

# TG8:21

## Fire Damage



The NASC is often asked if scaffolding equipment that has been exposed to excessive heat, such as during a building fire, can be safely re-used.

There is no simple answer to this question as a great deal depends upon the temperature generated by the fire, the time the equipment was exposed to that temperature and the type and grades of materials that were used to manufacture the equipment.

Some components, such as those manufactured from timber, plastic or GRP will display significant damage at relatively low temperatures and should be immediately discarded.

At higher temperatures, the strength of most metals decreases and this can often have a permanent effect on their strength when they return to normal temperatures. The time of exposure to high temperatures can also cause grain growth within the metal's structure, which will almost inevitably result in a lower yield stress. Another critical factor is how rapidly the material is cooled from the high temperature. Cold water used to extinguish the fire could result in rapid cooling, leading to the material becoming brittle.

With the high cost of energy and the influence of national and international standards, an increasing amount of equipment is manufactured by cold and hot working methods, which frequently adds to the strength of the finished product. However, exposure of such equipment to excessive temperatures can affect the material's loadbearing properties.

Certain alloying elements used to manufacture different grades of steel, such as those used in the manufacture of some bolts and rivets, may react differently at high temperatures, resulting in a proportionately higher reduction in yield strength.



The integrity of welds on system scaffolding and other components is critical to the performance of the product and careful and extensive examination is required in this instance.

Whilst heat conductivity from a fire at a reasonable distance from the scaffold is unlikely to cause damage, if there is any doubt regarding the range of temperatures to which the equipment has been subjected and whether or not this could have affected the internal structure of the material, the equipment should not be re-used until specialist examinations by a competent metallurgist have been carried out. However, due to the complexity and high cost of conducting a comprehensive survey, in most cases it would be sensible for any equipment which has been directly affected by fire, to be responsibly disposed of/recycled.

It is also safe to assume that if the galvanising coating on scaffolding components has melted during a fire, the structure of the steel is also likely to have been affected.

Due to its relatively low melting point, aluminium is greatly affected at temperatures much lower than those which would affect steel, so additional caution must be given to any components manufactured with aluminium and its alloys.

Equipment which has been subjected to fire damage must be immediately segregated and securely quarantined to ensure that it is not reused.

All fire damaged equipment should be taken to a reputable scrap/recycling merchant, who should be made aware that it has been fire damaged and must be responsibly recycled to eliminate any possibility of it re-entering the marketplace and being reused for scaffolding purposes. This should form part of a legible documented process. As an additional precaution, tube and other equipment may be cut into small lengths to prevent it being re-used.

Scaffold contractors should also be aware that the heating of equipment to remove paint etc. could have the same deteriorating effect as a building fire. It is therefore particularly important, from both a product integrity and a product security point of view, to check how second-hand equipment has been cleaned prior to it being purchased.

*Whilst every effort has been made to provide reliable and accurate information, we would welcome any corrections to information provided by the author which may not be entirely accurate, therefore and for this reason, the NASC or indeed the author cannot accept any responsibility for any misinformation posted.*



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