Vapormatt Ltd are leading suppliers of wet blast machines which are used extensively in the Formula 1 and Aerospace Industries for preparing Carbon Fibre/Titanium/Aluminium for bonding and painting. This process gives much more consistent bonding properties than results using conventional dry blast, peel ply and hand flatting techniques.

**The Process**

In all bonding and coating operations, preparation of the surfaces is a key operation.

GRP and carbon fibre are notoriously difficult to bond due to the presence of resinous material on the normally smooth non-retentive surface. The presence of grease or dust can further compromise effective adhesion.

The Vapormatt process utilises a cleaning fluid, which is directed from a process nozzle towards the surface to be prepared. The fluid which contains water and a very fine abrasive suspension is accelerated through the exit nozzle by compressed air and a slurry pump. The action of the liquid borne abrasive scours the surface leaving a thoroughly clean and lightly abraded result. The water can be heated and a mild detergent added to ensure all grease and oils are also removed. The resultant precision textured surface is extremely reactive and surgically clean.

The ratio between water pressure and air pressure in the process nozzle is variable to allow a “water buffer” to be maintained between the abrasive particles and processed surface. This water buffer has several effects.
1) It lubricates the action of the media,
2) It eliminates static build up,
3) It washes the surface continually during processing,
4) It prevents impregnation of hard abrasive particles into the soft composite resin surface,
5) It prevents fibre damage. In this application we use high quality fused aluminum oxide powders.

Processing pressures are easily adjusted depending on the material being treated. Until the Vapormatt process was used, most manufacturers used a combination of peel ply and hand flating using wet and dry abrasive papers. The latter leaves a very uneven surface finish and the part still needs to be chemically cleaned to remove any contamination left on the surface.

Dry sand blasting has been tried but when the carbon fibre is examined after this method of preparation, using scanning electron microscopy (SEM) more damage to the fibres of unidirectional carbon fibre (UD-CFRP) is visible compared to Vapormatting.

Vapormatt equipment is being used within the aerospace and motor racing sectors for cutting edge applications especially when adhesive joints are between dissimilar materials or when bonding areas are small.

With the greatest possible strain applying to both driver and car, Formula 1 manufacturers need to have the best materials and processing techniques. This is why many have chosen the Vapormatt process when establishing their procedures for critical composite bonding.

The speed of technological development within F1 is incredible. What takes days to develop here can take months and years in the more traditional motor and aerospace industries. Processing techniques developed for this arena can truly be seen as “state of the art”.

Advantages of using the Vapormatt Process for Bond Surface Preparation

• Resinous material can be removed without damaging the fibres of the material.
• The lightly matted surface is very “wettable” and retains the evenly spread adhesive.
• The ever present water buffer prevents impregnation of the resin surface.
• Vapormatting creates a very clean and reactive surface ideal for subsequent chemical bonding solutions.
• The same Vapormatt machine can be used to treat all composites, metals, plastics and ceramics prior to bonding with equally acceptable results.
• There are no health or environmental side effects and the process is completely dust free.

Vapormatt operates from bases in Europe and the USA. We offer an International service providing technical advice, service back-up and equipment to a wide range of surface finishing and manufacturing industries.

Sample parts can be processed at your premises using our International Demonstration Vehicle. If you would like to know more about the Vapormatt process we would be delighted to arrange for one of our technical sales team to visit your company to discuss it in more detail.

Please email our sales team
sales@vapormatt.co.uk

For further information contact: