

Silicones enable blast resistance and futuristic design at world's busiest international airport

Case Study: Heathrow Airport Terminal 5



City
London

Country
United Kingdom

Products
Dow Corning® 3362
Silicone Insulating Glass Sealant
Dow Corning® 993
Silicone Structural Glazing Sealant

Developer
BAA

Lead Architect
Richard Rogers Partnership
(now Rogers Stirk Harbour and
Partners)

Structural Design Consultants
Ove Arup and Partners Ltd

The Project

- Set to increase Heathrow's capacity by around 30 million passengers per year, the opening of Terminal 5 enables Heathrow to maintain its position as the world's busiest international airport.
- Opened in March 2008, this striking example of airport architecture is one of the largest construction projects ever undertaken in Europe, being able to fit around fifty full size football pitches across its five floors.
- This remarkable design is inspiring and futuristic. Consisting primarily of steel and glass allowing a swathe of light to engulf the building, it is one of the largest single-span structures in the UK.
- The extensive use of glass throughout the structure permits stunning panoramic views of the airfield from the airport lounges.
- Dow Corning® 993 Silicone Structural Glazing Sealant was specified to structurally bond the internal glass elevators.
- Dow Corning® 3362 Silicone Insulating Glass Sealant was specified to provide a secondary insulating glass edge seal for the curtain wall façade, rooflights, car parks and the sky bridges.

Extensive redevelopment of local infrastructure was required to facilitate ease of access, including a spur road from the M25 motorway, extensions to the Heathrow Express and Piccadilly line rail services and a new railway station exclusively for Terminal 5 passengers. In addition, two historic rivers have been diverted.

At its peak, there were around 8000 construction workers on site, working on 16 major projects and 147 sub-projects across a 260 hectare site. The sheer scale of this £4.3 billion project should not be underestimated.

The Exterior Curtain Walling and Roof

Curtain Walling Delivery Service: *Schmidlin (UK) Ltd*
Insulating Glass Manufacturer: *Polypane*

The terminal building is one of the largest single-span structures in the UK with a façade exceeding 30,000 square metres, made up of around 5,500 glass panels. The immense and dramatically curved roof weighs around 18,500 tonnes and contains 22 steel box section rafters supported by 11 pairs of supporting abutments. Dow Corning 3362 Sealant was specified to provide an insulating glass edge seal for the glass units installed throughout many elements of this construction including the outer skin, the roof lights, the car parks and sky bridges.

Polypane, suppliers of insulating glass panels for Terminal 5, are members of *Quality Bond™* – a recent Dow Corning initiative designed to lift standards of quality control, quality assurance and product application by specialist silicone fabricators and applicators. Franky Symoens, General Director of Polypane commented “*Quality Bond* membership enhances our capability to be successful in a market which embraces standards of best practice – a crucial factor in winning business, particularly on prestigious projects such as Heathrow Terminal 5”.

The Glazed Elevators

Design & Build Contractor: *Seele Austria GmbH & Co. KG*
Glass Manufacturer: *Eckelt Glas GmbH*

The Challenge

The use of glass throughout the internal fitting of this project is extensive, encompassing glass stairway balustrades to glass doors to glazed elevators and shafts where in certain areas, additional bomb blast loading was required to be accommodated within the design. To maximise the transparency of the glazed elevators, a technical innovation and design was proposed by First Tier Contractor Seele for the fixation of the glass.

The Solution

Dow Corning's close co-operation with Seele culminated in a project review and test regime which enabled the joints between the toughened elevator glass sections to be bonded using Dow Corning's 993 silicone structural bonding technology. The test regime included adhesion and compatibility

testing with adjacent materials, calculation of structural bite and thickness to accommodate permanent load and joint dimensioning to ensure that the sealant can function as intended without excessive stress.

This project is another example of Dow Corning proven silicone products specified in an innovative and challenging application within this prestigious construction project.

Dow Corning 993 Silicone Structural Glazing Sealant

Certified by European Technical Approval ETA 01/0005, *Dow Corning 993* exhibits excellent weathering properties and high resistance to ultra-violet radiation, heat and humidity once cured. It is ideal for structural bonding of glass and metal, including coated, enamelled and reflective glass.

Dow Corning 3362 Silicone Insulating Glass Sealant

A neutral curing silicone sealant specifically formulated for use as a secondary seal in the manufacture of high performance insulating glass units, with outstanding adhesion to a wide range of substrates including coated, enamelled and reflective glass. *Dow Corning 3362* has excellent temperature stability, is resistant to ozone and ultra-violet radiation, is certified by European Technical Approval ETA 03/0003 and complies with EN 1279-4 requirements.

About Quality Bond™

Quality Bond lifts silicone sealing and bonding to the highest level through the instigation of standards of best practice in quality control, quality assurance and product application by specialist silicone fabricators and applicators. *Quality Bond* allows customers and specifiers to share in Dow Corning's industry-leading expertise and benefit from our proven global performance track record. For more information, please visit www.qualitybond.com.

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