

Recent Canadian Developments Related to FRP Reinforcement for Concrete Structures, Design Codes, and Applications in Buildings and Bridges

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Abstract - The design principle of fiber-reinforced polymer (FRP) reinforcing bars for concrete structures has been well established through extensive research and field practices. Provisions governing certification testing and evaluation as well as quality control/assessment and FRP design provisions, are now in place to regulate materials specifications and design aspects and guide FRP manufacturers and end-users. The Canadian Standards Association (CSA) group addressing the state-of-the-art FRP material specifications and design requirement recently issued two updated provisions. The new edition of CSA S807 includes several additions and modifications in terms of quality and qualification requirements, material properties, testing procedures, and material mechanical and durability limitations. Additionally, the updated Section 16 of CSA S6 for the design of fiberreinforced structures and highway bridges aimed at providing more rational design algorithms and allowing practitioners to take full advantage of the efficiency and economic appeal of FRP bars. This keynote presents a summary of these recent modifications in Canadian codes and standards, introducing the underlying rationale. Additionally, the keynote highlights the recent field applications of FRP bars in different types of concrete civilengineering infrastructure as well as the developments and advances in FRP reinforcements for sustainable and resilient concrete including Glass FRP (GFRP), Carbon FRP (CFRP) and Basalt FRP (BFRP) straight and bent rebars using innovative techniques and materials.