Intumescent Fire Retardant Coatings

Editor
Faiz Ahmad

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PREFACE

A program to develop Intumescent Fire-Retardant coating, also known as Passive Fire Protection System, for fire protection of oil and gas industry, was launched in Universiti Teknologi PETRONAS during the last decade. The project was initially funded by the Petroleum Research Fund (PRF), with an amount of RM23.03M. The project was then continued to be financed by the Ministry of Higher Education (MOHE), Malaysia with a particular aim to improve the fire safety of steel structures. MOHE has funded approximately, RM1.0M in terms of several Fundamental, Exploratory and Prototype Research Grants. Fire Science Organisation, a subsidiary of Promat, Belgium provided industrial testing of coating according to ASMT 476 Part 20, while other standard tests were performed by SIRIM-Shah Alam and Luxembourg Institute of Technology, Luxembourg. Later, this research has developed several collaborations from around the globe. Becker Industrial Coating, Sweden signed an agreement for developing Intumescent Coil Coating for Fire Safe Building Panel for fire safety of construction application. University signed an agreement with International Center for Numerical methods, Barcelona Spain and University of New South Wales, Australia. Recently, technology transfer agreement is signed with Bina Paint Sdn Bhd, Kuala Lumpur, Malaysia. Universiti Technologi PETRONAS has given full support to develop this research program with an aim to provide a low cost, environment safe and thin coating for fire safety in construction and chemical industry applications.

This book contains several chapters including introduction of intumescent fire retardants, earlier developments and challenges of thermal performance, toxicity of binder system and intumescent ingredients. These are followed by the study of replacing expandable graphite by PER where extensive study was conducted to identify suitable contents and particle size of expandable graphite. A part of work on bauxite waste reinforced coating is also presented considering

thermal performance, adhesion, and toxicity of coating for the safety of building and inhabitants. A chapter on reinforcing bio-filler in intumescent coating and their performance is also dedicated for the audiences. A new study on reinforcing short and long inorganic fibers in the coating and their thermal, char adhesion and toxicity is also presented. The hybridisation of the inorganic fibers and their influence on the coating performance is also devoted. The authors have devoted study on adhesion of coating, scratch resistance, lap-shear strength, and char compression testing are for reader to understand the significance of coating in industrial application. The book also addressed a very important aspect of coating application that is weather resistance. Weather resistance is an important aspect of coating during its application, so water immersion test and fire performance post water immersion endorsed its significance for industrial safety.

"Intumescent Fire Retardant Coatings" is first of its kind published in Malaysia and in the world, which includes comprehensive results of experimentation on intumescent fire-retardant coating. It is sincerely hoped that this book will provide complete information for researchers, readers, and industry in understanding the process of developing coating and testing according to standards of application. Reading audience such as researchers, engineers and students dealing with or interested in passive fire protection system has a unique opportunity to find a comprehensive and cutting-edge information covering background, developing, testing and characterisation and application. The technology of passive fire protection system is new and unique and is covered in this single book.

Professor Dr Faiz Ahmad
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