INVESTIGATION AND COMPARISON OF THE MAJOR CHARACTERISTICS OF CEMENT VARIETIES USED IN CONSTRUCTION INDUSTRY

Edmund, W. A. D. P.[1*], Attygalle, M. L. C.[1] and Dewage, A. S.[2]

[1.] Department of Physics, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka

[2.] Sri Lanka Standards Institution

*pabasaraaa@gmail.com

Cement is categorized as either non-hydraulic or hydraulic binder. All the cements in Sri Lanka are hydraulic and four varieties of those cements have been introduced for the industrial and general construction purposes. The inadequate knowledge about the characteristics of cements, directs to inappropriate and inefficient utilities. Therefore, the effort of this research is to emphasize essential characteristics and demonstrate their gravity and make relationship between the cement varieties used in Sri Lanka and those used in Asian countries (e.g. India) and Europe. This study may help to minimize the trade barriers in cement trade with Sri Lanka. Since the test parameters of cements assist to quantify significant characteristics of cements, in this study, comparison is made on test parameters and their specification given in the Sri Lanka standards (SLS) with those in the Indian standards (IS) as well as European standards (EN).

Four varieties of cements; Ordinary Portland Cement, Blended Hydraulic Cement, Portland Limestone Cement and Masonry Cement are introduced in Sri Lanka. BHC consists of four types of Portland Pozzolana Cements, two types of Portland Slag Cements, four types of Portland Fly ash Cements two types of Sulphate Resisting Pozzolanic cements and two types of Masonry Cements. Other two cements; OPC and PLC do not consist of any types. Each variety or type of cements (except MC) include four strength classes (32.5N, 32.5R, 42.5N and 42.5R) based on standard strength and initial setting. Cements, specified for constructions in Sri Lanka are similar with the relevant cements, manufactured by European countries as per EN 197-1 or any other country where, their national standards are formulated based on EN 197- 1. Indian OPC grade 43 and 53 are similar with Sri Lankan OPC class 32.5N and 42.5N respectively. No any other Indian cement complies with Sri Lankan cements.

Series of past data, collected from the test results of cement samples tested under the two schemes (Import Inspection Scheme and Product Certification Scheme) available in SLSI, shows that the quality of cements have been improved consistently and considerably during previous years, and it is evident that the effectiveness of implementation of cement standards by the schemes.

Keywords: Cement standards, Construction materials, Hydraulic cement, Standard strength