

SpeedMask - UV curable masking resins reduce high value component processing costs

Losses from scrap in production of high value mechanical components is a vital consideration in improving quality and efficiency of manufacture; fortunately, we have available the [DYMAX family of solvent free UV curable SpeedMask masking resins](#) which offer significant improvements in reliability, worker safety, ease of use, quality of process outcome and actual piece part operation cost in comparison to traditional methods.

These resins cure in seconds under UV light and provide superior protection during machining, laser drilling, grit blasting, shot peening, acid stripping, plating, and thermal spray coating. Their ease of application, speed of cure, and consistent reliability surpasses that of waxes, tapes, lacquers and other slow curing, solvent-based masks and can provide substantial savings through reductions in labour, re-work and scrap. Typical components which have been successfully masked using these materials include aerospace parts like turbine blades and medical devices like replacement hip joints – components which are expensive, and so the masking process must be very effective.

[UV masking resins](#) are available in several viscosities and can be applied by spraying, dipping or brushing while being worker friendly and safe. They are specifically formulated to have no effect on the metallurgy of the surface being masked. Being acrylated-urethane based (without heavy metals, silica, or other compounds), these resins can be handled like any industrial plastic once cured.

These UV cured masking resins can be removed either by being burned off, peeled by hand, or dissolved in water. Burn-off grade masks require the components to be baked in an air-enriched furnace between 480°C and 760°C, achieving complete removal in as little as 15 minutes – producing gasses which do not pose a risk in the workplace or the environment.

Peelable masking resins are perhaps the most versatile and have been qualified for surface protection in processes such as grit blasting, shot peening, acid cleaning, plating and anodized coatings. The

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elasticity of the material typically permits fast removal in one piece with no residues, leaving a peeled mask that is non-hazardous and may be disposed of in accordance with local regulations for industrial scrap plastic.

Water soluble UV cured masks provide excellent protection for “dry” finishing processes such as grit blasting, grinding, shot peening, and plasma spraying. The ideal removal method uses heated water (60°-80°C) and a spray wash or agitated/ultrasonic bath. The mask completely dissolves in the water leaving no residue on the component surface. Water soluble temporary masks dissolved in water exhibit a neutral pH of 7 in up to 20% concentration and do not create a handling hazard to operators.

In two trials, very large savings were found and in the first case several cost factors were reduced or eliminated by switching to a UV cured masking resin. Less material was used due to the controlled viscosity of the resin. The resiliency and tenacious adhesion of the UV cured masking resin eliminated stripping and re-masking of the components between the cleaning and grinding processes. Scrap was reduced from 0.5% to zero (a significant factor as components ranged from several hundred to many thousands of dollars in value) leading to cost savings of \$32.00 per unit, a 40% reduction – plus masking can now be done in less than a quarter of the time, saving nearly one hour per piece.

In the second case cost savings were achieved of \$26.00 per unit (a 37% reduction), resulting from labour saving and the elimination of rework/scrap associated with the tape masking process. The added cost of equipment for the UV process was easily recovered in less than one month.

UV curable masking resins open the door to savings never before possible. Labour costs can be cut in half, scrap eliminated, and overall component processing time reduced by as much as 60-70%. In addition to cost cutting opportunities, UV curable masking resins improve the quality of the environment in the workplace, removing health hazards and reducing risk of operator injury leading to improved employee morale and consequent higher productivity.

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