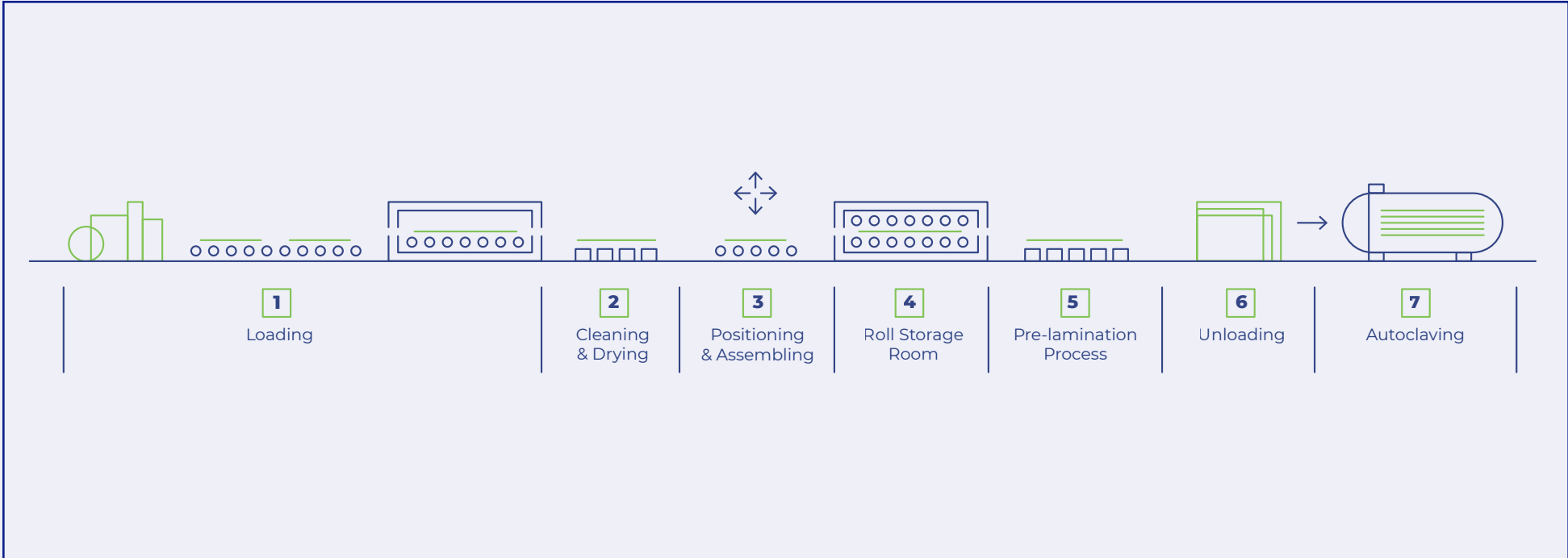


# OBEIKAN LAMINATED GLASS



# LAMINATION LINE AND PROCESS STEPS

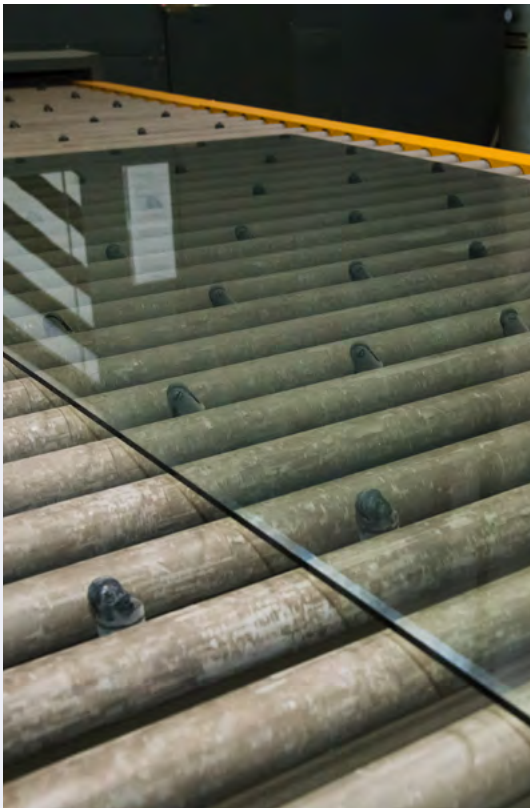


# LAMINATED GLASS



**Glass is widely used in buildings for its transparency and optical performance as well as resistance to the environment, such as wind, rain and temperature variations etc. However, as a basic material it is inherently brittle and has significant shortcomings for security applications.**

**Using laminated glass is generally the preferred way of overcoming these limitations.**



## **NOVA LAM**

Nova LAM is annealed laminated Glass Comprises two glass which is permanently bonded together using an interlayer called Vinyl Butyral Film (PVB); Supplier Kurary Germany). In the event of overload due to shock or impact, the glass does break, but the fragments adhere to the undamaged PVB layer. In this way the damaged glass has a residual stability and the glazed opening remains closed. The risk of injury is also reduced due to the fact that the shards are retained on the film.

### **Product Properties**

The structure of Nova LAM and the thickness are based on the safety demands placed on the glazing. Thrown-object / penetration-resistant glass can be adapted to the respective safety requirements by the number of layers and the thickness of the PVB film in between. The edges of the Nova LAM sheets must be protected against acid and alkaline solutions and against permanently wet conditions so that the film is not compromised.

The intermediate layers of PVB film; (Kurary Supplier) can be clear or tinted, and acoustic Based on customers demands

## LAMINATED GLASS WITH SAFETY PROPERTIES

- Injury reducing
- Throw object resistant
- Resistant to ball impact
- Shard retaining
- Fall preventing

**When Nova LAM exposed to impact damaged does not shatter into small pieces, but retains its intended effect.**

**The fracture pattern of Nova LAM shows its shard-retaining capability, It resembles a spider's web**



# NOVA LAM PRODUCT CONTROL



Obeikan Laminated Glass ( Nova Lam ) are following a range of standards which can be used to establish the performance and durability of laminated glass.

## The following are some of the key standards to be aware of:

BS EN ISO 12543- 1 to 6: 2021 Glass in building. Laminated glass and laminated safety glass.

| Standard            | Standard Scope   | Product         |
|---------------------|--|-----------------|
| ISO12543-1:2021 (E) | Glass in building, Laminated glass and laminated safety glass, Part#1Vocabulary and description of component parts | Laminated Glass |
| ISO12543-2:2021 (E) | Glass in building, Laminated glass and laminated safety glass, Part#2 Laminated safety glass                       | Laminated Glass |
| ISO12543-3:2021 (E) | Glass in building, Laminated glass and laminated safety glass, Part# 3 Laminated safety glass                      | Laminated Glass |
| ISO12543-4:2021 (E) | Glass in building, Laminated glass and laminated safety glass, Part#4 Test methods for durability                  | Laminated Glass |
| ISO12543-5:2021 (E) | Glass in building, Laminated glass and laminated safety glass, Part#5 Dimensions and edge finishing                | Laminated Glass |
| ISO12543-6:2021 (E) | Glass in building, Laminated glass and laminated safety glass, Part#6 Appearance                                   | Laminated Glass |
| BS EN 12600         | Glass in building, Pendulum test, Impact test method and classification for flat glass                             | -               |
| BS EN 356           | Glass in building. Security glazing. Testing and classification of resistance against manual attack                | -               |

## PERFORMANCE OF PRODUCT



**Interlayer Type**  
PVB



**Supplier**  
Kurary Germany

## Nova LAM Are following specific standards to evaluate the performance of product according to it.

**BS EN 12600:2012 Glass in building. Pendulum test. Impact test method and classification for flat glass.**

This test standard is intended to classify flat glass products into three principal classes by performance under impact and by the mode of breakage. The classification relates to increased robustness and personal safety by the reduction of cutting and piercing injuries to persons and the containment characteristics of the glass. The classification is recorded as number, letter, number, e.g. 1B1, to describe and categories impact performance.

| Thickness Structure | Pendulum Impact EN12600 Result |
|---------------------|--------------------------------|
| 33.1                | 2B2                            |
| 33.2                | 1B1                            |
| 33.6                | 1B1                            |
| 44.1                | 2B2                            |
| 44.2                | 1B1                            |
| 44.6                | 1B1                            |
| 55.1                | 2B2                            |
| 55.2                | 1B1                            |
| 55.4                | 1B1                            |
| 55.6                | 1B1                            |
| 66.1                | 2B2                            |
| 66.2                | 1B1                            |
| 66.3                | 1B1                            |
| 88.1                | 2B2                            |
| 88.2                | 1B1                            |
| 1010.2              | 1B1                            |

## DROP BALL TEST EN 356

Testing and classification of resistance against manual attack at Lower Level (P1A - P5A).

All panes must be able to withstand being hit three times by a weighing approx. 4.11 kg steel sphere with diameter 100mm, The drop heights in the individual categories are defined in the following table: To pass the test the ball must not penetrate the glass.

| Category | Drop Height (MM) | No of Strikes |
|----------|------------------|---------------|
| P1A      | 1500             | 3             |
| P2A      | 3000             | 3             |
| P3A      | 6000             | 3             |
| P4A      | 9000             | 3             |
| P5A      | 9000             | 9             |



# PERFORMANCE RESULT

 **Thickness**  
33.2

 **Interlayer Type**  
PVB

 **Supplier**  
Kurary Germany

| Test Type      | Standard reference          | Result   |
|----------------|-----------------------------|--|
| Bolling Test   | ISO12543-4:2021 (E),5.3.2   | No change in evaluated area and test result is pass  |
| Humidity Test  | ISO12543-4:2021 (E), 6.3.1  | No change in evaluated area and test result is pass  |
| Radiation Test | ISO12543-4:, 7.3.1 2021 (E) | Duration test 2000 Hours, Sources: 16 PCS of OSRAM Ultravitailux 300w, No observable changes in evaluated area and test result is pass, test is pass, $\Delta$ Tv %: -0.1% |
| Pendulum Test  | BS EN 12600                 | 1B1  |
| Drop Ball test | BS EN 356                   | P2A  |





[www.obeikanglass.sa](http://www.obeikanglass.sa)