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MDF – Versatile and Safe.

Medium density fibreboard, MDF, available in a variety of panel dimensions and thicknesses, can be cut easily and smoothly without any breakout or splintering. It can be profiled on edges and surfaces, in a variety of deeply-etched shapes. Its mirror-smooth surfaces are ideal for painting, veneering, laminating, grain printing and staining.

A variety of versions of MDF are available, including standard, flame-retardant, moisture-resistant, exterior and high density. None of its properties are affected by cutting or machining.

With the attributes and advantages outlined above it has proven to be an ideal panel material for use in a variety of industries, primarily furniture, building, signage and shopfitting.

In more than 30 years of usage, there is no evidence that MDF is a health risk. It has *never* been banned in any part of the USA or any other country (contrary to ill-informed rumours that surface from time to time that it has been banned in some country or other) and there is no reason for it to be so. It is a safe product.

COMPOSITION

A scientifically-devised board, MDF is typically composed of 82 per cent virgin wood fibre (predominantly softwood), 10 per cent synthetic resin binder, 7 per cent water, less than 1 per cent paraffin wax solids, less than 0.05 per cent total extractable formaldehyde, and less than 0.05 per cent silica.

FORMALDEHYDE

A urea formaldehyde resin binder is used for virtually all MDF boards manufactured in the UK, Ireland and throughout the world—a total of more than 20 million cubic metres of MDF per annum.

MDF contains a very low level of formaldehyde. The amount emitted from the board is not harmful and begins to reduce as soon as the board has been produced. Moreover, formaldehyde is a naturally occurring chemical. Used industrially for nearly a century, it is employed by at least 85 manufacturing sectors—for products such as paint, varnish, cosmetics, disinfectants, medicines, and adhesives.

The amount of any formaldehyde emitted from MDF is tiny. It is certainly well below the World Health Organisation's guideline figure for the amount of formaldehyde that may be emitted from all product sources and that may be present in ambient air—inside homes or outside—of 0.1 mg/cubic metre (equivalent to 0.08 parts per million). The UK's Building Research Establishment has tested the air in typical British homes and found it to contain about one-quarter of the above level from all sources. The estimated amount contributed by MDF sources is reckoned to be less than one-fifth of the WHO guideline maximum.

Manufacturers produce MDF under controlled conditions which comply with the most stringent requirements for formaldehyde content given in the European Standard (EN 622) and produce boards which are used throughout Europe.

Within Europe, Products intended for use in Construction have to satisfy the Essential Requirements of the Construction Products Regulation, which include requirements in respect of Safety and Health. For wood based panels, demonstration of compliance with the Directive is given by satisfying the requirements of the harmonized European Standard EN 13986 'Wood-based panels for use in construction-Characteristics, evaluation of conformity and marking'. There are requirements in this standard in respect of formaldehyde. European manufacturers produce MDF that complies with the lowest level of formaldehyde release specified in EN13986 i.e. Class E1 which when installed in a normally ventilated building would not result in the WHO guideline limit being exceeded.

Both inside and outside of Europe some countries have specific regulation limiting the release of formaldehyde from products including wood based panel products. European MDF manufacturers can supply products that satisfy all of these market regulations and as such there are no markets which are closed to European MDF manufacturers.

Formaldehyde Limit values introduced into regulation in the State of California (CARB) were already being satisfied by manufacturers producing to the European E1 limit value and therefore MDF products satisfying the limits are not excluded.

DUST

When machined, MDF produces a fine dust, as do other solid timber and wood-based products. Appropriate measures should be taken to control this dust.

In the factory, compliance with legal requirements (the COSHH regulations) will adequately control wood dust, including that from MDF.

In Britain (as in a number of other European countries) the maximum occupational exposure limit relating to respirable wood dust, including MDF, is 5 mg per cubic metre of air.

Any employer involved in cutting any wood or wood product should have the necessary, regulated dust control and extraction measures in place. Companies complying with these need take no additional precautions.

Particularly for DIY, small workshops, on-site operations, or school woodwork rooms, where individual extraction of hand-held machines or other tools may not be practical or adequate, a suitable dust mask should be worn and cutting carried out in a well-ventilated place. A suitable dust mask is one which is CE marked to at least EN 149 FFP2 – the European standard to which dust masks are manufactured.

All small-scale woodworking employers, as well as schools, are governed by the COSHH regulations. But personal precautions are common sense—protective clothing, good ventilation, and good housekeeping in terms of regular waste clearance.

Personal exposure to any type of wood dust should be avoided. The classic symptoms here are a sore throat and eye irritation. Proper levels of dust extraction or the use of dust masks and safety glasses will avoid this.

The known health risks associated with wood dust are related to long term (20–30 years) regular exposure, and most evidence of these risks relates to periods before the introduction of dust control systems in the workplace.

There is no evidence of any instances of cancer in humans related to exposure to dust from MDF, a product in use since the 1960s.

ENVIRONMENT

MDF is an environmentally friendly product. The softwood thinnings used in its production in the UK and Ireland are derived from forests managed on a sustainable yield basis—whatever is taken out to make MDF is fully replaced and generally exceeded by new planting.

REFERENCE

The Health & Safety Executive has undertaken an investigation into the health effects of MDF. The results of this investigation were reported on the 6 December 1999 and the following is an extract from the HSE Press Release.

“The Hazard Assessment Document for MDF reports on the scientific evidence for the possible health effects of exposures arising from machining MDF and includes information from the HSE commissioned research on the atmosphere created during the machining of MDF.

The Hazard Assessment Document was discussed by the Advisory Committee on Toxic Substances’ Scientific Sub-Group, the Working Group on the Assessment of Toxic Chemicals (WATCH). These committees provided a forum where both the trade unions and industry were able to present their views on the work that was taking place.

WATCH endorsed the conclusion of the hazard assessment that there is no evidence of any different ill-health effects associated with exposure arising from the machining of MDF to those associated with similar exposure arising from machining other forms of wood.

In respect of occupational exposure, WATCH expressed the view that the most appropriate risk management strategy for MDF is the one currently recommended by HSE. This specifies that the level of dust arising from the machining of MDF should be kept to as low as reasonably practicable below the Maximum Exposure Limits (MELs) for softwood dust and hardwood dust and that levels of free formaldehyde should be kept as low as reasonably practicable below the MELs for formaldehyde. Softwood and hardwood dusts each have an 8-hour time weighted average MEL of 5mg m^{-3} (total inhalable dust), whilst formaldehyde has MELs of 2 ppm, as an 8-hour time weighted average and as a 15 minute short term exposure limit.

Based on current available evidence, the HSE’s view is that any health risks that might arise from the use of MDF at work can and should be controlled (in

common with many other substances) by compliance with the Control of Substances Hazardous to Health (COSHH) regulations.”

In respect of DIY exposure, the Medical Research Council’s Institute for Environment and Health is on record as saying “Looking at the domestic situation, available evidence suggests that DIY exposure to wood dust (through cutting, sawing, sanding, etc) is unlikely to pose any measurable health risk”, and added that “While MDF (because of its composition) is likely to produce more fine dust than solid wood for the same operations, it is – as with wood – considered unlikely to pose any significant hazard”.

In respect of actual dust exposure levels in the home arising from DIY activity the MRC/IE&H opinion is that it seems unlikely that such activities would give rise to total dust exposures remotely approaching those seen in occupational settings.

The MRC recommended that during DIY activities, care should be taken when working on MDF so as not to liberate or inhale dust, an appropriate facemask should be worn.

FURTHER INFORMATION

The Wood Panel Industries Federation is willing to answer any further questions on this topic.

CONTACT

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