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Fire Testing of Nextel™ Ceramic Fabrics for Aerospace Applications

Abstract: An experimental investigation is performed to compare the thermal and flame performance of alternative fabrics made from ceramic fibers with different deniers. Commercially available Nextel™ 312 AF-10 is currently used in many flame barrier applications. This fabric design is based on lower denier input (600 d) that makes the manufacturing process slow and increases the fabric cost. Different fabric designs using high denier fiber (e.g. 900 d, 1800 d) are evaluated in comparison to commercially available Nextel™ 312 AF-10 fabric. An optimized fabric design is proposed that can be considered as an alternative in high temperature applications including where AF-10 is currently used. New fabric design and properties are presented alongside properties of commercial fabric(s) including AF-10. Comparative flame propagation and burn through resistance are also presented per FAR 25.856-a and FAR 25.856-b (fabric only, exposure for 5 min) and development test simulating performance per ISO2685 (fabric only, exposure per 15min).