



**COMMENTS ON THE CONTENTS OF CEMENT AND CONCRETE RESEARCH,  
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With 47% of papers by authors in countries outside the USA and W. Europe, this issue of Cement and Concrete Research sustains many other indications of growing impact on the international concrete research from the developing countries of the world. This corresponds to the demographic changes and the trends of the global industrial development.

It is also interesting that 5 of the 17 papers deal with properties of concrete as related to the use of supplementary cement materials, notably fly ash, GGBS, and silica fume, thus reflecting a consistent concern about proper utilisation of the industrial by-products in the service of resource household and environmental protection.

One paper, "*A new way of predicting cement strength—Fuzzy-Logic*" by Gao Fa-Liang from the Fuzzy Engineering Research Institute, Shanghai University, P.R. China, is pioneering the application of the Fuzzy-Logic method for termination of the conventional problems with laboratory modelling data interpretation by regression analyses. In principle, logic says, as expressed for cement strength by the author, that conventional knowledge and testing can only represent the materials to a certain extent: "*That is the Fuzzy property in the field of test values. But people used to take it as definite.*"

Actually, planning of tests and analyses of test data relied upon in all the 16 other papers of the journal issue would achieve higher validity by application of the Fuzzy-Logic methodology, which may come to general predominance in concrete research in the near future.

For five papers on various compositions and properties of blended cement concrete,

**"TRANSITION ZONE IN HIGH PERFORMANCE CONCRETE DURING HYDRATION"**  
by Kangesu Vivekanandam

**"CONCRETE CONTAINING TERNARY BLENDED BINDERS: RESISTANCE TO  
CHLORIDE INGRESS AND CARBONATION"** by M.R. Jones, R.K. Dhit, and B.J.  
Magee

**"EFFECT OF SLAG AND SILICA FUME ON MECHANICAL PROPERTIES OF HIGH  
STRENGTH CONCRETE"** by Li Jianyong and Tian Pei

**"INFLUENCE OF SLAG BLENDED CEMENT CONCRETE ON CHLORIDE DIFFU-  
SION RATE"** by Changiz Dehghanian and Mosieb Arjemandi

**"PULLOUT BEHAVIOR OF STEEL FIBERS FROM CEMENT-BASED COMPOSITES"**  
by M. Jamal Shannag, Rune Brincker, and Will Hansen

it is apparent that the presented laboratory testing programmes operate with uncertainties of:

The properties of the materials and combined materials within samples;

The properties in the field of tested values, i.e., depending upon equipment and instrumentation, skill of laboratory operators etc.

It is for instance classic knowledge that the effects of any of the industrial byproducts referred to in blends with Portland cement depend upon:

- The physical properties of the blend materials, i.e., fineness, particle size distribution, particle shape, and unit weight;
- The chemical properties of the blend materials, among other things the contents of “secondary components,” such as alkalis;
- The mineralogical compositions of the blend materials, especially the content of glass vis-à-vis the content of crystallised components in fly ash and GGBS.

These series of characteristics of the used Portland cements and by-products are influencing both the rheology and self-compaction of the freshly blended materials, the rate of consolidation and development and utilisation of the heat in the composite hydration processes, and consequently also the final level of strength, permeability, resistance to chloride ingress, etc.; all in an integrated, holistic physico-chemical activation process that converts energy to mechanical work.

Seen from a practical point of view, application of the Fuzzy-Logic approach might therefore have revealed in the studies that the effects in some of the experimental tests referred to, which are ascribed to Silica Fume by paper authors, might in fact have relied upon the non-disclosed finer fractions or the degree of crystallinity of the fly ash or GGBS in the used blends, or on the alkali content of the used Portland cements, etc. Such revelations could identify relevant economic implications for industries with interest in transfer of the research accomplishments.

It is presumably optimistic to count with that the test results in the five different papers mentioned might profitably be analysed together as a bulk study by the Fuzzy-Logic methodology, but it is non-fuss logic that adequately planned laboratory testing would gain higher validity by planning application of Fuzzy-Logic already at the preparatory phases of research projects.