

DEVELOPMENTS ON FRP REBARS AS INTERNAL REINFORCEMENT IN CONCRETE STRUCTURES AND FIELD APPLICATIONS

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ABSTRACT

Extensive research and field practices have established the design principle of using fiber-reinforced polymer (FRP) bars to reinforce concrete structures. Material specifications and design aspects are now regulated through provisions governing certification testing, quality control/assessment, and FRP design. The Canadian Standards Association (CSA) updated two provisions related to FRP materials and design. The 2019 edition of CSA S807 includes modifications to quality and qualification requirements, material properties, testing procedures, and material mechanical and durability limitations. Section 16 of CSA S6 (2019) was also updated to provide more rational design algorithms for fiber-reinforced structures and highway bridges, allowing practitioners to fully utilize the efficiency and economic appeal of FRP bars. Additionally, the recent editions of CSA S900.2 (2021) on the structural design of wastewater treatment plants and CSA S413 (2021) for parking garages include provisions on the use of FRP bars as high-durable reinforcement. This presentation provides an overview of the recent changes in Canadian codes and standards and explains the reasoning behind them. It also highlights examples of recent field applications of FRP bars in various types of concrete civil-engineering infrastructure.

KEYWORDS

Fiber-Reinforced Polymer (FRP) bars; Reinforced Concrete Structures; Design Codes