

TECHNICAL INFORMATION SHEET

Dark Colour Finishes on External Wall Insulation (EWI) Systems; PAREX THERM Acrylic and PAREX THERM Mineral render systems

DARK COLOUR FINISHES ON EXTERNAL WALL INSULATION SYSTEMS

Parex specifications call for a finish with a lightness value of at least 30% (the finish must reflect at least 30% of the light that strikes it). There are two issues that must be addressed when consideration is given to using a Parex finish that has a lightness value of less than 30% on a Parex EWI System, and these are:

1. Possible damage to the insulation board in particular, expanded polystyrene and PIR type boards.
2. The likelihood of fading or colour changing of darker colour finishes.

The first issue, possible damage to the insulation board, is a functional problem and can affect the performance of the EWI System. The second issue, fading of the colour, is an aesthetic problem that does not affect the performance of the system, but is still not a desirable condition. Let's look at each of these issues in more detail.

Possible Damage to Insulation Board

The insulation that is used in most EWI Systems is the expanded or extruded polystyrene board. In some instances the PIR board is also used. The producers of these boards recommend a maximum service temperature of 167°F (75°C). At temperatures higher than this value, the boards begin to deform.

Therefore, the use of dark colour finishes over the polystyrene boards should be avoided in order to prevent the occurrence of high temperatures on the surface of the insulation boards. Energy absorption of a dark colour finish is one of the factors to be considered, but one must also take into account the overall climate and the orientation of the surface utilizing the dark colour. Given the proper set of variables, the temperatures on the surface of the EWI System can exceed the service temperature of the polystyrene insulation board. Specific variables that can affect the service temperature are:

Ambient Temperature

The higher the ambient temperature, the higher the surface temperature of the EWI System.

Surface Orientation

The angle of incidence of the surface to the sun or the more direct angle of the sun to the wall (closer to 90 degrees), the higher the surface temperature. Also, the direction the wall faces will influence the performance of a dark colour EWI System, as a north facing wall will never see direct sunlight (unless it is reflected) and thus would not be a problem. The east elevation of a building is the next best condition, as ambient temperatures are not at the peak as the sun rises in the east. South and west elevations are the potentially most troublesome due to sun direction and ambient temperatures.

Climate

Such things as cloud cover, air pollution, number of cooling degree days and climate in general will affect the service temperature of the EWI System when a dark colour finish is used.

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Wall Area

Relatively small surface areas like decorative bands pose less of a problem when dark colours are used, as the surface heat can be dissipated more readily than on a large wall area.

Reflected Light

A dark coloured finish that not only receives direct radiation from the sun, but can also be exposed to additional reflected light from a window or some other reflector, is far more susceptible to have a surface temperature that exceeds the service temperature of the polystyrene board. This double dose of radiation can rapidly produce excessive surface temperatures in just about any environment or climate.

Colour

The darker the colour, the less light is reflected, so more energy is absorbed.

When colour selections are made, it is important to be aware of the potential damage that may result from the elevated surface temperatures when a dark colour finish is desired.

The Parex acrylic colour chart indicates the lightness values of all the standard colour finishes in a scale between 1 and 100 with the lighter colours having the higher numbers. Colours with a lightness value of 30 or greater are typically safe to use over a EWI System in any geographical area and climatic condition. We recommend that before a colour selection is made, the lightness value of the colour is determined, and if it is below 30%, the other determining variables are examined to assess the potential damage and risk associated with the use of a dark colour on the System.

The Parex mineral colour chart indicates with an * the colours that have a higher co-efficient of absorption factor greater than 0.70 lightness value. Colours with a lightness value of 70 or less are typically safe to use over a EWI System in any geographical area and climatic condition. We recommend that before a colour selection is made, the lightness value of the colour is determined, and if it is above 70%, the other determining variables are examined to assess the potential damage and risk associated with the use of a dark colour on the System.

Colour Fading

The second issue with using a dark colour is the probability of fading. The gradual changes in colour or fading is primarily due to the pigments that must be incorporated into the finish in order to achieve the desired colour. Finishes of lighter colours typically utilize pigments that are made up of inorganic chemicals. These pigments are very stable and are not easily broken down by exposure to ultra-violet light. Therefore, fading is not much of an issue in lighter coloured finishes.

To achieve darker colours, it may be necessary to switch to pigments that are made up of organic compounds, and in some instances, these types of chemicals may be susceptible to ultra-violet light degradation. If a certain organic pigment must be used to achieve a certain dark colour, and if this pigment is prone to UV breakdown, then the fading of the colour is almost a certainty.

The degree of fading will be a function of exposure to UV light which is directly related to some of the variables already discussed above.

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Once again, fading is an aesthetic issue and does not compromise the functionality of the EWI System, but the selection of the proper colour with the most stable pigments can make the difference between years of beautiful colours or a constant maintenance program to rejuvenate original colours.

To assist in reducing the effects of fading Parex recommend our clear sealer product called **600 Clear Sealer**. This product is a 100% acrylic transparent coating, designed to:

- Protect finishes from harmful UV light.
- Is well-suited for use with darker colours to increase fade resistance.
- Aids finishes in resisting chalking
- Provides a protective exterior acrylic-based coating. Compatible with Parex external finishes.
- Can also act as a masonry sealer.

Does Parex have a high performance top coat system?

Yes this is called AquaSol™ or DPR Optimum

AquaSol™ is a unique acrylic finish with enhanced hydrophobic and photo-catalytic technology. In addition to the impressive features found in our standard acrylic finishes, AquaSol™ also repels water, reflects UV rays, and reduces pollution. DPR Optimum has all the above properties except the photo-catalytic technology and thus does not offer the same UV reflective and reduction in pollution properties.

From residential to commercial buildings, AquaSol™/DPR Optimum will optimize both environmental and aesthetic values throughout the buildings life cycle. Environmentally, the photo-catalytic technology behind AquaSol™ helps breakdown atmospheric pollutants in the air and on the surface. The photo-catalytic properties of AquaSol™ also help keep the wall surface temperatures cool as it reflects heat from the sun. Aesthetically, the exterior remains cleaner as dirt merely runs off the AquaSol™/DPR Optimum surface whenever water hits the facade. Ideal applications include new construction or retrofit projects over Parex EWI Systems, render, masonry or concrete substrates.

If you have any questions or require additional information, please feel free to contact the Parex Technical Department.

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

Or for product datasheets contact;

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