



Half Ball Lenses



Introduction

Half ball lenses are specially designed for the use in the field of LED lighting. They are intended for the production of very large quantities. Prices comparable with the price of plastic lenses are combined with all the very useful characteristics of three different glass types:

- ▶ High surface quality
- ▶ Scratch-proof surface
- ▶ High or very high refraction index
- ▶ Heat resistant up till more than 300°C (572°F)

How to find the right glass type:

In most cases, B270 will be the best choice. It is a very high quality optical glass at a very good price. Its thermal expansion rate lies within a good range, but not as good as that of Borosilicate glass. If you need a very high refraction index, F2 will be a good choice. It is a special optical glass at a much higher price as B270 or Borosilicate glass, and is thus not a standard glass in stock.

If you require a very low thermal expansion rate combined with a mid-range refraction index, Borosilicate glass will be the first choice. The price of this glass lies between that of B270 and F2. Half ball lenses of Borosilicate glass are not available from stock.



Weight of half ball lenses with different diameters and different glass types in gramm per 1,000 pcs

Made from B270 Gramm per 1,000 pcs.			
	4mm	5mm	6mm
Standard	42.7	83.4	144.2
Truncated	33.2	68.5	122.6
Extended	52.3	98.4	165.8

Made from Borosilicate Glass Gramm per 1,000 pcs.			
	4mm	5mm	6mm
Standard	37.4	73.0	126.1
Truncated	29.0	59.9	107.2
Extended	45.7	86.0	145.0

Made from F2 Gramm per 1,000 pcs.			
	4mm	5mm	6mm
Standard	60.5	118.1	204.1
Truncated	47.0	97.0	173.6
Extended	74.0	139.3	234.7

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Half Ball Lenses

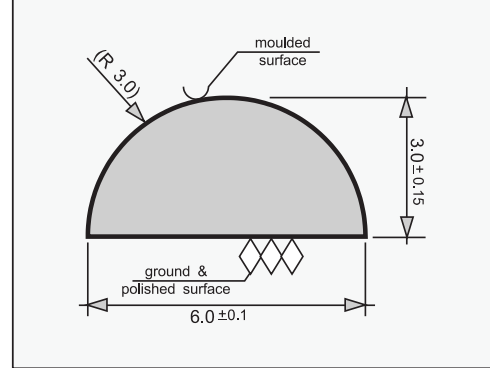
Notice: Specification, description and dimensional data are for information only, they are subject to correction or change without notice or incurring obligation.

- * Standard types are available at short notice. Prototypes are typically available from stock.
- * Truncated as well as extended versions are available on request. Please allow some weeks of production time for prototypes if there are none on stock.
- * There are no tooling costs for all types shown here.
- * Other diameters, glasses, thickness ... on request.

Standard thickness

Diameter	6.00 ± 0.10 mm
Thickness	3.00 ± 0.10 mm
Radius	(3.00 mm)
Focal Length	(5.74 mm)
Material	Glass
	B 270 (Schott)
Refraction Index	$n_d = 1.5230$ (@588nm)
Thermal Expansion Index	$95 \times 10^{-7} / K$

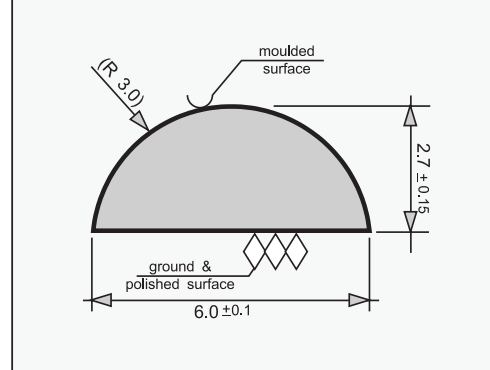
standard hemisphere lens D60R30H30



Truncated

Diameter	6.00 ± 0.10 mm
Thickness	2.70 ± 0.10 mm
Radius	(3.00 mm)
Focal Length	(5.74 mm)
Material	Glass
	B 270 (Schott)
Refraction Index	$n_d = 1.5230$ (@588nm)
Thermal Expansion Index	$95 \times 10^{-7} / K$

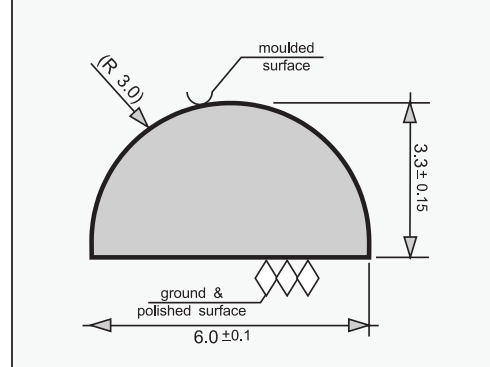
truncated hemisphere lens D60R30H27



Extended

Diameter	6.00 ± 0.10 mm
Thickness	3.30 ± 0.10 mm
Radius	(3.00 mm)
Focal Length	(5.74 mm)
Material	Glass
	B 270 (Schott)
Refraction Index	$n_d = 1.5230$ (@588nm)
Thermal Expansion Index	$95 \times 10^{-7} / K$

extended hemisphere lens D60R30H33



6.00 mm Diameter / Radius 3.00 mm

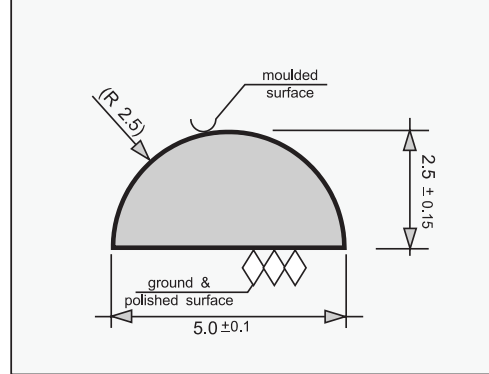
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5.00 mm Diameter / Radius 2.50 mm

Standard thickness

Diameter	5.00 ± 0.10 mm
Thickness	2.50 ± 0.10 mm
Radius	(2.50 mm)
Focal Length	(4.78 mm)
Material	Glass
	B 270 (Schott)
Refraction Index	$n_d = 1.5230$ (@588nm)
Thermal Expansion Index	$95 \times 10^{-7} / K$

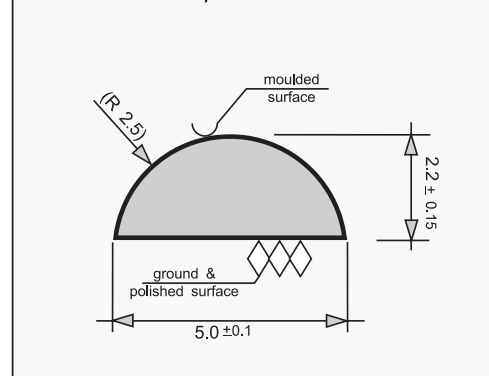
standard hemisphere lens D50R25H25



Truncated

Diameter	5.00 ± 0.10 mm
Thickness	2.20 ± 0.10 mm
Radius	(2.50 mm)
Focal Length	(4.78 mm)
Material	Glass
	B 270 (Schott)
Refraction Index	$n_d = 1.5230$ (@588nm)
Thermal Expansion Index	$95 \times 10^{-7} / K$

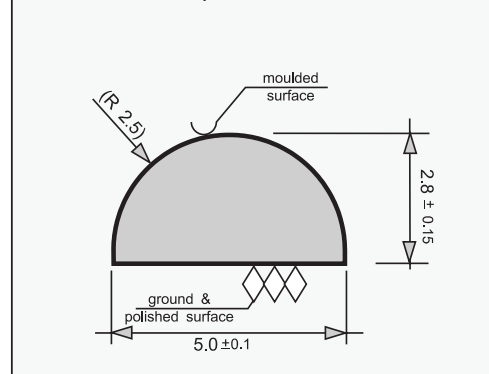
truncated hemisphere lens D50R25H22



Extended

Diameter	5.00 ± 0.10 mm
Thickness	2.80 ± 0.10 mm
Radius	(2.50 mm)
Focal Length	(4.78 mm)
Material	Glass
	B 270 (Schott)
Refraction Index	$n_d = 1.5230$ (@588nm)
Thermal Expansion Index	$95 \times 10^{-7} / K$

extended hemisphere lens D50R25H28



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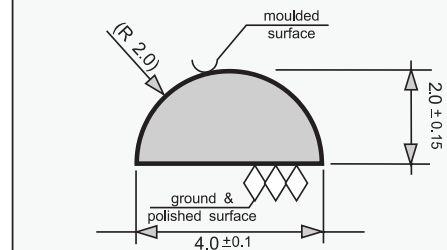
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- * There are no tooling costs for all types shown here.
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Standard thickness

Diameter	4.00 ± 0.10 mm
Thickness	2.00 ± 0.10 mm
Radius	(2.00 mm)
Focal Length	(3.82 mm)
Material	Glass
	B 270 (Schott)
Refraction Index	$n_d = 1.5230$ (@588nm)
Thermal Expansion Index	$95 \times 10^{-7} / K$

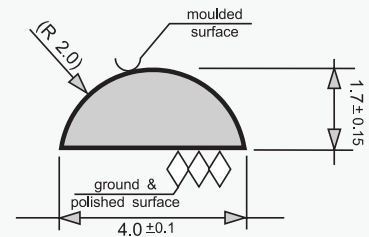
standard hemisphere lens D40R20H20



Truncated

Diameter	4.00 ± 0.10 mm
Thickness	1.70 ± 0.10 mm
Radius	(2.00 mm)
Focal Length	(3.82 mm)
Material	Glass
	B 270 (Schott)
Refraction Index	$n_d = 1.5230$ (@588nm)
Thermal Expansion Index	$95 \times 10^{-7} / K$

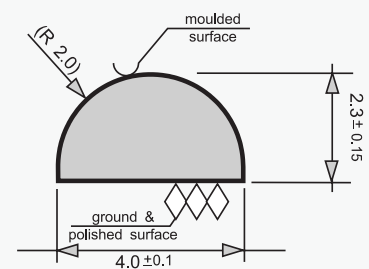
truncated hemisphere lens D40R20H17



Extended

Diameter	4.00 ± 0.10 mm
Thickness	2.30 ± 0.10 mm
Radius	(2.00 mm)
Focal Length	(3.82 mm)
Material	Glass
	B 270 (Schott)
Refraction Index	$n_d = 1.5230$ (@588nm)
Thermal Expansion Index	$95 \times 10^{-7} / K$

extended hemisphere lens D40R20H23



4.00 mm Diameter / Radius 2.00 mm

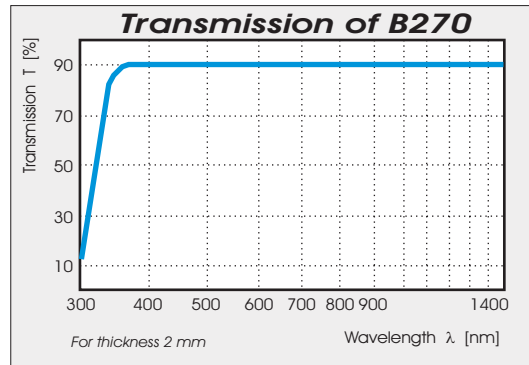
Standard glass

B270 Superwhite® by Schott is a high-quality optical glass with an excellent transmission in long wavelengths.

MOULDED OPTICS GMBH has specialised in manufacturing aspherical lenses, mirrors, prisms, and other optical components from this glass, using a blank moulding process.

High-quality Half Ball Lenses, in extremely large quantities and at the lowest cost, are the latest development of MOULDED OPTICS GMBH. Blank moulded lenses offer the best cost-effectiveness.

Lenses made from B270 Superwhite® are lead-free, mercury-free, chromium-free and cadmium-free. They fulfill RoHS.



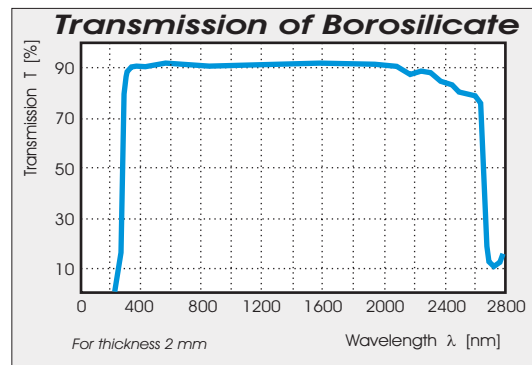
thermal expansion index (+20 .. +300 °C)	$95 \times 10^{-7} / K$
Refraction index	$n_d = 1.5230$

Borosilicate glass

Comparable, known glass types are Duran® by Schott or Pyrex® by Corning.

Borosilicate glass is used where a low thermal expansion index is required.

Thermal expansion index of Borosilicate glass is close the index of ceramics. The refraction index of Borosilicate glass is close to the index of plastic.



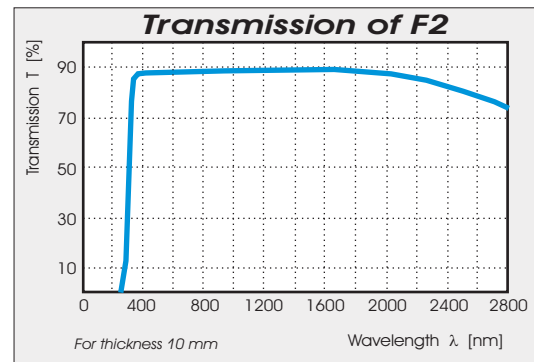
thermal expansion index (+20 .. +300 °C)	$32 \times 10^{-7} / K$
Refraction index	n_d approx. 1.48

N-F2 glass

High-quality optical glass, by Schott, with a high refraction index.

The expansion index is a little bit better than the index of B270, but the price of F2 is much higher.

So, F2 is the best glass where a much higher refraction index than B270 is a must.



thermal expansion index (-30 .. +70 °C)	$82 \times 10^{-7} / K$
Refraction index	$n_d = 1.62004$

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Packaging

Packaging is subject to discussion on the basis of the customer's requirements. Our goods come in plastic bags of 1,000 or 10,000 pcs. as a standard.

Shipping

All prices are ex works (EXW).

Shipping can be arranged by Moulded Optics GmbH. In that case the shipping costs will be added on the invoice.

Quantities & payment terms

Half ball lenses are ordered by quantity.

The lowest quantity should be 10,000 pcs. per diameter and thickness.

Typical payment terms are open invoice, to be paid within 30 days net.

Normally, Moulded Optics GmbH will issue the invoices in Euro.

Other shapes

Blank moulding allows MOULDED OPTICS GMBH to produce nearly any kind of geometry and combinations of lenses that can be created by optics developers and system designers.

The geometry of the optically effective surface is not restricted to radii; blank moulding allows to produce lenses with aspherical surfaces.

There are many applications in which aspheric lenses will improve the performance of technical and optical systems.

Many applications need lenses in flye-eye-array.

Blank moulding allows to produce just the right array you need. This helps to save assembly costs.

Please note that the minimum distance between the lenses is 0.5 mm or more.

