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Fire & Rescue Division Hazardous Materials Section

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THE IMPORTANCE OF SOFT BRISTLE BRUSHES

When purchasing and using scrub and dust brushes for the purpose of decontamination, it is important to understand the difference between *STIFF-BRISTLE* and *SOFT-BRISTLE*, as well as the benefits and negative aspects of both. Only *SOFT-BRISTLE* brushes should be used for the purpose of decontamination of chemical protective clothing (CPC), and of civilians.

***STIFF-BRISTLE* TYPE:**

STIFF-BRISTLE type brushes are great for scrubbing off scale, hard water mineral crust, thick gum or mud, dried organic mulch, flaked paint, tar-like sticky substances, etc. They are also intended to be used on surfaces that are hard and won't be damaged by the abrasive nature of the stiff bristle. These surfaces are usually porcelain, glass, metal, hard woods, soft woods with hard coatings, epoxy surfaces, rock, linoleum flooring, tires, etc. The scrubbing action to encourage the removal of stubborn substances off these surfaces usually does not harm the surface.

Their Advantages – In The Decontamination World:

STIFF-BRISTLE type brushes therefore are very functional in cleaning small hand tools such as wrenches, pliers, hammers, etc., large hand tools such as shovels, scoops, pry bars, etc., and equipment such as vehicles, hydraulic hoses, and air bottles. Additionally they might be useful in cleaning durable and hard-wearing fabric surfaces such as tents, heavy canvas, turnout clothing (always follow manufacturer's cleaning recommendations), and carpeting. In the decontamination world the use and application of *STIFF-BRISTLE* type brushes should be limited to only these instances.

Their Disadvantages – In The Decontamination World:

On the other hand there are situations where the use of *STIFF-BRISTLE* type brushes would be improper and not recommended. This is especially true when employing decontamination procedures at a hazardous materials incident.

Chemical Protective Clothing: It is often presumed by many that the use of *STIFF-BRISTLE* type brushes to cleanse the outer surface of a CPC garment material provides for better removal of a surface contaminant. This is false. Use of *STIFF-BRISTLE* type brushes will in all likelihood cause irreparable damage. The stiff bristle can be so abrasive that it will permanently scratch the outer layer

of the protective membrane. This is sometimes invisible to the human eye, but it severely compromises the chemical barrier protection integrity of the garment material. This membrane on chemical protective clothing ensembles certified for use in hazardous chemical environments is an extremely thin fluoropolymer film (i.e. Teflon®). Such repeated abrasive action can essentially render the garment prone to permeation and penetration of threat chemical substances through the tiny scratches and scuffs caused by a *STIFF-BRISTLED* brush.

Therefore, using *STIFF-BRISTLE* type brushes to clean CPC during a decontamination process must be avoided. Some CPC manufacturers have recommended not to use cleansing tools of this type on their garments for the very reason as explained.

Personal Hygiene: Using *STIFF-BRISTLE* type brushes to assist in cleansing the surface of body parts (arms, hands, legs, etc.) of civilians or workers will in all likelihood cause damage and irritation. The stiff bristle is very abrasive to skin tissue. It can generate a situation far worse than if nothing had been done at all. The scrubbing action can quickly scratch the surface of the skin to expose layers of more sensitive epidermal layers, tiny blood vessels, and nerve endings. This can be done with just one swipe of a *STIFF-BRISTLE* brush on human skin. Light bleeding or bruising (under-skin bleeding) may occur. Further, any destruction to the skin tissue can allow for the opportunity of other substances to enter or penetrate into the body. These substances include the target (or suspect) contaminant, the cleansing fluid (soap), dirt, grime, and germs.

Therefore, *STIFF-BRISTLE* type brushes should NEVER be used for personal hygiene decontamination.

***SOFT-BRISTLE* TYPE:**

Their Advantages – In The Decontamination World:

SOFT-BRISTLE type brushes are useful for the quick removal of light dusty coatings, sawdust, chalk, powders, shavings, grit, and any other solid particulate material that is dry and not encrusted (adhering) onto the surface of an object. This includes small and large hand tools.

After a preliminary dry brushing, these items may only need an additional cleansing with soft soap and water, especially for encrusted or adhering substances. Light brushing with a soft soap should be more than sufficient to create a surfactant environment by which the soap will cling onto and remove resistant powdery materials, scum, mud, oily films, or slightly sticky water soluble substances. The use of a *SOFT-BRISTLE* brush in the early stages of decontamination on chemical protective clothing will lessen the chance of causing damage and unnecessary wear and tear on the delicate outer membrane of the garment.

Therefore, *SOFT-BRISTLE* type brushes should ALWAYS be the choice for cleansing and decontamination of CPC.

And remember, DO NOT USE LIQUID DETERGENTS on CPC, as they too can cause damage and degradation to the outer protective membrane, only use a soft liquid hand soap.

Their Disadvantages – In The Decontamination World:

Not functional in cleaning and scrubbing tools and soles of boots to remove sticky grime, packed dirt, and mud.

SEL Item # 10.2.2: BRUSHES, LONG HANDLE (commonly known as the Toilet Bowl type)

The two pictures below show the following:

A **very stiff bristled brush**. Note how the bristles resist bending in the right picture. A great deal of pressure is being applied to these bristles. This type of scrub brush characteristically has very stiff bristles and are intended for heavy duty scrubbing. These brushes can be very abrasive.



The two pictures below show the following:

A **soft bristled brush**. Note how the ends are “tufted” to increase softness and decrease abrasion. Also note how much more easily the bristles bend in the right picture.



SEL Item # 10.2.4: BRUSHES, SHORT HANDLE (commonly known as Rat Tail or Carpenter's brush)

The two pictures below show the following:

A **very stiff bristled rat tail** type short handle scrub brush. Note how the bristles resist bending in the right picture. This type of scrub brush characteristically has very stiff bristles and is intended for heavy duty brushing. This type of brush can be very abrasive.



The two pictures below show the following:

Two **soft bristled rat tail** examples on left. Note how the ends are "tufted" to increase softness and decrease abrasion. Also note how much more easily the bristles bend in the far right picture.

