

**High-**  
**rise**

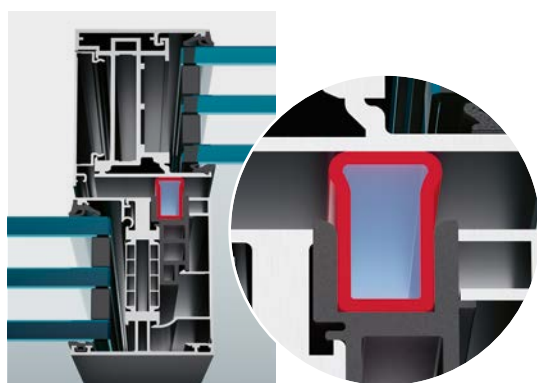
**high-**  
**lights**

# Optimum impermeability thanks to patented sealing system

Until now, sliding units have been used only very rarely in high-rises, as the sealing has caused problems due to the lack of contact pressure of the seal. Even the lift-slide or parallel sliding systems installed today are often unsatisfactory in terms of sealing, ease of use and visual appearance.

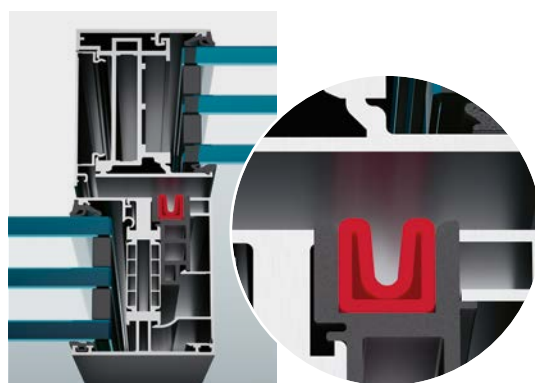
The air-lux sealing concept breaks new ground by simply moving the seal instead of the heavy sliding unit to achieve the required contact pressure. This innovative and patented sealing concept provides a number of benefits. The working principle is shown below.

## Sealing with air – the air-lux sealing concept



### Active

With the press of a button, air is introduced into the frame. This closes the gap between the slider and the fixed frame, creating a perfect seal.



### Inactive

To open the unit, the button is pressed a second time. The air is released and the seal retracts to its original concave profile.

## Optimum quality by sealing with air

*Test results for product standard 14351-1*



### Air permeability

Classification to EN 12207:  
1999-11

Class 4



### Driving rain permeability

Classification to EN 12208:  
1999-11

Class E1500



### Wind pressure resistance

Classification to EN 12210:  
1999-11/ AC: 2002-80

Class C4/B4

1600 Pa, max. 2400 Pa

# Constant performance of the air seal

The pressure on window systems in high-rise buildings is enormous. The higher the building, the greater the wind load and the more important the impermeability to driving rain. Conventional sealing systems, such as brush seals or rubber lip seals, show heavy wear after only a short period of time. This wear is caused by the enormous interacting load of pressure and suction to which the seals are constantly exposed.

## Extremely high pressure on the seal

### Wind load at ground level

The wind load on an unexposed high-rise building in Europe is approximately  $100 \text{ kg/m}^2$  pressure (+) and  $85 \text{ kg/m}^2$  suction (-).

### Wind load at the 17th floor

At the 17th floor, the load on the façade is twice as great at more than  $200 \text{ kg/m}^2$  (+) and  $170 \text{ kg/m}^2$  (-).

## Load on the sliding unit

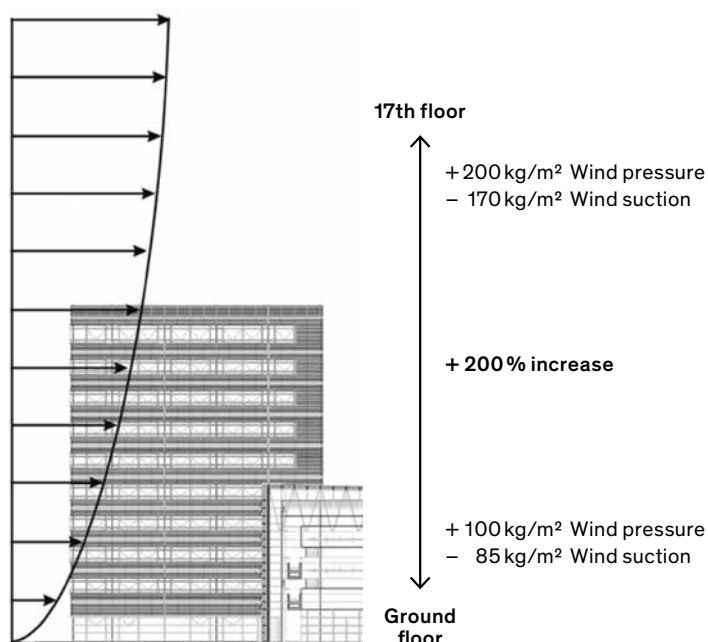
For a sliding unit on the 17th floor of  $3 \times 3 \text{ m}$ , the nominal wind load is  $1900 \text{ kg}$  pressure and  $1530 \text{ kg}$  suction.

As the air-lux sealing concept does not have any complex fittings, the system is almost maintenance-free. This leads to very low maintenance costs and an improved ROI.

## Waldheimstrasse, Zug

air-lux was developed for this project in 2004. 422 sliding units measuring  $5 \text{ m} \times 2.5 \text{ m}$  were installed in three high-rise buildings: the seal on these units is still 100% effective.

Wind profile

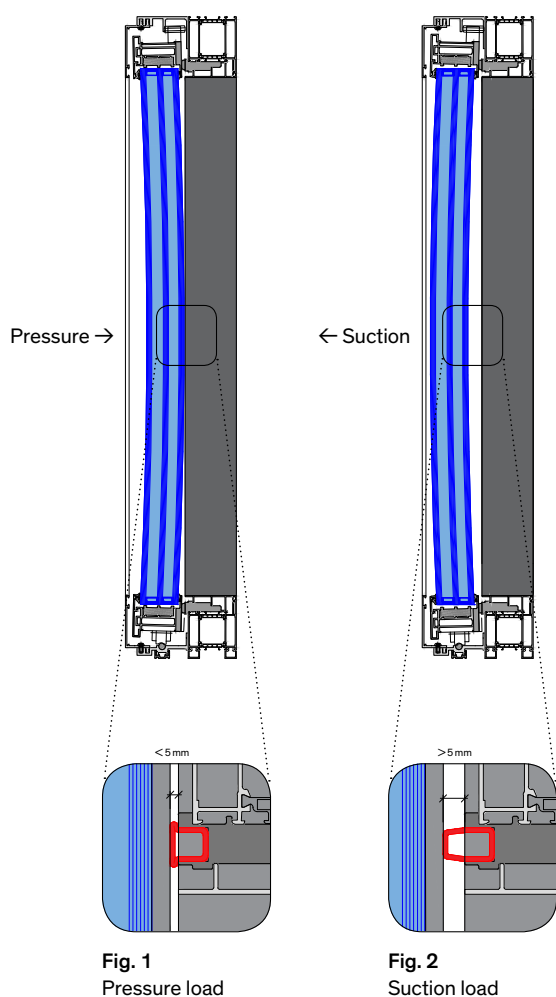


# air-lux seal with membrane function

Due to the interacting effects of wind load on the façade (pressure/suction), the sliding panes and the fixed elements sag. On a 3 m high sliding unit and with a maximum permissible sag of L150, this produces a deformation of up to 20 mm.

The membrane design of the air seal accommodates this degree of movement and the sliding window remains 100% sealed, irrespective of load from either pressure (Fig. 1) or suction (Fig. 2). In addition, impact noise from the profile in strong winds is a thing of the past. The air seal's constant contact pressure eliminates any play in the slide.

## Sealing with membrane function



## Shanghai, China

Two residential blocks with pressure/suction load of  $316\text{ kg/m}^2$ .  
Maximum noise insulation requirements due to central location.





**Diakonie Bethanien, Zurich**  
 Height: 40m  
 Sliding units: 500  
 Project: complete façade cladding



**One-One, Cham**  
 Height: 46 and 49 m  
 Sliding units: 58  
 Project: complete façade cladding

↑ **B125 Baarerstrasse, Zug**  
 Height: 56 m  
 Sliding units: 136  
 Project: complete façade cladding

# Sealing with air – the ingenious solution for high-rises



- 100% impermeability against driving rain, wind and noise – on every floor
- air-lux air seal with membrane design
- constant performance air seal with no wear marks
- low maintenance costs and good ROI (return on investment)



## **air-lux – a Krapf AG development**

Krapf AG was founded in 1964 and is now one of the leading metalworking and glass façade specialists in Switzerland. As a full service provider and professional project partner, Krapf AG creates outstanding projects that impress architecturally, technically and functionally. Krapf AG developed air-lux in 2004.