

Intumescent Steel Protection

Guidelines for Common Scenarios

This document is intended to give generic guidance and advise on common situations that are encountered during the installation and application of Nullifire intumescent for the protection of structural steel against fire.

This generic approach will address the protection requirements where interactions are encountered between different elements of the building project. Examples could be such as wind bracing, supporting a façade or holding a suspended ceiling interacting with the primary structural building frame, which could be fire protected before other systems are installed.

In case of doubt, advice should be sought from a suitably qualified competent person, such as a structural fire engineer.

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I. Coat-back on secondary steel and attachments

Secondary steel refers to steel members that are attached to a primary loadbearing section that need to be fire protected. Primary steel is that which is integral to the stability of the structure. Secondary steel is not critical to the stability of the structure and is installed for aesthetic purposes or other than structural – such as supporting a façade. The fire performance of the secondary steel itself is not considered to be a concern. However, such steel could conduct heat back along into the primary section, undermining the fire protection.

Testing at Tremco CPG UK Ltd’s Centre of Excellence for Fire Protection has shown that the standard industry coat-back guidance can be reduced to 200 mm providing the following criteria are met:

- The secondary steel or attachments should not cover more than 5% of the surface area of the primary steel per metre length or square metre.
- Both primary and secondary sections/attachments must be made of structural steel.
- The secondary steel/attachments must be of equal or lower thickness/mass than the primary steel.

This is valid for Nullifire SC600, SC800 and SC900 series intumescent for 30-120 minutes fire protection.

If the secondary steel branches within the coat-back distance the protection must extend along all branches for a total of 200 mm from the primary steel. See figure 1.

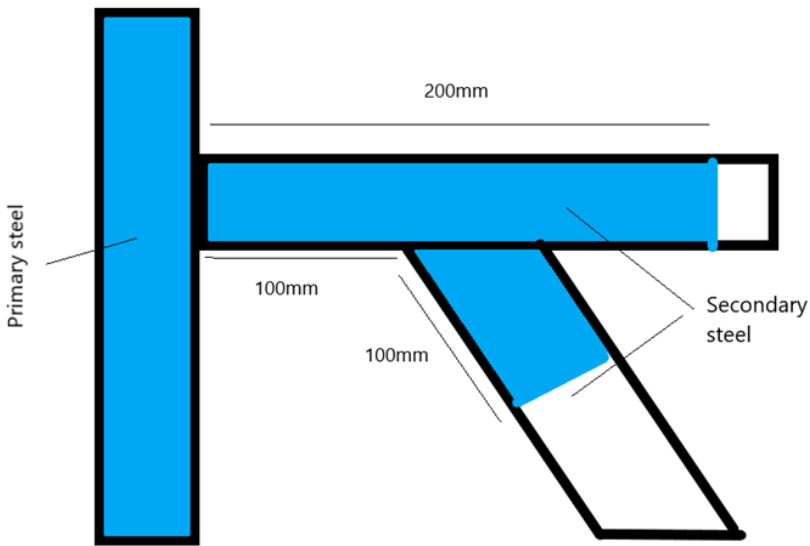


Figure 1 – coat-back on branching secondary steel

Attachments must also be coated along all branching paths to the specified distance. If the entirety of the attachment falls within the coat-back distance, then it must be coated across its full surface.

Small attachments or secondary steel with a total cross sectional area footprint of less than 3000 mm² per linear/square metre of primary steel, may have any coatback omitted as per ASFP guidance (Advisory Note 21).

This would also mean that any damaged area of upto 3000 mm² would not need to be repaired, but it is recommended as good practice to repair as soon as possible. 3000 mm² equates to an area of 54 mm x 54 mm (or 2 inch x 2 inch).

2. Expansion Gaps

The effective expansion of an intumescent paint may be inhibited by a material that is durable enough to survive in a fire situation.

Situations where a barrier degenerates slowly during a fire are dealt with in other sections.

The ASFP recommends an expansion gap of 50x the intumescent DFT as a safe guideline as to how much space an intumescent needs to expand into. If such a gap exists, no further measures are needed.

Further to this, Tremco CPG have identified that an expansion gap of 37.5 mm allows adequate space for Nullifire intumescents to function as designed in the event of a fire for fire resistance times of 30-120 minutes when installed vertically.

2.2 Intumescent protected structural steel elements used to support partition walls

2.2.1 Partition walls attached to structural steel elements rated R60 or less

Testing has shown that attaching partition walls to structural steel elements rated R60 or less causes no deterioration in the ability of the intumescent to protect the structural steel element. This building method can be used for both universal and hollow columns. The following points should be noted:

- The intumescent coating can be applied first and then the studding attached, or the studding can be added first and then coated at the same time as the section. Both methods are acceptable.
- It is permissible for the plasterboard to either terminate at the structural steel element or overlap it, leaving the section concealed inside the wall. However, the plasterboard should only be fixed to the partition studding and track, not the structural steel element itself.
- In the event of plasterboard overlapping the structural steel element, it is permissible for it to be in direct contact with the coating. No expansion gap is needed.

2.2.2 Partition walls attached to structural steel elements rated R75 or more

At time periods over 60 minutes, the stud must be separated from the structural steel element by blocks of insulating material. These blocks are placed at the points where the stud is attached to the structural steel element, such that the fixing passed through the stud, block and into the steel substrate. See figure.

The following restrictions apply:

- The material used to form the insulation blocks should be vermiculux, calcium silicate, or formed by laminating together plasterboard cut-offs.
- The blocks should have a minimum thickness of 37.5 mm, the same width as the stud and a length of 50 mm.
- It is permissible for the plasterboard to either terminate at the structural steel element or overlap it, leaving the section concealed inside the wall. However, the plasterboard should only be fixed to the partition studding and track, not the structural steel element itself.
- In the event of plasterboard overlapping the structural steel element, it is permissible for it to be in direct contact with the coating. No expansion gap is needed.

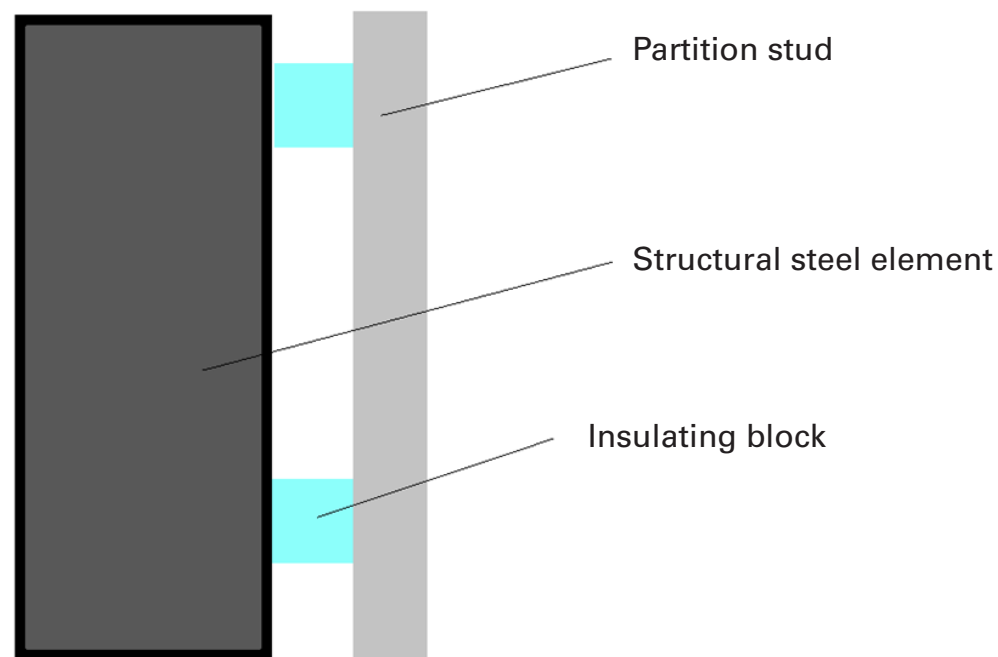


Figure 2 – insulation blocks for partition walls.

3. Mineral fibre in close proximity to intumescent protected section

Testing has shown that FB750 Intubatt within the expansion zone of an intumescent protected section will not reduce fire performance at R60 or less. This permission can be extended to cover other mineral fibre systems, so long as they are known to provide equal or better insulation than a single layer of FB750 Intubatt.

4. Metallic straps in contact with intumescent

Sometimes, metallic straps or bands (usually steel) are used to secure attachments in place. These present a barrier to char expansion, but testing has shown that this does not have a negative effect on fire performance, so long as the straps are 25 mm or less in width, no more than 2 mm thick, and at 300 mm centres minimum. Straps larger than this should be treated as attachments and coated in accordance with section 1.

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The testing used to derive the guidance in this document is ad-hoc testing. This means that where possible standards have been followed such as in setup and operation of equipment, etc. However, where no specific guidance exists in any recognised standard, these practices have been adapted to allow consistent clear guidance to be developed where it didn't exist. The English language version of this document prevails over any other translated version.



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