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Utilisation of Spill Return Atomiser (SRA) in Decontamination, Coating and Fire Suppression

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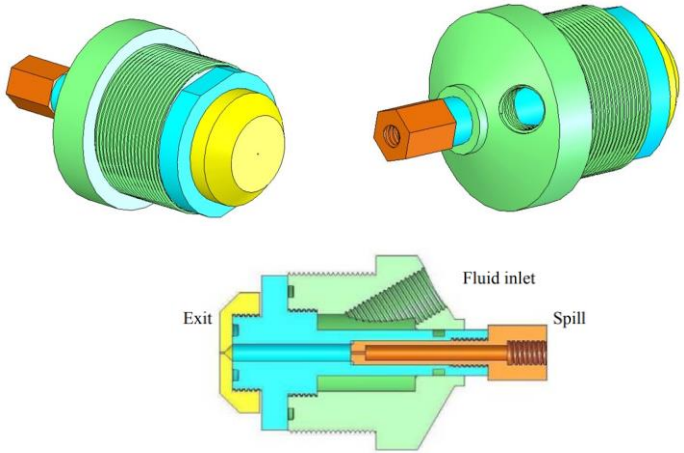
Decontamination

- The **risk** of **exposure to hazardous materials**, in many industrial environments and in everyday life is widely recognised. It is therefore pertinent to have robust **decontamination equipment** to limit the effects of hazardous materials and in turn protect human life and assets.

- **Chemical, Biological, and Radiological or Nuclear (CBRN)** materials can be classed into four main types of hazards: contact, inhalation, injection and ingestion.

- By utilising fine sprays for coverage/deposition on the human body, It was found that fine sprays decrease the consumption of decontamination liquid that is normally used in practice which has many advantages in practice.



(a)

(b)

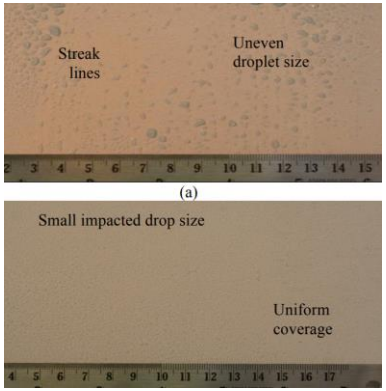
Proposed decontamination systems (a) chambers and (b) typical tents.

Coating in Healthcare

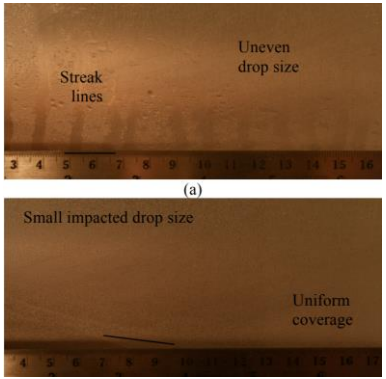
- The **effective use of disinfectants on surfaces**, therefore, within the health care environment constitutes an important factor in preventing Hospital Acquired Infections (HAIs).

- A mobile fine spray unit, utilising a novel **Spill-Return Atomiser (SRA)** has been developed for the purpose of disinfection within healthcare environments. The developed system produces droplet sizes between 15 to 25 microns, liquid flow rate as low as 1.7 g/s at supply pressure of 120 bar.

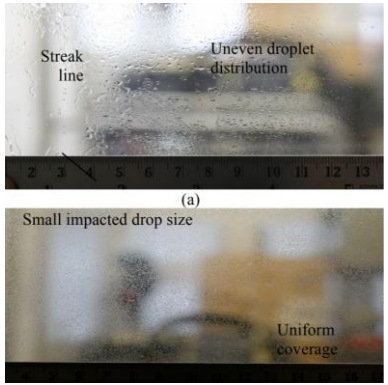
Laminated plywood Surface at 90 bar pressure, **0.8 m and 1.8 m**

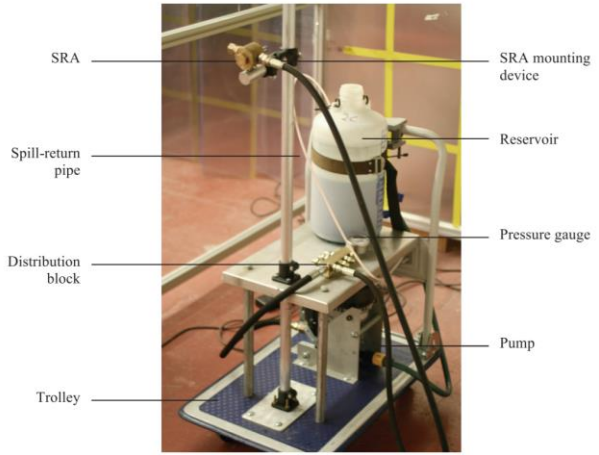


Brushed Steel Surface at 90 bar pressure, **0.8 m and 1.8 m**



Glass Surface at 90 bar pressure, **0.8 m and 1.8 m**





Fire Suppression

- For the past fifty years or so there has been a great deal of interest in the use of water based explosion suppression systems, designed to mitigate or reduce the impact of thermal explosions and their consequential overpressures.

- By using SRAs with small particle sizes between 15 to 29 microns, spray angle between 35 to 49 degree and liquid flow rate between 5 to 23 g/s, the mitigation of slow deflagrations with resulting speeds of below 30m/s can be achieved. A flame travelling at such low relative speeds will not possess the inertia to inflict secondary atomisation by hydrodynamic break up.