

June 1971

Brief 71-10198

NASA TECH BRIEF

Goddard Space Flight Center



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Office, NASA, Code KT, Washington, D.C. 20546.

Improved Fire-Resistant Coatings

New formulations for fire-resistant water-base coatings containing potassium silicate show considerable improvement in the areas of quick air-drying; crack, craze, and abrasion resistance; adherence; and leach resistance (water insolubility). The coatings should prove particularly useful as thermal-barrier layers in furnaces, and as general purpose fire-resistant surfaces where vapor impermeability is not a requirement.

The basic compositions of the coatings are as follows:

36-80 parts (by weight)	Potassium silicate (K_2SiO_3) and water solution, containing 10-24% (by weight) of solids with SiO_2/K_2 mol ratio of 4.8 to 5.3.
1-10 parts (by weight)	Ceric oxide and an alkyl trialkoxy silane (e.g., methyl trimethoxy silane), the mixture of which acts as a leach retardant (or rehydration suppressant).
5-15 parts (by weight)	Fibrous calcium silicate (wollastonite), which acts as a crack and craze retardant.

Up to 10 parts (by weight) of a supplemental binder-filler, consisting of talc and/or kaolinite, may be added to any of these compositions. This

filler would be most desirable where fast furnace drying is preferred, or where the composition is to be applied to structures subjected to high temperatures.

Pigments such as carbon black, cadmium sulfide, and the oxides of titanium, iron, copper, chromium and manganese may also be added.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Goddard Space Flight Center
Greenbelt, Maryland 20771
Reference: TSP71-10198

Patent status:

This invention has been patented by NASA (U.S. Patent No. 3,493,401), and royalty-free license rights will be granted for its commercial development. Inquiries about obtaining a license should be addressed to:

Patent Counsel
Mail Code 204
Goddard Space Flight Center
Greenbelt, Maryland 20771

Source: J. B. Schutt and J. W. Stuart
Goddard Space Flight Center
(GSC-10072)

Category 04