



# PYROSHIELD®

**The superior flame retardant system**

- For use over multi-layered paint systems
- Upgrades the Class 4 Warrington Blue Board to Class 1 and Class 0
- No antimony or brominated compounds
- Thousands of finish colours available
- Water-based, quick drying formulation

# PYROSHIELD®

**Delaying the spread  
of fire at a crucial time**

**Pyroshield is specifically formulated to combat the potential hazard of rapid flame spread posed by existing multi-layered paint systems.**

*Pyroshield* from Dulux Trade represents a breakthrough in flame retardant coatings with a revolutionary new formulation that upgrades the reaction to fire characteristics of existing potentially flammable multi-layered paint surfaces with few of the drawbacks associated with conventional flame retardant coatings.

The effects of fire can be devastating, but this technological breakthrough in flame retardant coatings can play a major role in

reducing the rate of fire spread.

*Pyroshield* has been specifically developed to help specifiers meet the increasingly demanding requirements set down in legislation, where independently accredited flame retardant coatings are increasingly required to help them comply with 'duty of care' responsibilities thereby replacing conventional coating systems.

*Pyroshield* is the result of an intensive and rigorous research and testing programme.

It has the ability to delay the early stages of fire spread at a time when the occupants of the building may still be making their way to safety. Furthermore, its revolutionary new formulation is free from hazardous materials such as antimony and brominated compounds. These substances, which are widely used in conventional flame retardant coatings, can carry significant Health, Safety, and Environmental concerns.

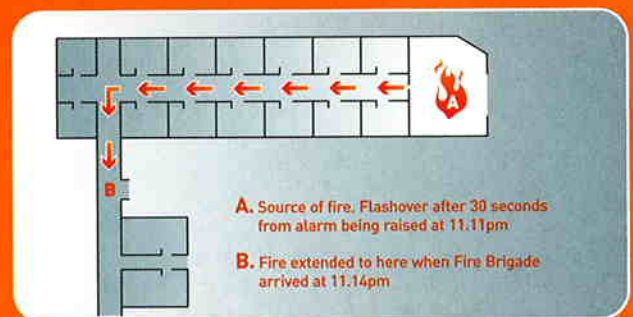
## Fire hazards of multi-layered paint surfaces

A major incident in the UK which drew attention to the potential hazard of multi-layer paint finishes occurred at Moston hospital in Cheshire.

Alerted to a dormitory fire by an alarm, a nurse escorted patients to safety. The Fire Service arrived just three minutes after the alarm was raised, yet within that brief time, flames had spread along the painted surfaces of walls and ceilings to a distance of 50m.

Warrington Fire Research Centre were involved in the subsequent investigations into the fire, and the reasons behind the reported behaviour of the finished surfaces. This investigation showed that a sample of the painted plasterboard lining in a similar corridor demonstrated a very rapid spread of flame - the sample was shown to have over 18 layers of paint beneath the top surface. Similar fires have occurred, for example, in the stairwells of high-rise blocks in London and in low-rise properties in Birmingham to name but two.

From the incidents that have occurred where paint has been implicated in the growth and spread of fires, all UK specifiers should now be aware of the potential flammability of multilayered paint and in particular the hazards posed in communal areas of multi-occupancy buildings in terms of flame spread and toxic fume emissions.



## In fire legislation, safety of the occupants is paramount



## The realisation of the potential fire danger posed by multi-layered paint in communal areas brings with it a duty of care for specifiers.

Fire legislation, as it applies to buildings, puts the safety of the occupants first. With this in mind, Dulux Trade have developed *Pyroshield* specifically to delay the early stages of fire growth, particularly in circulation areas and escape routes.

### A dangerous build up

Whilst internal linings are only a part of fire safety precautions within a building, they can be pivotal in reducing the potential for early fire growth and spread. *“There is a growing realisation that the build up of paint coatings on internal walls and ceilings contributes to fire growth, and that all existing paint films of unknown origin and of whatever thickness, age or condition should be regarded as potentially flammable”\**. This build up of potentially flammable paint layers means that walls and ceilings once designated as Class 0 or Class 1 may no longer meet current fire legislation requirements.

The removal of existing surface finishes can be a costly, dirty and disruptive process with the potential for creating a health hazard, particularly where older lead based paints may be present. However, there is now a cost

effective alternative to removal.

The application of *Pyroshield* over soundly adhering existing multi-layered paint systems, as applied to internal walls and ceilings, upgrades the reaction to fire classification of these painted surfaces, returning them to their original classification of Class 0 or Class 1.

### Regulations and Classification

Section B2(1) of the Building Regulations, 2000 (as amended), Internal fire spread (linings) states:

- ‘To inhibit the spread of fire within the building, the internal lining shall –
- adequately resist the spread of flame over their surfaces; and
  - have, if ignited, either a rate of heat release or a rate of fire growth, which is reasonable in the circumstances.’

In England and Wales the required reaction to fire performance of internal linings is classified within Approved Document B to the Building Regulations. Similar documentation defines the same **Class 1** and **Class 0** classifications for use in Scotland and Northern Ireland.

**Class 1** represents the highest performance classification as measured by BS476: Part 7: 1997 Surface Spread of Flame. With the exception of small rooms, Class 1 is generally the minimum requirement for wall and ceiling finishes in buildings.

**Class 0** is defined in the Approved Document where, in addition to Class 1 flame spread, it defines limitations in heat release from a surface when tested to the requirements of BS476: Part 6: 1989. Class 0 is generally required for wall and ceiling finishes in circulation areas including escape routes.

Whilst the Building Regulations and the associated Approved Document relate to new buildings or those undergoing material alterations, other legislation and guidance documentation adopts similar requirements with respect to the ongoing maintenance of the reaction to fire characteristics of surfaces within buildings. Health and safety legislation imposes a duty of care on those responsible to ensure that fire safety requirements are satisfied, and it is in this that the flame retardant properties of the *Pyroshield* system can play a crucial role.

### Approved Document B Surface Classifications

The following general Surface Classification Requirements for internal walls and ceilings are presented in Table 10 of Approved Document B to the Building Regulations.

Residential	Rooms larger than 4sq.m.	Circulation area
House of 1 or 2 storeys	Class 1	Class 1
Flats	Class 1	Class 0
Institutional	Class 1	Class 0
Other residential	Class 1	Class 0
Non-Residential	Rooms larger than 30sq.m.	Circulation area
Assembly	Class 1	Class 0
Offices	Class 1	Class 0
Shops	Class 1	Class 0
Other Non Residential	Class 1	Class 0



# PYROSHIELD®

**Proven performance  
under the most stringent  
test conditions**



## Fire propagation and Pyroshield: meeting the requirements of BS476: Part 6.

Multi-layered paint systems on walls and ceilings can act as a fuel source thereby supporting fire growth. In a building where ignition has occurred and where oxygen and fuel continue to be available, the fire will quickly spread and grow. In situations where the source of ignition is adjacent to a coated wall or ceiling and the coatings have a significant organic content, *Pyroshield* can be particularly effective in helping to reduce the rate of fire spread and growth.

*Pyroshield* works by using low hazard mineral flame retardant chemicals that react in a fire situation to take in oxygen and create steam. This cools the heat of the fire and reduces the amount of available oxygen. Also, as the coating reacts, it forms a thermally stable char that acts as a barrier,

thus physically separating the fire from paint coatings underneath that could otherwise act as a fuel source and propagate the fire growth and flame spread.

### Reaching the required performance

In tests conducted to the requirements of BS476: Part 6, 'Method of test for fire propagation of products', at BRE, 'Blue Board'\* multi-layered painted substrates treated with *Pyroshield* and overcoated with various Dulux Trade paint systems have achieved the required performance to enable the surface to meet Class 0 requirements (see panel on page 5). The test programme was designed to encompass the extensive colour ranges of the overcoating systems together with multiple redecoration cycles.

**FIRE PROPAGATION TEST** - Measures fire propagation characteristics of the test specimen to help evaluate the potential contribution of such a surface to fire growth.



## None of the health and safety concerns associated with many existing products

*Pyroshield* represents a breakthrough in flame retardant coating technology not simply because of its proven performance in slowing the spread of flames, but also because of its advantages from a health and safety point of view. Unlike many competitive products it contains no antimony oxide or brominated compounds.

### Concerns over antimony oxide

Flame retardant coatings play an important role in preventing or limiting the spread of fires, yet some of the materials they commonly use are the focus of mounting health and environmental concerns. The EU has initiated a formal risk assessment on antimony oxide, to be conducted by the Swedish government.

- Products containing 1% or more of antimony oxide must be classified as Category 3 (possible human) carcinogens.<sup>1</sup>
- In the UK, antimony compounds are subject to a MEL (maximum exposure limit) of 0.5mg/m<sup>3</sup>. Under COSHH this places a legal requirement on employers to carry out monitoring to ensure that exposure never exceeds the MEL and is reduced as far as reasonably practical.<sup>2</sup>

### Concerns over brominated compounds

- New UK regulations coming into force in August 2004 prohibit the placing on the market of Pentabromodiphenyl Ether and Octabromodiphenyl Ether, used in flame retardant coatings, as a substrate or as a constituent of preparations in concentrations higher than 0.1% by mass.<sup>3</sup>



## Slowing the spread of flame can buy the time that saves lives

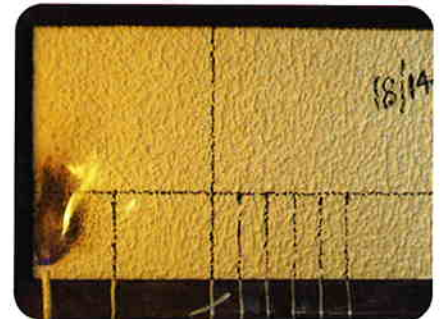


### Surface spread of flame and Pyroshield: meeting the requirements of BS476: Part 7.

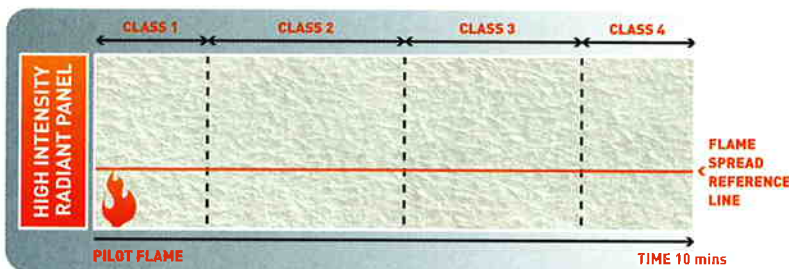
Limiting flame spread, especially in circulation areas and escape routes, is a prime function of *Pyroshield*. In tests conducted to the requirements of BS476: Part 7, 'Method of test to determine the classification of the surface spread of flame of products', at WFR, 'Blue Board' multilayered painted substrates treated

with *Pyroshield* and overcoated with specified Dulux Trade paint systems have achieved the required performance to enable the surface to meet Class 1 requirements. The test programme was designed to encompass the extensive colour ranges of the overcoating systems together with multiple redecoration cycles.

*Pyroshield* overcoated 'Blue Board' panels in the BS476: Part 7 test.



**SURFACE SPREAD OF FLAME TEST** - measures the rate and extent of flame spread across the specimen. The test is repeated on a minimum of six specimens; consistent satisfactory results must be achieved for the Class 1 classification to be awarded.



## Tested to the extreme

A system you can count on, from a name you know and trust: the *Pyroshield* flame retardant system from Dulux Trade has achieved a Class 0 upgrade performance over the Class 4 'Blue Board'.

### A testing substrate

*Pyroshield* was put to the test over the most challenging substrate to work with - the 'Blue Board'. This is a highly flammable Class 4 panel that has been specifically developed to simulate a 'worst case' scenario for a multi-layered paint decorated surface. It is the result of a rigorous research programme conducted by Warrington Fire Research into the fire hazards posed by the build up of multi-layered paint coatings. The panel is made up of plasterboard coated with a particularly flammable combination of paint coatings to a strictly controlled standard. *Pyroshield* achieved a Class 0 upgrade performance even when overcoated with subsequent layers of specified Dulux Trade paint systems.

### *Pyroshield* achieves Class 0 rating

Satisfactory results in both BS476: Part 6 fire tests at BRE and BS476: Part 7 fire tests at WFR, enabled *Pyroshield*-coated surfaces to achieve a Class 0 classification, as defined in the Approved Document to the Building Regulations. The adjacent table details the number of coats required to achieve Class 1 and Class 0 ratings.



Apply *Pyroshield* basecoat with tested and approved finish

CLASS 1	CLASS 0
2 Coats <i>Pyroshield</i>	3 Coats <i>Pyroshield</i>
2 Coats approved finish	2 Coats approved finish

# PYROSHIELD®

## Effective fire upgrade specification

It is vital to establish the type and condition of surface you're working with before deciding whether to apply *Pyroshield*. Thoroughly assessing the soundness of the existing coating or coatings is absolutely essential.

### Good Adhesion

Where you have a build of multi layered paint coatings, so long as the adhesion is good, simply apply *Pyroshield* basecoat and

an approved Dulux Trade water-based finish to upgrade the surface classification of the internal walls and ceilings.

If, however, you know the history and nature of the existing coatings and if you're confident that painting over them will still maintain the required Class 1 or Class 0 surface classification, then there is no need to specify an upgrade system such as *Pyroshield*. Similarly on new and unpainted

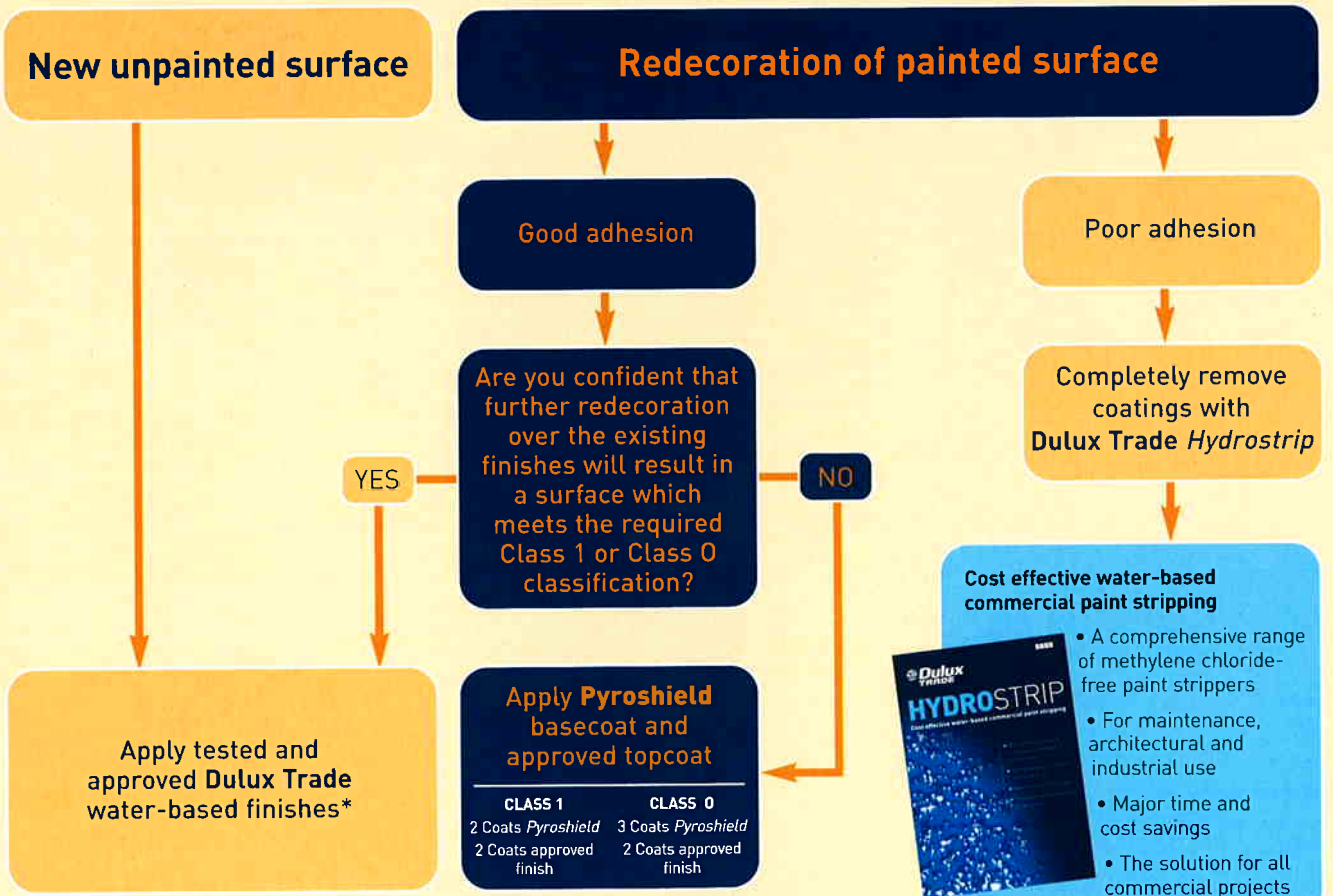
surfaces, an upgrade system such as *Pyroshield* is not required.

### Poor Adhesion

Imperfect adhesion - often indicated by blisters and flaking - means pockets of air are present within the coating, which is likely to allow the fire to take hold in the painted surface. Consequently if adhesion is poor, all coatings must be completely removed with *Dulux Trade Hydrostrip*.

## Fire Safety Coatings Strategy

Analysis of surfaces to be fire upgraded should be carried out according to these guidelines:



\* See Assessment Report or Dulux Trade specification for approved finish and system classification

## Quicker drying with the widest range of colour options



The revolutionary new **Pyroshield** system delivers a water-based, quick drying, low hazard flame retardant solution which offers superior performance, quicker drying, a range of finishes and thousands of colours.

*Pyroshield* has been tested and approved in conjunction with the following Dulux Trade water-based finishes. Consequently there are any one of the 6,000 colours available through the **Dulux Trade Colour Palette**.

Uniquely the *Pyroshield* test programme was designed to encompass both the extensive colour ranges of the overcoating systems together with multiple redecoration cycles. When specifying *Pyroshield* from Dulux Trade you can be assured that the chosen finish colour will not have a detrimental effect on the fire performance and also have the reassurance that the system has been tested over multi-decoration cycles.

The Dulux Trade water-based finishes approved for use over the *Pyroshield* basecoat provide a choice of sheen levels from matt to gloss and a range of performances from standard vinyl matt emulsion through to a high performance graffiti resistant finish.



### Anti-Graffiti

The total solution against graffiti vandalism

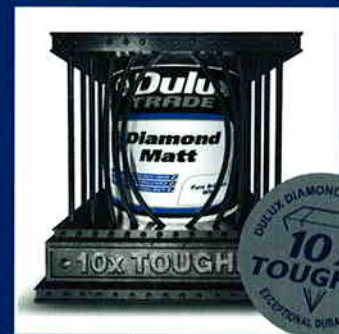


The Dulux Trade Anti-Graffiti Paint Finish is a high performance water-based epoxy coating delivering a superior durability gloss finish that can be regularly cleaned and even steam cleaned without the need for redecoration.

\*Dulux Trade Anti-Graffiti Finish is available in a selected range of pastel colours only. See separate colour card for details.

### Diamond Matt

A breakthrough in matt paint technology



Dulux Trade Diamond Matt is the first matt that is as tough as an acrylic eggshell. It can be scrubbed clean time after time without affecting the matt finish, making it ideal for high traffic environments.



**Pyroshield** is part of a comprehensive range of advanced products and service solutions from **Dulux Trade** that meet the needs of the professional specifier.

#### Site Surveys

**Dulux Trade** Specifier Account Managers will carry out a full site inspection. This will include assessment of the current condition of surface coatings, help with identification of difficult substrates and advice on extending maintenance cycles.

#### Specification Writing

**Dulux Trade** offers full specification support tailored to your individual requirements. This will ensure that correct preparation is highlighted and the products specified are the most appropriate for the location, environment and substrate type.

#### Contract Meetings

**Dulux Trade** Specifier Account Managers will attend pre-contract, tenant liaison, project review and post contract assessment meetings, ensuring collaboration and clear communication from concept to completion.

#### Site Visits

During the course of the work, if required, site visits can be made to ensure that work is being carried out correctly and in accordance to the specification.

#### Report to Project Owners

A critical element of any project is minimising down time. Knowing the status of the work in progress and thus keeping control of events is equally important. The **Dulux Trade** Specifier Account Managers will ensure that Property Managers are kept closely informed about the status of all work in progress.

#### Colour Service

For larger painting projects, **Dulux Trade** Colour Consultants can provide help and advice on colour choice using **Dulux Previews**, our unique colour specification software.

#### Health and Safety

We can help and advise on Health and Safety issues relevant to the use of **Dulux Trade** products.



To obtain the best performance from ICI products, it is important to ensure that they are applied correctly to the specification and this is why **Dulux Trade** established the **Contract Partnership** scheme for painting contractors.

The scheme offers you the reassurance of using **Dulux Trade** approved contractors who work to an agreed code of conduct. Contract Partners undergo stringent independent auditing and ongoing assessment programmes to ensure the highest standards of professionalism, which mean that you can be sure of consistent quality standards across the board.

Contract Partners receive regular training on **Dulux Trade** products to ensure that they fully understand product application and performance characteristics ensuring that a quality job is completed effectively and efficiently, right first time.

#### Contact Us

For more details on the **Dulux Trade Contract Partnership** scheme please contact your local Specifier Account Manager or e-mail us at [decr\\_dtcp@ici.com](mailto:decr_dtcp@ici.com)

Footnotes from Page 4

1. Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (SI 2002 No. 1689). (CHIP 2002)

2. The Control of Substances Hazardous to Health Regulations 2002 (SI 2002 No. 2677); as amended.(COSHH 2002)

3. The Control on Pentabromodiphenyl Ether and Octabromodiphenyl Ether Regulations 2004 (SI 2004 No 371).

Patent Applied for: GB0319787.1 and GB0324735.0

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