

<b>ZF11</b>	<b>699301</b>
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nd =1.69895	vd =30.07	nF – nC =0.023246
ne =1.70445	ve =29.84	nF' - nc' =0.023611

Refractive Indices		
	$\lambda$ ( nm )	
$n_r$	706.5	1.68853
$n_c$	656.3	1.69221
$n_{c'}$	643.8	1.69326
$n_{He-Ne}$	632.8	1.69425
$n_D$	589.3	1.69875
$n_d$	587.6	1.69895
$n_e$	546.1	1.70445
$n_F$	486.1	1.71546
$n_{F'}$	480.0	1.71687
$n_g$	435.8	1.72939
$n_h$	404.7	1.74174
$n_i$	365.0	1.76486

Constants of Dispersion (Cauchy)	
$A_0$	2.7906689
$A_1$	$-1.0644977 \times 10^{-2}$
$A_2$	$2.9071854 \times 10^{-2}$
$A_3$	$2.1286607 \times 10^{-3}$
$A_4$	$-1.5815625 \times 10^{-4}$
$A_5$	$1.7145247 \times 10^{-5}$

Relative Partial Dispersions			
$P_{d,c}$	0.2899	$P'_{d,c'}$	0.241
$P_{e,d}$	0.2366	$P'_{e,d}$	0.233
$P_{g,F}$	0.5991	$P'_{g,F'}$	0.5303

Deviation of Relative Partial Dispersions	
$\Delta P_{F,e}$	-0.0001
$\Delta P_{g,F}$	0.0055

NHG	HOYA	OHARA	SCHOTT
ZF11	FD15	PBM35	SF15

Chemical Properties	
	Group
RC(S)	1
RA(S)	1
DW	1
DA	1

Thermal Properties	
$T_g$ ( °C )	454
$T_s$ ( °C )	511
$T_{10}^{14.5}$ ( °C )	405
$T_{10}^{13}$ ( °C )	446
$\alpha_{20/120^\circ C}$ ( $10^{-7}/K$ )	77.92
$\alpha_{20/300^\circ C}$ ( $10^{-7}/K$ )	85.14

Mechanical Properties	
Hardness ( $10^7 Pa$ )	405
FA (Relative Abrasion)	0.56
Young's Modulus ( $10^7 Pa$ )	6079
Rigidity Modulus ( $10^7 Pa$ )	2466
Poisson's Ratio	0.232

Photoelastic Constant	
$\beta$ ( $10^{-12}/Pa$ )	

Color	
$\lambda_{80}/\lambda_5$	41/37

Specific Gravity	
$\rho$ ( $g/cm^3$ )	4.1

Internal Transmittance		
$\lambda$ ( nm )	$\tau_{5mm}$	$\tau_{10mm}$
2400	0.96	0.921
2200	0.967	0.935
2000	0.984	0.969
1800	0.991	0.982
1600	0.999	0.998
1400	0.999	0.998
1200	0.999	0.998
1060	0.999	0.998
1000	0.999	0.998
950	0.998	0.997
900	0.998	0.997
850	0.997	0.995
800	0.997	0.994
700	0.996	0.993
650	0.995	0.991
600	0.995	0.99
550	0.995	0.99
500	0.992	0.985
480	0.99	0.98
460	0.987	0.975
440	0.983	0.967
420	0.973	0.946
400	0.918	0.843
390	0.82	0.68
380	0.62	0.38
370	0.26	0.07
360	0.03	
350		
340		
330		
320		
310		
300		
290		
280		



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