

Dispersion Equations

Dispersion Equations for Optical Materials

Typically either a Sellmeier or Laurent series equation is used to describe glass dispersion.

The Sellmeier series equation is:

$$\eta^2 = 1 + \frac{B_1\lambda^2}{\lambda^2 - C_1} + \frac{B_2\lambda^2}{\lambda^2 - C_2} + \frac{B_3\lambda^2}{\lambda^2 - C_3}$$

where the wavelength, λ , is expressed in μm .

Dispersion Equation Constants - Sellmeier series equation

	B ₁	B ₂	B ₃	C ₁	C ₂	C ₃
MgF ₂ η_e	4.13440230E-01	5.04974990E-01	2.49048620E+00	1.35737865E-03	8.23767167E-03	5.65107755E+02
MgF ₂ η_o	4.87551080E-01	3.98750310E-01	2.31203530E+00	1.88217800E-03	8.95188847E-03	5.66135591E+02
Sapphire η_e	1.50397590E+00	5.50691410E-01	6.59273790E+00	5.48041129E-03	1.47994281E-02	4.02895140E+02
Sapphire η_o	1.43134930E+00	6.50547130E-01	5.34140210E+00	5.27992610E-03	1.42382647E-02	3.25017834E+02
CaF ₂	5.67588800E-01	4.71091400E-01	3.84847230E+00	2.52642999E-03	1.00783328E-02	1.20055597E+03
Fused Silica	6.96166300E-01	4.07942600E-01	8.97479400E-01	4.67914826E-03	1.35120631E-02	9.79340025E+01
Schott BK7	1.03961212E+00	2.31792344E-01	1.01046945E+00	6.00069867E-03	2.00179144E-02	1.03560653E+02
Schott N-BK7	1.03961212E+00	2.31792344E-01	1.01046945E+00	6.00069867E-03	2.00179144E-02	1.03560653E+02
Schott F2	1.34533359E+00	2.09073118E-01	9.37357162E-01	9.97743871E-03	4.70450767E-02	1.11886764E+02
Schott N-F2	1.39757037E+00	1.59201403E-01	1.26865430E+00	9.95906143E-03	5.46931752E-02	1.19248346E+02
Schott SF2	1.40301821E+00	2.09073176E-01	9.39056586E-01	1.05795466E-02	4.93226978E-02	1.12405955E+02
Schott SF10	1.61625977E+00	2.59229334E-01	1.07762317E+00	1.27534559E-02	5.81983954E-02	1.16607680E+02
Schott N-SF10	1.62153902E+00	2.56287842E-01	1.64447552E+00	1.22241457E-02	5.95736775E-02	1.47468793E+02
Schott SF11	1.73848403E+00	3.11168974E-01	1.17490871E+00	1.36068604E-02	6.15960463E-02	1.21922711E+02
Schott N-SF11	1.73759695E+00	3.13747346E-01	1.89878101E+00	1.13188707E-02	6.23068142E-02	1.55236290E+02
Schott N-LAK21	1.22718116E+00	4.20783743E-01	1.01284843E+00	6.02075682E-03	1.96862889E-02	8.84370099E+01

Laurent Series Equation

The Laurent series equation is:

$$\eta^2 = A_0 + A_1\lambda^2 + \frac{A_2}{\lambda^2} + \frac{A_3}{\lambda^4} + \frac{A_4}{\lambda^6} + \frac{A_5}{\lambda^8}$$

where the wavelength, λ , is expressed in μm .

Dispersion Equation Constants - Laurent series equation

	A ₀	A ₁	A ₂	A ₃	A ₄	A ₅
Crystal Quartz η_e	2.38490000E+00	-1.25900000E-02	1.07900000E-02	1.65180000E-04	-1.94741000E-06	9.36476000E-08
Crystal Quartz η_o	2.35728000E+00	-1.17000000E-02	1.05400000E-02	1.34143000E-04	-4.45368000E-07	5.92362000E-08
S-LAM60M	2.95844800E+00	-1.54203600E-02	2.03097300E-02	1.30264600E-03	-1.23870800E-04	7.40159800E-06
S-BSL7M	2.26250500E+00	-1.03792100E-02	9.34172400E-03	6.45307100E-04	-7.46385800E-05	4.09621500E-06

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