

# Product Passport

Door system in accordance to EN 14 351-1 +A1



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|                     |  |
|---------------------|--|
| System              | <b>LK90X doors</b>   |
| Product line        | Thermally insulated<br>outward opening<br>door and double leaf door    |
| Materials           | Aluminium: EN-AW 6063 T5<br>Thermal breaks: polyamide<br>Gaskets: EPDM |
| Surface treatment   | Anodizing<br>Powder coating  |
| Glass/ infill panel | thickness 33..73 mm  |
| Frame depth         | 90 mm  |
| Frame width         | 50..95 mm  |

Product standard (hEN):

EN 14 351-1:2006+A1:2010

Test reports:

VTT-S-04206-13  
VTT-S-04207-13  
VTT-S-04211-13  
VTT-S-05921-14  
VTT-S-05922-14  
VTT-S-04201-13  
14/8749-936  
14/8749-937  
15/11460-3015  
15/11460-3017

## Properties/ Class \*)

|  |   |  |                                      |                             |
|--|---|--|--------------------------------------|-----------------------------|
| Resistance to fire (E / EI)<br>npd                                     | Smoke leakage (S)<br>npd  | Self-closing (C)<br>npd                          | Resistance to wind load<br><b>C3</b> | Watertightness<br><b>8A</b> |
| Dangerous substances<br>npd  | Impact resistance<br>npd  | Load-bearing capacity of safety devices<br>npd   | Height<br>**)                        | Ability to release<br>npd   |
| Acoustic performance $R_w (C; C_{tr})$<br>**)<br><b>43 (-1; -3) dB</b> | Thermal transmittance ( $U_D$ )<br>**)<br><b><math>\geq 0,80 \text{ W/m}^2\text{K}</math></b> | Radiation properties ( $g_D / \tau_{v}$ )<br>**) | Air permeability<br><b>4</b>         |                             |

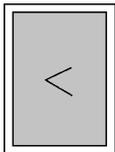
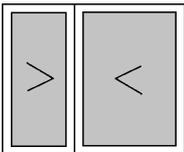
\*) Only tested/ calculated maximum values of the system for single leaf door

\*\*) Declared value according to project

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| ref.No. for hEN-standard | Name:  | LK90X door  | LK90X double leaf door  |                                |               |                 |                      |
|--------------------------|--|---|---|--------------------------------|---------------|-----------------|----------------------|
|                          | Description:   |  |  |                                |               |                 |                      |
|                          |  | Thermally insulated single leaf door  | Thermally insulated double leaf door  |                                |               |                 |                      |
| -                        | Resistance to fire (E / EI)                              | npd   | npd   |                                |               |                 |                      |
| -                        | Smoke leakage (S)  | npd   | npd   |                                |               |                 |                      |
| -                        | Self-closing (C)   | npd   | npd   |                                |               |                 |                      |
| 4.2                      | Resistance to wind load <sup>1)</sup>                    | <b>C3</b><br>(1200 Pa, ≤1/300)  | <b>C3</b><br>(1200 Pa, ≤1/300)  |                                |               |                 |                      |
| 4.5                      | Watertightness <sup>2)</sup>                             | <b>8A</b>   | <b>6A</b>   |                                |               |                 |                      |
| 4.6                      | Dangerous substances                                     | npd   | npd   |                                |               |                 |                      |
| 4.7                      | Impact resistance  | npd   | npd   |                                |               |                 |                      |
| 4.8                      | Load-bearing capacity of safety devices <sup>1)</sup>    | npd   | npd   |                                |               |                 |                      |
| 4.9                      | Height <sup>3)</sup>                                     | 3)  | 3)  |                                |               |                 |                      |
| 4.10                     | Ability to release                                       | npd   | npd   |                                |               |                 |                      |
| 4.11                     | Acoustic performance <sup>2) 3)</sup>                    | $R_w$<br>43dB   | $R_w+C$<br>42dB   | $R_w+C_{tr}$<br>40dB           | $R_w$<br>41dB | $R_w+C$<br>40dB | $R_w+C_{tr}$<br>39dB |
| 4.12                     | Thermal transmittance <sup>3)</sup><br>( $U_D$ )         | <b>≥ 0,80 W/m<sup>2</sup>K</b>  |   | <b>≥ 0,81 W/m<sup>2</sup>K</b> |               |                 |                      |
| 4.13                     | Radiation properties <sup>3)</sup><br>( $g_D / \tau_v$ ) | 3)  |   | 3)                             |               |                 |                      |
| 4.14                     | Air permeability <sup>2)</sup>                           | <b>4</b>  |   | <b>3</b>                       |               |                 |                      |

NOTE! Values in the table apply for single leaf door 990x 2090 mm and double leaf door 1520x 2090 mm excl. thermal transmittance which is calculated for standard size door (1230x 2180 mm and 2000x 2180 mm)

<sup>1)</sup> Element size: single leaf door ≤ 2,1 m<sup>2</sup>, double leaf door ≤ 3,2 m<sup>2</sup>

<sup>2)</sup> Element size: single leaf door ≤ 3,1 m<sup>2</sup>, double leaf door ≤ 4,8 m<sup>2</sup>

<sup>3)</sup> Values according to project are declared separately

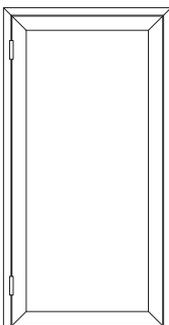
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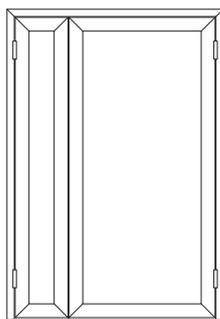
**LK90X**  $U_D$ -values for standard size door:

Single leaf door (1230x 2180 mm)



|                  | Glass $U_g$ -value (W/m <sup>2</sup> K) |      |
|------------------|---|------|
|                  | 0,5                                     | 0,6  |
| IGU spacer       | Door $U_D$ -arvo (W/m <sup>2</sup> K)   |      |
| TGI (0,044 W/mK) | 0,81                                    | 0,88 |
| TPS (0,038 W/mK) | 0,80                                    | 0,87 |

Double leaf door (2000x 2180 mm)



|                  | Glass $U_g$ -value (W/m <sup>2</sup> K) |      |
|------------------|---|------|
|                  | 0,5                                     | 0,6  |
| IGU spacer       | Door $U_D$ -arvo (W/m <sup>2</sup> K)   |      |
| TGI (0,044 W/mK) | 0,82                                    | 0,89 |
| TPS (0,038 W/mK) | 0,81                                    | 0,88 |

Tabulated  $U_D$ -values can be used for single leaf door (1230x 2180 mm) when the door size  $\leq 3,6 \text{ m}^2$ .  
Tabulated  $U_D$ -values can be used for double leaf door (2000x 2180 mm) when the door size  $> 3,6 \text{ m}^2$ .  
Specific values according to project are declared separately.

The thermal transmittance of the frames ( $U_f$ ) are defined according to standard SFS-EN ISO 10077-2:2017

IGU = Insulating Glass Unit

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## LK90X Single leaf doors acoustic performance:

Glazings:

- Glass-1:** 3K 4-18-4-18-4
- Glass-2:** 3K 6-16-4-18-6
- Glass-3:** 3K 6-16-4-16-8
- Glass-4:** 3K 13.1Phon-18-6-18-9.1Phon
- Glass-5:** 3K 6-16-4-16-9.1Phon

Opaque panels:

- UO-1:** 1,5 mm aluminium sheet - 6 mm HDF - 50 mm PUR - 6 mm HDF - 1,5 mm aluminium sheet
- UO-2:** 1,5 mm aluminium sheet - 6 mm HDF - 50 mm hard mineral wool - 6 mm HDF - 1,5 mm aluminium sheet
- UO-3:** 1,5 mm aluminium sheet - 9 mm fibre-cement sheet - 50 mm hard mineral wool - 9 mm fibre-cement sheet - 1,5 mm aluminium sheet
- UO-4:** 1,5 mm aluminium sheet- 13 mm gypsum board - 50 mm PUR - 13 mm gypsum board - 1,5 mm aluminium sheet
- UO-5:** 1,5 mm aluminium sheet - 9 mm fibre-cement sheet - 50 mm PUR - 9 mm fibre-cement sheet - 1,5 mm aluminium sheet
- UO-6:** 1,5 mm aluminium sheet - 13 mm gypsum board - 50 mm hard mineral wool - 13 mm gypsum board - 1,5 mm aluminium sheet

| Number of door leaves | Door type             | Tested glazing   panel | R <sub>w</sub> [dB] | R <sub>w</sub> + C [dB] | R <sub>w</sub> + C <sub>tr</sub> [dB] |
|-----------------------|-----------------------|------------------------|---------------------|-------------------------|---------------------------------------|
| 1                     | Fully glazed door     | Glass-1                | 35                  | 33                      | 30                                    |
| 1                     | Fully glazed door     | Glass-2                | 38                  | 36                      | 33                                    |
| 1                     | Fully glazed door     | Glass-3                | 39                  | 38                      | 34                                    |
| 1                     | Fully glazed door     | Glass-4                | 42                  | 42                      | 40                                    |
| 1                     | Fully glazed door     | Glass-5                | 41                  | 39                      | 35                                    |
| 1                     | Glass door with panel | Glass-1   UO-1         | 36                  | 35                      | 32                                    |
| 1                     | Glass door with panel | Glass-2   UO-2         | 40                  | 39                      | 34                                    |
| 1                     | Glass door with panel | Glass-2   UO-3         | 40                  | 40                      | 36                                    |
| 1                     | Glass door with panel | Glass-2   UO-4         | 38                  | 37                      | 34                                    |
| 1                     | Glass door with panel | Glass-2   UO-5         | 39                  | 38                      | 35                                    |
| 1                     | Glass door with panel | Glass-2   UO-6         | 41                  | 40                      | 36                                    |
| 1                     | Glass door with panel | Glass-4   UO-6         | 43                  | 42                      | 38                                    |
| 1                     | Glass door with panel | Glass-5   UO-6         | 42                  | 41                      | 37                                    |
| 1                     | Glass door with panel | Glass-3   UO-6         | 42                  | 41                      | 37                                    |
| 1                     | Glass door with panel | Glass-4   UO-3         | 43                  | 42                      | 40                                    |

Tested door sizes and maximum total areas (A) of doors:

Single leaf doors: **990x 2090 mm** **0 m<sup>2</sup> < A ≤ 3,1 m<sup>2</sup>**

- Terms: **R<sub>w</sub>** Sound reduction index (the higher the R<sub>w</sub> number, the better the sound insulation)  
**R<sub>w</sub>+C** Jet aircraft noise, sounds of fast trains, industrial noise (high and mid frequency)  
**R<sub>w</sub>+C<sub>tr</sub>** City traffic noise, sounds of slow trains, industrial noise (low and mid frequency)

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## LK90X Double leaf doors acoustic performance:

Glazings:

**Glass-1:** 3K 4-16-4-16-4 RST

**Glass-2:** 3K 13.1Phon-12-6-12-9.1Phon

Opaque panels:

**UO-1:** 1,5 mm aluminium sheet - 4 mm plywood - 50 mm PUR - 4 mm plywood - 1,5 mm aluminium sheet

**UO-2:** 1,5 mm aluminium sheet - 9 mm fibre-cement sheet - 40 mm hard mineral wool - 9 mm fibre-cement sheet - 1,5 mm aluminium sheet

| Number of door leaves | Door type               | Tested glazing   panel | R <sub>w</sub><br>[dB] | R <sub>w</sub> + C<br>[dB] | R <sub>w</sub> + C <sub>tr</sub><br>[dB] |
|-----------------------|-------------------------|------------------------|------------------------|----------------------------|--|
| 2                     | Fully glazed door       | Glass-1                | 35                     | 33                         | 30                                       |
| 2                     | Fully glazed door       | Glass-2                | 41                     | 40                         | 39                                       |
| 2                     | Glass door with transom | Glass-1                | 35                     | 34                         | 30                                       |
| 2                     | Glass door with transom | Glass-2                | 41                     | 40                         | 39                                       |
| 2                     | Panel door with transom | UO-1                   | 32                     | 31                         | 28                                       |
| 2                     | Panel door with transom | UO-2                   | 40                     | 39                         | 35                                       |
| 2                     | Glass door with panel   | Glass-1   UO-1         | 33                     | 32                         | 29                                       |
| 2                     | Glass door with panel   | Glass-1   UO-2         | 37                     | 35                         | 32                                       |
| 2                     | Glass door with panel   | Glass-2   UO-1         | 40                     | 39                         | 37                                       |

Tested door sizes and maximum total areas (A) of doors:

Double leaf doors: **1520x 2090 mm**  $m^2 < A \leq 4,8 m^2$

Terms: **R<sub>w</sub>** Sound reduction index (the higher the R<sub>w</sub> number, the better the sound insulation)

**R<sub>w</sub>+C** Jet aircraft noise, sounds of fast trains, industrial noise (high and mid frequency)

**R<sub>w</sub>+C<sub>tr</sub>** City traffic noise, sounds of slow trains, industrial noise (low and mid frequency)