

Dry ice blasting



With greater emphasis placed on finding more environmentally-friendly cleaning processes, Mike Martin of MSM, discusses a 'greener' alternative

A drive by industry and government to re-evaluate manufacturing processes, has been generated by environmental concerns, economic competitiveness, and technology. Many companies have changed from traditional solvent cleaning to alternative methods, in a move towards zero discharge, as they are faced with new challenges of providing environmentally safer and more cost-effective ways of cleaning industrial equipment.

Problems of cleaning in an industrial environment are continual. The need to reduce downtime, the desire to eliminate mould wear, or reduce the use of hazardous solvents, are all factors that affect day-to-day running. The potential damage to base surfaces, accumulations of grease and dirt, layers of old paints, and general grime, can all have an effect on the operation of equipment and add to business costs.

Solvents, sand blasting, and manual sweeping or bushing, have normally been used in industrial cleaning. Each has specific applications and constraints, and all result in additional environmental and disposal concerns.

The most common method today is the use of solvents to remove oils, grease, dirt, and even paint, from machinery and equipment. Effective and easy to use, this method of cleaning is an important tool in plant maintenance. However, there are considerable risks and costs involved.

Workers must be protected from carcinogens, the cost of disposing of hazardous waste is rocketing, and solvents release severe greenhouse gases and deplete the ozone layer. In many cases, solvent cleaning creates more waste than the original dirt or grease, and the resultant waste is considered hazardous.

Sand blasting is another common method of removing layers of paint or dirt from exposed areas. It is useful only where there is sufficient space to

mitigate the resultant dust cloud, and where the projected sand can reach large open areas of the equipment. It has many significant disadvantages, including the generation of more solid waste than was originally present on the equipment, breathing hazards for workers, and potential damage to the underlying surface being cleaned by the abrasive sand particles.

Manual cleaning

The age-old method of manually scraping, brushing, and sweeping, dirt and grime from surfaces, is the simplest but least-efficient method of industrial cleaning. The soaring cost of labour, the unpopularity of performing such tasks – which often leads to a high turnover of personnel – are all problems associated with manual cleaning. The complexity of some equipment and the consequent downtime, also makes this an unpopular choice.

Whether it is because companies have had problems with one or all these traditional cleaning methods, dry ice blast cleaning has gained widespread acceptance in a variety of industries as the preferred method of cleaning. Industries and applications benefiting from the dry ice blasting method, include food, rubber, plastic and aluminium, automotive, glass bottles, paper and packaging, shipping, robotics, dryers, and engine maintenance.

Dry ice blasting

This technology involves the use of solid carbon dioxide, commonly known as dry ice, which is propelled at high velocity to impact and clean a surface. Upon striking the surface, it lifts away the contaminant, whether it is rubber or plastic residue, release agents, dirt, paint, or other unwanted material. The dry ice then sublimates and disappears. The contaminants drop to the floor and are swept away.

Because dry ice disappears on con-

tact with the surface, no other contaminant is introduced during the cleaning process. This allows manufacturers to clean in situ without downtime or disassembly. Jobs that once took hours or even days, may now take only minutes. As dry ice cannot etch or profile most surfaces, it is no longer necessary to replace moulds or equipment damaged by grit blasting.

The dangers of toxic or polluting residues and wastes, are eliminated, and there is no more collection, treatment, or disposal, of hazardous waste in the form of used solvents or large amounts of contaminated sand. The machinery requires no post-treatment cleaning, as is often the case with both sand blasting and solvent cleaning, and only the actual residue remains for disposal.

As a result of the speed in which dry ice blasting removes contaminants, its users save substantial time. Its application time is either equal to or faster than both solvent washing and sand blasting, without the extensive post-application clean-up time required by both of the other methods. Cleaning costs are thus directly reduced, as are costs associated with plant machinery downtime and lost production opportunity.

Those manufacturers not yet familiar with CO₂ blast cleaning technology such as Cryonomic, will be surprised at the dramatic reductions in downtime made by on-line cleaning. For example, the US tyre industry has cited a gain of nearly 9,000 press hours annually, by using this method of cleaning.

Today's environmental issues and resultant legislation, is only the beginning, with the prospect of further legislation imposing even stricter regulations on general industry. Dry ice blasting provides industry with a means of meeting current and future legislation while saving costs on solvents, labour, downtime, and the early renewal of capital equipment.