

U.S. Fire Administration / National Fire Academy

Coffee Break Training

Topic: Plastics (Part III: Plastic, Elastomer, and Rubber Groups)

Learning Objective: The student shall be able to categorize plastics, elastomers, and rubber into “Groups” in accordance with nationally recognized fire protection standards.

For fire protection purposes, plastics, elastomers, and rubber are divided into three “groups” based on their relative fire characteristics of both heat of combustion and heat release rate (HRR). Last week’s Coffee Break Training 2008-26 explained how the plastic groups are defined.

Sample Classification of Plastics, Elastomers, and Rubber*

Group A

ABS (acrylonitrile-butadiene-styrene copolymer), Acetal (polyformaldehyde), Acrylic (polymethyl methacrylate), Butyl rubber, EPDM (ethylene-propylene rubber), FRP (fiberglass-reinforced polyester), Natural rubber (if expanded†), Nitrile-rubber (acrylonitrile-butadiene-rubber), PET (thermoplastic polyester), Polybutadiene, Polycarbonate, Polyester elastomer, Polyethylene, Polypropylene, Polystyrene, Polyurethane, PVC (polyvinyl chloride—highly plasticized, with plasticizer content greater than 20 percent) (rarely found), SAN (styrene acrylonitrile), SBR (styrene-butadiene rubber).

Group B

Cellulosics (cellulose acetate, cellulose acetate butyrate, ethyl cellulose), Chloroprene rubber, Fluoroplastics—(ECTFE—ethylene-chlorotrifluoro-ethylene copolymer; ETFE—ethylene-tetrafluoroethylene-copolymer, FEP fluorinated ethylene-propylene copolymer), Natural rubber (not expanded†), Nylon (nylon 6, nylon 6/6), Silicone rubber.

Group C

Fluoroplastics—(PCTFE)—polychlorotrifluoroethylene; PTFE—polytetrafluoroethylene), Melamine (melamine formaldehyde), Phenolic PVC (polyvinyl chloride—flexible PVCs with plasticizer content up to 20 percent), PVDC (polyvinylidene chloride), PVDF (polyvinylidene fluoride), PVF (polyvinyl fluoride), Urea (urea formaldehyde).

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† “Expanded” plastics (such as expanded polystyrene cups) obtain their cell structure when a blowing agent or gas, usually pentane, is dissolved in the plastic.

Since fire behavior may be affected significantly by the amount and arrangement of Group A, B, or C plastics in an environment, the fire protection professional must be able to categorize these materials to apply appropriate fire protection requirements.

You can obtain more information about plastics from the American Plastics Council at www.plastics-info.com



Consumer products in plastic containers.