

Cleaning Rubber Goods for Safety



Dirty grounding jumper for underground.



Cleaned grounding jumper for underground.

How the right cleaner can extend the life of tools and workers by uncovering hidden damage and restoring high visibility.

By Sheri H. Dahlke

A power utility got a big surprise recently when they tested a new, specially formulated rubber goods cleaner on a hot-line jumper. The cleaner revealed potentially hazardous burn and cut damage lurking beneath the grimy, blackened surface. The failed tool was removed from service, averting possible injury.

REMOVE GRIME, REVEAL DAMAGE

Rubber goods take a beating in the field. Dirt and grime

INCIDENT PREVENTION

build-up turns tools black. Any change in appearance is a warning that the rubber may not retain its electrical insulating property. Protective rubber equipment should be inspected for anything that might compromise its integrity, but grimy discoloration can mask damage. Abrasions, burns, and minor nicks are particularly difficult to detect on dirty rubber goods. Regular cleaning before each inspection is the best way to stay safe.

VARIETY OF DAMAGE POSSIBLE

Protective rubber goods are not used in a pristine environment. Rubber is soft and particularly susceptible to physical and chemical damage. Damage can be caused by cuts from

sharp tools, punctures from wood splinters and barbed wires, degradation from chemicals such as hydraulic fluid, and much more.

Scratches and scuff-like damage are normally caused when rubber comes in contact with a rough, abrasive surface. This may appear like graining on leather. Nicks, snags, scratches or cuts are typically caused by objects such as knives, pointed tools, sharp edges on electrical equipment, barbed wire, staples, or splinters. This damage is particularly evident—and exacerbated—when rubber is placed under strain, such as stretching. Punctures occur when sharp objects penetrate the entire thickness of the rubber. Embedded foreign matter may appear as a small bump in the rubber. Tears describe the separation of the rubber, usually at the edge, created when the rubber is pulled apart forcefully.

Other kinds of damage are the result of electrical leakage and tracking, as well as chemical degradation. Tracking and breakdown result from excessive electrical leakage over the surface of the rubber. Ozone cracks, a series of interlacing fractures that start at stress points, are caused by continuous exposure to the elements. Age cracks look like glazed ceramic crazing, and worsen with time. These are usually caused by exposure to sunlight and atmospheric ozone, and originate in stressed areas of the rubber. Hard and soft spots are usually created by contact with heat, oils or chemicals.

ROLL THE RUBBER

ASTM F1236 Guide for Visual Inspection of Electrical Protective Rubber Products presents techniques for the visual inspection of electrical protective rubber goods. The preferred method of inspection before each use is to gently roll the entire surface. Lightly squeezing the outside and inside surface of the rubber highlights irregularities that can occur from the damages described above. For gloves and sleeves, carefully pinch and roll the rubber. Once the outside surface is thoroughly checked, continue the inspection by turning the glove inside-out and rolling the inside surface. Never leave a glove or sleeve in an inside-out condition. For blankets, lay on a clean, flat surface and roll tightly, starting at a corner. Line hose can be inspected by slowly bending two ends of the hose downward, forcing the slot open for better inspection. Work through the entire length of hose for a thorough check. Gloves can be manually inflated to test for punctures and small tears. It is important not to over inflate.

WHY CLEAN?

ASTM F1236 further recommends good lighting and a thorough cleaning before each inspection and use. Protective rubber goods are often contaminated with a variety of grimes such as creosote, pine pitch, corrosion inhibitor, carbon, dirt, grease and oils. Contamination darkens the surface, masking its true color. In the worst cases, contaminating materials cover cuts, burns, small nicks and holes. Cleaning the rubber surface can

uncover damage that would otherwise stay hidden.

Regular cleaning is simply good practice. It preserves electrical integrity and adds to the life of the equipment. Some contaminants are less obvious and can't be seen on rubber goods. Dry fertilizer, herbicide and pesticide residues are invisible, but will degrade rubber's integrity. Most protective rubbers are designed to resist ultraviolet light, ozone and oxidants, but tend to be susceptible to chemical damage. Degradation by various contaminants such as oil and grease can cause hard or soft spots and accelerated aging. Other contaminants are conductive, especially when combined with moisture from rain, snow or high humidity.

Cleaning also restores original color—usually brilliant yellow or orange—to tools. It is crucial that grounding jumpers be clean and highly visible for electrical and vegetation trimming crews. It is especially critical during storm restoration to differentiate tools from dangling branches.

FIND THE PROPER CLEANER

Though they may effectively remove grime, strong industrial cleaners and solvents can also damage protective rubber. Petroleum distillates or hydrocarbons, kerosene, and terpenes such as d-limonene should be avoided. Other solvents commonly added to water-based degreasers, such as glycol ethers, can also degrade the protective rubber properties. Cleaner residue must not change the physical integrity and insulating properties of the rubber. Cleaners should be tested for compatibility with various types of rubber compounds per ASTM D471 and ASTM F496-99 to ensure compatibility and dielectric integrity.

An effective rubber goods cleaner is easy to use. It removes the heavy grimes and contamination typical of utility work without too much “elbow grease.” A mild, pH-neutral cleaner is more likely to be used regularly. Convenient package options such as spray bottles and pre-saturated wipes also encourage regular use.

CLEAN IS SAFE

Clean and inspect your protective rubber goods before each job. Clean rubber is easier to inspect and provides increased tool visibility in the field. Regular cleaning prolongs the life and effectiveness of rubber protective goods and is fundamental to electrical safety. *ip*

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