



INDUSTRIAS ASOCIADAS
INSTRUMENTACIÓN PARA LA INDUSTRIA



ZIGHT

MADE IN NORTH AMERICA



ZIGHT

VISION FOR THE
AMERICAN INDUSTRY

MADE IN NORTH AMERICA

INDUSTRIAL GLASS

VISION FOR THE AMERICAN INDUSTRY

Bogotá

PBX (1) 371 2929

Barranquilla

PBX (5) 316 1860

Cartagena

PBX (5) 642 9330

Cali

PBX (2) 369 0680

Medellin

PBX (4) 204 2310



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BOROSILICATE SIGHT GLASS

TEMPERED ACC DIN 7080

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BOROSILICATE SIGHT GLASS

TEMPERED

DIN 7080

ZIGHT GLASS

Manufactured in 3.3 Borosilicate Glass, these sight glasses are used in several applications where a good chemical resistance and low thermal expansion coefficient are required. A bad chemical resistance may cause glass to react and release unwanted substances in the process, such as arsenic which is formed with a non-borosilicate glass reacts with water.

Special dimensions of glasses are available upon request, where the minimum diameter is 10mm, and the maximum diameter is 350mm. The thickness can be manufactured to a minimum of 3mm and a maximum of 35mm. Do not hesitate to contact us for recommendations as to which sight glass fits your application the best.

MANUFACTURED IN ACCORDANCE TO DIN 7080

In order to achieve the standardization of this type of type of sigh glasses in all the different industries, the German regulatory institute, DIN for its acronym in German, designed standard parameters for the manufacture of this type of glass.

The main issues this norm regulates is the pressure resistance in terms of the total diameter of the glass, the observable diameter of the glass, and the glass thickness. It also dictates permissible imperfections in the glass, chemical attack, markings, and dimensional tolerances.



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TECHNICAL INFORMATION

PHYSICAL PROPERTY	TESTING METHOD	VALUE OBTAINED
THERMAL EXPANSION COEFFICIENT	ISO 7991	$3.3 \times 10^{-6} \text{°K}$
DENSITY AT 25°C	SN 7005 13	2.23 g/cm ³
REFRACTIVE INDEX ($\lambda = 587.6\text{nm}$) _{nd}		1.472
TRANSFORMATION TEMPERATURE	ISO 7884-8	560°C
HIGHEST SHROT-TERM WORKING RANGE	ISO 7884-7	500°C
THERMAL SHOCK RESISTANCE	ISO 7884	230 K
YOUNGS MODULUS		63.150 MPa
POISSON CONSTANT		0.20
THERMAL CONDUCTIVITY	20°C - 100°C λ	(1.2)(W·m ⁻¹)(K ⁻¹)
PHOTOELASTIC CONSTANT	DIN 52314	(4.00 x 10 ⁻⁶)(mm ² /N)
SPECIFIC ELECTRIC RESISTANCE	DIN 52326	250°C
DIMENSIONAL TOLERANCES DIAMETER	DIN 7080	PASS (SEE ANEX B1)
DIMENSIONAL TOLERANCES THICKNESS	DIN 7080	PASS (SEE ANEX B1)

OPTICAL PROPERTY	TESTING METHOD	VALUE OBTAINED
BUBBLE ON GLASS	DIN 7080	PASS (SEE ANEX A1)
MARKINGS ON GLASS	DIN 7080	PASS (SEE ANEX A2)
EDGE TOLERANCES (CHAMFER ON GLASS)	DIN 7080	PASS (SEE ANEX B2)
VISCOUS KNOTS	DIN 7080	NON-VISIBLE NO EYE
CRYSTALLINE INCLUSIONS	DIN 7080	LESS THAN 0.2MM



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Special dimensional design upon request is available

(DIAM MIN 10mm MAX 350mm) / (THICKNESS MIN 3mm Max 35MM)

	Glass Diameter	Glass Thickness	Visible Diameter	Pressure Resistance (BAR)	Pressure Resistance (PSI)
AMERICAN UNITS, MOST STANDARD SIZES	4"	3/4"	3-1/4"	25 BAR	362 PSI
	5"	3/4"	4"	16 BAR	232 PSI
	6"	3/4"	5"	10 BAR	145 PSI
	6-3/4"	3/4"	5-3/4"	10 BAR	145 PSI
	8-3/8"	3/4"	7-3/8"	8 BAR	116 PSI
INTERNATIONAL UNITS, MOST STANDARD SIZES	63 mm	10 mm	48 mm	16 BAR	232 PSI
	80 mm	12 mm	65 mm	16 BAR	232 PSI
	100 mm	15 mm	80 mm	16 BAR	232 PSI
	125 mm	15 mm	100 mm	10 BAR	145 PSI
	125 mm	20 mm	100 mm	16 BAR	232 PSI
	150 mm	20 mm	125 mm	10 BAR	145 PSI
	150 mm	25 mm	125 mm	16 BAR	232 PSI
	175 mm	20 mm	150 mm	10 BAR	145 PSI
	175 mm	25 mm	150 mm	16 BAR	232 PSI
	200 mm	20 mm	175 mm	8 BAR	116 PSI
	200 mm	25 mm	175 mm	10 BAR	145 PSI
	200 mm	30 mm	175 mm	16 BAR	232 PSI
	250 mm	25 mm	225 mm	8 BAR	116 PSI
250 mm	30 mm	225 mm	10 BAR	145 PSI	

d1	TOTAL GLASS DIAMETER
d2	VISIBLE GLASS DIAMETER
p	PRESSURE IN BAR
δ	SAFETY FACTOR (5 RECOMMENDED)
σ	SURFACE COMPRESSIVE STRESS (70N/mm2)

$$Thickness\ in\ mm \geq 0.55 \cdot \frac{d_1 + d_2}{2} \sqrt{\frac{p \cdot \delta}{10 \cdot \sigma}}$$



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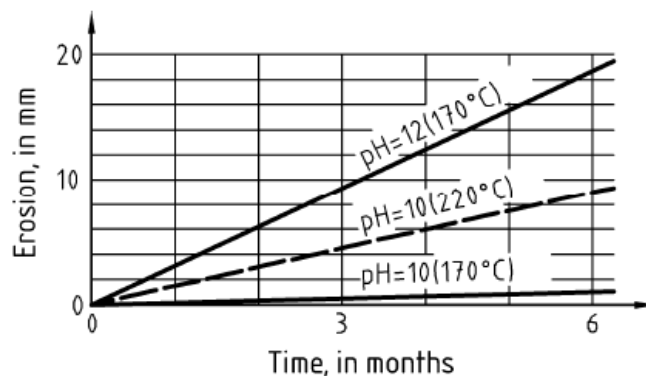
CHEMICAL PROPERTIES

CHEMICAL PROPERTIES	TESTING METHOD	VALUE OBTAINED
HYDROLITIC RESISTANCE	ISO 719	HGB 1
ACID RESISTANCE	ISO 1776	CLASS S1
ALKALINE RESISTANCE	ISO 695	SLASS A2
CHEMICAL COMPOSITION	SiO ₂	Min 80% Content
	B ₂ O ₃	Min 13% Content
	Na ₂ O + K ₂ O	Min 4,5% Content

CHEMICAL ATTACK ON GLASS

The extent to which glass in boiler sight glasses is attacked when exposed to aqueous media will normally increase exponentially as the temperature and pH of the medium rises and the attack may be considerably accelerated by chemical additives such as those used in various ways and amounts in water treatment plants.

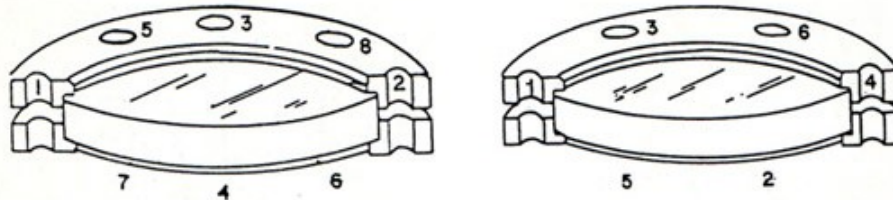
The resultant severe erosion and consequential dimensional changes may endanger the working safety of the sight glass and may result in rupture. The most important influencing variables are, however, the pH and temperature, but, for other complex reasons, the temperature plays a major role at temperatures markedly above 200 °C. To illustrate this, the figure below shows the erosion of a glass surface at 170 °C for two different pH levels, while the broken line shows the effect of increasing the temperature to 220 °C at a pH of 10 under laboratory conditions.





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PREVIOUS INSPECTION

Upon receipt of the equipment, it is important to check all components for damage that may occur during shipment. In case you find damage, please do not try to install; immediately contact the freight forwarder and seller to request a damage analysis. The user will be responsible for reviewing the following:

- > That the equipment received is exactly what you requested in your purchase order.
- > That the conditions of use are the same or higher than those specified on the equipment.
- > That the working conditions of the equipment meet the conditions requested in its purchase.
- > That the fluids to work comply with the specifications of the materials used in the manufacture of the equipment.

SAFETY EQUIPMENT

It is important that operators have complete safety equipment; this includes safety glasses, hard hat, boots with cap, gloves and industrial clothing.

IMPORTANT INFORMATION

Use only qualified personnel familiar with the handling of this type of equipment. Personnel must be able to fully understand this manual for equipment installation and maintenance. Using personnel without prior experience or training can result in damage to the equipment, which can cause important damage.

REVIEW OF MATERIALS

Do not continue with the installation until it has been checked

that the glass to be used is free of imperfections. Crystals with imperfections or chips have been weakened and the pressure / temperature tables are not valid in these cases.

It is important to check that the connections and interior of the equipment are free of foreign materials. Failure to do so can result in serious damage to equipment, personnel, and / or facilities.

PRE-OPERATIONAL INSPECTION

Check that all installation steps have been completed successfully. Check that all bolts have been tightened according to the torque specified in the bolt torque table of this manual. Check that the glass does not show any damage, scratches or chips. Check that all connections are tightened correctly.

PRESSURE REGULARIZATION

Before subjecting the equipment to any type of pressure, take the necessary precautions to handle the possibility of leaks. Perform hydrostatic test at 50 PSI and correct leaks before proceeding. Increase the working pressure gradually. It is important not to subject the equipment to sudden changes in pressure, as this can lead to excessive stress on the glass. Strong pressure shocks can cause glass damage, instantaneous pressure releases, damage to personnel, equipment and facilities.

Bolt Tightening, Star system

For tightening and un.tightening the bolts, it is important to use a start-tightening-system, where the next-bolt-to-tighten is the one directly across or the one next to it. This Will cause the glass and the gaskets to compress uniformly



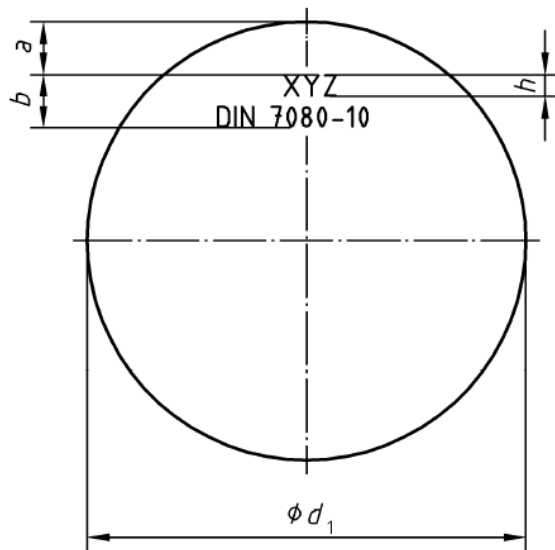
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ANEX A

A1 -

Bubble diameter, d_3	Permissible number of bubbles
$d_3 < 0,3$	3 per cm ² of sight glass
$0,3 \leq d_3 \leq 0,5$	10 per sight glass
$0,5 < d_3 \leq 1$	4 per sight glass
$1 < d_3 \leq 2$	2 per sight glass

A2 - MARKINGS ON GLASS



Dimensions in millimetres

Diameter d_1	a	b	h
45	9	6,5	2,5
(50)			
(60)			
63			
80	12	12	5
100			
125			
135			
150			
175			
200			
250			
265			



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ANEX B

B1 - DIMENSIONAL TOLERANCES

Dimensions in mm

Diameter d_1			Thickness s	
$d_1 \leq 135$	$150 \leq d_1 \leq 200$	$d_1 > 200$	$10 \leq s \leq 20$	$s > 20$
$\pm 0,5$	$\pm 0,8$	± 1	+0,5 -0,25	+0,8 -0,4

B2 - EDGE TOLERANCES

Diameter d_1	Edge dimensions
≤ 100	-1,0 -0,3
> 100	-1,5 -0,3

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