



Thermally broken Brakel® Optima smoke ventilators

# Unusual solution for refrigerated warehouse Centurion South Africa

## Non guided smoke ventilation

A massive distribution facility in Centurion had to be extended with a -28°C area (3500 m²) and a 1°C area (7000 m²). Consulting engineers WSP teamed up with Brakel Certified Partner Quality Power. This led to an unusual, sustainable and cost saving solution for the 1°C area. Jan Eager, consulting engineer at WSP explains.

"We worked together with Quality Power because Quality Power conducted the necessary market research and code requirements to secure that we offered certifiable roof ventilators that comply with South African regulations."

### 1°C area: refrigerated area extended right up to roof sheet level

Quality Power proposed a configuration which surpasses the generally implemented method in South Africa. Normally, insulated ventilators are fitted onto the ceiling, allowing smoke to rise into the ceiling from where it is ventilated outside of the building via controllable louvered ventilators. Jan Eager states: "What is not normal for South African installations is that smoke extracted from the building is not guided

from the refrigerated space through the roof void and then out of the building. At this cold store only one smoke ventilator – type Brakel Optima which is rated for large temperature differences - was installed. The refrigerated space is therefore extended right up to the roof sheet level."

### Customer satisfied with this solution

Jan Eager continues: "Compared with previous systems installed, there is a vast difference in customer satisfaction. There is no problem with leaking roof ventilators and associated condensation inside the refrigerated space."

### -28°C area: openings drastically reduced

"Due to the problematic nature of openings through freezer panels and icing problems, smoke vent openings had to be minimized. Through the use of mechanical extraction, openings could be drastically reduced compared with other areas of the building." Fans were installed inside shafts of the ceiling void. To minimize heat transfer between the cold area below and the void which can reach temperatures up to 40°C in summer, Brakel® Duo Therna flap ventilators were fitted onto the ceiling. Brakel® Eura louvered ventilators were fitted above the fans in order to prevent rain ingress through the roof.

### Future buildings: Optima louvered vents with glass blades?

It was remarkable how much daylight entered the building through the thermally broken Optima vents when they were open. Since cold stores are 100% illuminated with artificial lighting, Quality Power investigated the feasibility of installing glass blades in the louvered ventilators since the artificial lighting could be reduced during daylight hours. What would be the heating effect?

### Financial value and heating influence

Calculations show that daylight entering the cold store will have a financial effect only if the artificial lighting can be reduced during hours of daylight. But what about the heating effect during daylight? Empirical tests were done to see what effect daylight would have on the temperature inside the building. The results: there was much to be gained by using translucent blades. There was an additional load but that did not outweigh the cost reduction in artificial lighting.

**"There is no problem with leaking roof ventilators and associated condensation inside the refrigerated space."**  
Jan Eager, consulting engineer WSP



Brakel® Eura ventilators above the fans



Brakel® Duo Therna flap ventilator