

# FRALOCK®

A Division of Lockwood Industries Inc

## CIRLEX® Technical Data Sheet

### Product Description

CIRLEX® has been developed to provide industry with a wider variety of thick polyimides, with pricing reflective of market needs.

CIRLEX® has the same excellent balance of physical, chemical, and electrical properties over a wide temperature range as offered by all Kapton® films. Overall operating temperature range is -269°C to +351°C.

CIRLEX® is offered in thicknesses from 0.006" (0.15mm) to 0.125" (3.175mm). Thicker constructions are available.

CIRLEX® can be modified by laser cutting, drilling, machining, stamping, shearing and chemical etching to very exact tolerances. A brief processing guide is available upon request

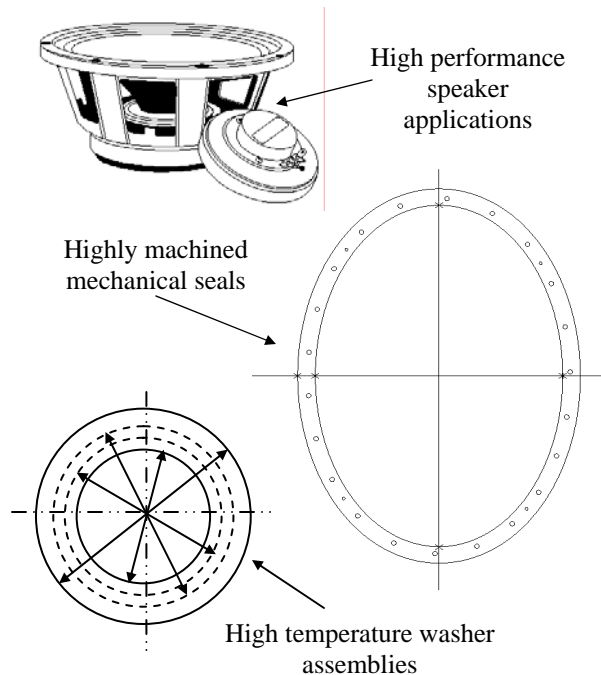
CIRLEX® is offered with a wide variety of laminated foils, either on the surface or imbedded, utilizing all-polyimide adhesiveless technology. Special applications are always welcome.

### Applications

- PCB stencils
- Loudspeaker components
- Metal clad, thick polyimide materials (>0.008" thick)
- High-density electronic interconnects
- High-temperature mechanical seals

### Packaging

CIRLEX® is packaged in "lay-flat" containers with protective interleaving. Several thicknesses may be shipped in each box to best utilize space or shipped as required by the customer. Customers are responsible for shipping cost unless other arrangements are made.



### Contact Information – United States

Fralock, Main Office  
28525 W. Industry Drive  
Valencia, CA 91355  
P: 661.702.6999  
P2: 800.372.5625  
F: 661.702.9899

Fralock, San Carlos  
1200 Industrial Road  
San Carlos, CA 94070  
P: 650.631.2470  
F: 650.631.2478

### Ordering Information:

Call Fralock at 1.800.372.5625  
or contact Fralock on the web:  
<http://www.fralock.com>  
<http://www.cirlex.com>  
*MSDS available upon request*

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Typical Properties of CIRLEX® at 23 °C (73 °F) and at 200 °C (392 °F)

Gauge	Cirlex® 900 CL	Cirlex® 1200 CL	Cirlex® 1500 CL	Cirlex® 3000 CL	Cirlex® 5000 CL
<b>Thickness</b>	<b>0.009"</b> <b>(0.23mm)</b>	<b>0.012"</b> <b>(0.31mm)</b>	<b>0.015"</b> <b>(0.38mm)</b>	<b>0.030"</b> <b>(0.76mm)</b>	<b>0.050"</b> <b>(1.27mm)</b>
<b>Yield Point @ 3% Elong. (PSI)</b>					
23 °C	6112	6500	7836	7097	6113
200 °C	5490	EL	EL	EL	EL
<b>Stress @ 5% Elong. (PSI)</b>					
23 °C	10360	10800	11230	10370	9413
200 °C	8339	EL	EL	EL	EL
<b>Tensile (PSI)</b>					
23 °C	32490	34000	35000	33300	31800
200 °C	32490	EL	EL	EL	EL
<b>Elongation (%)</b>					
23 °C	65	64	63	57	56
200 °C	85	EL	EL	EL	EL
<b>Modulus (KPSI)</b>					
23 °C	330	332	334	274	264
200 °C	239	EL	EL	EL	EL
<b>Density (G/cc or G/ml)</b>	1.42	1.42	1.42	1.42	1.42
<b>Specific Heat (J/g K)</b>	1.09	1.09	1.09	1.09	1.09
<b>CTE (ppm/°C)</b>	20 ppm	20 ppm	20 ppm	20 ppm	20 ppm
<b>Tg (°C)</b>	~351°C	~351°C	~351°C	~351°C	~351°C
<b>Dimensional Stability 250 °C</b>					
Machine Direction	0.13	0.09	0.07	0.27	0.20
Transverse Direction	0.07	0.07	0.07	0.27	0.40
<b>Dimensional Stability 400 °C</b>					
Machine Direction %	0.33	0.33	0.33	0.13	0.00
Transverse Direction %	0.40	0.40	0.40	0.40	0.20
<b>Dielectric Strength</b>					
V/mil	2790	2000	1940	1270	Arc Over
<b>Dielectric Constant KHz</b>					
25 °C	3.45	3.55	3.58	3.74	3.72
<b>Dissipation Factor</b>	0.0021	0.002	0.0018	0.0023	0.0026
<b>Moisture Absorption</b>					
% Max.	4.0	4.0	4.0	4.0	4.0
<b>Thermal Conductivity</b>					
W/m K	0.17	0.17	0.17	0.17	0.17
<b>UL Rating</b>					
UL File # - E39505	UL 94V0	UL 94V0	UL 94V0	UL 94V0	UL 94V0

\* EL (Material exceeded test limits of test equipment)

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