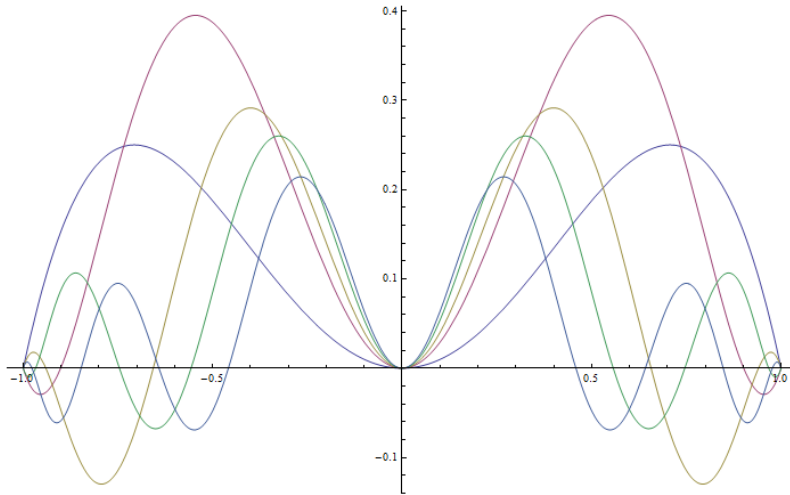
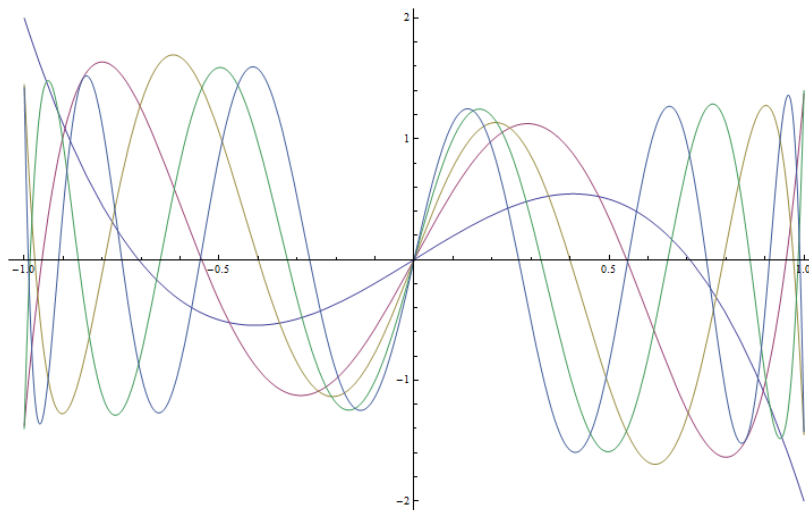


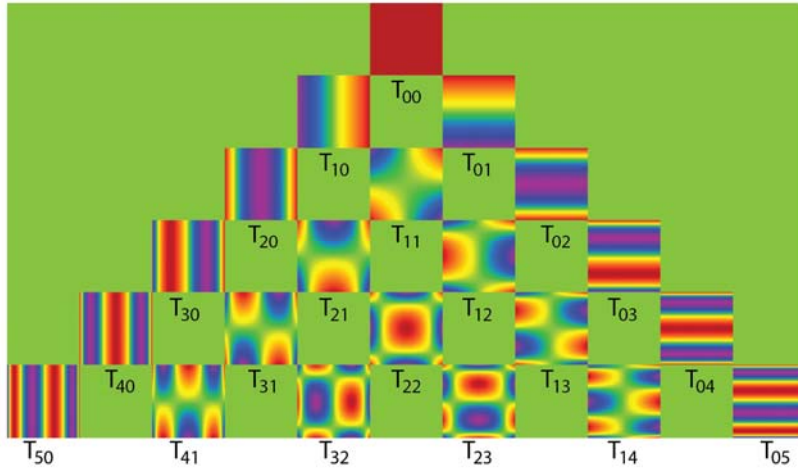
### Forbes Qbfs Polynomials



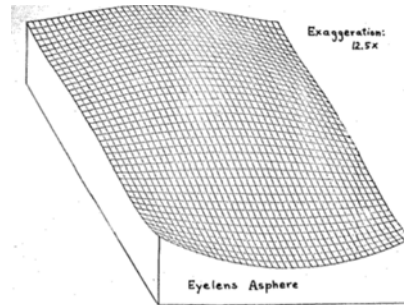
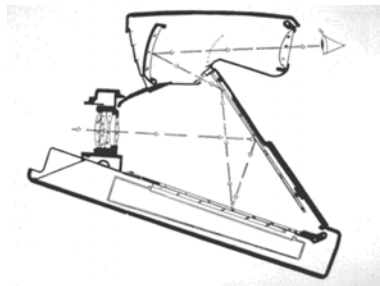
### Qbfs Slope Functions



# Chebyshev Polynomials

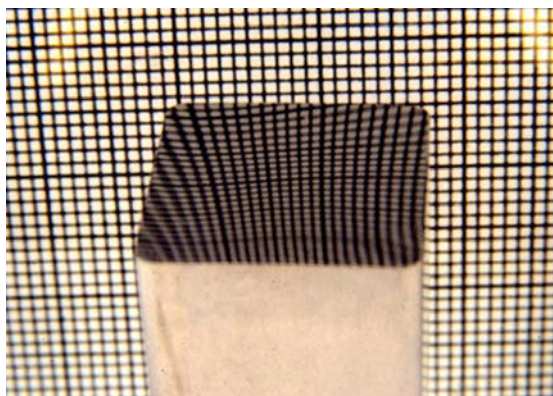


# SX-70 Eye Lens



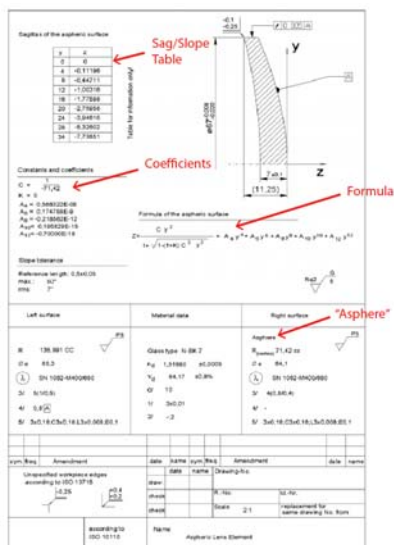
[www.wtptoptics.com](http://www.wtptoptics.com)

## SX-70 Eye Lens



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## ISO 10110 Asphere Drawings



- ISO 10110-12 Definitions of various conic, biconic, toroidal and cylinder forms. Specs on adding info to drawings.
- ISO 10110-19 General surfaces e.g. freeform, Chebyshev, Zernike ...
- ISO 14999-2 Annex A gives some example of orthogonal functions.

# Asphere Drawings

$C = -0.7142$   
 $K = 0$   
 $A_4 = 0.549522E-08$   
 $A_6 = 0.174758E-9$   
 $A_8 = -0.218502E-12$   
 $A_{10} = 0.195502E-15$   
 $A_{12} = -0.700006E-19$

Formula of the aspheric surface

$$Z = \frac{C y^2}{1 + \sqrt{1 - (1+K) C^2 y^2}} + A_4 y^4 + A_6 y^6 + A_8 y^8 + A_{10} y^{10} + A_{12} y^{12}$$

Slope tolerance  
 Reference length: 0.540.05  
 max: 30°  
 min: 7°

Left surface	Material data	Right surface
R 135.991 CC D 64.3 SN 1092-6M400880 S/F 8(10.8) 4/ 0.8(A) M/ 3x0.18.C5x0.16.L3x0.008.E0.1	Glass type N-BK7 n <sub>d</sub> 1.51880 ±0.0005 ν <sub>d</sub> 64.17 ±0.8% QF 10 1/ 3x0.01 2/ -2	Asphere R <sub>gen</sub> 71.42 or D 64.1 SN 1092-6M400880 S/F 4(0.8x0.4) 4/ - M/ 3x0.18.C5x0.16.L3x0.008.E0.1

- Asphere – usually base surface plus power series terms e.g. odd/even aspheres.
- Paraboloid, toroid, etc. – no power series terms.
- GS – General Surface, more complex representations like Zernikes, Chebyshev, etc.

# Sagitta Tables

Sagitta of the aspheric surface  
 X Y Z S  
 0,0 0,0 5,213 218 7,023 156°  
 5,0 0,0 7,231 564 1,213 648°  
 5,0 5,0 3,201 487 5,812 364°  
 .. .. .. ..  
 .. .. .. ..

Coefficients  
 C = -0.7142  
 K = 0  
 A<sub>4</sub> = 0.549522E-08  
 A<sub>6</sub> = 0.174758E-9  
 A<sub>8</sub> = -0.218502E-12  
 A<sub>10</sub> = 0.195502E-15  
 A<sub>12</sub> = -0.700006E-19

Cartesian or Polar tables with sag (z) and possibly slope (s) values at various coordinates. Can also include tolerances Δz and Δs.

Table 2 — Example of a sagitta table in Cartesian coordinates

X	Y	Z	S
0,0	0,0	5,213 218	7,023 156°
5,0	0,0	7,231 564	1,213 648°
5,0	5,0	3,201 487	5,812 364°
..	..	..	..
..	..	..	..

Table 3 — Example of a sagitta table in polar coordinates

ρ	φ	Z	S
0,0	0,00°	3,346 545	10,245 650°
5,0	1,57°	1,357 573	8,145 679°
5,0	3,14°	2,346 239	2,145 876°
..	..	..	..
..	..	..	..