



**GKB Vision Ltd.**

**Ophthalmic Front mould  
specifications**

**1.498/1.56 CT/FT 28 BIFOCAL MOULD**

# OPHTHALMICS FRONT MOULD SPECIFICATIONS

## 1.498 / 1.560 FLAT TOP/CURVE TOP 28 BIFOCAL MOULDS

### Reference:

**Datasheet:** QE Glass, Code 8092.

**Zone definition for cosmetic inspection:** Figure 1

**1. PURPOSE:** The document specifies the 1498 & 1.560 flat top/Curve top 28 Bifocal Front Mould specifications to cast the semi-finish organic lenses.

**2. MOULD BASE CURVE & ADDITION:** The Base curve & Addition range is listed below.

**3. DIMENSIONS:** The moulds shall be manufactured with reference to Drawing No: FT28\_STD\_1 & CT28\_STD\_1.

### 4. GENERAL DIMENSIONS ON MOULD:

Parameters	Symbol	Value	Tolerance
Outer Diameter	<b>OD</b>	As per request	+/-0.3mm
Inner Diameter	<b>ID</b>	As per request	+/-0.5mm
Center Thickness	<b>CT</b>	As per request	+/-0.3mm
Segment Inset	<b>Xsg</b>	5.50mm	+/-0.5mm
Segment Drop	<b>Ysg</b>	4.00mm	+/-0.5mm
Chamfer	<b>Ch</b>	0.5mm	+/-0.3mm
Angle of relief	<b>AOR</b>	10 deg,	+/-4 deg

### 5. BASE CURVE & SEGMENT RADIUS:

**5. A. FOR CASTING 1.498 INDEX:** The surface power for Base & segment has been computed with reference to 1.498 refractive index of organic lens

Base curve	Diopter CC (1.498) +/-0.04dpt.	Radius CC mm	Diopter CX (1.498) +/-0.12dpt.	Radius CX mm
<b>0.50</b>	0.35	1432.43	0.35	1432.43
<b>1.50</b>	1.22	407.20	1.22	407.20
<b>3.00</b>	2.79	178.60	2.79	178.60
<b>4.50</b>	4.30	115.68	4.30	115.68
<b>6.00</b>	5.87	84.83	5.87	84.83
<b>8.00</b>	7.97	62.50	7.97	62.50

Table showing Base curve radius for 1.498 RI

<b>SEGMENT RADIUS (mm) WITH TOLERANCE OF +/-0.09dpt</b>						
<b>BASE/ADD</b>	<b>0.50</b>	<b>1.50</b>	<b>3.00</b>	<b>4.50</b>	<b>6.00</b>	<b>8.00</b>
<b>0.75</b>	453.69	252.41	140.74	98.52	75.22	57.12
<b>1.00</b>	369.53	224.02	131.46	93.87	72.48	55.53
<b>1.25</b>	311.71	201.38	123.32	89.65	69.94	54.02
<b>1.50</b>	269.53	182.89	116.13	85.79	67.57	52.60
<b>1.75</b>	237.41	167.51	109.73	82.25	65.35	51.25
<b>2.00</b>	212.13	154.52	104.00	78.99	63.27	49.96
<b>2.25</b>	191.71	143.39	98.84	75.97	61.33	48.74
<b>2.50</b>	174.88	133.76	94.17	73.18	59.49	47.57
<b>2.75</b>	160.77	125.35	89.92	70.59	57.77	46.46
<b>3.00</b>	148.76	117.93	86.03	68.17	56.14	45.40

**Table showing segment radii in millimeters for 1.498 RI**

**5. B. FOR CASTING 1.560 INDEX:** The surface power for Base & segment has been computed with reference to 1.560 refractive index of organic lens

<b>Base curve</b>	<b>Dioptr CC (1.560)</b>	<b>Radius CC</b>	<b>Dioptr CX (1.560)</b>	<b>Radius CX</b>
	<b>+/-0.04dpt.</b>	<b>mm</b>	<b>+/-0.12dpt.</b>	<b>mm</b>
<b>1.50</b>	1.38	407.20	1.38	407.20
<b>3.00</b>	3.14	178.60	3.14	178.60
<b>4.50</b>	4.84	115.68	4.84	115.68
<b>6.00</b>	6.60	84.83	6.60	84.83

**Table showing Base curve radius for 1.560 RI**

<b>SEGMENT RADIUS (mm) WITH TOLERANCE OF +/-0.09dpt</b>				
<b>BASE/ADD</b>	<b>1.50</b>	<b>3.00</b>	<b>4.50</b>	<b>6.00</b>
<b>1.00</b>	235.77	135.41	95.87	73.67
<b>1.25</b>	213.31	127.69	91.94	71.32
<b>1.50</b>	194.77	120.81	88.31	69.12
<b>1.75</b>	179.19	114.62	84.97	67.05
<b>2.00</b>	165.91	109.04	81.86	65.11
<b>2.25</b>	154.47	103.98	78.97	63.27
<b>2.50</b>	144.51	99.37	76.28	61.53
<b>2.75</b>	135.75	95.15	73.77	59.88
<b>3.00</b>	127.99	91.27	71.42	58.32

**Table showing segment radii in millimeters for 1.560 RI**

**6. MATERIAL:** The material of Mould is Corning Glass QE # 8092. After the process of grinding & polishing, the moulds will undergo a process of chemical tempering that hardens the glass. Refer Data sheet: QE glass: Code 8092.

**7. LABELING & ENGRAVING:** Customized engraving can be provided upon request on both molding & non molding side. The labeling will be done with chemical etching. All moulds shall be engraved in a manner that they are clearly legible & portray a professional appearance.

**8. COSMETIC QUALITY:** The inspection method for cosmetic is visual in dark room, using a bright Halogen lamp & also fluorescent tube. The mould is also been inspected on carbon arc lamp. The edges & marking are directly controlled by eye inspection.

**9. ZONE DEFINITION:** The different zones of inspections of concave surface are defined in the **figure 1**.

ZONE 1: is the central area of Mould.

ZONE 2: is the intermediate area.

ZONE 3: is the outer area, containing the flat for ease of De-molding & mould edges.

**10. DEFECTS ACCEPTANCE CRITERIA:**

**DOT SHAPED DEFECTS:** The size & intensity of defects based on Carl Ziess plate.

	<b>ZONE 1</b>	<b>ZONE 2</b>	<b>ZONE 3</b>
<b>DOT</b>	1 x 0.010	1 x 0.025	Any dot
	2 x 0.004	2 x 0.010	Any dot

Max number of dots allowed in Zone 1 is two.

Max number collectively in Zone 1 & 2 is three.

**SCRATCHES & LINE SHAPED DEFECTS:** The size & intensity of defects based on Carl Ziess plate.

	<b>ZONE 1</b>	<b>ZONE 2</b>	<b>ZONE 3</b>
<b>SCRATCH</b>	1 x 0.010	1 x 0.025	Any scratch
		2 x 0.010	Any scratch

Max number of scratches allowed in Zone 1 & 2 combine is three.

Any number of scratches allowed in Zone 3 as long as they are not Perpendicular from edge into Zone 2.

The total number of scratch & dot shape defects in Zone 1 & 2 must not exceed four.

**OTHER SURFACE DEFECTS:**

In Zone 3, only edge chip, not larger than 2mm along the circumference, 1mm radially & 0.50mm in depth are allowed.

No marks or stain allowed in Zone 1. Marks that are faintly visible with naked eye are acceptable in Zone 2.

Marks or stains in Zone 3 are allowed.

Visual aberration in Zone 3 is allowed.

Inspection Technique: As per **DIN 58203**.

**11. PACKAGING:** The moulds shall be packed in a individual white boxes. The packing shall protect the moulds against damages during transportation.

The boxes shall clearly identify the mould it contains & shall mention at least Base & Addition.

Glass designation :	<b>QE</b>	Code <b>8092</b>
Color :	<i>White</i>	
Glass type:	<i>Chemtemperable, crown glass.</i>	
Application:	<i>Molds for Organic Ophthalmic lenses.</i>	

PHYSICAL PROPERTIES	
Density	2.62
Linear Exp. Coef.	95.10 <sup>-7</sup>
Viscosity Soft. Pt	735°C
Ann. Pt	545°C
Strain pt	505°C

REFRACTIVE PROPERTIES	
Refractive Index <i>n<sub>d</sub></i>	1.5231
Abbe Number <i>v<sub>d</sub></i>	57.1
TRANSMISSION PROPERTIES (2mm)	
Luminous transmission Factor	91.5%

CHEMICAL DURABILITY (Class)	To Water	(NF B 35601)	3
	To Acid	(DIN 12116)	3
	To Alkalis	(NF B 35602)	2

CHEMTEMPERING			
<p>The chemtempering process builds up a compressive stress in the surface of the piece through ion exchanges between the glass and the salt bath.</p> <p>The amount of compressive stress, and the depth of the compressed layer, are the two parameters that determine the mechanical resistance of the molds:</p> <p style="padding-left: 40px;">Maximized depth of layer (D.O.L.), insure longer mold life (ie: serviceability), as it reduces the negative impact of damaged surfaces.</p> <p style="padding-left: 40px;">Higher compression shall enhance break resistance.</p> <p>The balance between those two parameters depends on processing conditions.</p>			
<b>Recommended bath and cycle :</b>	<b>D.O.L.</b>	<b>Compression</b>	
	<b>(µm)</b>	<b>PSI</b>	
<b>Bath</b>	<b>Potassium Nitrate</b>	<b>99.5%</b>	
	<b>Sodium Nitrate(maxi)</b>	<b>0.5%</b>	
	<b>Silicic Acid</b>	<b>0.5%</b>	
<b>Time</b>	<b>16 hr</b>	<b>90</b>	<b>53000</b>
<b>Temperature</b>	<b>450°C</b>		
<p>Longer time cycle , or higher processing temperature, will produce larger DOL, but decrease compression.</p>			
<b>Short Schedule.</b>			
<p>Short chemtempering schedules may be found appropriate, although they leads to reduced DOL, which may translate into reduced molds serviceability.</p>			
<p>Typical performances are as follows:</p>			
Time	4hr	D.O.L.	Compression
Temperature	450°C	55µm	50000 psi

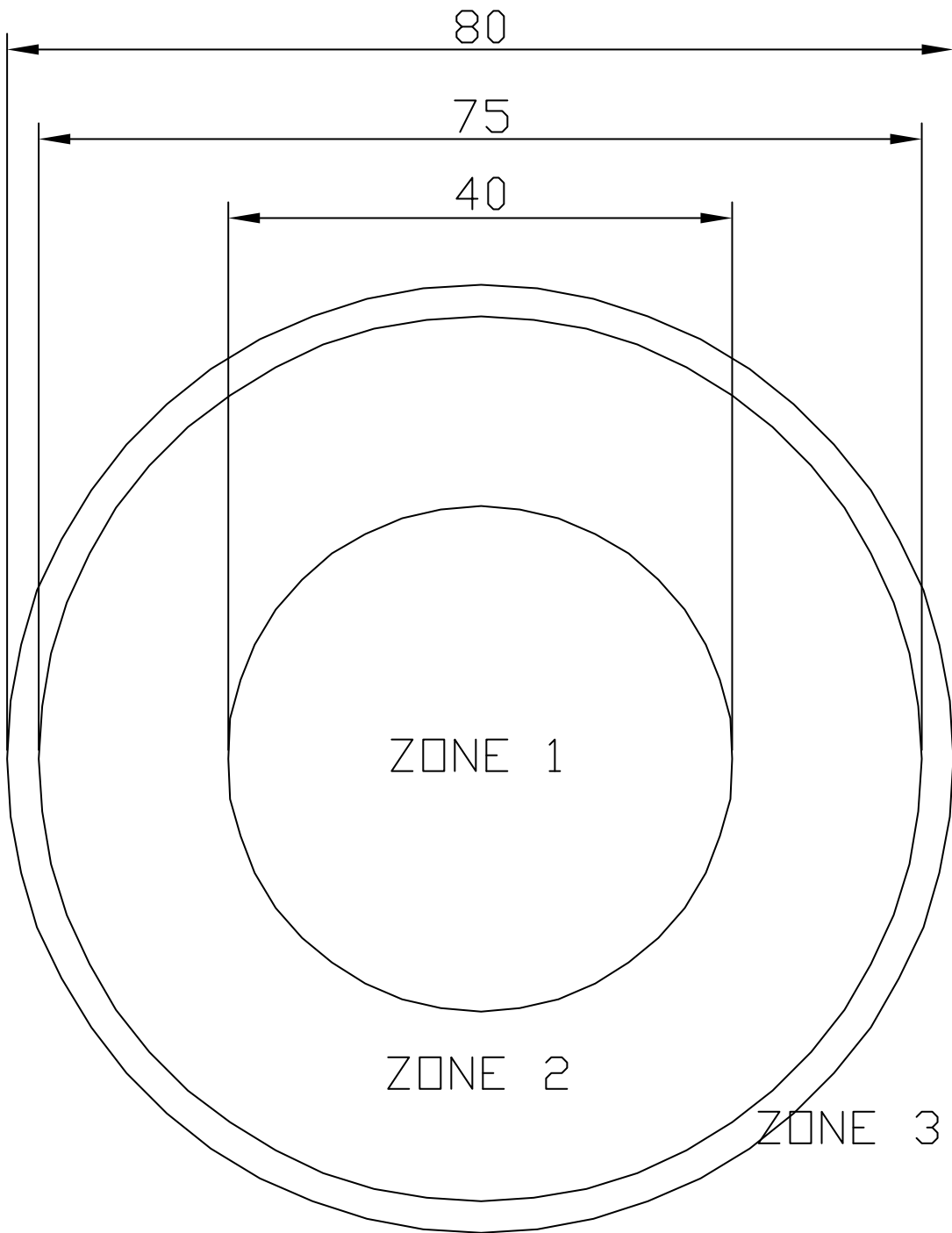
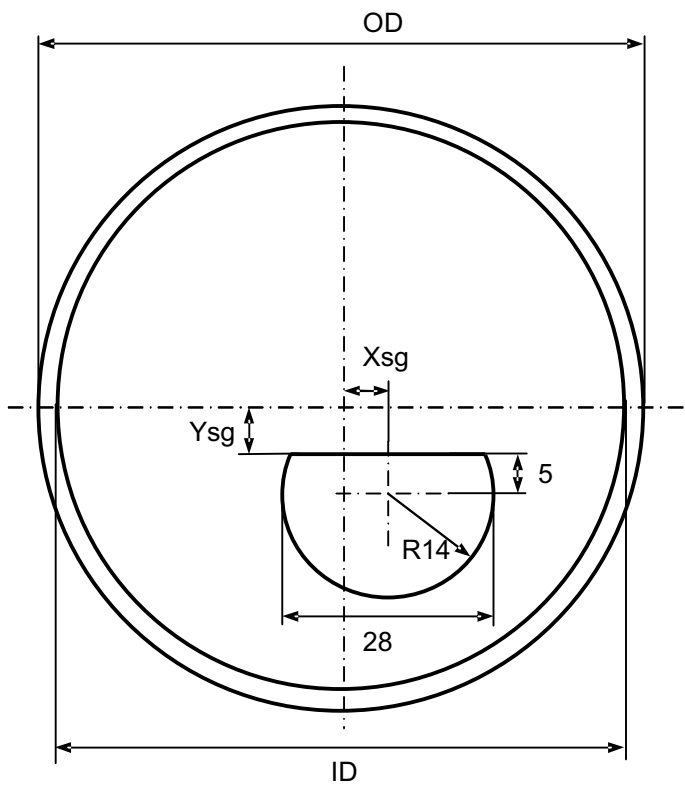
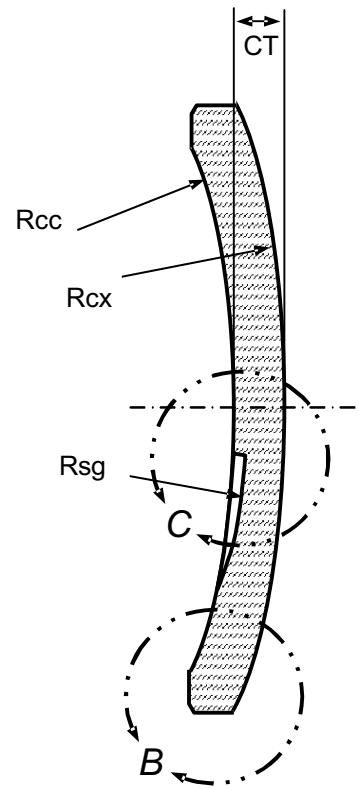


FIGURE 1

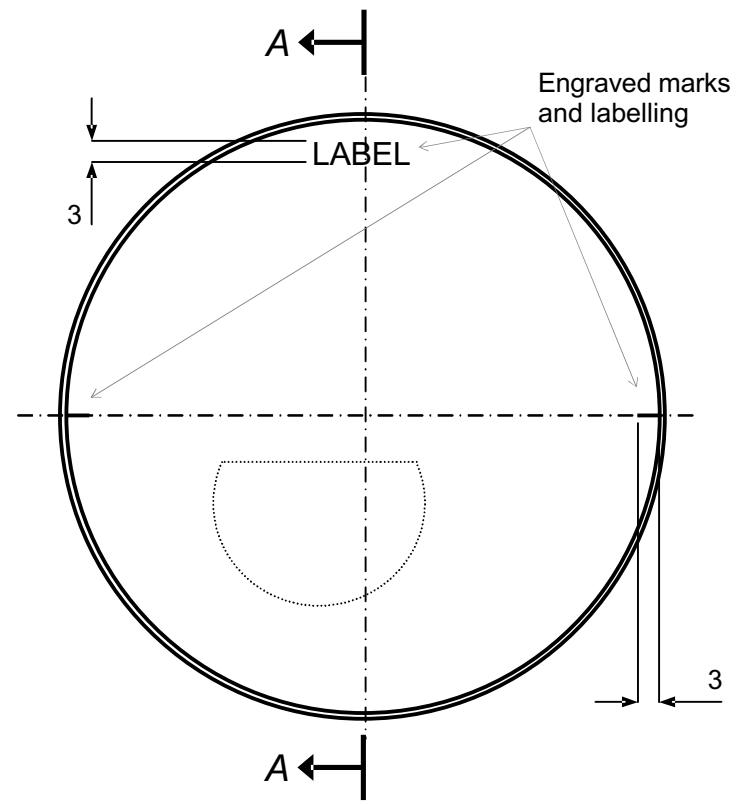
ZONE DEFINITION



CONCAVE SIDE



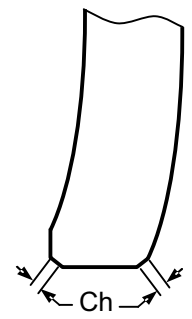
SECTION A A



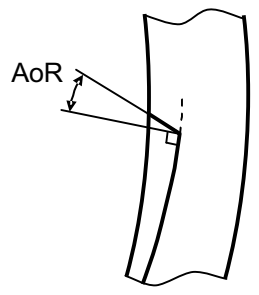
CONVEX SIDE

Notes:

- Refer to separated document for full specification
- Glass material = QE 8092
- Chemically tempered glass
- Gen. Tol. =  $\pm 0.5$  unless specified
- Unit = mm

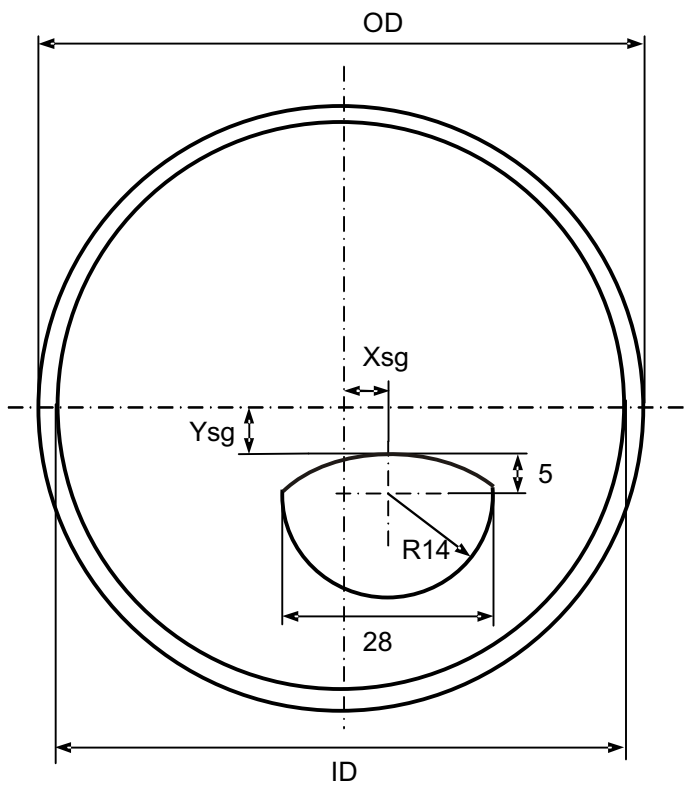


DETAIL B

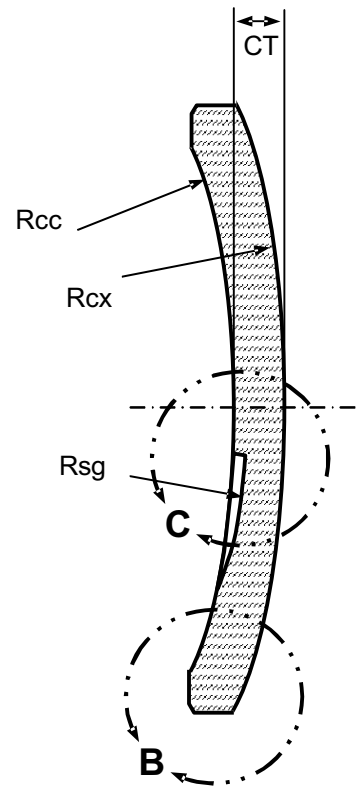


DETAIL C

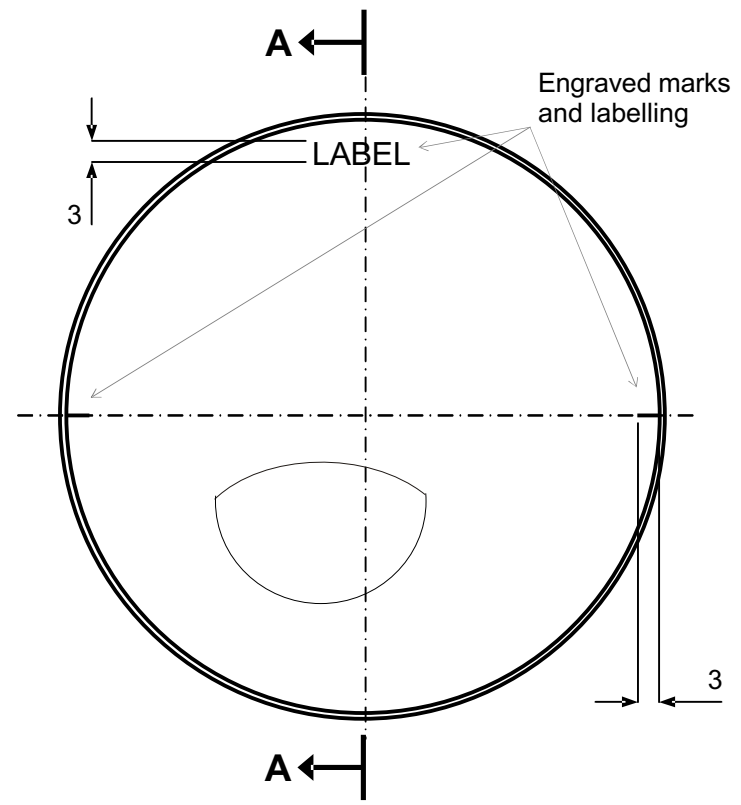
Flat Top 28 bifocal glass mould		
	FT28_STD_1	A
Scale : No scale	Sheet 1 of 1	



**CONCAVE SIDE**



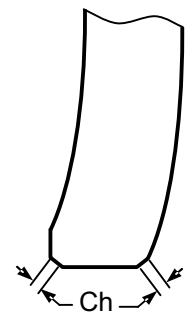
**SECTION A A**



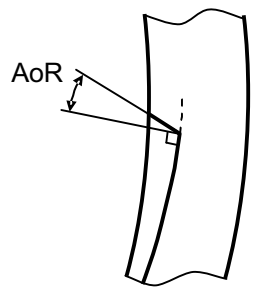
**CONVEX SIDE**

**Notes:**

- Refer to separated document for full specification
- Glass material = QE 8092
- Chemically tempered glass
- Gen. Tol. =  $\pm 0.5$  unless specified
- Unit = mm



**DETAIL B**



**DETAIL C**

Curve Top 28 bifocal glass mould		
	CT28_STD_1	A
Scale : No scale	Sheet 1 of 1	