



# Makrolon® IR sheet

## Welding Face Shields

Makrolon® IR is a polycarbonate sheet product developed to meet ANSI Z87.1, EN 169, and CSA Z94.3 standards for face shield applications. Proprietary additive systems block UV and IR light providing protection during gas flame welding and cutting operations and meeting the requirements for welding shades 3 and 5. Polycarbonate's toughness provides outstanding impact performance and state-of-the-art extrusion manufacturing delivers high optical quality needed for face shield applications.

## Applications

Face shields for flame welding and cutting and general IR protection

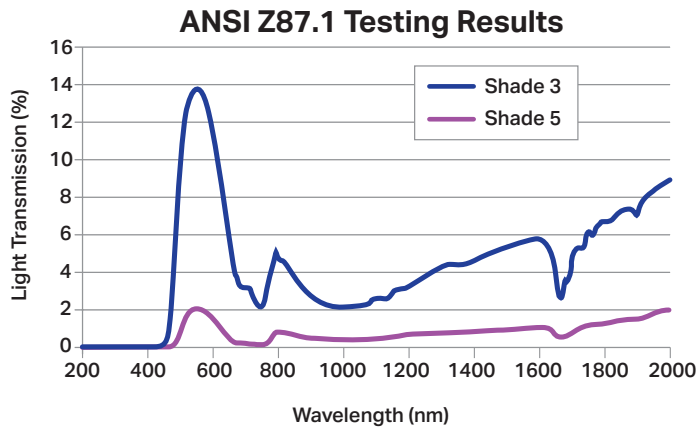
Typical Properties*			
Property	Test Method	Units	Values
<b>PHYSICAL</b>			
Specific Gravity	ASTM D 792	-	1.2
Water Absorption, 24 hrs	ASTM D 570	%	0.15
Poisson's Ratio	ASTM E 132	-	0.35
Light Transmission, Welding shades 3 and 5	ANSI Z87.1	-	Pass
	EN 169	-	Pass
	CSA Z94.3	-	Pass
Welding Curtain, Grades Medium and Dark	AWS F2.3M:2011	-	Pass
<b>MECHANICAL</b>			
Tensile Strength, Break	ASTM D 638	psi	9,500
Tensile Strength, Yield	ASTM D 638	psi	9,000
Tensile Modulus	ASTM D 638	psi	340,000
Elongation	ASTM D 638	%	110
Flexural Strength	ASTM D 790	psi	13,500
Flexural Modulus	ASTM D 790	psi	345,000
Compressive Strength	ASTM D 695	psi	12,500
Compressive Modulus	ASTM D 695	psi	345,000
Instrumental Impact, 0.044"	ASTM D 3763	ft/lbs	18
<b>THERMAL</b>			
Coefficient of Thermal Expansion	ASTM D 696	in/in°F	3.75 x 10 <sup>-5</sup>
Heat Deflection Temperature @ 264 psi	ASTM D 648	°F	270
Heat Deflection Temperature @ 66 psi	ASTM D 648	°F	280
<b>ELECTRICAL</b>			
Arc Resistance			
Stainless Steel Strip Electrodes	ASTM D 495	Seconds	10
Tungsten Electrodes	ASTM D 495	Seconds	120
Dielectric Strength, In air @ 0.125"	ASTM D 149	V/mil	380
<b>FLAMMABILITY</b>			
Ignition Temperature, Self	ASTM D 1929	°F	1070
Ignition Temperature, Flash	ASTM D 1929	°F	870

\*Typical Properties are not intended for specification purposes

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## Meeting Shade 3 and Shade 5 standards for maximum safety

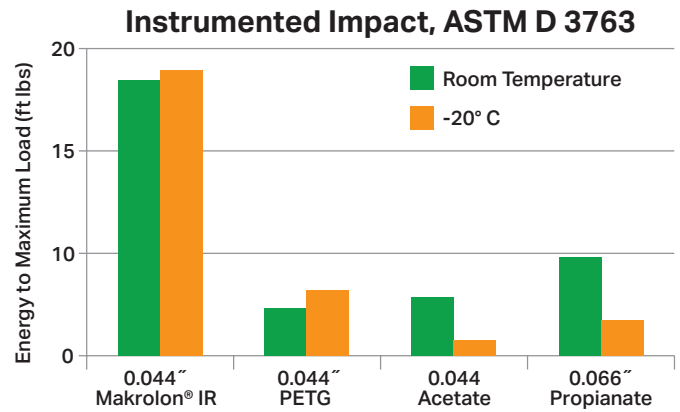
The high temperatures of flame welding and cutting emit a range of visible UV and IR light that can damage your eyes when that light is too bright. A green tint alone in any material does not indicate compliance. Covestro recommends only Makrolon® IR where Shade 3 and Shade 5 standards apply.



Shade 3 and Shade 5 of Makrolon® IR polycarbonate meet the ANSI Z87.1, EN 169, and CSA Z94.3 light transmission requirements for flame welding applications.

## Superior impact performance for maximum peace of mind

The high molecular weight of Makrolon® IR extrusion grade polycarbonate yields high impact strength and high toughness at a wide temperature range. Makrolon® IR polycarbonate also meets high mass, high velocity, and needle penetration requirements in standard face shield designs.



119 Salisbury Road  
Sheffield, MA 01257  
Toll Free: 800.254.1707  
Fax: 800.457.3553  
sfdinfo@covestro.com  
sheets.covestro.com

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