NATIONAL STEEL PAINTING CONTRACTORS ASSOCIATION

WORKING TO PRESERVE AND EXPAND OPPORTUNITIES FOR OUR IUPAT SIGNATORY CONTRACTORS ACROSS NORTH AMERICA.

NSPCAssociation.org

NEW AMPP STANDARD FOR POWER TOOL CLEANING OF NON-FERROUS METALS AND STAINLESS STEELS

By Alison B. Kaelin, CQA | NSPCA Technical Advisor

The Association for Materials, Protection and Performance (AMPP) recently published an industry surface preparation standard (SP-19) for Power Tool Cleaning (PTC) of two non-ferrous metals (that do not contain iron or steel), aluminum and copper, and stainless steels, prior to coating application. The previously published SSPC standards that we are familiar with (SSPC SP-3, SP-15, and SP-11) were written for power tool cleaning of carbon steel. SP-19 addresses power tool cleaning of the more delicate specialty metals that are coated, noting that the traditional SSPC power tool cleaning standards are not suited for stainless and non-ferrous metals.

While there are many similarities between SSPC SP-11 and the new SP-19 standard, there are some notable operational differences that, if ignored during the power tool cleaning process, could lead to quality issues requiring rework and repair, and potential coating adhesion failure.

These differences focus on using power tools on softer, lighter-weight, thinner metals, as well as the potential for galvanic corrosion caused by dissimilar metal contact during the cleaning process.

TOOLS, MEDIA, AND TECHNIQUES

SP-19 highlights caution when using power tools on softer metals compared to use on carbon steel. Aggressive cleaning can erode and damage soft and lightweight metals such as aluminum and copper. While aggressive cleaning can work to a degree when removing tightly adhered coatings on softer metals, aggressive cleaning becomes problematic once the operator gets down to the metal substrate. The use of chipping hammers and scrapers, for example, can gouge aluminum and should be avoided; instead, power tool cleaning of thin metals is best performed using less aggressive tools such as finer grit pads and sanding disks containing non-ferrous media. Lowering rotational tool speed as well as shortening dwell times are also important practices that avoid deformation of the more delicate metals such as aluminum.

SUBSTRATE CONCERNS (GALVANIC CORROSION)

In addition to the kind of tools and media to use, another important concern is the risk of galvanic, dissimilar metal corrosion, when working on non-ferrous or stainless-steel substrates. When cleaning aluminum, for example, it is important to be aware of potentially creating galvanic corrosion when using tools or media that contain steel, which can contaminate or embed into the substrate. SP-19 recommends using stainless-steel tools and non-ferrous media when cleaning aluminum and copper.

The galvanic corrosion issue also applies when cleaning stainless steel with a carbon steel grit media resulting in dissimilar metal contact that can cause severe pitting and rust spots.

SURFACE PREPARATION AND COATING APPLICATION

SP-19 defines three cleaning levels:

- Level 1: Bare metal similar to SSPC SP-11
- Level 2: Bare metal that allows traces of coating and corrosion to remain in pits
- Level 3: The same as Level 2 except that up to 5% staining is allowed

All three levels require creation of a minimum 1 mil (25 micron) surface profile. Coating requirements require applying the first coat as soon as feasible after power tool cleaning to avoid oxidation of the cleaned surface. While aluminum, copper, and stainless metals do not typically

Joye Blanscett | Executive Director | (657) 382-5262 | jblanscett@nspcassociation.org
Rick Matthews | Director of Contractor Engagement | (410) 533-6025 | rmatthews@nspcassociation.org
Alison B. Kaelin, CQA | Technical Advisor | (412) 841-7260 | akaelin@nspcassociation.org

rust back like carbon steel, they oxidize, and oxidation can cause contamination that can affect coating performance.

OPERATOR TRAINING

Since improper use of power tools, use of the incorrect tool, or use of excessive pressure and longer dwell times can damage specialty metals, it is important for the contractor to study the power tool manufacturer's product literature, talk with the tool manufacturer's technical representative, and ensure operators are properly trained on the tools being considered for power tool cleaning.

ENVIRONMENTAL, SAFETY, AND HEALTH ISSUES

SP-19 does not cover specific safety and health concerns. It instead states that users of the standard are responsible for reviewing relevant environmental, safety, and health regulations and studying the risks associated with working on metals such as aluminum, copper, and stainless steel.

COMBUSTIBLE DUST

Combustible metal dust consists of very fine particles of metals, typically ranging from 1 to 1000 micrometers, which can ignite and explode when suspended in air and in the presence of oxygen and an ignition source. Even small accumulations in dust collectors or on surfaces can create explosive environments.

Metals such as aluminum, chromium, magnesium, titanium, and zirconium are highly combustible when in fine dust form, with other metals like iron, copper, zinc, and nickel also pose dust explosion hazards.

TOXIC METALS

Stainless steel contain a minimum of 10.5% chromium, which likely includes hexavalent chromium. OSHA regulates chromium and copper under 29 CFR1926.55, Gases, vapors, fumes, dusts, and mists, which require protection of workers to exposure above Threshold Limit Values. OSHA regulates hexavalent chromium under 29 CFR 1926.1126, Chromium (IV).

HAZARDOUS WASTE

EPA requires that waste-containing chromium be evaluated by testing to determine if it is characteristic toxic waste. EPA CFR 261.23 characteristics of reactivity states a material is reactive if it, "is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement." Combustible dusts may meet this condition.

Contractors are advised to consult with a safety or industrial hygiene professional when establishing safety and health procedures for working on specialty metals to ensure that workers are provided adequate training and protection from exposure to combustible and airborne exposures resulting from working with these metals.

To obtain a copy of SP-19, visit https://www.ampp.org and click on STANDARDS & TECHNICAL in the top menu for details. AMPP members can take advantage of unlimited access to AMPP standards.

Joye Blanscett | Executive Director | (657) 382-5262 | jblanscett@nspcassociation.org
Rick Matthews | Director of Contractor Engagement | (410) 533-6025 | rmatthews@nspcassociation.org
Alison B. Kaelin, CQA | Technical Advisor | (412) 841-7260 | akaelin@nspcassociation.org