

# Caesium Iodide (CsI)

## Specialist Data Sheet

Product Name	Caesium Iodide (CsI)
Transmission Range	0.25 ~ 55 $\mu$ m
Refractive Index	1.73916 @ 10 $\mu$ m
Reflection Loss	13.6% @ 10 $\mu$ m (2 surfaces)
Absorption Coefficient	n/a
Reststrahlen Peak	145.8 $\mu$ m
dN/dT	-99.3 x 10 <sup>-6</sup> /°C
dN/du	6 $\mu$ m
Density	4.51 g/cc
Melting Point	621 °C
Thermal Conductivity	1.1 W m <sup>-1</sup> K <sup>-1</sup> @ 298 K
Thermal Expansion	48.3 x 10 <sup>-6</sup> /°C @ 293 K
Hardness	Knoop 20 with 200g indenter
Specific Heat Capacity	201 J Kg <sup>-1</sup> K <sup>-1</sup>
Dielectric Constant	5.65 @ 1 Mhz
Youngs Modulus (E)	5.3 Gpa
Shear Modulus (G)	6.24 Gpa
Bulk Modulus (K)	12.67 Gpa
Elastic Coefficients	C11=24.6; C12=6.7; C44=6.24
Apparent Elastic Limit	5.6 Mpa (810psi)
Poisson Ratio	0.214
Solubility	44g/100g water @ 0°C
Molecular Weight	259.83
Class/Structure	Cubic CsCl, Pm3m, no cleavage, deforms

### Notes:

CsI is grown by sealed ampoule Stockbarger techniques with ingots of approximately 70mm diameter. CsI is very soft and pliable.

### Application:

The material with the deepest known IR transmission, CsI is sometimes used for components in the widest range spectrophotometers. An extremely soft material it is extremely difficult to polish and so performance is compromised for range. Doped with thallium, CsI(Tl) is a useful scintillator which emits at a wavelength which is a good match for silicon photodiodes. Arrays of this material are used in security imaging systems.



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### Refractive Index:

$\mu\text{m}$	No	$\mu\text{m}$	No	$\mu\text{m}$	No	$\mu\text{m}$	No
0.5	1.8064	14.0	1.7355	28.0	1.7125	42.0	1.6709
1.0	1.7572	15.0	1.7344	29.0	1.7101	43.0	1.6671
2.0	1.7466	16.0	1.7332	30.0	1.7077	44.0	1.6631
3.0	1.7440	17.0	1.7319	31.0	1.7052	45.0	1.6591
4.0	1.7431	18.0	1.7306	32.0	1.7027	46.0	1.6549
5.0	1.7424	19.0	1.7291	33.0	1.7000	47.0	1.6505
6.0	1.7418	20.0	1.7276	34.0	1.6972	48.0	1.6460
7.0	1.7412	21.0	1.7260	35.0	1.6943	49.0	1.6414
8.0	1.7406	22.0	1.7244	36.0	1.6913	50.0	1.6366
9.0	1.7399	23.0	1.7226	37.0	1.6882		
10.0	1.7392	24.0	1.7207	38.0	1.6849		
11.0	1.7384	25.0	1.7188	39.0	1.6816		
12.0	1.7375	26.0	1.7168	40.0	1.6781		
13.0	1.7365	27.0	1.7147	41.0	1.6746		

### Transmission Range Graph:

