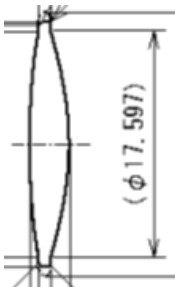
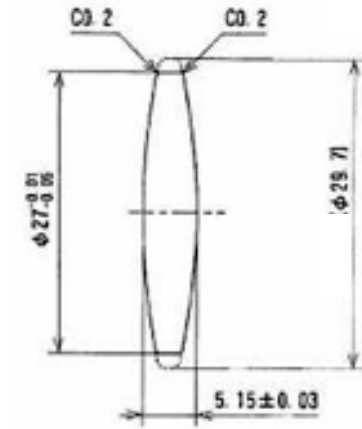


Low Dispersion Glass Material for Molded Optics Lens

M-FCD1

- Suppressed chromatic aberration correction, contribute to the compact use low dispersion optical glass (FCD1) GMO use lens (Diameter is $\phi 20\text{mm} \sim \phi 27\text{mm}$).
- Using preforms (GOB) for precision molding could overcome the occurrence of cracking during pressing process, the occurrence of scratches during second-half process and is suitable for mass production.
- We offer two types of preforms to satisfy customer requirements: GOB (MP-FCD1-M20) and cold processing preforms (MC-FCD1-M20) Type of preform depends on design requirements.

<Sample Lens>

Shape Configuration			
		(With flat round edge)	
Glass Type		M-FCD1	M-FCD1
Diameter (mm)		$\phi 20$	$\phi 27$
Center Thickness (mm)		3	5
R1	asph./sph.	asph.	sph.
	R(mm)	70	70
R2	asph./sph.	asph.	asph.
	R(mm)	23	56

M-FCD1

497-816

$n_d = 1.49710$ $\nu_d = 81.56$ $n_F - n_C = 0.006095$
 $n_e = 1.49856$ $\nu_e = 81.15$ $n_{F'} - n_{C'} = 0.006144$

屈折率 Refractive Index		
	λ (nm)	
n_t	1013.98	1.49015
n_s	852.11	1.49192
$n_{A'}$	768.19	1.49310
n_r	706.52	1.49418
n_C	656.27	1.49524
$n_{C'}$	643.85	1.49554
n_{633}	632.80	1.49582
n_D	589.29	1.49705
n_d	587.56	1.49710
n_e	546.07	1.49856
n_F	486.13	1.50134
$n_{F'}$	479.99	1.50168
n_g	435.84	1.50462
n_h	404.66	1.50732
n_i	365.01	1.51185

分散式の定数 Constants of dispersion formula	
A_0	2.2189068
A_1	$-6.1707065 \times 10^{-3}$
A_2	8.0887631×10^{-3}
A_3	1.3357782×10^{-4}
A_4	1.9476186×10^{-7}
A_5	$-2.2577804 \times 10^{-7}$

部分分散 Partial dispersions	
$n_C - n_t$	0.005089
$n_d - n_C$	0.001861
$n_F - n_d$	0.004234
$n_g - n_F$	0.003281
$n_{C'} - n_t$	0.005385
$n_e - n_{C'}$	0.003020
$n_{F'} - n_e$	0.003124
$n_g - n_{F'}$	0.002936

部分分散比 Partial dispersion rates			
$P_{C,t}$	0.8349	$P'_{C',t}$	0.8765
$P_{d,C}$	0.3053	$P'_{d,C'}$	0.2547
$P_{e,d}$	0.2387	$P'_{e,d}$	0.2368
$P_{F,e}$	0.4559	$P'_{F',e}$	0.5085
$P_{g,F}$	0.5383	$P'_{g,F'}$	0.4779
$P_{h,g}$	0.4430	$P'_{h,g}$	0.4395
$P_{i,h}$	0.7434	$P'_{i,h}$	0.7375

異常分散性 Anomalous dispersions	
$\Delta P_{C,t}$	-0.0920
$\Delta P_{C,A'}$	-0.0249
$\Delta P_{g,d}$	0.0471
$\Delta P_{g,F}$	0.0369
$\Delta P_{i,g}$	0.1669

化学的性質 Chemical Properties	
D_W	1
D_A	3
T_{Blue}	4
D_{NaOH}	4
D_{STPP}	3
D_O	2
D_H	1

熱的性質 Thermal Properties	
T_g (°C)	384
T_s (°C)	427
$T_{10^{14.5}}$ (°C)	369
$T_{10^{13}}$ (°C)	381
$T_{10^{7.6}}$ (°C)	513
$\alpha_{-30/+70^\circ C}$ ($10^{-7}/K$)	131
$\alpha_{100/300^\circ C}$ ($10^{-7}/K$)	163
λ [W/(m·K)]	0.755
C_p [kJ/(kg·K)]	0.583

機械的性質 Mechanical Properties	
H_K	385 (4)
F_A	410
E (GPa)	81
G (GPa)	31.0
μ	0.290
σ_b (MPa)	

屈折率の温度係数 Thermal coefficient of refractive indices ($\times 10^{-6}/K$)		
(°C)	dn/dT (rel.)	dn/dT (abs.)
-40/-20	-4.9	-6.9
-20/0	-5.3	-7.1
0/+20	-5.7	-7.2
+20/+40	-5.9	-7.2
+40/+60	-6.1	-7.3
+60/+80	-6.3	-7.3

光弾性定数 Photoelastic Constant	
B ($10^{-12}/Pa$)	0.77

比重 Specific Gravity	
d	3.64

内部透過率 Internal Transmittance		
λ (nm)	τ 5mm	τ 10mm
1550	0.999	0.997
1500	0.998	0.997
1400	0.999	0.997
1300	0.999	0.999
1200	0.999	0.999
1100	0.999	0.999
1060	0.999	0.999
1050	0.999	0.999
1000	0.999	0.999
950	0.999	0.999
900	0.998	0.999
850	0.998	0.999
830	0.998	0.999
800	0.998	0.999
780	0.998	0.999
750	0.998	0.999
700	0.999	0.998
650	0.999	0.998
600	0.999	0.999
550	0.999	0.999
500	0.999	0.999
480	0.999	0.998
460	0.998	0.997
440	0.998	0.996
420	0.998	0.995
400	0.998	0.996
390	0.997	0.993
380	0.993	0.987
370	0.986	0.972
360	0.968	0.938
350	0.929	0.863
340	0.852	0.726
330	0.721	0.520
320	0.537	0.288
310	0.334	0.112
300	0.167	0.028
290		
280		

着色度 Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	350/305
着色度 (内部透過率) Coloration of Internal Transmittance	
$\lambda_{\tau 80}/\lambda_{\tau 5}$	345/304

備考 Remarks					
硝種対照表 Glass Cross Reference Index					
	HOYA	SCHOTT	OHARA	HIKARI	CDGM
Glass Type	M-FCD1	N-PK52AP		Q-FK01S	
Code	497-816	497-816		496-817	
作成 201104					