

# laservision

## Laser safety windows tolerances & marking

### 1. General tolerances for linear and angular dimensions

Plastic and mineral glass windows

| Nominal size [mm] | Glass       |        | Plastic & non transparent barrier |        |          |        |        | Perpendicularity [°] |
|-------------------|-------------|--------|-----------------------------------|--------|----------|--------|--------|----------------------|
|                   | rectangular | round  | rectangular                       | round  | freeform | radius | hole   |                      |
| 3 - 6             | -           | ± 0,15 | -                                 | ± 0,30 | -        | ± 0,5  | ± 0,30 | ± 1,0                |
| > 6 - 30          | -           | ± 0,20 | -                                 | ± 0,30 | -        | ± 1,0  | ± 0,30 | ± 1,0                |
| > 30 - 120        | ± 0,30      | ± 0,30 | ± 0,30                            | ± 0,30 | ± 0,30   | ± 1,0  | ± 0,30 | ± 0,5                |
| > 120 - 400       | ± 0,50      | -      | ± 0,50                            | ± 0,50 | ± 0,50   | -      | -      | ± 0,5                |
| > 400 - 1000      | -           | -      | ± 0,80                            | ± 0,80 | ± 1,00   | -      | -      | ± 0,5                |
| > 1000 - 2000     | -           | -      | ± 1,20                            | -      | -        | -      | -      | ± 0,5                |
| > 2000 - 3000     | -           | -      | ± 2,00                            | -      | -        | -      | -      | ± 0,5                |

All dimensions in mm.

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## 2. Tolerances material thickness

### a. Plastic laser safety windows

|                               | PC based laser safety windows |                       | PMMA based laser safety windows |                                      |
|-------------------------------|-------------------------------|-----------------------|---------------------------------|--------------------------------------|
| <b>Standard</b>               | DIN EN ISO 11963:2018         |                       | DIN EN ISO 7823-1:2003          |                                      |
|                               | Nominal thickness [mm]        | Tolerance [mm]        | Nominal thickness [mm]          | Tolerance [mm]                       |
|                               | $1,5 \leq h \leq 5$           | $\pm 10\%$            | h                               | $\pm (0,4 \text{ mm} + 0,1 \cdot h)$ |
|                               | $5 \leq h$                    | $\pm 5\%$             |                                 |                                      |
| <b>Product specifications</b> | <b>Nominal thickness [mm]</b> | <b>Tolerance [mm]</b> | <b>Nominal thickness [mm]</b>   | <b>Tolerance [mm]</b>                |
| <b>P5B04</b>                  |                               |                       | 3                               | 2,3 .. 3,7                           |
| <b>P1D01</b>                  | 6                             | $\pm 0,3$             |                                 |                                      |
| <b>P5E04</b>                  |                               |                       | 3                               | 2,3 .. 3,7                           |
| <b>P5E05</b>                  |                               |                       | 3                               | 2,3 .. 3,7                           |
| <b>P1H09</b>                  |                               |                       | 3,2                             | 2,48 .. 3,92                         |
| <b>P1L03</b>                  |                               |                       | 3,175                           | 2,8 .. 3,56                          |
| <b>P1N01</b>                  |                               |                       | 3,175                           | 2,8 .. 3,56                          |
| <b>P1P01</b>                  |                               |                       | 3,175                           | 2,8 .. 3,56                          |
| <b>P1P10</b>                  | 3,1                           | $\pm 0,1$             |                                 |                                      |
|                               | 6,1                           | $\pm 0,1$             |                                 |                                      |
| <b>P1P16</b>                  | 6,1                           | $\pm 0,1$             |                                 |                                      |
| <b>P1P20</b>                  | 6,1                           | $\pm 0,1$             |                                 |                                      |
| <b>P1P21</b>                  | 3,1                           | $\pm 0,1$             |                                 |                                      |

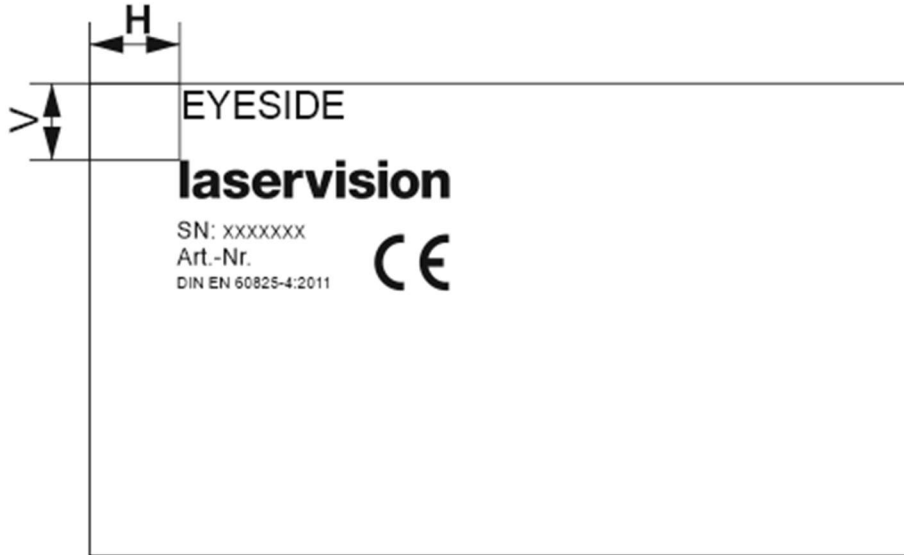
### b. Glass laser safety windows

Laser safety windows made out of mineral glass are specified according to the optical density (OD). Depending on the melt (batch) the thickness of the windows can vary for the specified OD. Smaller thickness tolerances can't be given and compliance with tight tolerances cannot be guaranteed. In individual cases, please ask about the thickness of the current batch.

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## 3. Standard marking

### a. Glas laser safety windows



Marking dimensions:

W x H ~ 30 mm x ~ 20 mm

EYESIDE

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SN: xxxxxxxx

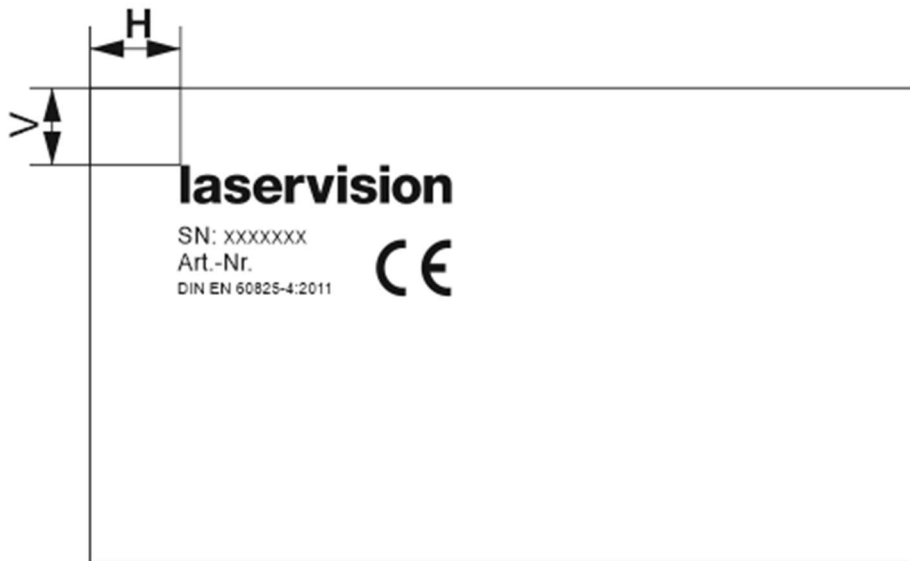
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DIN EN 60825-4:2011



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## b. Plastic laser safety windows



### Marking dimensions:

W x H ~ 30 mm x ~ 15 mm

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## c. Marking distance (H/V) according to window dimension

| Dimension                    | Marking       | Distance H/V  |
|------------------------------|---------------|---------------|
| < 65 x 55                    | Label         | Concluded     |
| 65 x 55 - < 200 x 100 mm     | Laser marking | 3 mm / 3 mm   |
| > 200 x 100 - < 297 x 210 mm | Laser marking | 5 mm / 5 mm   |
| 200 x 100 mm                 | Laser marking | 10 mm / 10 mm |
| ≥ 297 x 210 mm               | Laser marking | 10 mm / 10 mm |
| ≥ 1000 mm Breite             | Label         | Concluded     |