

Specialist materials for civil engineering, infrastructure and construction

TECHNICAL INFORMATION SHEET

Adhesive & mechanical attachment of mineral wool and phenolic insulation boards used on Externally Insulated Facade Systems.

Why do Parex require the mineral wool & phenolic insulation to be adhesively and mechanically fixed to the substrate?

Due to the make-up of the mineral wool and phenolic insulations, adhesive and mechanical anchoring of the insulation is always required. Mechanical only applications generally suffer long term issues.

The adhesive provides comprehensive bonding over the back face of the insulation board and helps to reduce the stresses in the system which occurs at the insulation board joints as a result of thermal changes. The adhesive is an effective restraint against thermal changes which occur daily and seasonally due to the prevailing weather. When only mechanical application is used the potential for thermal breaks to occur between the insulation panels is increased and this may, over time, show through the surface finish leaving un-slightly sight lines. This can be particularly apparent when an acrylic finish is used.

Parex adhesive significantly minimises these potential issues as it is a highly modified and high performance product which has high bond capability onto multiple substrates, which has also undergone rigorous testing and has achieved full European Technical Approvals and British Board of Agrément certification.

With mechanical only applications the resultant effects can be;

- Fixing not working due to poor installation
- Curling of the insulation – particularly at the edges
- Fixing only generally provides minimal resistance to insulation shrinkage particularly at board joints
- Micro cracking or visible cracking of the adhesive – allowing in moisture – consequence of above
- Staining of the façade – usually shown up as joint lines – consequence of above

The adhesive and mechanical fixing approach provides comprehensive and assured bonding of the insulation board and minimizes the risk of potential failures.

On flat surfaces the adhesive can be applied over the back face of the insulation board using a notched trowel.

For uneven substrates or when a dot and dab method is used, Parex recommends a minimum of 50% coverage of the board, with a full perimeter of adhesive together with a minimum of 5 dabs, but always in the fixing location points.

At all corners, this includes reveals too, ensure to apply a full adhesive bed to the edge of the insulation and that there are no gaps.

Does the adhesive thickness affect the bond strength?

With adhesive applications, the thickness of the adhesive does not affect the bond strength.

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Does the adhesive affect the thermal performance?

The application of the adhesive does not affect the thermal performance as the adhesive is applied wet and when the insulation is applied to the wall and the mechanical anchors are installed, the adhesive is squashed tight against the wall surface and the mineral insulation has an element of 'give' within its structure so the insulation will compress against the wall surface. Adhesive and mechanical fixing is the recommended application procedure for mineral wool and phenolic insulations under the European Application Guidelines for EWI.

Can I just use mechanical fasteners and no adhesive?

No. In addition to not providing effective thermal restraint, when mechanical fasteners are the only form of connection to fasten the insulation board, the attachment failure under full scale negative wind load (wind suction pulling off the boards) laboratory testing (to replicate the conditions that can occur to the most vulnerable parts of the building e.g. external corners, high exposure locations) is caused by the fixings creating a punching shear (the fixing is left in place and the insulation is pulled away) around the fastener head through the insulation panel. A typical 65mm diameter fastener, fixing a 50mm insulation panel at 8 fixings m² will provide a negative wind load failure of approximately 43kN/m². This is significantly less than is achieved using the insulation board and adhesively fixed application. Insulation thickness beyond 50mm does not significantly increase the pull off resistance of the insulation.

Conclusion

If the insulation board was mechanically only fixed, under severe wind loading conditions, the insulation could shear at the fixings and the whole insulation panel would come away from the structure creating a failure of the system and under less major situations the surface finish can show staining marks around all the board joints.

Bonding and mechanically fixing the insulation board provides consistency of fixing, resists thermal movement and provides a quality installation. There is no assurance that all mechanical fixings hold correctly and this would generate weak zones within the installation.

For additional information on fixing requirements for other types of insulation please refer to our other Technical Information Sheet - **Adhesive VS Mechanical Attachment of insulation boards used on Externally Insulated Facade Systems.*

For additional information or other Technical Information Sheets, please visit our Web site link http://www.parex.co.uk/Render_Systems/Technical_Information_Sheets_and_FAQs

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