ISO 14484:2020-03 (E)

Performance guideline s for design of concrete structures using fibre-reinforced polymer (FRP) materia ls

Contents

Page

Foreword iv

Introduction v

1 Scope 1

2 Normative references 1

3 Terms and definitions 1

4 Design basics 2
4.1 General 2
4.2 Design methodology 2

5 Properties of materials 2
5.1 Properties of concrete and steel 2
5.2 Properties of FRP materials 3
5.2.1 General 3
5.2.2 FRP bars, grids, and plates 3
5.2.3 FRP sheets 3
5.2.4 Other FRP systems 3
5.3 Resins 3

6 Structural analysis 3

7 Serviceability limit states 4
7.1 General 4
7.2 Calculation of stress and strain 4
7.3 Cracking 4
7.3.1 Allowable crack width 4
7.3.2 Tension and flexural cracks 4
7.3.3 Shear and torsion cracks 4
7.4 Deflections 4

8 Ultimate limit states 5
8.1 General 5
8.2 Axial and flexural capacity 5
8.2.1 Axial strength and deformation capacity 5
8.2.2 Flexural strength and deformation capacity 5
8.3 Shear capacity 5
8.3.1 Shear strength 5
8.3.2 Punching shear strength 5
8.3.3 Torsion 6
8.4 Creep-rupture and fatigue 6

9 General structural details 6
9.1 FRP reinforcements/tendons 6
9.1.1 Bent configurations 6
9.1.2 Anchorages 6
9.1.3 Splices 6
9.2 Externally bonded FRP sheets/plates 6

9.2.1 Anchorage of FRP sheets/plates 6
9.2.2 Splice of FRP sheets/plates 6
9.2.3 FRP sheets at rounded corners 6
9.3 Near-surface mounted FRP reinforcement 7
9.3.1 Dimension of grooves 7
9.3.2 Anchorage of near-surface mounted FRP reinforcement 7