

# Sapphire Inspection Criteria

## Standard Polish and Bulk Quality Definition

EFG Sapphire < 36sq.in			
Section 1: Surface Finish (REF MIL SPEC 80/50)			
<b>Scratches</b>	<b>Width</b>	<b>Max. Allowable Summed Length</b>	
	<0.002"	Unlimited	
	0.002 - 0.0025"	Part perimeter x 0.20"	
	0.0025 - 0.003"	Part perimeter x 0.083"	
	>0.003"	0	
<b>Digs</b>	<b>Max Allowable Size</b>	<b>Max. Allowable Sum of Length</b>	
	0.020"	<= .040" within any 0.8"-diameter circle	
<b>Edge Chips</b>	<b>Max Allowable Size</b>	<b>Max. Allowable Sum of Length</b>	
	0.020"	<= 1% of part perimeter	
Section 2: Bulk Material			
<b>Bubble and Inclusion</b>	<b>Max Allowable Size Within Clear Aperture</b>	<b>Max. Allowable Sum of Length Within Clear Aperture</b>	
	0.020"	≤ 0.040" within any 0.8" diameter circle	
	<b>Minimum Allowable Transmission ≤ .305" Thick</b>	<b>Micro-Voids / Haze</b>	
		<b>*Visual Quality</b>	<b>Concentration</b>
<b>A</b>	83% at 700 nm	*Not Visible	Permitted
<b>B</b>	Visible microvoids will be permitted provided that the location of microvoid will transmit 83% at 700nm	*Visible	Permitted
<b>C</b>	Not Applicable	*Visible	Permitted
Section 3: Bulk Material (STRUCTURAL GRADE)			
	<b>Max. Allowable Size</b>	<b>Max. Allowable Sum of Length</b>	
<b>Bubble and Inclusion</b>	0.070"	<= 0.100" within any 0.8"-diameter circle	
<b>Molybdenum Inclusion</b>		Acceptable	
<b>Micro voids and Haze</b>		Acceptable	

\*Inspection Methods Per : MIL-PRF-13830B Section 4.2.2.1 and 4.2.2.2  
Transmission Test per SGC OI 22975

**Section 1: Surface Finish**

<b>Scratches</b>	<b>ASTM F 428</b>	<b>Allowable Summed Length</b>
	LEVEL - 7	0
	LEVEL - 6	< 1" long within Clear Aperture, < 2" long outside Clear Aperture
	< LEVEL - 6	Unlimited length if not detectable from 3 ft.
<b>Digs</b>	<b>Max Allowable Size</b>	<b>Max. Allowable Sum of Length Within Clear Aperture or (Area C)</b>
	0.062"	≤ 0.124" within any 2.5" diameter circle
	Max Allowable Size Outside of Clear Aperture or (Area B)	
	0.092"	
<b>Edge Chips</b>	<b>Max Allowable Single Size</b>	<b>Max. Allowable Sum of Length</b>
	0.045'	Unlimited

**Section 2: Bulk Material**

<b>Bubble and Inclusion</b>	<b>Max Allowable Size Within Clear Aperture or (Area C)</b>	<b>Max. Allowable Sum of Length Within Clear Aperture or (Area C)</b>
	0.062"	≤ 0.124" within any 2.5" diameter circle
	<b>Max Allowable Size Outside of CA or (Area B)</b>	
	0.092"	
<b>Molybdenum Inclusions</b>		<b>Max Allowable Size</b>
		If detectable from 3ft. then can not exceed .3" in length
<b>All other Defects (Micro-Voids and/or Haze)</b>		Allowable Size
		Must not be detectable from 10ft.
Defects 0.008" or less are exempt		

**Section 3: Bulk Material >36 square inches (STRUCTURAL GRADE)**

	<b>Max. Allowable Size</b>	<b>Max. Allowable Sum of Length</b>
<b>Bubble and Inclusion</b>	0.1"	≤ 0.250" within any 2.5" diameter circle
<b>Molybdenum Inclusion</b>		Acceptable
<b>Micro voids and Haze</b>		Acceptable

\*Inspection Methods Per : ASTM C 1036 Section 6.1.1



Manufacturer reserves the right to alter specifications.  
©2019 Saint-Gobain Ceramics & Plastics, Inc. All rights reserved.