

### Standards and Quality

Glasses fitted in our level gauges and spare comply with the following Standards:

- DIN 7081      - ONORM M 7354      - MIL-G-18498 B
- TLG 7210    - OMV H 2009            - Esso Eng. Spec. 123
- BS 3463     - JIS B 8211              - S.O.D. Spec. 123

Physical and chemical features:

- Resistance to bending strain: > 150 N/mm<sup>2</sup>
- Mean coefficient of linear expansion (30 °C to 300 °C): < 5,0 · 10<sup>-6</sup> · K<sup>-1</sup> - DIN 52328
- Transition temperature: 550°C - DIN 52324
- Hydrolytic resistance: Class 1- DIN 12111 and ISO 719
- Alkali resistance: Class 2 - DIN 52322 and ISO 695
- Acid resistance: Class 1 - DIN 12116.

Material is always borosilicate glass pre-stressed and optically tested. "Pre-stressed", "hardened", "extra hard" and similar definitions are perfectly equivalent. We never use "soda-lime" glasses, since they have quite insufficient features.

### Joints for glasses

- Each sight glass is usually supplied with 2 joints (1 sealing joint + 1 cushion joint).
- The cushion joint is usually of standard quality, whereas there are more qualities of sealing joints, namely:
  - standard for general applications
  - oil and solvent resistant
  - PTFE, for strong chemical agents.
- Length and width of joint are the same as those of the respective glass. Standard thickness is approx. 1.3 mm.
- Reflex glasses type A-BR13 - for fitting in reflex gauges type BR13 - need special sized joints. See maintenance instructions.
- Transparent glasses type A-BT12 - for fitting in transparent gauges type BT12 - need special sized joints. See maintenance instructions.

### Shields for glasses

When glass protection against corrosive fluids is to be taken in consideration (including boiler water pressured over 35 bar), you must remember that only smooth surfaces can be shielded by smooth sheets having same length and width as sight glass.

Therefore:

- reflex glasses: only external face can be shielded by mica sheets or other material against corrosive environmental agents.
- transparent glasses: both faces can be shielded by mica or transparent polytrifluorochloroethylene (Kel-F) sheets.

Protection of the internal glass face in contact with fluid is usually sufficient.

Mica sheets inside level gauges are always recommended for application with water steam: thickness of mica sheets is usually 0.15 to 0.20 mm.

### Non-frosting Blocks

Frost on gauge obstructing level reading could develop when level gauge operates at fairly low temperature.

In such cases a nonfrosting block of transparent acrylic resin must be fastened and sealed outside the gauge body.

This block shall protrude according to the thickness of the frost

Recommended protrusion:

Working temperature of fluid		Protrusion of block
0°C	through -19 °C	38mm
-20°C	through -49°C	75mm
-50°C	through -99°C	150mm
-100°C	and under	200mm

Shield

Solid Shield

Gasket  
Cushion  
Seal

With slot for vision through

"Shield" is solid with no slot, for protection of glass against corrosion across the full face.

"Gasket" or "Cushion" is slotted for trough-vision, to the liquid level.

Kel-F is transparent (milky white) so it is used as a solid "Shield"

"Kel-F" is still the term widely used but the new trade name is Daikin and the generic name for the material is PCTFE (Polytrifluorochloroethylene)

We use the following warning on our Level gauges for HF acid service:

### HF ACID WARNING

HF acid (hydrofluoric) will attack gage glass.

Use Kel-F shield to protect glass. Must use plain glass.

Do NOT remove plain glass and shield and substitute reflex glass.

Reflex glass cannot be shielded.

Unshielded glass subject to rapid attack by acid & sudden failure.

Flush seal pot after contamination with acid.

Kel-F shield is not designed for continuous contact with HF.

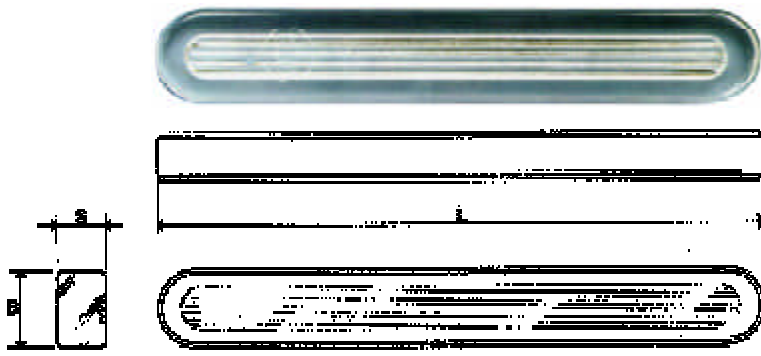
Prolonged exposure will

cause penetration of shield & attack and eventual failure of glass.

### Note

Kel-F is old trade name.  
New name is DaiKin  
Generic name is PCTFE

### Reflex Glasses



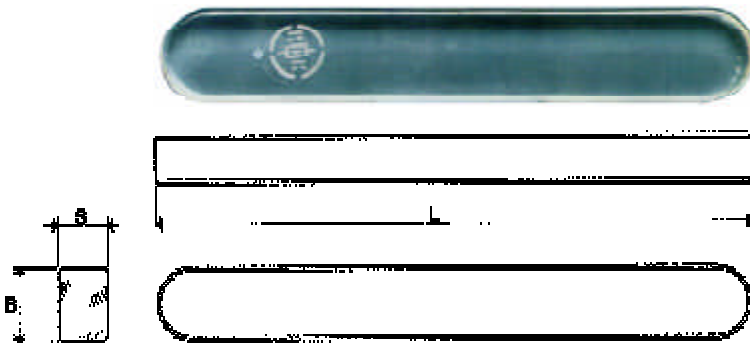
These patterns have one smooth face (external face) and the other face provided with moulded prismatic grooves (internal face). For application with reflex level gauges.

#### Dimensions

Reflex glasses have following dimensions

Size	Type A			Type B			Type H		
	Leng. L	Width B	Thick. S	Leng. L	Width B	Thick. S	Leng. L	Width B	Thick. S
0	-	-	-	95	34	17	-	-	-
1	115	30	17	115	34	17	115	34	22
2	140	30	17	140	34	17	140	34	22
3	165	30	17	165	34	17	165	34	22
4	190	30	17	190	34	17	190	34	22
5	220	30	17	220	34	17	220	34	22
6	250	30	17	250	34	17	250	34	22
7	280	30	17	280	34	17	280	34	22
8	320	30	17	320	34	17	320	34	22
9	340	30	17	340	34	17	340	34	22
10	-	-	-	370	34	17	-	-	-

### Transparent glasses



These patterns have both smooth faces. For application with transparent level gauges.

Transparent glasses Type A (cross section 30x17 mm) are only spare parts for old pattern level gauges.

Transparent sight glasses include glasses for bicolour level gauges which are small disc glasses sized to the gauge.

#### Dimensions

Transparent glasses have following dimensions

Size	Type A			Type B			Type H		
	Leng. L	Width B	Thick. S	Leng. L	Width B	Thick. S	Leng. L	Width B	Thick. S
1	115	30	17	115	34	17	-	-	-
2	140	30	17	140	34	17	140	34	22
3	165	30	17	165	34	17	165	34	22
4	190	30	17	190	34	17	190	34	22
5	220	30	17	220	34	17	220	34	22
6	250	30	17	250	34	17	250	34	22
7	280	30	17	280	34	17	280	34	22
8	320	30	17	320	34	17	320	34	22
9	340	30	17	340	34	17	340	34	22
10	-	-	-	370	34	17	-	-	-

Sizes of glasses are now indicated by Arabic numerals (1, 2, etc.). Former size indication was in Roman numerals (I, II, etc.).