

How to dramatically reduce your chemical and effluent costs with dry steam

BY MILES COMPTON

Environmental concerns over wastewater and or water chemical mix disposal are becoming more apparent as metal working companies seek efficiency conservation and environmental compliance in their cleaning and preparation processes. These environmental concerns are primarily in the area of effluent disposal.

Pressure washers are used by many facilities for heavy duty cleaning in a wide variety of applications, such as trucks, bulldozers and other heavy-duty equipment. When these behemoths are covered with heavily laden soils the pressure washer has few equals. The high volume of water combined with detergents removes these soils readily. The large volume of water is not a problem because the material being removed from the equipment is not a threat to the environment. Thus both the washing and the rinsing do not present a problem of effluent disposal.

Also, for many years pressure washers (heated high-pressure water and chemical solution) have been used by metal working fabricators to prepare metal for powder and paint adhesion. This method of preparation requires a considerable amount of water and chemical.

ANOTHER WAY

In an attempt to be more environmentally friendly, plant owners and managers have sought other methods to produce the same results while reducing their wastewater and effluent.

Preparing metal surfaces for the adhesion of powder or paint can be achieved by an alternate method that will save a substantial amount of water and chemicals – high-pressure dry steam. Dry steam, for this article, is defined as steam whose moisture content is so low that it evaporates instantly.

Dry steam is created in a steam generator by pressure. The amount of pressure the steam is under is directly proportional to the temperature of the steam. As the pressure inside the vessel increases, the temperature of the steam increases as well. In a typical steam boiler, the temperature of the steam is 328 degrees F when the pressure inside the boiler is 85 psi. With the use of a dry steam generator, at these conditions, the amount of water and chemical mix used is only one gallon per minute. Since the water and chemical solution is mixed with dry steam at the point of application (the nozzle of a steam wand or gun) two thirds of this solution evaporates immediately due to its high temperature. Under these conditions, time tests have shown that approximately 20 ft squared /minute of metal surface can be cleaned and phosphatized with dry steam. In glaring contrast a standard pressure washer will consume approximately 3-5 gallons of solution per minute during the cleaning cycle. During the cleaning cycle, when using a steam generator, 67 per cent less water and chemical solution will be used.

During the rinse cycle, the generator uses only dry steam therefore generating only a negligible amount of effluent. In contrast the use of a standard pressure washer consumes three gallons of water per minute, and this creates yet another volume of effluent that must be properly disposed. Typically, the effluent created by the pressure washer must be contained in a containment area, and then treated prior to disposal in municipal systems. By using dry steam for cleaning and phosphating metal surfaces for painting and powder coating, a substantial saving is realized.

Two concerns of any work place, especially a production or chemical application facility are employee safety and



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insurance costs. Insurance writers as a whole are concerned with volatile fuel-fired machines being used within enclosed areas. Greater concern is that sparks may be present that could ignite flammable fuels. An all-electric dry steamer that has no open flames, generates no fumes requiring ventilation, and is available with explosion proof construction can be used in extremely volatile areas. The lack of flame with an electric steam generator allows many companies to realize lower insurance coverage. More saving can be achieved since extra ventilation is not required.

All-electric dry steam generator cleaners provide a proven method of preparing metal surfaces for excellent power or paint adhesion. The safety and cost benefits of dry steam cleaning remain unchallenged and several large well known companies have been using this method for over half a century. ■

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