

OPCORE[®] G

**THERMAL
INSULATION**

for

RECYCLABLE

PROTECTIVE

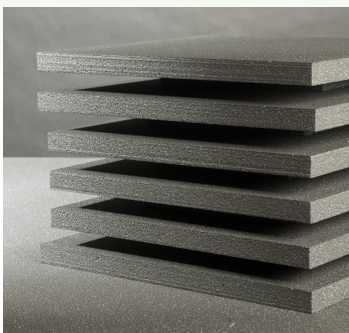
PACKAGING



OPCORE® G

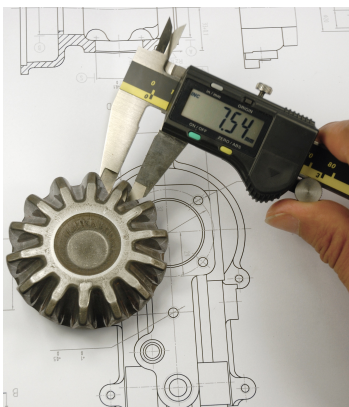
THERMAL INSULATION
for **RECYCLABLE PROTECTIVE PACKAGING**

What if your choice of cold-ship thermal insulation packaging material let you ship more product?



Place more product in the box...or use a smaller box. Either way, it can be less cost to you.

At R-5 per 1 1/16 in of thickness, OPCORE-G+ can achieve the same thermal insulation performance in a profile that is up to 22% thinner than insulation made of white EPS foam.



Greater dimensional accuracy means you'll have a superior protective thermal envelope.

OPCORE-G+ is dimensionally accurate to 1/32 of an inch in thickness and 1/16 of an inch on width and height. This means air leakage is minimized, your product will consistently fit, therefore thermal and impact protection is maximized.



Higher impact resistance means your product arrives undamaged and your customer is happy.

OPCORE-G+ packaging products have been proven to handle multiple impacts in rough environments for more than a decade.

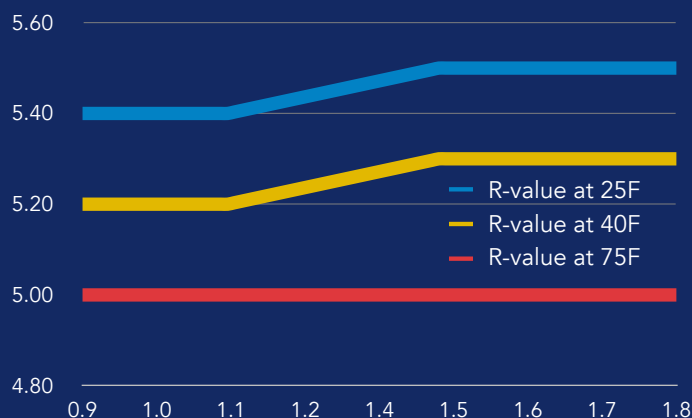
OPCORE-G+: Simply Better Insulation.

OPCORE-G+ is highly effective at keeping package contents cold.

By absorbing radiant energy, high purity graphite wholly contained in the polymer matrix of OPCORE-G+ slows the flow of heat through the material.

As shown in the chart below, the effect is even more pronounced at lower mean temperatures. This means what starts out cold inside of an OPCO-designed OPCORE-G+ cold-ship packaging solution stays cold...and your brand, reputation and products stay protected.

R-value* vs Material Density



*R-value means resistance to heat flow. The higher the R-value, the greater the insulating power. The R-value properties are based on 1-1/16 in thickness. Material density = pounds per cubic foot.



Physical Property	Method	Units	Material Property Values				
Density, nominal	ASTM C303	lbs / ft ²	1	1.25	1.4	1.5	2
Density, minimum	ASTM C303	lbs / ft ²	0.90	1.15	1.35	1.45	1.80
Sustainability / Environmental	Summarized conclusions from scientific experiments in the public domain or product specification.	<ul style="list-style-type: none"> • Recyclable as #6 Plastic. • Can reduce carbon emissions by lowering energy needed to heat or cooling buildings, or refrigerate package contents. Retains R-value over time. • Does not contain chlorofluorocarbons. • <i>Can contain recycled content per specification.</i> • UL GreenGuard Gold Certified for Indoor Air Quality. • Material expansion agent has zero ozone depletion potential. 					
ASTM C578 Classification ⁽¹⁾	ASTM C578	Type	I	VIII	II	II +	IV
Compressive Resistance	ASTM D1621	at yield or 10% deformation, psi (kPa)	10 (69)	13 (90)	15 (104)	20 (138)	25 (173)
Thermal Resistance (R-value*), 75F ⁽²⁾	ASTM C518	°F·ft ² ·h/BTU (K·m ² /W) 75 ±2°F (23.9 ±1°C)	5.0				
Thermal Resistance (R-value*), 40F ⁽²⁾	ASTM C518	°F·ft ² ·h/BTU (K·m ² /W) 40 ±2°F (4.4 ±1°C)	5.2		5.3		
Thermal Resistance (R-value*), 25F ⁽²⁾	ASTM C518	°F·ft ² ·h/BTU (K·m ² /W) 25 ±2°F (-3.9 ±1°C)	5.4		5.5		
Flexural Strength	ASTM C203	psi (kPa)	25 (173)	30 (207)	35 (241)	40 (276)	50 (345)
Water Vapor Permeance ⁽³⁾	ASTM E96	For 1" (25.4 mm), perm (ng/PA·s·m ²), max	5.0	3.5	3.5	3.5	2.5
Water Absorption by Total Immersion	ASTM C272	Volume % absorbed, max	4.0	3.0	3.0	3.0	2.0
Dimensional Stability	ASTM D2126	max % linear change	< 2.0				
Oxygen Index	ASTM D2863	min, volume %	> 24.0				
Surface Burning Characteristics	ASTM E-84 or UL 723	Flame Spread / Smoke Developed	Flame Spread 5, Smoke Developed 25				
Biological Behavior			Will not support growth of mold or mildew. No harmful effects on health known.				
Chemical Resistance			Insensitive to water, the majority of acids and alkalis; sensitive to organic solvents.				
Application Limiting Temperature		° F / ° C	165 (73.9) nominal / 180 (82.2) max				

⁽¹⁾ OPCORE-G meets and/or exceeds ASTM C578-11b "Standard Specification For Preformed, Cellular Polystyrene Insulation"; published by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.

⁽²⁾ OPCORE-G rigid thermal insulation, and its use and application requirements per building code, are described in ICC-ES ESR 3463 available at www.opcodirect.com/library and from ICC-ES. Thermal resistance (R-value) is based on tested values at 1.06-inch thickness at the temperature indicated. It is recommended to multiply your installed thickness by the R-value indicated and divide the result by 1.06.

⁽³⁾ R-value means resistance to heat flow. The higher the R-value, the greater the insulating power. Ask your seller for help with sizing. The R-value properties shown are based on 1 in thickness.

⁽⁴⁾ Values quoted are maximum values for 1 inch (25mm) thick samples and are based upon most recent raw material product quality audit data. Actual water vapor permeance data decreases as thickness increases. Where water vapor permeance is a design concern, use of the product is subject to professional engineering review at the specifiers option.

The physical property data shown above are presented as typical average values as determined by industry accepted and standard test methods, except where noted, and are subject to normal manufacturing variation. ASTM specifications shown are typical for rigid, cellular polystyrene thermal insulation and are published by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.



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