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Altro Whiterock™

Factors affecting performance of hygienic wall cladding

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Abstract

The performance of wall cladding is not decided by a single 'silver bullet' product feature. It is the combination of a range of important factors encompassing product design, manufacture, installation and lifecycle.

This paper interprets the results of wall cladding product testing and research and development, to outline the key factors determining levels of performance, with particular reference to hygiene. Important commercial considerations during specification and purchasing of wall cladding products are also reviewed in the light of imperatives such as sustainability.

About the author

Tim Walker has been involved in the sales and development of walls products for twenty-four years. Beginning his career as a Product Manager for dry-lining products, he joined Altro 19 years ago as a Sales Consultant. He progressed to UK Sales Manager, a role he held for five years, and then spent six years as General Manager of the Altro Walls business. Today he is the company's Global Walls Development Manager with an international remit for wall cladding products, and specific responsibility for the company's worldwide sales and distribution network, particularly in rapidly expanding markets such as North America, Europe and the Asian Pacific rim.

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1.0 Performance factors

1.1 Integrity of cladding material

The most obvious factor in performance of wall cladding is also the most difficult to determine with the naked eye. The materials from which the wall cladding is constructed are critical.

The best levels of performance can be expected from those wall cladding products manufactured using high quality raw materials. This contributes to the strength of the product and its robustness during installation. Products manufactured using inferior raw materials are often associated with a lower upfront cost, but they can be prone to thinning when thermoformed, making them less impact resistant.

High quality raw materials also contribute to the UV stability of cladding (important for batch-to-batch consistency at time of installation, and to maintain the visual effect of the cladding throughout its lifecycle).

The choice of component material will also affect ease and speed of cleaning and chemical resistance.

The thickness of the material should also be noted. Cladding in 2.5mm thicknesses or above, can provide improved impact resistance and wear characteristics compared with 2mm cladding. As mentioned above however, the quality of the materials used in its construction remain the key concern.

Specifiers can demand cladding that is tested to BS EN438 to ensure that the products they are buying comply with regulatory levels of impact resistance.

1.2 Hygiene protection

Whilst the importance of the material of construction is frequently underestimated, the role of biocides is sometimes overestimated. It is true that full thickness penetration of biocides¹ can ensure long-term hygienic protection, even if the product is scratched or damaged. But their presence should not be seen as a replacement for thorough cleaning and disinfection regimes after fitting.

Contrary to any claims, to our knowledge, no biocide can guarantee 100% protection against bacteria, and anything less than 100% should be deemed a risk.

As explained in sections 1.3 and 1.4, adhesion integrity and the management of potential areas of stress/weakness are also important in retaining hygiene protection.

Specifiers looking for compliance with all EU Directives on health and hygiene should request wall cladding is tested according to ISO 22196 guidelines and meeting JIS Z 2801 standards. Cladding manufacturers should also meet the requirements of the European Directive on the Hygiene of Foodstuffs (93/43/EEC) ensuring compliance both in the UK and Europe².

1. Altro has, for many years, added Altrosan™ to its product range at the point of manufacture. It is present throughout the full thickness of the product. Competitive products have, more recently, followed suit with the incorporation of biocides although, in some cases, these are only surface applied.

2. Altro wall cladding products are tested according to ISO 22196 guidelines and meet JIS Z 2801 standards. Altro is also compliant with the European Directive on the Hygiene of Foodstuffs (93/43/EEC).

1.3 Adhesion integrity

One of the most fundamental factors contributing to hygiene performance is the method of adhesion. Whilst the recommended method of installing wall cladding has always been to fully-bond the cladding substrate to the wall³, more recent entrants in the cladding manufacturing sector have advocated the practice of affixing the cladding by gunning on or 'dot and dabbing' with silicone.

This practice can trap bacteria between the cladding and the wall, undermining hygiene performance. Benefits of reduced cost are traded off against an increased level of risk.

In contrast, a fully-bonded system reduces opportunities for the growth of bacteria and adds strength, as the strength of the cladding itself is combined with that of the substrate immediately behind it.

1.4 Integrity of the product at potential points of stress/weakness

The hygiene performance of the wall cladding can only be as strong as its weakest point.

Under this category we can include any/all of the following:

- Where wall cladding meets other materials (such as flooring, doors, ceilings etc)
- Integrity of the material/adhesive bond
- Areas of sealing/waterproofing
- Vertical joints
- Transition trims

Best practice when specifying products includes:

- Buying all materials (wall cladding sheet and jointing profiles, flooring materials, doorsets, adhesives and silicones etc) from a single source. This ensures consistency of product development and ensures materials can be fitted alongside one another without risk of incompatibilities that

might cause joined surfaces to 'part company'

- Requesting samples of the complete system (not just the sheet) so that the quality of the jointing profiles can be viewed
- Asking the manufacturer to explain how the product has been developed to minimise potential problems, such as dirt collecting in corners, joints or ledges⁴
- All internal and external corners should be thermoformed on site by the installer. Choosing cladding manufactured in high quality raw materials at a thickness of 2.5mm or above (as mentioned previously) will ensure that no stress fractures or cracking occur during thermoforming

1.5 Quality of installation

With the points outlined in 1.4 in mind, it is clear to see that quality of installation is an important factor in the long-term performance of wall cladding.

It is always advisable to look for a warranty on the installation of the product. Having established where to obtain one, delve a little deeper to identify what level of control over installation quality the manufacturer is able to achieve through training its installation network. The very best in the market will support Continuous Professional Development with dedicated training facilities for technicians, schemes for accrediting its approved installers, and will have developed formal specifications, and structures for on-going auditing of installation partners.

3. In the 27 years since it was first developed, Altro Whiterock has always been applied using a fully-bonded system (a 2-part polyurethane or 1-part acrylic adhesive applied by trowel to the complete surface of the Altro Whiterock sheet). We have been concerned for some time with regard to the 'dot and dab' approach to adhesion recommended by other cladding manufacturers and have been pleased to see that, more recently, most suppliers of hygienic wall cladding have adopted an all over adhesive system and are following Altro's lead.

4. Altro, for example, recommends overlapping of Altro Whiterock sheet where wall cladding is used with coved floors. This avoids use of a transition trim, and ensures that a 'shelf' does not form where dirt can gather. Altro vertical joints are rounded with a low profile. The 2-part trim ensures the sheets fit snugly into the trim, and joints have neoprene seals. This level of hygienic detailing is preferred by infection control and Environmental Health Officers and can deliver long-term benefits for building occupants.

1.6 Customer maintenance/cleaning regimes

Complex, extremely rigorous cleaning regimes, using special products or equipment, should not be deemed necessary to maintain performance of the cladding.

Specifiers should look for products that only require quick, simple day-to-day care, for example, those that are easily wiped clean.

1.7 Fire protection

Development of the cladding product should have included some level of testing/compliance with relation to fire protection⁵.

In addition to the factors outlined above, relating directly to product performance, there are a number of additional considerations that will figure in any purchasing decision.

5. Altro Whiterock is tested to BS 476 Parts 6 & 7 (achieving Class 0 for propagation and Class 1 for surface spread of flame), and EN 13501-1 (the European standard for reaction to fire, achieving B-s3-d0) for Altro Whiterock, Altro Whiterock Satins™ and Altro Whiterock Illusions™.

2.0 Important commercial considerations at point of specification/purchasing

In addition to the factors outlined above, relating directly to product performance, there are a number of additional considerations that will figure in any purchasing decision.

2.1 Sustainability

The environmental impact of buildings has become an increasingly important issue for architects, the construction industry, contractors, facilities managers and building occupants. The considerable benefits of PVC-based materials for wall cladding have to be balanced against their environmental performance.

The progress of individual wall cladding manufacturers in the area of sustainability varies significantly depending on the priorities and levels of investment of individual companies. Moving towards greater sustainability can involve extensive research and development, and considerable capital investment to create infrastructure for material re-use and recycling.

At the time of writing (December 2010) there is only one wall cladding product range that can receive a BRE (Building Research Establishment) Global environmental rating⁶ and only one manufacturer has invested to create a wall cladding recycling take-back scheme⁷.

Given the growing importance of this aspect of product performance for stakeholders (particularly site owners/occupiers in the public sector), specifiers are advised to compare and contrast the sustainability achievements of their potential wall cladding suppliers prior to awarding contracts.

2.2 Warranties and support

It is perfectly feasible for a specifier to obtain a 20 year warranty to cover product/installation/labour for wall cladding products. As with any warranty, however, before purchasing, the specifier must be satisfied that the warranty claim would be fully deliverable by the supplier if required.

The reasons for this are twofold.

In the current economic climate, the financial viability of any supplier must be examined to ensure that its long-term future is sound.

Secondly, in respect of the long-life of a wall cladding product, a specifier may feel more confident dealing with a long-established manufacturer with identifiable reference sites where product has actually been installed for the period of time outlined in the warranty⁸.

Product support can vary enormously from one manufacturer to the next. Current best practice in this area is suggested below⁹.

Pre-installation

- Project management from start to finish
- Technical assistance with specification writing
- Advice on DDA colour and contrast
- Site visits
- Technical and product literature and detailing diagrams
- Sales and technical support
- Samples service
- Case study reference sites and testimonials

continued >

6. Altro was awarded an A rating from BRE Global in September 2010 for its Altro Whiterock™ White and Altro Whiterock Satins products where used in conjunction with a timber stud, plasterboard internal wall specification. To achieve the A rating, the product was assessed across every stage of its lifecycle, from the manufacturing process, the materials used, associated waste and environmental attributes.

7. All Altro Whiterock products are recyclable through Altro's Recowall™ scheme, the UK's first ever PVC wall cladding recycling take-back scheme which offers a collection service for off-cut wall cladding waste.

8. As the inventor of hygienic wall cladding, 27 years ago, Altro is the only company with real-life experience of in-situ ageing/wear of products in support of its warranty.

9. Example outlines current support services provided to customers by Altro.

During installation

- On site assistance and quality audit
- Technical hotline
- Fully trained installer network
- Efficient delivery

Post-installation

- Sales and technical support
- Cleaning demonstrations
- Operations and Maintenance packs to meet your Construction Design and Management requirements
- Warranties
- Asking for your feedback to assist continuous improvement
- Joint PR and marketing opportunities

2.3 Design capabilities

Whilst this paper has dealt primarily with the hygiene performance of wall cladding, the decorative capabilities are equally important in the purchasing decision. These capabilities extend in some cases¹⁰ to the creation of bespoke designs on surfaces, in addition to an extensive range of colours, designs and finishes.

2.4 Speed and ease of installation

In addition to the quality of training provided to installers by the manufacturer, there may be issues relating to speed and ease of installation arising from the manufacturing process of the material itself. Cladding manufactured in high quality raw materials can be expected to have greater consistency of colour from one batch to the next. This will avoid snags that might otherwise be experienced during installation resulting from subtle differences in the finish of cladding manufactured in inferior materials.

10. For example Altro Whiterock Digiclad™

3.0 Checklist for use when specifying wall cladding

Question

Best practice

✓ or ✗

What is the product made from?	High quality raw materials.	
What is the thickness?	2.5mm provides greater strength and impact resistance than 2mm.	
Does the product meet the requirements of BS EN438?	This indicates compliance in the area of impact resistance.	
What levels of compliance does the product have with regard to EU directives on health and hygiene?	Best practice would be indicated by compliance with: ISO 22196 guidelines, JIS Z 2801 and EU Directive 93/43/EEC on Hygiene of Foodstuffs.	
How is the cladding applied to the wall?	A fully-bonded system is necessary (in preference to adhesive dotted across the surface) to prevent the growth of bacteria between the cladding and the wall. Fully-bonded systems also add strength.	
Do you supply a full wall cladding system or just the sheet?	Buying all materials (sheet, trims, adhesives, silicones, doorsets and flooring) from a single manufacturer increases supplier accountability and avoids incompatible materials 'parting company'.	
Can you supply samples of the complete system, including examples of joints?	Joints are an important point of potential weakness. Samples will give specifiers an important indication of the integrity of materials for hygiene etc.	
How will your installer eradicate potential problems in areas such as corners, joints and coved floors?	All internal and external corners should be thermoformed on site by the installer. Vertical joints should be rounded and have a low profile preventing ridges where dirt can gather. Joints should have neoprene seals, and trims should be designed to fit snugly. Techniques should have been specially developed to tackle areas such as coved floors, and passed on to installers through training.	
How do you train your installers?	Training should be well-resourced and structured, with dedicated facilities and levels of certification.	
Once they have received initial training how do you keep installers up-to-date with new/ improved techniques?	The manufacturer should have a process by which to deliver and certificate Continuous Professional Development.	
How do you monitor the quality of workmanship of your installers?	Best practice will include a process of on-going auditing of installation partners to maintain standards.	
What levels of fire protection does the product comply with?	Best practice will be indicated by compliance with: BS 476 Parts 6 & 7 (for example Class 0 for propagation and Class 1 for surface spread of flames) and EN 13501-1 to achieve B-s3-d0.	
What cleaning regimes should be followed after installation?	Cladding should retain its performance with simple easy day-to-day care, eg easily wiped clean.	
Does the product carry a BRE Global A environmental rating?	This rating only available from Altro WhiteRock (at time of going to print, December, 2010) can be valuable for all parties in the supply chain (eg architects, contractors, facilities managers and building occupants) when assessing environmental performance.	
What facilities do you provide for recycling of waste material at installation and for the disposal of cladding when it reaches the end of its lifecycle?	Current best practice in the UK is represented by Altro's Recowall recycling scheme. The long life of PVC makes it an unpopular product for landfill disposal.	
What warranty do you provide?	A 20-year warranty is current best practice, but the specifier must be confident that the manufacturer of the product has the technical experience on which to base its claims, and the financial stability to fulfil obligations in the long-term if required.	
What support do you offer, prior to installation, during installation and after installation?	Examples of best practice are outlined in detail in point 2.2 of this white paper.	
What design capabilities can you offer, in terms of range of colours, design, finishes and the ability to create bespoke designs?	The range of opportunities available should satisfy the aesthetic requirements of the specific application.	
How is consistency of colour maintained, from one batch to the next?	Cladding manufactured in high quality raw materials will provide greater consistency and avoid snags during installation. Also look for evidence of compliance with international manufacturing quality standards.	

4.0 References

Peter D Askew
Managing Director
Industrial Microbiological Services LTD
Pale Lane
Hartley Wintney
Hants RG27 8DH
UK

BS 476-6:1989
Fire tests on building materials and structures.
Method of test for fire propagation for products

BS 476:Part 7
Fire tests on building materials and structures.
Method for classification of the surface spread of
flame of products

BS EN13501-2
Fire classification of construction products and
building elements. Classification using data from
fire resistance tests, excluding ventilation services

BS EN438-1:2005
High-pressure decorative laminates (HPL). Sheets
based on thermosetting resins (usually called
laminates). Introduction and general information

CDM (Construction Design and Management)
Regulations www.cdm-regulations-uk.co.uk

ISO 22196:2007
Plastics – Measurement of antibacterial activity on
plastics surfaces

JIS Z 2801
Test for Antimicrobial Activity of Plastics

Council Directive 93/43/EEC on the Hygiene of
Foodstuffs

BRE Building Research Establishment
– Watford UK www.bre.co.uk

Recowall – Altro's PVC wall cladding recycling
take-back scheme www.altro.com/recowall



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