



TECHNICAL BULLETIN #2

RESILIENT PLAYGROUND SURFACING SYSTEMS

Installer Health Issues

BACKGROUND INFORMATION ON MDI

Di-phenylmethane Di-isocyanate (MDI) is a common component used in the manufacture of polyurethane based products. MDI is a part of a family of isocyanates, as it is the safest of all commercially available forms of isocyanate suitable for the manufacture of binders and adhesives. It is the extremely low vapor pressure of MDI that enables it to be used safely in the manufacture of our products and also during the application or end-use of those products by our customers. As the vapor pressure of MDI is very low, the volatility (or speed at which it evaporates) is also very low. This feature of low volatility enables the safe use of our products in a well-ventilated area without the need for additional respiratory protection, as isocyanate vapors are not readily given off.

HEALTH HAZARDS ASSOCIATED WITH MDI

Di-isocyanates have been linked to two forms of occupational asthma: allergic and irritant. There are different intervals between exposure and onset of the disease for these two forms.

Allergic asthma is the most common scenario with di-isocyanate; it develops some time after the actual exposure to the di-isocyanate – perhaps even up to 1-2 years later, depending on the level of exposure, etc.

Irritant asthma is associated with distinct over-exposure incidents such as a major spillage, and develops immediately. This would be very unlikely to occur through the use of wet pour binders, as the free monomer content is only around 20%.

The effects of sensitization are regarded as irreversible once the asthmatic response has been triggered in this way; even very small further exposure to isocyanate vapors can induce respiratory systems. However, this does not mean to say that the condition will worsen over time; it highlights the fact the working with isocyanates can be problematic.

There has been extensive atmospheric monitoring of the production facility over the past years. At no time during these studies have we detected levels of MDI that exceed those permitted. In many cases the levels have been so low that it becomes extremely difficult to obtain a positive value. If one takes into account the quantities of MDI binders, coupled with elevated manufacturing temperatures of approximately 70°C, and compares them with using wet pour binder containing 20%(+/-) un-reacted MDI (free monomer) outside in the open air, it is safe to conclude that the associated health hazards from inhaling MDI vapor is very low indeed. The same conclusion would apply to other wet pour binders, although the percentage of free monomer may differ.

As with all chemicals, it is important to prevent skin contact and observe high standards of personal hygiene in order to prevent the risk of irritation caused by dermal exposure. The same is true to prevent accidental ingestion of the chemical from contaminated hands when eating or smoking etc. It is important to note that if the binder is heated on site to facilitate mixing and installation because of low site temperatures, the free vapor levels will increase, and therefore vapor is more likely to be inhaled. Likewise, smoking would increase the amount of vapor inhaled when working in proximity to open binder material.

SUMMARY

Isocyanate binders in un-reacted or uncured form are respiratory sensitizers, and therefore must be treated with care and respect at all times. Safe working practices, correct use of personal protection equipment, and high levels of personal hygiene are prerequisites for the safe use of any chemical substance. There no latent exposure issues after the wet poured surface has cured.

The use of MDI based wet pour binders should pose no significant risk to those persons using it for intended application, provided that it is used, handled, and stored in accordance with the information detailed in the MSDS.

While it is possible that an installer can become sensitized to MDI from using products as instructed, one should be ever vigilant for potential problems by close examination of his working methods, previous employment and levels of personal hygiene.

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