Modulus (avg)	D882	kpsi	60	60	60	55	50
Tensile Strength (avg)	D882	kpsi	15	15	15	15	15
Elongation (avg)	D882	%	135	145	150	160	170
Tear Strength (avg) (Elmendorf)	D1922	g	15	20	25	40	70
Spencer Impact	D3420	in-lbs	8	10	13	15	22
WVTR	F1249	g/100 in <sup>2</sup> /24 hr	1.9	1.5	1.4	1.0	.75
Oxygen Transmission	D3985	cc/100 in <sup>2</sup> /24 hr	790	600	500	400	300
CO2 Transmission	--	cc/100 in <sup>2</sup> /24 hr	3000	2,500	2,300	1,600	1,200

\*Film Temperature Note:

These values are typical data for Clysar LLG shrink film and are not product release specifications, warranties, or limiting specifications. Values are based on initial production and tests run during development of this film.

## Bemis Worldwide

## Toll-free (U.S.A.) 888 4-CLYSAR

Internet/World Wide Web:  
<http://www.clysar.com>

E-Mail:  
[Clysar.marketing@bemis.com](mailto:Clysar.marketing@bemis.com)

The technical data contained herein are guides to the use of Bemis Clysar films. The advice contained herein is based upon tests and information believed to be reliable, but users should not rely upon it absolutely for specific applications because performance properties will vary with processing conditions. It is given and accepted at user's risk and confirmation of its validity and suitability in particular cases should be obtained independently. Bemis Clysar makes no guarantees of results and assumes no obligations or liability in connection with its advice. This publication is not to be taken as a license to operate under, or recommendation to infringe, any patents.

**CAUTION:** Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see Bemis Medical Caution Statement, MCS\_02.