

Fire Retardant Materials

**A Project Report Submitted
In Partial Fulfilment of the
requirement for the award of the
degree of**

**Bachelor of Technology
In
Civil Engineering**

**By
Manoj Sharma
Roll No. 18CE20L**

**Under the Supervision of
Mr. Chitranjan Kumar
(Assistant Professor)**



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Department of Civil Engineering


**Lingaya's Vidyapeeth Faridabad
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Session 2018-2022

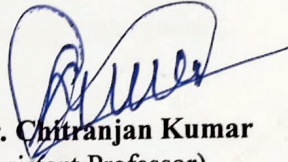
Certificate

This is to certify that the project report entitled "**Fire Retardant Materials**" being submitted by **Manoj Sharma with Roll No. 18CE20L** for the partial fulfillment of the award of the degree of **BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING** by Lingaya's Vidyapeeth, Faridabad is a record of a bonafide work carried out by them under my supervision during the year 2022.

The contents of this report have not been submitted to any other University or institute for award of any degree or diploma.



Dr Maniraj M.
(Head of Department)
Department of Civil Engineering
Vidyapeeth
Faridabad



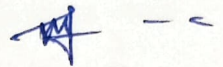
Mr. Chitranjan Kumar
(Assistant Professor)
Department of Civil Engineering Lingaya's
Lingaya's Vidyapeeth
Faridabad

DECLARATION

I **Manoj Sharma with Roll No18CE20L** the student of Bachelor of Technology in Civil Engineering during session 2018-2022 at Lingaya's Vidyapeeth, Faridabad, Haryana, hereby declare that the work presented in this report entitled "**Fire Retardant Materials**" is the outcome of our own bonafide work and is correct to the best of my knowledge and this work has been undertaken taking care of Engineering Ethics.

It contains no material previously published without referring or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

Submitted by:



Manoj Sharma

Roll No 18CE20L

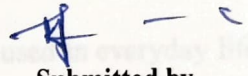
ACKNOWLEDGMENTS

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Allow me to express my sincere gratitude to our HOD **Dr Maniraj M.**, for his tremendous and selfless support in design of the project and time management skills while fabricating the product.

It is my great honor to have had the opportunity to work with these great minds and their remarkable characters. Their spirit of enthusiasm and commitment even in the times when we students found it hard to do is commendable.

Also I appreciate the moral support of my family during my project work.



Submitted by

Manoj Sharma

Roll No. 18CE20L

Abstract

Fire retardants or Flame retardants are chemicals used to slow down or hinder the growth of fire and provide a sufficient amount of time to evacuate a building. Their application on construction materials is absolutely essential to meet the necessary fire safety standards and codes.

Fire retardants are available in various forms such as sprays, sealants, paints, powders and gels. Their application raises the threshold temperature at which a material catches fire, reduces the rate at which materials burn, and minimizes the spread of flames.

Conventional materials (natural and man-made fibres, plastics, wood, paper etc.) used in everyday life are, in different degrees, liable to ignition. This fact has impelled the development of new materials which are inherently resistant to flame and heat or to modify these materials by using flame-retardant additives/treatments to meet the stringent regulations set for fire protection. This paper gives an overview of the newly developed inherently flame-retardant fibres and engineering plastics specifically aramids, polyimides, polybenzimidazole, novoloid, polyphenylene sulphide and carbon fibres. The use of various additives and FR finishes has also been highlighted.

Keywords: Flame-retardant materials; solid phase active flame retardant; vapour phase inhibition; aramids; carbon fibres.