



Borosilicate gauge glasses

Reflex gauge glasses

Transparent gauge glasses

Circular gauge glasses

Edition 2007

Tel. +43 (0)2252 600-0
Fax +43 (0) 2252 600 359
Web: www.klinger.kfc.at



Borosilicate gauge glasses

long and circular types

The quality of a sight (gauge) glass depends mainly on the chemical composition and mechanical strength of the glass material.

Constant glass quality is provided through glass analyses and acid/alkali tests. The mechanical strength is attained through thermal pre-stressing.

Liquid level gauges

The gauge glass is the most important component of the liquid level gauge.

KLINGER gauge glasses are suitable for installation in liquid level gauges of almost any make.

Our gauge glasses are exclusively made of "extra-hard" borosilicate glass which is subsequently heat-treated.

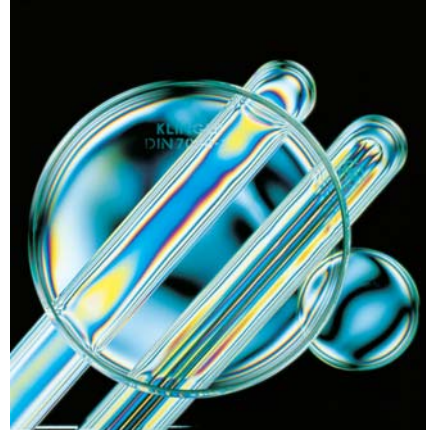
KLINGER gauge glasses have high mechanical strength and are exceptionally resistant to alkalis, acids and boiler water (within the service limitation).

Continuously quality control tests are carried out: purity of glass, flaws in glass, dimensional accuracy. This ensures the high quality standard of all KLINGER gauge glasses.

We manufacture reflex and transparent glasses according to the most varied international standards.

Fields of application:

- Oil refineries
- Petro-chemical plants
- Pharmaceutical manufacture
- Chemical processing
- Mechanical engineering, especially manufacture of boilers and storage vessels
- Food and beverage industry
- Water engineering
- Pulp and paper industry
- Textile industry
- Marine engineering
- Nuclear engineering



Stress-optical view of thermally pre-stressed circular and long gauge glasses in polarised light



KLINGER transparent glass (above) and reflex glass (underneath)



Circular gauge glasses made from borosilicate glass "extra-hard"

Circular sight glasses

made from borosilicate glass “extra-hard”

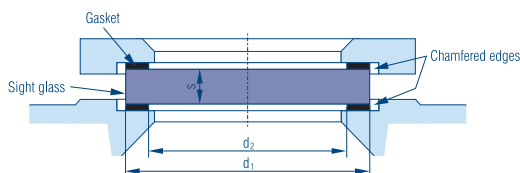
From our standard range

Glass		Permiss. PB**) bar	Gasket		
Diameter mm	Thickness mm		O. D. mm	I. D. mm	Thickness mm
31,75	12,7	175	*)	*)	*)
40	12	50	42	30	1,5
45	10	40	47	32	1,5
45	12	50	47	32	1,5
50	10	25	52	35	1,5
50	12	40	52	35	1,5
60	10	16	62	45	1,5
60	12	25	62	45	1,5
60	15	40	62	45	1,5
63	10	16	65	48	2
63	12	25	65	48	2
63	15	40	65	48	2
70	12	25	72	55	2
80	12	16	82	65	2
80	15	25	82	65	2
80	20	40	82	65	2
90	10	10	92	75	2
100	10	8	102	80	2
100	15	16	102	80	2
100	20	25	102	80	2
100	25	40	102	80	2
110	20	25	112	90	2
120	10	8	122	100	2
125	15	10	127	100	2
125	20	16	127	100	2
125	25	25	127	100	2
150	15	8	152	125	2
150	20	10	152	125	2
150	25	16	152	125	2
150	30	25	152	125	2
170	15	8	172	140	2
175	20	10	177	150	2
175	25	16	177	150	2
175	30	25	177	150	2
200	20	8	202	175	2

■ Dimensions not in DIN 7080 or OeNORM M7353

*) Gasket set and micas for high-pressure steam gauges **) PB=working pressure (gauge)

Calculation of the correct glass thickness



$$s = 0,55 \cdot d_m \sqrt{\frac{p \cdot S}{10 \cdot \sigma_{bb}}}$$

s: Theoretical minimum thickness in mm

d_m : $\frac{d_1 + d_2}{2}$ Mean diameter of gasket

d_1 : O. D. of glasses and gasket

d_2 : I. D. of gasket

p: Max. permissible working pressure (gauge) in bar

σ_{bb} : Minimum bending strength in N/mm²

S: Safety factor



Technical datas

Material:

Borosilicate glass, thermally pre-stressed, optically tested, properties as laid down in DIN and OeNORM.

Extract from the OeNORM: “Chemical pre-stressing of glasses is not permissible. For safety reasons soda-lime glasses may not be used.”

Resistance to bending strain:

≥ 160 N/mm²

Mean coefficient of linear expansion:

$\alpha_{20/300} \leq 4,5 \cdot 10^{-6} \cdot K^{-1}$, tested to DIN 52328.

Transition temperature:

$t_g = 550^\circ C$, tested to DIN 52324.

Chemical resistance

Alkali resistance:

alkali class 2, tested to ISO 675.

Water resistance:

hydrolytic class 1, tested ISO 719.

Acid resistance:

acid class 1, tested to DIN 12116.

moulded – ground – polished – thermally pre-stressed

Temperatur resistance:

suitable for temperatures from $-273^\circ C$ to $+300^\circ C$, size 31.75/12.7 up to $356^\circ C$

made from borosilicate glass “extra-hard”

KLINGER Package unit:

Sight glasses are packed in individual cardboard boxes. In addition to the glass, each package contains a KLINGER sealing gasket and cushion gasket and forms a complete unit ready for installation. Handy, shock-proof package.

Standards

Klinger reflex and transparent glasses are produced acc. to the following standards:

OeNORM M 7353 (Austrian Standard)

DIN 7080 (German Standard)

BS 3463 (British Standard Institution).

JIS 8211 (Japanese Industrial Standard)

At request we supply circular sight glasses in any desired dimension.



Dimensional tolerances:

Glass Ø	DIN 7080 OeNORM M 7353	KLINGER house standard
31,75 mm	–	±0,13 mm
to 125 mm	±0,5 mm	±0,5 mm
150 to 200 mm	±0,8 mm	±0,5 mm
Glass thickness		
12,7 mm	–	±0,05 mm
10 to 20 mm	±0,5 mm	±0,5 mm
above 20 mm	±0,8 mm	±0,5 mm

Key role

Link

Innovation

Navigation

Growth

Efficiency

Routine

KLINGER Fluid Control GmbH
 A-2352 Gumpoldskirchen, Austria
 Am Kanal 8-10
 Tel. +43 (0)2252-600-0
 Fax +43 (0)2252-600 359
 e-mail: office@klinger.kfc.at
 www.klinger.kfc.at