APPLICATIONSUPDATES

Terminal 5 at Heathrow underlaid with hot-melts

Phase 1 of the construction of Terminal 5 at Heathrow airport is scheduled to open on 27 March. It is forecast that 27 million passengers a year will use the new terminal - a further three million a year will be handled when the second phase opens in 2011.

"Not many of these people will be aware that a hot-melt adhesive is in the foundations of the new complex", says Stuart Wetherell, marketing director, **Beardow Adams**. "Terminal 5 will be sitting on a layer of Cellcore anti-heave honeycomb panels which uses Pressen 1835, an environmentally-friendly hot-melt adhesive, in its manufacture."

Cellcore is one of a range of products made by Cordek in Slinfold, West Sussex - Beardow Adams has been its major supplier of industrial hot-melts for more than six years. The panels comprise a honeycomb of interlocking expanded polystyrene sections with a solid top board. They are designed to deal with the forces created by ground movement - the anti-heave honeycomb compresses and buckles in a predetermined manner to accommodate movement as it reduces the transmission of forces to the foundations.

In the Terminal 5 project Cellcore type CP was used under the slabs that support the new buildings and the surrounding tunnels - including the Underground line extensions. Many of the installations are 20 metres below the surface.

The product incorporates a heavy-duty expanded polystyrene panel over the honeycomb structure and is protected by a 2mm-thick polypropylene top board. Pressen 1835 is used to bond the honeycomb to the polystyrene panel and this panel to the polypropylene board.

Hot-melt adhesive is applied by jet to the polypropylene board using a Melton hot-melt system with the temperature set at 160°C. A computer-controlled X-Y plotter table is used to ensure that the adhesive is positioned correctly. The polypropylene board is brought into contact with the expanded polystyrene panel and pressure applied; then the board is passed through the application unit again prior to the polystyrene panel being bonded to the honeycomb. (Another Cellcore product - type CC - has a heavy-duty polypropylene top which also is bonded to the honeycomb structure with the Pressen 1835.)

Beardow Adams' Pressen 1835 was specified "because it is a pressure-sensitive hot-melt which provides the open time required for this application", Stuart Wetherell explains. "It is clear running, has a medium molten tack, can be used in summer or winter, and is suitable for bonding polypropylene and polystyrene as well as a variety of other substrates including foil, foam, plastics, metal, wood, paper, and other fibrous materials."

Rodney White, managing director of Cordek, states that "we soon realised during our extensive trials that there were too many health and safety issues surrounding solvented adhesives, particularly regarding odour and the need for a ventilation system. In comparison we have found that hot-melt adhesives can be applied quickly and easily, have virtually no odour, do not require any special ventilation, and make for a cleaner working environment.

"In addition, with all the cost benefits that they bring we would not want to change to any other adhesive."

Stuart Wetherell believes that "with major construction projects being on Brownfield sites, which can have problems below ground, or Greenfield sites, at which large quantities of top soil often have to be excavated, ground movement is a serious problem. Cordek's Cellcore products are designed to overcome such problems - with the help of hot-melt adhesives!"

Cellcore CP at Terminal 5 at Heathrow airport. Many of these anti-heave panels are now 20 metres below ground.

At Cordek's plant Cellcore CP is manufactured while the Melton unit (right) pumps Beardow Adams' Pressen 1835 hot-melt adhesive to the gluing head. The adhesive is positioned using a computer-controlled X-Y plotter table to coat a polypropylene panel that is removed and placed on an expanded polystyrene structure while the second panel is being coated.

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