

The post-fire corrosion hazard of the materials used in shipboard power and communication cables upon small specimens of HY80 steel, type 304 stainless steel, brass, and Monel 400 was investigated.

The metal coupons were exposed to the combustion products generated by the burning cables in full-scale fire tests aboard an instrumented ship. Tests were conducted with cross-linked polyethylene cables and polyvinylchloride (PVC) cables. The test scenarios for the two cable materials were quite different, with the PVC cables producing an extensive fire with large quantities of smoke while the polyethylene cables resisted propagation of the fire and produced only small quantities of smoke. The metallic coupons were stored under both moderate and high-humidity conditions after the fire tests.

During the post-fire period, which lasted nearly a year, the specimens were weighted and observed periodically to assess the degree of corrosion. The HY80 steel coupons which were exposed to the PVC cable smoke experienced the greatest degree of corrosion as assessed by mass increase and macroscopic appearance.

The corrosion produced by the combustion products from the cross-linked polyethylene cables was insignificant due to the much smaller quantities of smoke produced and the lack of significant quantities of corrosive gases such as hydrogen chloride.