



APPLICATION:

MAXOS® safety sight glasses are required wherever visual inspection of processes in vessels under pressure, thermal and chemical stress must be ensured.

The high level of safety is achieved by a special borosilicate glass with good chemical resistance, extraordinary purity and homogeneity. In combination with the low thermal expansion typical for this borosilicate glass, a thermal pre-stress (hardening) leads to a particularly high thermal shock resistance.

OPERATING CONDITIONS:

The characteristic values of the glasses and the narrow dimensional tolerances are guaranteed by production and quality tests during the process. With these outstanding safety properties, MAXOS® safety sight glasses can be used for extreme conditions.

Operating conditions:	Pressure	Temperature
Unprotected reflex and transparent sight glasses with saturated steam or hot water pressure	35 bar / 500 psi	243 °C / 470 °F
Transparent sight glasses protected with mica for saturated steam or hot water pressure	103 bar / 1500 psi	320 °C / 608 °F
Reflex sight glasses for use without steam and without technically significant glass attack	280 bar / 4000 psi	38 °C / 100 °F
For media without technically significant glass attack for transparent sight glasses	345 bar / 5000 psi	38 °C / 100 °F
High pressure transparent sight glasses in special fittings	414 bar / 6000 psi	38 °C / 100 °F

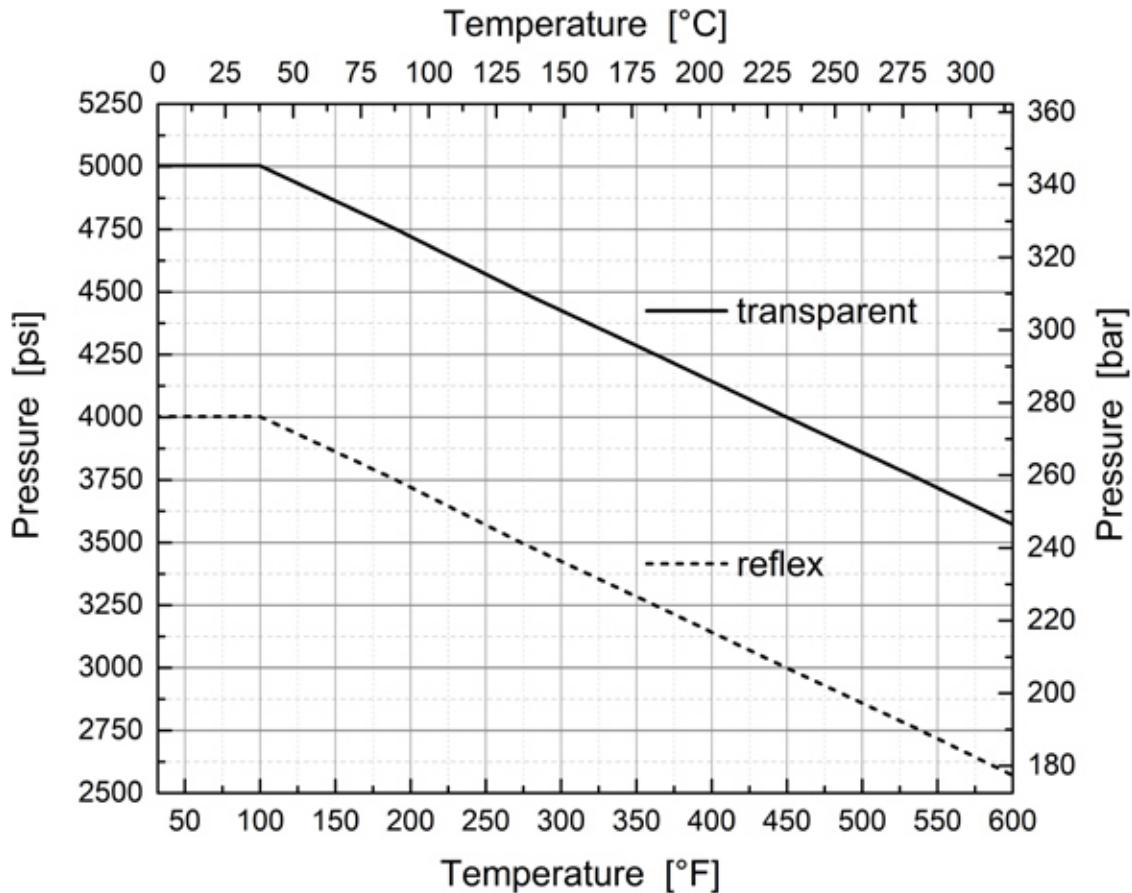
Observe pressure-temperature rating on next page!

Technical Information:	
Coefficient of expansion at 20 °C/300 °C	$4.1 \times 10^{-6} \text{ K}^{-1}$
Modulus of elasticity	$67 \times 103 \text{ N/mm}^2$
Thermal conductivity at 90 °C	1.2 W/(m·K)
Stress optical coefficient K	$3.2 \times 10^{-6} \text{ mm}^2/\text{N}$
Thermal shock resistance	230 °C

Chemical resistance:	
Water resistance acc. to DIN ISO 719/720	Hydrolysis class 1
Acid resistance acc. to DIN 12116	Acid class 1
Alkali resistance acc. to DIN 52332	Alkali class 2

PRESSURE-TEMPERATURE RATING:

The following pressure-temperature diagram shows the operating conditions for MAXOS longitudinal sightglass plates according to DIN 7081. The diagram may vary depending on the medium and pH value. We will be happy to assist you in the selection of suitable glasses.



DIMENSIONAL TOLERANCES:

The dimensional tolerances are in accordance with DIN 7081 for sight glass plates made of borosilicate glass. The dimensional tolerances to be expected can be found in the adjacent tables. The parallelism for standard sight glasses \leq is 0.08 mm and for high pressure sight glasses \leq 0.05 mm.

Dimensional tolerances for longitudinal glasses Width 34 mm	
length (95 ... 400 mm)	+ 0 mm / - 1,5 mm
width (34 mm)	+ 0,2 mm / - 0,8 mm
thickness (17,5 mm)	+ 0 mm / - 1,0 mm

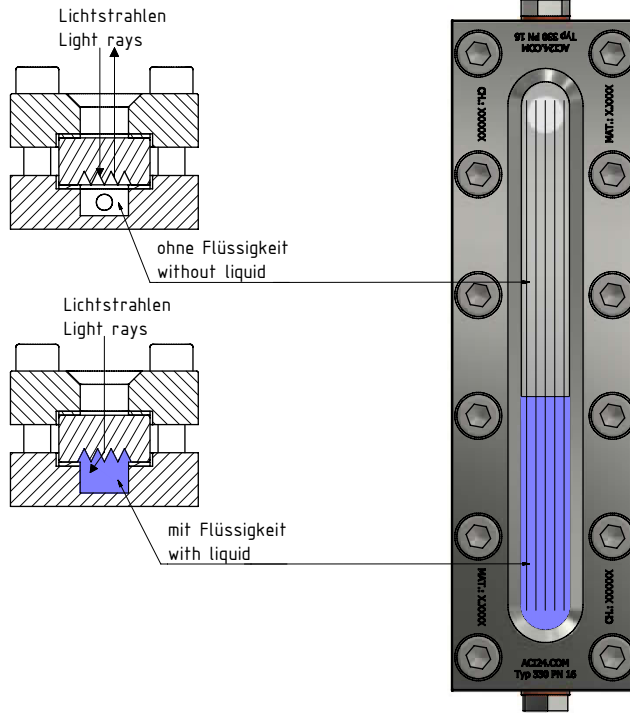
Dimensional tolerances for longitudinal glasses Width 30 mm	
length (115 ... 340 mm)	
up to 250 mm	\pm 0,8 mm
from 250 mm	\pm 1,0 mm
width (30 mm)	+ 0,5 mm / - 0,8 mm
thickness (17,5 mm)	+ 0 mm / - 1,0 mm

POSSIBLE APPLICATIONS FOR TRANSPARENT AND REFLECTIVE GLASS:

REFLECTIVE GLASS:

For dark media, dark or non-illuminated tanks, a closed level indicator, a reflex sight glass is recommended. (see picture on the right) Due to the refraction of light in the integrated prisms, the filling level is easier to see. The liquid area is usually brighter than the area without liquid. If the colour of the medium has to be visible, transparent glasses should be used, as reflective glasses make a colour change of the medium difficult to detect.

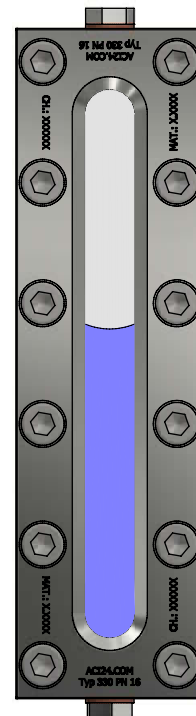
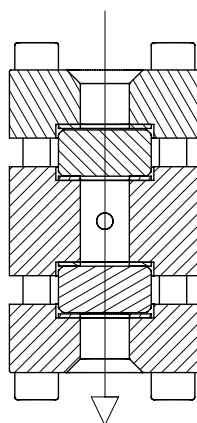
Reflective glass is not suitable for saturated steam or aggressive media, however, as these cannot be protected with mica screens without losing their function.



TRANSPARENT GLASS:

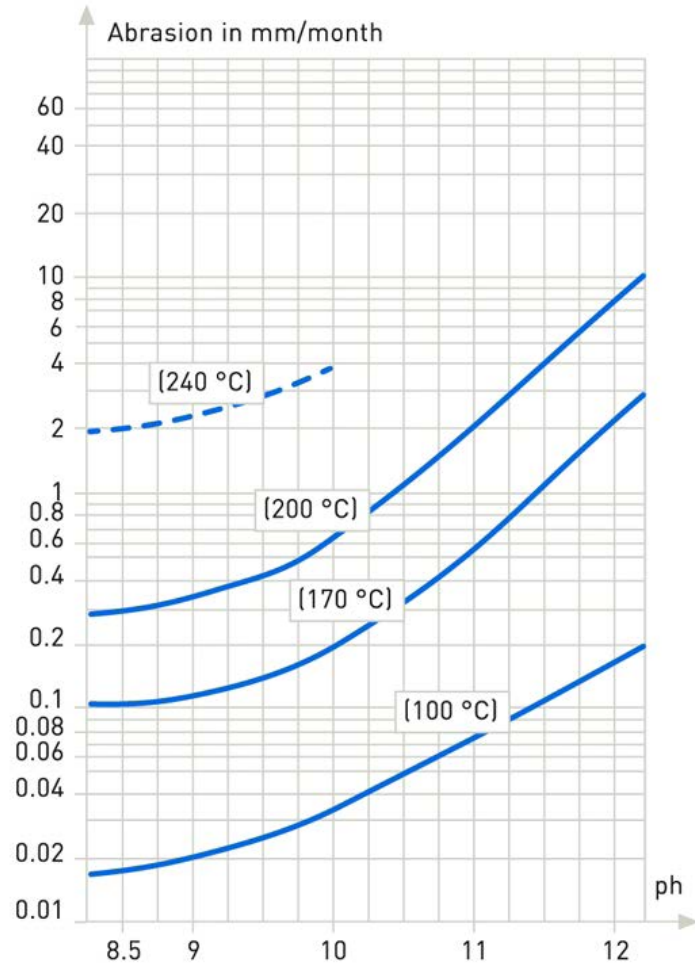
Transparent glass is commonly used for illuminated tanks and transparent indicators (see picture on the right). They are also used when the medium is very bright or the colour of the medium must be visible. With transparent indicators the light passes through the indicator, which makes the level and the colour of the medium clearly visible. (adjacent pictures)

In the case of saturated steam or aggressive media, the transparent glasses should be protected with a mica shield. In this case, an additional light is generally recommended which is mounted on the back of the transparent indicator, as the mica protection darkens the transparent glasses a slightly.



ABRASION RATES:

The abrasion of MAXOS sight glass plates according to DIN 7081 in aqueous phase at different temperatures as a function of the pH value can be seen in the adjacent graph.



PERMISSIBLE MATERIAL DEFECTS:

Round bubbles enclosed in the glass may have a maximum diameter of 2 mm. Oval bubbles must not exceed the value $(\text{length} + \text{width})/2 = 2$ mm. Tapered bubbles are not permitted.

Permissible bubble frequency		
bubble diameter (d3)	Permissible bubble frequency (length)	
	≤ 250 mm	> 250 mm
d3 < 0,3	3 per cm ² Visible area	
0,3 ≤ d3 ≤ 0,5	10 per glass	15 per glass
0,5 < d3 ≤ 1	4 per glass	6 per glass
1 < d3 ≤ 2	2 per glass	3 per glass

TRANSPARENT GLASSES:

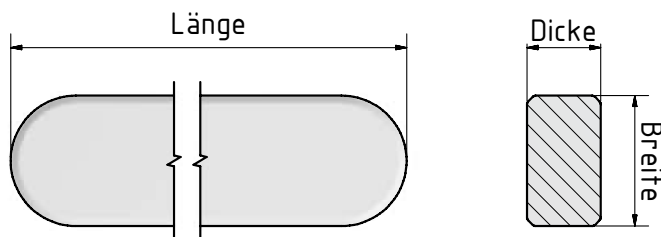
Below Maxos transparent glasses according to DIN 7081 / similar to DIN 7081 / BS 3463

Transparent glass acc. to DIN 7081			
Productcode	length	width	thick.
2071769	140	30	17
2071770	165	30	17
2071771	190	30	17
2071772	220	30	17
2071773	250	30	17
2071774	280	30	17
2071775	320	30	17
2071776	340	30	17
2071778	140	34	17
2071779	165	34	17
2071780	190	34	17
2071781	220	34	17
2071782	250	34	17
2071783	280	34	17
2071785	320	34	17
2071786	340	34	17
2071787	370	34	17
2071788	400	34	17

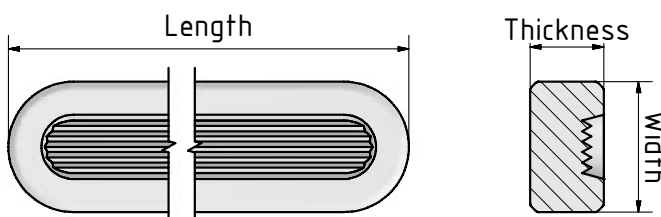
Transparent glass BS 3463			
Productcode	length	width	thick.
2071818	115	34	17
2071819	140	34	17
2071820	165	34	17
2071821	190	34	17
2071822	220	34	17
2071823	250	34	17
2071824	280	34	17
2071825	320	34	17
2071826	340	34	17

Transparent glass similar to DIN 7081			
Productcode	length	width	thick.
2071768	115	30	17
2071777	115	34	17
2071784	300	34	17
2071789	420	34	17
2071790	430	34	17
2071791	460	34	17
2071792	480	34	17
2071793	500	34	17
2071794	115	34	21
2071795	140	34	21
2071796	165	34	21
2071797	190	34	21
2071798	220	34	21
2071799	250	34	21
2071800	280	34	21
2071801	320	34	21
2071802	340	34	21
2071803	370	34	21
2071804	420	34	21
2071805	460	34	21
2071806	480	34	21
2071807	500	34	21
2071817	95	34	17
2071857	113	27.6	16.8
2071862	278	27.6	16.8
2071863	318	27.6	16.8

Transparentschauglas / Transparent sight glass



Reflexschauglas / Reflective sight glass



REFLECTIVE GLASSES:

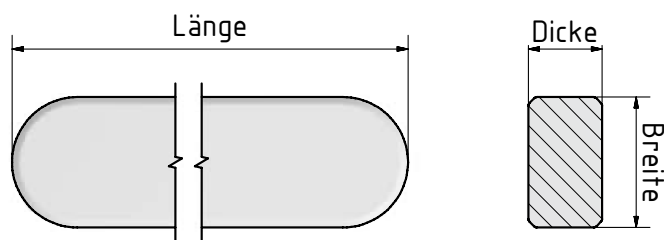
Below Maxos reflex glasses according to DIN 7081 / similar to DIN 7081 / according to BS 3463

Reflective glass according to DIN 7081			
Productcode	length	width	thick.
2071676	140	30	17
2071677	165	30	17
2071678	190	30	17
2071679	220	30	17
2071680	250	30	17
2071681	280	30	17
2071682	320	30	17
2071683	340	30	17
2071685	140	34	17
2071686	165	34	17
2071687	190	34	17
2071688	220	34	17
2071689	250	34	17
2071690	280	34	17
2071691	320	34	17
2071692	340	34	17
2071693	370	34	17
2071694	400	34	17

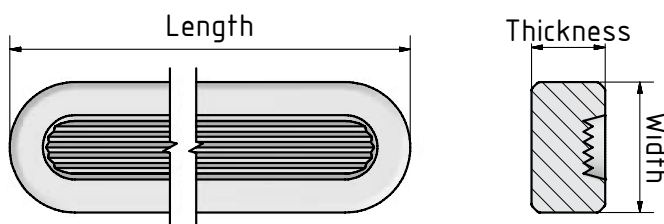
Reflective glass similar to DIN 7081			
Productcode	length	width	thick.
2071675	115	30	17
2071684	115	34	17
2071695	430	34	17
2071696	460	34	17
2071697	500	34	17
2071698	220	34	21
2071699	250	34	21
2071700	280	34	21
2071701	320	34	21
2071702	340	34	21
2071703	430	34	21
2071704	460	34	21
2071705	500	34	21
2071713	300	34	17
2071716	95	34	17

Reflective glass BS 3463			
Productcode	length	width	thick.
2071717	115	34	17
2071718	140	34	17
2071719	165	34	17
2071720	190	34	17
2071721	220	34	17
2071722	250	34	17
2071723	280	34	17
2071724	320	34	17
2071725	340	34	17

Transparentschauglas / Transparent sight glass



Reflexschauglas / Reflective sight glass



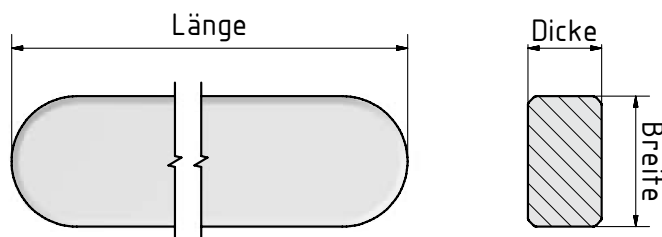
TRANSPARENT GLASSES USA:

Below Maxos Transparent Glasses USA / High-Pressure USA

Transparent glass USA			
Productcode	length	width	thick.
2071808	115	34	17
2071809	140	34	17
2071810	165	34	17
2071811	190	34	17
2071812	220	34	17
2071813	250	34	17
2071814	280	34	17
2071815	320	34	17
2071816	340	34	17
2071848	115	34	17
2071849	140	34	17
2071850	165	34	17
2071851	190	34	17
2071852	220	34	17
2071853	250	34	17
2071854	280	34	17
2071855	320	34	17
2071856	340	34	17
2071888	279	25	15
2071889	304	25	15
2071890	330	25	15
2071891	381	25	15
2071892	457	25	15
2071893	508	25	15

Transparent glass High-Pressure USA			
Productcode	length	width	thick.
2071827	115	34	17
2071828	140	34	17
2071829	165	34	17
2071830	190	34	17
2071831	220	34	17
2071832	250	34	17
2071833	280	34	17
2071834	320	34	17
2071835	340	34	17
2071839	115	34	17
2071840	140	34	17
2071841	165	34	17
2071842	190	34	17
2071843	220	34	17
2071844	250	34	17
2071845	280	34	17
2071846	320	34	17
2071847	340	34	17

Transparentschauglas / Transparent sight glass



Reflexschauglas / Reflective sight glass

