

Introduction

Intumescent coatings swell up when exposed to fire to protect steel members reaching their critical core fail temperatures. The intumescent reaction is produced when a mixture of specific chemicals is heated and this means that intumescent coatings contain key ingredients. Unlike the pigments used in standard protective coating systems the chemicals needed to produce an intumescent coating are soluble in water to some extent. This means that all intumescent coatings have the potential to be damaged by water. Nullifire have invested substantial resources over the last 30 years in producing intumescent coatings which are as durable as they can be without compromising the competitiveness of the products. During this time significant improvements have been made in the durability of the Nullifire range but to help our customers get the best out of the products we would like to highlight the following considerations.

Selection of the correct specification is essential. For guidance on specifications please consult tremco illbruck passive fire protection technical desk.

A critical factor which can determine the selection of Nullifire specification is the actual application of the fire protection. There are a number of options for when and how intumescent products can be applied;

- Offsite- with repair of handling damage done once erected on site.
- On site- after erection of the steelwork but before the building is weather tight.
- On site- Once the building has been made weather tight.

The options above can lead to products being applied and subsequent exposure to varying degrees of environmental conditions.

Nullifire Material Selection

Application	Water Based	Solvent Based	Hybrid Based
Offsite Application	Not Recommended*	Approved	Recommended
Onsite Application (Open to Weather)	Not Recommended*	Recommended	Recommended
Onsite Application (Weather Tight Building)	Recommended	Suitable ¹	Suitable ¹

* See weathering resistance guidance

¹ subject to environmental considerations, e.g. solvent levels

Weathering Resistance - Construction Phase² (up to C3 Environment)

Top Coat	Water Based	Solvent Based	Hybrid Based
No Top Coat	Not Suitable	up to 6 months	up to 6 months
TS816/TS815 at 50µm(*)	up to 3 months	up to 12 months	N/A
TS134 at 75µm(*)	up to 6 months	up to 12 months	up to 12 months
TS134 at 150µm(*)	up to 6 months	up to 10 years	up to 10 years

²The durability period above all rely on the intumescent coating being fully dry before the material is exposed to any weathering. It is also essential that the materials are not kept in prolonged contact with water, e.g. ponding or running water.

Life to First Major Maintenance or Service Level

Top Coat	Water Based	Solvent Based	Hybrid Based
No Top Coat	C1 - Life of Building C2 - Not Suitable	C1 - Life of Building C2 - Not Suitable	C1 - Life of Building C2 - Life of Building
TS816/TS815 at 50µm(*)	C1 - up to 20 years C3 - Not Suitable	C1 - up to 20 years C3 - Not Suitable	N/A
TS134 at 150µm(*)	C3 - up to 10 years C4 - Not Suitable	C3 - up to 10 years C4 - Not Suitable	C3 - up to 10 years C4 - up to 10 years

For exposure in a C5 environment, or if greater durability is required, please consult Nullifire Technical Desk for Further advice.

The above table assumes that the specified top coat is free from defects. The presence of any defects such as pinholes or discontinuities will reduce the life to first major maintenance in the area of the defect to that expected for no top coat.

For internal environments corresponding to C1 and C2 Nullifire water based, solvent based and hybrid intumescent coatings would give the same life to first major maintenance. Once the environment becomes more aggressive than category C2 the differences between solvent, Hybrid and water based intumescent coatings are more apparent. This is the reason why water based intumescent coating is not recommended for offsite application or application on site before the structure is weather tight.

Solvent based intumescent coatings are more durable than water based materials, they also tend to be quicker drying when applied in cold and/or damp conditions and these factors make solvent based materials a much more versatile choice.

Life to First Major Maintenance or Service Level Cont.

This document is offered to assist specifiers and/or applicators in determining the most appropriate type of intumescent coating to be used on a project. Hybrid, solvent and water based products can be used in most projects where the application will be on site, however solvent / hybrid based coatings should be favoured if:

- The building is not yet weather tight or the area being coated cannot be made weather tight.
- The ambient temperature is below 10°C
- The relative humidity could exceed 80%

For further advice on specific projects please contact a member of the technical team.

(*) Other top coats may be suitable and in certain cases Nullifire have approved the use of competitor's topcoats. It must be recognised that these approvals relate to the intercoat adhesion and compatibility of the products and not to the long term weathering properties.

It is impractical for Tremco Illbruck to carry out long term performance testing on the multitude of competitor topcoats available. However, it is considered reasonable to expect similar durability times from competitor topcoats where these utilise similar technology, provided those topcoats are from a reputable manufacturer and of a similar quality.

It is recommended that the manufacturer of the topcoat is contacted to ensure the product chosen from their portfolio is suitable for use in the specified environment, is of similar quality and utilises similar resin chemistry to the products listed above.

Notes

The environmental categories referred to in this document are those described in BS EN ISO 12944 Part 2.

Technical Services

Nullifire has a team of experienced Technical Sales Representatives who provide assistance in the selection and specification of products. For more detailed information, service and advice, please call Customer Services on 01942 251400.