

REPRINTED FROM
FIRE TECHNOLOGY

Vol. 4 No. 4 NOVEMBER 1968

WV-0174 #5
FT-40.

PLAINTIFF'S EXHIBIT

UC-3723

Fire Exposure

Fire Tests on Thermal Insulation Systems for Pipes

DURBIN H. WAY, SFPE, and CARLOS J. HILADO
Union Carbide Corporation

Thermal insulation systems used to conserve heat and refrigeration in industrial plants should be evaluated in the same manner as construction materials insofar as fire performance is concerned. The authors report a wide range of behavior for several insulation systems examined in large-scale fire tests.

THERMAL insulation systems play an important part in the efficient operation of industrial plants because of the appreciable value of energy employed in heating and refrigeration. Because their use is widespread in manufacturing facilities, they tend to be among the first materials subjected to flame impingement in an accidental fire. Their performance under fire conditions, therefore, is of significant concern from the viewpoints of fire hazard, fire protection, and fire damage.

A LOOK AT THERMAL INSULATION SYSTEMS

Thermal insulation systems consist of three components: the thermal insulation material, which has the function of effectively reducing heat transfer; the protective material, which has the function of preventing reduction in the efficiency of the thermal insulation by the environment and by mechanical abuse; and the securement material, which has the function of keeping the entire system in place.

At the very least, a thermal insulation system should present no significant fire hazard: that is, it should not contribute significantly either as fuel for the fire or as a means of propagating the fire. It would be more desirable if it provided some measure of protection for the insulated pipes or vessels, preferably at least one hour before pipe or vessel wall temperatures reach a critical level. Ideally, it should survive the fire undamaged by either direct flame impingement or the impact of quenching water.

A thermal insulation system is judged as presenting a fire hazard if it either increases the severity of the fire in its existing location, or propagates the fire to adjacent areas. Fire hazard can result from fuel contribution by a combustible thermal insulation material, from flame spread on the protective material, or from severe failure of the securement material.

271

PRICE \$1.20 EACH. Discounts on Quantity

Copyright 1968 NATIONAL FIRE PROTECTION ASSOCIATION

Printed in U.S.A.

60 BATTERYMARCH ST., BOSTON, MASS. 02110

UCC 011914