

U.S. Department of Labor

Occupational Safety and Health Administration
Washington, D.C. 20210



December 16, 1998

Mr. Dennis Vance
Safety Specialist
711 Low Gap Road
Princeton, WV 24740

Re: 1926.403(e); 1926.405(g)(2)(iii); 1926.416(e)(1).

Dear Mr. Vance:

This is in response to your letter of March 20, and your follow-up letter of October 9, concerning the use of electrical tape to repair minor damage (abrasions and cuts of limited depth) on the outer jacket of an extension cord. We apologize for the lateness of this reply.

Generally, electrical tape may be used to cover superficial damage to cord jackets

You ask whether there is any prohibition against putting electrical tape over these kinds of abrasions and nicks when there is no damage beyond the jacket -- the conductors have not been scraped or exposed and the insulation inside the jacket has not been displaced or compressed.

Section 1926.416(e)(1) provides that "worn or frayed electrical cords or cables shall not be used." Superficial nicks or abrasions -- those that only slightly penetrate the outer jacket of a flexible cord, and do not permit the cord to bend more in that area than in the rest of the cord -- do not normally render a cord "worn or frayed." Therefore, there is no need to repair or replace such a cord.

Recommendation against taping

While taping these incidental abrasions and cuts does not necessarily violate any OSHA standard, we recommend that employers not tape this type of damage for two reasons. First, Section 1926.403(a) requires that "all electrical conductors and equipment shall be approved." This standard precludes the use of approved electrical conductors and equipment if their characteristics are significantly altered. Applying electrical tape that is too thick or applying too much of it could change the cord's original flexibility and lead to internal damage. Second, the depth of the abrasions and cuts cannot be monitored to see if they get worse without removing the tape.

It should also be kept in mind that the heavy duty extension cords commonly used on construction sites are designed to withstand a hostile environment. Damage to an extension cord that is bad enough to consider taping may have caused damage beyond the jacket.

Tape may not be used to repair significant damage to cord jackets

Repair or replacement of a flexible cord (depending on its gauge) is required when the outer jacket is deeply penetrated (enough to cause that part of the cord to bend more than the undamaged part) or penetrated completely, or when the conductors or their insulation inside are damaged. Two provisions of the standard prohibit the repair of the jacket of a worn or frayed flexible cord with electrical tape. Section 1926.403(a) requires that the cord be approved. The original approval of the cord was based on the types of materials and construction used. As noted above, taping the cord can change the flexibility characteristics of the cord, which in turn can affect the amount of stress in the adjacent areas. This is of particular concern with respect to the grounding wire. Also, the jacket is designed both to prevent damage to the conductors and insulators inside, and to further insulate the conductors. Taped repairs usually will not duplicate the cord's original characteristics; in most cases neither the jacket's strength nor flexibility characteristics will be restored. Therefore, tape repairs of the jacket may not be used to bring a

worn or frayed flexible cord into compliance.

In addition, section 1926.405(g)(2)(iii) states that "flexible cords shall be used only in continuous lengths without splice or tap. Hard service flexible cords No. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced." This standard precludes the repair of flexible cords smaller than No. 12.

MSHA has a different standard governing the repair of flexible cords

You point out in your letter that U.S. Department of Labor's Mine Safety and Health Administration (MSHA) permits the taping of damaged flexible cords in mines, which are, in many cases, very hazardous environments. The standard that applies in mines is different from the OSHA standard. The MSHA standard, located in volume 30 of the Code of Federal Regulations, section 75.517, provides that "power wires and cables...shall be insulated adequately and fully protected."

A mine employer complies with this standard by "insulating adequately and fully protect[ing]" the cord. By its terms, this permits the use of cords as long as they are properly insulated and protected. Where that can be accomplished by the proper application of suitable electrical tape, the requirements of that standard are met. In contrast, the OSHA standard, which is based in large part on the National Electric Code, requires that the cords be "approved," and prohibits the repair of cords smaller than No. 12. Consequently, the use of tape to repair a worn or frayed cord is permitted under the MSHA standard but not under the OSHA standard.

If you require any further assistance, please do not hesitate to contact us again by writing to: Directorate of Construction -- OSHA Office of Construction Standards and Compliance Assistance, Room N3621, 200 Constitution Avenue, N.W., Washington, D. C. 20210.

Sincerely,

Russell B. Swanson, Director