



**GKB Vision Ltd.**

**Ophthalmic Front mould  
specifications**

**1.60 CURVE TOP 28 BIFOCAL MOULD**

# OPHTHALMICS FRONT MOULD SPECIFICATIONS

## 1.60 CURVE TOP 28 BIFOCAL MOULDS

**Reference:**

**Drawing:** 1.60 CURVE TOP 28 BIFOCAL MOULD: CT 001

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

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

**1.PURPOSE:** The document specifies the 1.60 curve top 28 Bifocal Front Mould specifications to cast the semi-finish organic lenses.

**2.MOULD BASE CURVE & ADDITION:** There are five different base curves viz. 0.50, 2.25, 4.25, 6.25 & 8.25 with additions from 1.00 to 3.50 in a step of 0.25diopter.

**3.DIMENSIONS:** The moulds shall be manufactures with reference to Drawing No: CT 001.

**4.GENERAL DIMENSIONS ON MOULD:**

Parameters	Symbol	Value	Tolerance
Outer Diameter	OD	80mm	+0.1/-0.4mm
Center Thickness	CT	5mm	+/-0.2mm
Chamfer	Ch	Refer drawing	-0.0/+0.3mm
Angle of relief	AOR	12 deg,	+/-3 deg

**5. BASE CURVE & SEGMENT RADIUS:** The surface power for Base & segment has been computed with reference to 1.592 refractive index of organic lens.

Base curve	Diopter CC (1.592)	Radius CC	Diopter CX (1.592)	Radius CX
	<b>+/-0.03dpt.</b>		<b>+/-0.12dpt.</b>	
<b>0.50</b>	0.41	1432.40mm	0.41	1432.40mm
<b>2.25</b>	2.11	280.00mm	2.11	280.00mm
<b>4.25</b>	4.55	130.00mm	4.55	130.00mm
<b>6.25</b>	5.92	100.00mm	5.92	100.00mm
<b>8.25</b>	8.82	67.09mm	8.82	67.09mm

Table showing Base curve radius

<b>SEGMENT RADIUS (mm) WITH TOLERANCE OF +/-0.08dpt</b>					
<b>BASE/ADD</b>	<b>0.50</b>	<b>2.25</b>	<b>4.25</b>	<b>6.25</b>	<b>8.25</b>
<b>1.00</b>	420.069	190.548	106.736	85.641	60.285
<b>1.25</b>	358.073	176.579	102.207	82.701	58.824
<b>1.50</b>	311.305	164.518	98.047	79.956	57.407
<b>1.75</b>	275.676	154.000	94.212	77.387	56.071
<b>2.00</b>	247.366	144.746	90.666	74.978	54.795
<b>2.25</b>	223.527	136.244	87.255	72.630	53.530
<b>2.50</b>	204.546	128.950	84.205	70.504	52.367
<b>2.75</b>	188.535	122.397	81.360	68.499	51.252
<b>3.00</b>	174.850	116.479	78.702	66.605	50.185
<b>3.25</b>	163.194	111.189	76.251	64.841	49.177
<b>3.50</b>	152.673	106.202	73.872	63.113	48.176

**Table showing segment radii in millimeters**

**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:** A 3mm high labels shall be engraved onto the convex surface of the moulds. The label identifies the Nominal Base & additions.

**8.COSMETIC QUALITY:** The inspection method for cosmetic is visual in dark room, using s 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 DEFINATION:** 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. ENGRAVING:** All moulds shall be engraved in a manner that they are clearly legible & portray a professional appearance.

**12. 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

The chemtempering process builds up a compressive stress in the surface of the piece through ion exchanges between the glass and the salt bath.

The amount of compressive stress, and the depth of the compressed layer, are the two parameters that determine the mechanical resistance of the molds:

Maximized depth of layer (D.O.L.), insure longer mold life (ie: serviceability), as it reduces the negative impact of damaged surfaces.

Higher compression shall enhance break resistance.

The balance between those two parameters depends on processing conditions.

<b>Recommended bath and cycle :</b>	<b>D.O.L.</b>	<b>Compression</b>
	<b>(µm)</b>	<b>PSI</b>
<b>Bath</b>		
Potassium Nitrate	99.5%	
Sodium Nitrate(maxi)	0.5%	
Silicic Acid	0.5%	
<b>Time</b>	16 hr	90
<b>Temperature</b>	450°C	53000

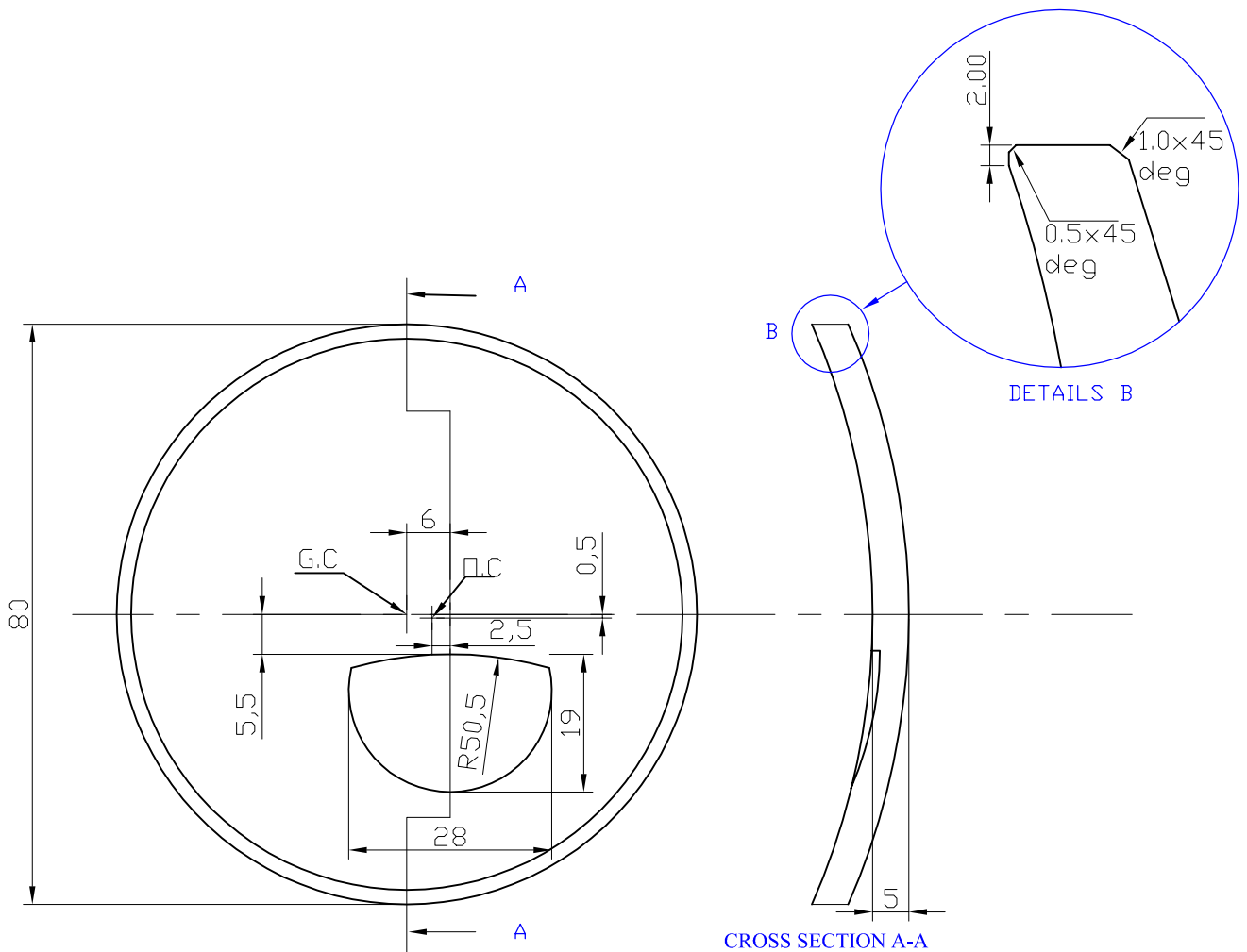
Longer time cycle , or higher processing temperature, will produce larger DOL, but decrease compression.

**Short Schedule.**

Short chemtempering schedules may be found appropriate, although they leads to reduced DOL, which may translate into reduced molds serviceability.

Typical performances are as follows:

Time	4hr	D.O.L.	Compression
Temperature	450°C	55µm	50000 psi



G.C--Geometrical Center  
 O.C--Optical Center

R<sub>D</sub>--Radius in Distance  
 R<sub>N</sub>-- Radius in near vision

GENERAL TOLERANCE  
 =+/-0.5mm

# 1.60 CURVE TOP28 BIFOCAL MOULD

ALL DIMENSIONS IN MM

				File name DRW/EX 001	Date 29-10-2006
GKB Vision Ltd			1.60 CT28 BIFOCAL MOULD		
			CT 001	Edition	Sheet

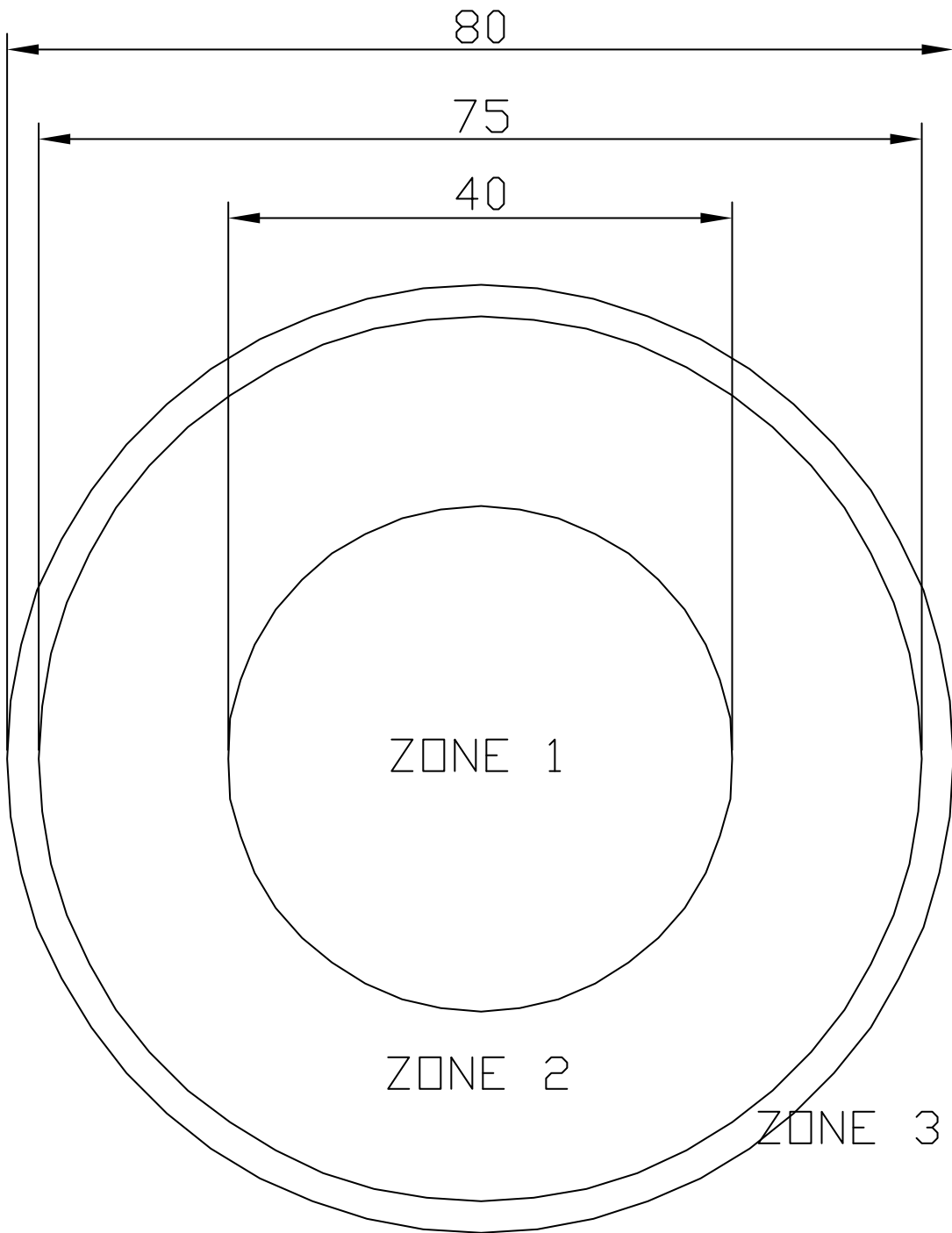


FIGURE 1

ZONE DEFINITION