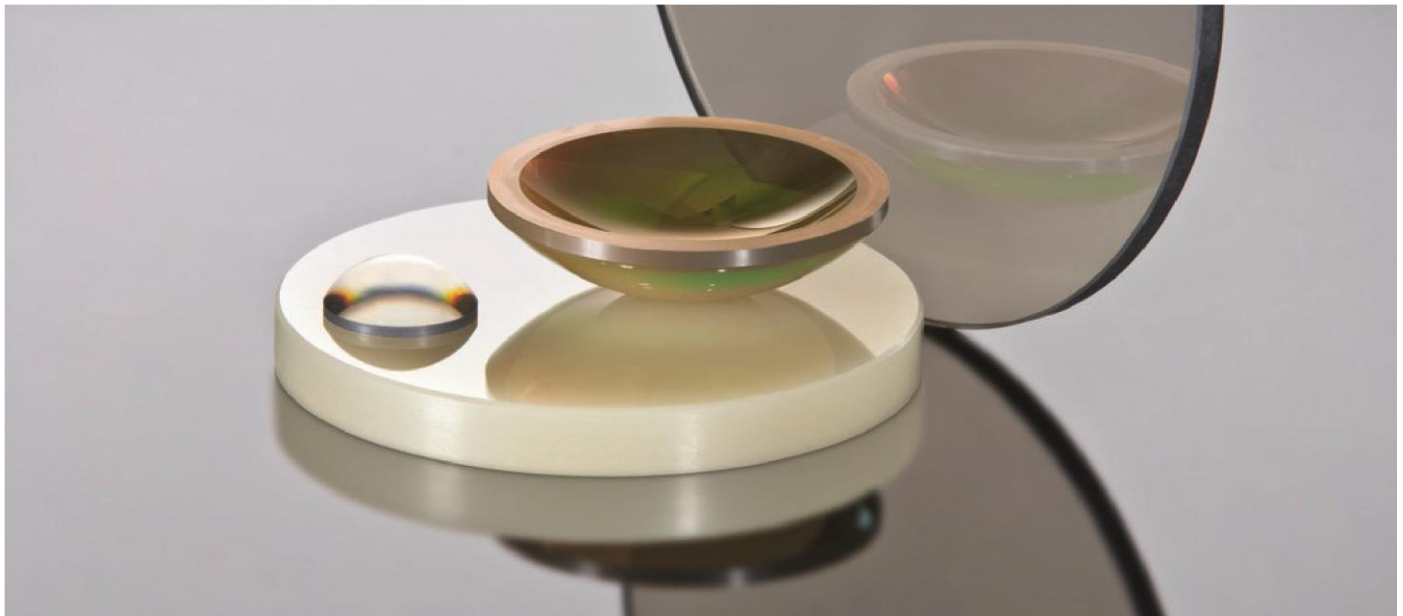


# Broadband Infrared Ceramics for Harsh Environments



## Product Information

Zinc Sulfide is the most suitable material for broadband infrared windows, domes and optics. No other material offers this combination of optical properties and environmental resistance. SCHOTT has developed a ceramic process to produce polycrystalline Zinc Sulfide, IRC-1. IRC-1 has significantly improved optical and mechanical performance compared to CVD processed material.

**IRC-1 is the material of choice for mid and long wave IR applications**

## Advantages

- **IRC-1** performs with high transmission between 3 – 12  $\mu\text{m}$
- Fine grained and homogenous microstructures
  - Higher strength and hardness
  - Lower cost finishing
  - Improved results from deterministic finishing
- Ceramic process allows the production of near net shape dome blanks and curved window blanks
  - Reduces processing time and associated costs
  - Reduces production complexity

**These properties make IRC-1 the ideal solution for mid and long wave IR windows in harsh environments**

## Forms of Supply

SCHOTT can provide IRC-1 products in various custom shapes, sizes, thickness, and surface finishes. Flat blanks, dome blanks, and curved windows can all be produced to meet each customer's specific requirements.

## Sample Parts

For sample parts we would like to offer you the following sample sizes:

- Diameter: 25 mm with a thickness of 2.0 mm
- Diameter: 38 mm with a thickness of 2.5 mm
- Diameter: 50 mm with a thickness of 3.0 mm

## Applications

- Thermal Imaging Systems
  - Thermography
  - Predictive Maintenance
  - Automotive Safety Systems
  - Vandal Proof Surveillance and Imaging
  - Force Protection
  - Intrinsically Safe IR Imaging System
- Machine Vision Systems
  - Process Control
  - Robotic Manufacturing
  - UAV Imaging

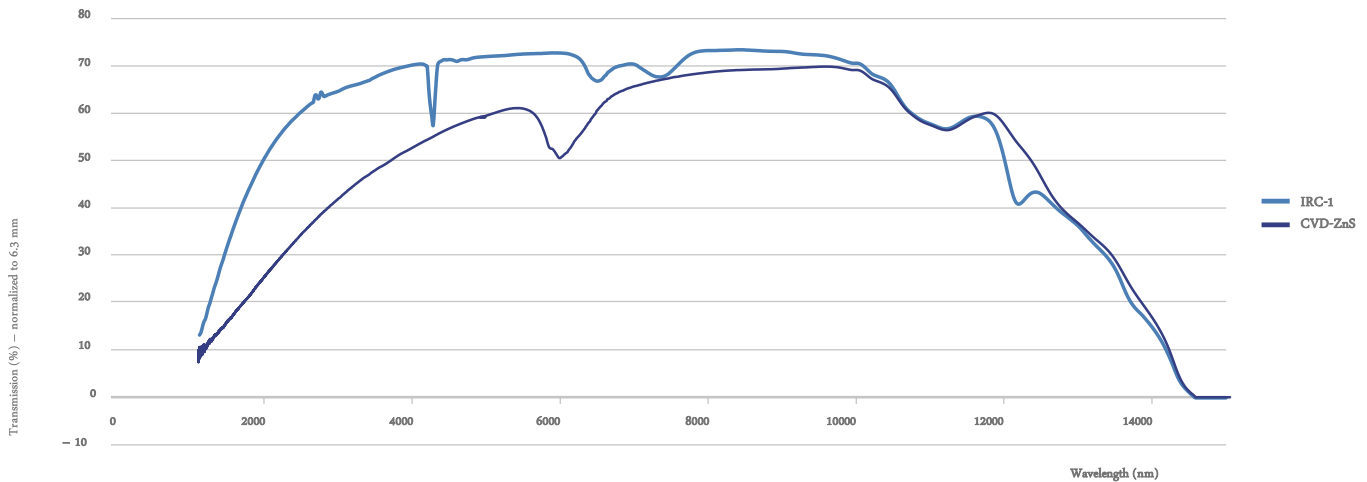
## Specifications

Optical Properties		
Wavelength, Microns	Refractive Index @ 20°C	dn/dT, 10 <sup>-6</sup> /K
0.441	2.482	
0.639	2.348	
0.947	2.297	
1	2.292	50
2	2.264	47
3	2.257	46
4	2.252	46
5	2.246	46
6	2.239	46
7	2.232	45
8	2.223	45
9	2.212	45
10	2.200	45
11	2.186	45
12	2.170	45
13	2.152	45
14	2.130	

Thermal Properties	SCHOTT IRC-1	CVD Processed Material
Thermal Conductivity @ 20 °C, W/m/K	16.70	16.70
Specific Heat, J/g/K	0.47	0.47
Thermal Expansion (20 °C) x 10 <sup>-6</sup> , K <sup>-1</sup>	6.80	6.80

Mechanical Properties	SCHOTT IRC-1	CVD Processed Material
Rupture Modulus MPa	120	70
Young's Modulus GPa	74	74
Poisson's Ratio	0.27	0.27
Hardness (Knoop) kg/mm <sup>2</sup>	270– 310	210–240
Density g/cc	4.08	4.08

## Transmission (typical curves)



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