

# Process-related recommendations for the powder coating of MDF

# Technical information TI 111

## Goals of MDF pre-treatment

Among others, the major objectives of preparing medium density fibre panel (MDF) substrates include:

- homogeneously prepared MDF substrate by e.g. "grinding"
- avoiding defects in / on the surface
- avoiding grinding marks

## Procedure for MDF pre-treatment

The finer the fibres were ground during the MDF manufacture, the better the surface quality, the middle layer, and homogeneity of the panel.

Currently (as of August 2014) EGGER MBP-L is among the favourites of recommended MDF panels for the powder coating of MDF.

The raw material for the parts to be milled is sawed out of large full-format panels. Before further processing, if the surface finish from the plant does not yet have the quality required, the panels should receive a surface finish with a graining of at least 220. The edges must at least be rounded (radius > 1 mm). As a result of grinding and the subsequent cleaning with compressed air, the surface is ground to a fine finish, evenly and freed of dirt, minor scratches, dust, grease, etc.

The material is then milled to its desired form on a CNC machine or double-end tenoner, the edges ground and various other processing steps performed (drilling, milling out...). After the processing, the material must be thoroughly cleaned of milling and grinding dust on the surfaces and edges with compressed air. The cleaner the material is when freed of dust, the cleaner the area remains in which it is later hung up and coated, which represents an important quality factor for the final result.

In order to be able to guarantee a wider production window, individual conditioning of the MDF depending on the type, quality and the ambient climatic conditions, is recommended.

## Hanging

In most cases each work piece has 1-2 drill holes from which it can be hung. The product carriers may have a thread at the hanging point to prevent the work piece slipping off. Hanging points without thread should have at least the same diameter as the drill hole to prevent the work piece slipping off. To guarantee flawless conduction the contact area must be plain and clean.



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The product carriers are hung on an earthed conveyor. This ensures the conduction required of each work piece. Each work piece is examined for flaws while hanging and side lit, and once again freed of dust using compressed air, before coating.

Before the material passes through the pre-warmer, it must be free of all defects and dust. Every flaw, scratch or impurity will reduce the quality of the coating result after the coat.

## Pre-warming

The work piece is warmed up by IR radiation in the pre-warmer. The maximum temperature on the surface during the pre-warming of the raw MDF should not exceed 100° C. Wood fibres on the surface dry/shrink differently and show up as a result in the coat.

The ideal MDF surface temperature for coating by spray gun is between 40 and 60° C, depending on the geometry and MDF type. Warming increases the conductivity of the panel markedly.

In the case of the two-layer coating procedure, the earthed work piece can undergo higher pre-warming before applying the top coat, since MDF surface drying can no longer occur due to the primer layer.

## Applikation

A homogeneous coat must be guaranteed in the application. The surface and edge must have the same coating thickness

The powder output of the spray guns should not exceed 250g/min. Increased powder output leads to a lower electrical charge of the powder and as a result a poorer first application degree. The application settings can be selected in a wide window. They depend on whether raw MDF or already coated MDF is coated and what coating thicknesses are desired.

The setting of the tension (kV) can be selected from 20-90 kV, the electricity between 5 and 50 µA. The optimal settings on the application must be evaluated visually on the coated parts. The work piece should be homogeneously coated with the required coating thickness without revealing back spray on the corners or edges. The coating thickness on the edges can be checked with the adjustable counter electrode. The forward run and follow up of the spray guns must be set individually after visual assessment. It must be ensured that the optimal quantity of powder is on the front and rear edge.

The minimum coating thicknesses can be found in the corresponding data sheets.

## Dry through

As a result of limited thermal conductivity of the substrate, the use of infrared (electric / gas catalytic) or combined convection/infrared ovens is recommended.

Determination of the surface temperature is achieved on a powder-coated MDF panel with bonded temperature sensors (preferably temperature element type K). A temperature stable glass fabric tape (type 69; 3M) is recommended for attaching the temperature sensors. The product specific curing conditions can be found in the particular data sheets. Practical experiments adapted to the particular object and curing oven are recommended in order to determine the best possible curing conditions in each case.

## Hanging

The surface temperature should not be above 40° C during hanging and stacking.

## Test methods

The following tests can be carried out to test the quality of the coat:

Acetone test	(IGP AA 341.58)
Edge-Extension-Test	(IGP AA 341.54)

Please contact us if you have any further questions.