

25 PROMOTING AND PROTECTING OUR INDUSTRY

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SUMMARY: From the outset, the alkali-resistant (AR) fibre manufacturers realized that it would be necessary for them to take the lead in advising GRC producers on good technique, while at the same time actively promoting the material to specifiers and initiating the procedures for establishing official norms and Standards for GRC.

In the early days, Cem-FIL operated a licensing system that established GRC as a viable building material, but as the industry grew this was replaced by creating the GRCA and other similar associations in a growing number of countries. These associations are strongly supported by the fibre manufacturers and together they have successfully written specifications for GRC that are widely accepted. They have also helped to establish official norms and Standards and these need to be expanded further.

All of this costs time and money so, as the industry continues to expand and new AR fibre manufacturers start up, such as those in China, it is essential that funds are made available to continue with this work. If prices are too low, then funding will not be possible and the GRC industry will stagnate. Lower prices will come with increased volume as has already been demonstrated over the last 30 years. The AR fibre producers have a responsibility to bring value to the industry investing in research and development, marketing and the setting of Standards and quality guides.

This paper will briefly review past efforts and successes, discuss the role of the fibre producers and the various GRC associations and offer some thought-provoking proposals on how we should proceed in the future.

KEYWORDS: Alkali-resistant glassfibre, fibre producers, GRC, GRC associations, quality, standards.

INTRODUCTION

For the Glassfibre Reinforced Concrete (GRC) industry to grow as it did in the past, it was necessary to protect it while it was in its infancy. This was done by the alkali-resistant (AR) glassfibre supplier issuing licenses to serious companies interested in producing quality products and marketing them in a controlled manner. Once the infant started to grow, this system became over-protective and was replaced by offering advice to producers and specifiers and developing and issuing Standards for GRC.

The AR glassfibre suppliers still retain a pivotal role in the development of the GRC industry. From Day 1, Cem-FIL®, followed later by Nippon Electric Glass (NEG), committed substantial resources to the development of the market. They recognised the need to invest heavily in the industry in order to establish GRC as a viable, safe, new building material and, at the same time, demonstrate its long-term durability. They set about doing this by carrying out controlled laboratory work, including accelerated ageing, and laying down test boards in different world climates so as to gather real-time data over a 20-year period. In addition, early GRC producers were advised and manufacturing was controlled, resulting in GRC now being accepted as a viable building material in more than 40 countries around the world.

As the baby grew, the GRCA was set up, again with the active support of the AR fibre producers. This is now the International Glassfibre Reinforced Concrete Association and it brings together all those with an interest in GRC specifically to:

- exchange knowledge and experience concerning GRC
- promote GRC in all its valid applications and advance the interests of its members
- participate in establishing codes of practice and national standards covering manufacture and performance
- organise international conferences as a forum for discussing and disseminating GRC knowledge on materials, products and uses.

The GRCA and the fibre producers encouraged other countries to set up their own associations or chapters of existing concrete-oriented organisations so as to meet local needs, and a number of these, such as the PCI in America and the NPCAA in Australia have done sterling work. More recently, China has also set up its own GRC association and we wish to help and encourage them in their endeavours.

The GRC industry continues to expand, as is evident by this year's Congress being held in Hong Kong, and we must use this occasion to ensure its healthy future. So what does need to be done?

THE ROLE OF THE ALKALI-RESISTANT GLASSFIBRE MANUFACTURERS

The AR fibre manufacturers have played a key role in developing and marketing GRC and this has to continue if the market is to expand. They have the position and the resources to lead the industry while not dictating to it. However, this needs a sustained effort and funding can continue only if adequate profits are made. As the number of AR fibre manufacturers increases, so should the funding, thus allowing the various GRC associations and the suppliers to continue to support development work, both external and internal, promote GRC via conferences and construction industry shows and to educate specifiers, such as architects and engineers. *We call upon the new AR fibre suppliers to understand the need for this funding.* If the current fibre supply level is simply reduced in value by indiscriminate price cutting, then adequate resources will no longer be available and growth will cease. Like all suppliers, the AR fibre suppliers need increased sales to justify investment and this will not occur without R & D and the promotion of GRC. *Increased volume will allow for lower prices AND adequate funding.* Simply lowering prices may result in a temporary increase in market share by one supplier but will result in reduced investment by all and stagnation of the GRC industry.

THE ROLE OF QUALITY

Another important issue is the quality of the GRC being offered by the fabricators. The AR fibre suppliers have a role to play but this should become more the responsibility of the associations and the GRC fabricators themselves.

The GRCA has made an excellent start with the setting up of the Approved Manufacturers Scheme (AMS) and it is essential that this or another version of it become more widely accepted. Similarly, the PCI in America recognised from the outset that quality would be a key factor in obtaining any specification for the large, stud-frame GRC panels used in the USA. To this end they introduced the Recommended Practice for GRC and its accompanying Quality Control Manual and all manufacturers have to pass their inspection and approval systems before they can become members of the PCI.

Should we insist that all manufacturers become 'Approved' before they are allowed to join the GRCA, NPCAA or Chinese association etc?

This is particularly true when more and more new manufacturers are starting up. In the early 1980s, GRC in the UK suffered a serious setback when a few projects had problems. In most cases, this was finally traced back to bad quality control and production practices or site abuse of panels. Bad news always makes the press and it takes many years to recover from a damaged image. The industry as a whole cannot accept cowboy practices. There have been incidences where third party suppliers have repacked E-glass or low zirconia glassfibre and sold it for use with concrete! If this was inadvertently used in a product which subsequently failed, the consequences would be disastrous, especially for the producer in countries such as America where litigation is the order of the day. Everybody is responsible for protecting the reputation of GRC and I call on existing associations to introduce and find ways to enforce good quality practices.

What we need is a Code of Ethics for the GRC industry and all of the AR fibre suppliers must support the associations and the manufacturers to establish one.

However, care has to be taken to avoid any Codes which are too narrow or too protective of niche interests since this would stifle the market as a whole. One possible solution would be to take the current GRCA's AMS format and offer it to other associations or even respected, independent third party organisations (e.g. Bureau Veritas in France; Ross Bryan & Associates, Consulting Engineers in the USA). It is already in the form of a series of checkpoints that independent inspectors could use to assess a manufacturer. The funding would come mainly from the GRC manufacturer but could be subsidised by the AR glassfibre and other raw material suppliers as well as the associations themselves.

ROLE OF SPECIFICATION, NORMS AND STANDARDS AROUND THE WORLD

For GRC to be universally accepted, the architect, engineer or simply the end client needs to be able to refer to accepted Specifications or Standards or be able to be shown that the product corresponds to existing requirements. In the USA, a lot of effort has gone into the ASTM committees resulting in a number of test methods specific to GRC such as ASTM C1560-03 and C947. They have also shown that GRC conforms to the Unified Building Code.

For their part, the GRCA has been working for 20 years (initially on British Standards) on EN Standards. This has resulted in EN 1170 parts 1-8 covering test methods being issued and prEN 14649 describing the AR glassfibre 'SIC' test method being written for consideration. Draft Standard prEN 15191 is currently being prepared and will cover the 'Classification of glassfibre reinforced concrete performance'. In Australia, the NPCAA has issued a comprehensive guide to GRC. These are all important documents and are very time-consuming in their preparation. When GRC can be specified simply by calling up or mildly modifying standard specifications and citing them within local codes or standards, then we will see a massive increase in the amount of work being proposed in GRC.

The problem is one of funding and time. Most specifications, norms and codes are created via local committees and consensus. They are usually the result of protracted discussions and consume a lot of time and travel (to meetings). The fibre suppliers have played a key role in these discussions and, frequently, it has been their personnel who have attended the meetings. For these standards to progress, this work has to continue and it is hoped that the new Chinese AR suppliers will offer the same support in the future.

Finally, on specifications, it is essential that the existing definition of AR glassfibre be respected when these fibres are to be used in a cement matrix. There are manufacturers who will always seek the cheapest materials and sometimes do not understand the need for special products. **It is the duty of all AR fibre suppliers** to ensure that these companies understand why E-glass and even low zirconia AR glass are not suitable for use with the high alkaline Portland cements. The use of unsuitable fibres will result in long-term failures which would be catastrophic for our industry.

TECHNICAL SUPPORT FROM THE AR GLASSFIBRE SUPPLIERS

Traditionally, the AR glassfibre suppliers have brought value to the industry. We wish to encourage the Chinese suppliers to also support this ideal by investing in R & D and training. Cem-FIL® and NEG have supported new and existing GRC producers by developing the original manufacturing techniques, training production personnel and even helping the equipment suppliers with their development work. They continue to look at new techniques or methods to refine existing ones. To support its Cem-FIL® activities, Saint-Gobain Vetrotex Espana has set up a comprehensive Application Laboratory in Alcala de Henares, Madrid, and is actively studying the key characteristics of mass production methods such as filament winding, injection moulding and pressing. We are also developing fibre products which make existing methods easier, e.g. premix that flows better without segregation and new products for as yet undeveloped techniques. An example of a futuristic application would be the placing of Cem-FILO into a closed mould which would then be filled with a special, fluid sand : cement mix. This would give an excellent surface finish and the mould could be heated for rapid demoulding or used with rapid-setting cements. Another example is the use of Cem-MAT as the reinforcement for a new system of seismic retrofit of masonry walls.

The possibilities are endless; all take time and money which we will continue to invest for as long as it is possible.