

# Contents

Foreword by <i>Dr I. Dunstan</i>	vii
<b>1 Alkali-Resistant Glass Fibres</b>	<b>1</b>
Historical	1
The matrix phase	5
Alkali-resistant glass fibres	10
Glass/cement interactions	17
<b>2 Theoretical Principles</b>	<b>26</b>
Introduction	26
Notation	27
Mechanism of reinforcement: aligned long fibre composites	28
Effect of fibre length and orientation: efficiency factors	34
Fibre/cement bond	49
<b>3 Production Methods for Grc Components</b>	<b>55</b>
Constituent materials	55
Spray production methods	56
Mix and place methods	61
Other (miscellaneous) processes	62
Curing	66
Surface finishes	67
Quality control	67
<b>4 Properties of Portland Cement Grc</b>	<b>70</b>
Spray-dewatered grc	70
Premixed grc	86
Other properties of grc	87
<b>5 Grc From Modified Portland Cement Matrices</b>	<b>92</b>
Fillers	92
Pozzolanas	93
Lightweight grc	107

<b>6</b>	<b>Polymer Modified Grc</b>	<b>112</b>
	Polymer modified AR glass fibre reinforced cement	113
	Polymer modified E-glass fibre reinforced cement	125
	Polymer modified E-glass reinforced high-alumina cement	128
	Polymer impregnated grc	129
<b>7</b>	<b>Non-Portland Cement Grc</b>	<b>130</b>
	High-alumina cement (HAC) composites	131
	Supersulphated cement (SSC) composites	134
	Portland blastfurnace cement (PBFC) composites	139
	Other cement composites	139
	Glass fibre reinforced autoclaved calcium silicate (grcs)	140
<b>8</b>	<b>Microstructure of Grc and Glass/Cement Bond</b>	<b>143</b>
	Initial microstructure	143
	Microstructure changes with time	144
	Microstructure of Cem-FIL 2/grc	150
	Microstructure of grc made from non-Portland and blended cements	150
	Microstructure and bond	154
	Microstructure and cracking	161
<b>9</b>	<b>Durability</b>	<b>164</b>
<b>10</b>	<b>Applications and Future Developments</b>	<b>177</b>
	Applications	178
	Future prospects	181
	References	183
	Index	193