Road Emulsion Association Limited

REAL Technical Data Sheet No. 3 - Recommendations for the Cleaning and Maintenance of Spraying Machines for use with Bitumen Emulsions

Introduction

Bitumen emulsions may be applied by hand but for large areas and for those where uniform distribution of the emulsion is required spraying is more practical. Small areas are often sprayed using a hand-held nozzle (hand lance) connected to a machine where pressure is applied to the emulsion indirectly by means of compressed air or where the emulsion itself is pumped. For larger areas specially designed large capacity machines are used. Distributors for cold applied emulsions should comply with BS 3136 and those for hot applied emulsion with BS 1707.

The following is intended as a guide to the cleaning and maintenance of such machines. Where reference is made to solvent this relates only to approved solvents e.g. kerosene or gas oil.

General Precautions Before Use

1. Cationic and Anionic emulsions will coagulate if mixed with each other. Even a small amount of one mixed with a large amount of the other will be sufficient to precipitate bitumen, causing blockages in the working parts of the machine and spray jets. To avoid this the following procedure should be adopted when changing from one type of emulsion to the other.

(a) Drain the machine as completely as practicable.
(b) Flush the machine, including the hand lance if used, by continuous circulation of solvent.
(c) Pump all solvent from the machine into a waste receptacle and drain completely.

2.Spraying units to be used for the application of hot emulsion may previously have contained cutback binders. As emulsions should not be heated above 90°C, the temperature is not normally high enough to melt any residual binders in the machine. It therefore becomes essential to ensure that machines which have contained cutback are completely emptied before filling with emulsion. It may be necessary in some circumstances to flush the system with solvent before filling following the procedure given in 1. above. In all cases the spray bar and jets should be flushed with solvent before use. Conversely any emulsion left in a tank will boil if hot cutback is pumped into it with a consequent risk of overflow. The procedure for avoiding this is:

(a) Drain the tank as completely as practicable.
(b) Quarter to half fill the tank with the cutback (note:- do not use heating coils at this stage).
(c) Drive the vehicle around to disperse the heat and thus boil off any water.
(d) Check that the contents of the tank are free from water.
(e) Complete the filling.

Cleaning

It is essential to keep machines clean both internally and externally.

1. Bulk Sprayer. It is not necessary to empty the tank at the end of the days operations but, particularly in the case of hot emulsions, it is good practice to leave sufficient emulsion in the tank to cover the heating coils. The spray bar and jets however should be flushed out with solvent and

drained into a suitable receptacle at the end of each days operations or where there is any delay in the progress of the work. Drainings should not be returned to the tank.

2. Hand-Operated Machines. Breaks in spraying should be accompanied by flushing of the lance with solvent to prevent blockage. At the end of the working shift, it is good practice to empty completely the contents of the container, flushing with solvent by continuous circulation followed by draining should then take place. Hot solvent should not be used for flushing hand sprayers as this could damage the piston seals. Jets may be soaked in solvent overnight if desired.

Maintenance

General maintenance should be carried out according to manufacturers' recommendations. In addition the following points are stressed;

(a) All hoses and seals should be manufactured from oil resistant materials and checked regularly for leakages.

(b) Leaking glands should be replaced immediately since these considerably reduce the spraying efficiency of the machines.

(c) The plunger rod of small pump operated spraying machines has a tendency to become coated with bitumen, giving rise to excessive friction which breaks the emulsion and jams the machine. This can be avoided by keeping the plunger rod lubricated with solvent.

(d) Where a hand lance is used, special attention should be given to ensure that it is not blocked.

For further information see Summary and Reference Sheet.