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ELECTRON BEAM PROCESSING OF CARBON FIBRE REINFORCED BRAIDED COMPOSITES BEAMS

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In this paper the possibility of producing a new type carbon fiber reinforced composite is examined by applying *braiding*, a well-known process of textile technology. The appearance of the new Hungarian carbon fiber with excellent mechanical properties in the market enables the development of newer type carbon fiber reinforced composites in the continuously widening range of engineering applications. Advanced hollow profiles, pipes and other composite products can be manufactured in continuous operation. A new way of composite production of this kind is the manufacturing of reinforcing structure by braiding technology producing a composite with sufficient mechanical properties from this cross directional fabric-like textile structure by impregnation. This manufacturing process can complete the variety of hollow products serving the same purpose as pultrusion or filament winding. This way a profile type framework element with a hollow cross section is manufactured having favorable mechanical properties. Owing to its small mass and high specific strength this product can be applied in dynamically loaded structures e.g. in the automotive industry. For crosslinking of the matrix the method of high-speed electron beam curing has been examined in order to reach continuous operation. The field of use and application of carbon fiber braided structures has a great chance especially in machine engineering and in the automotive industry. The main reason for this is that braiding processes are capable of producing structures having good mechanical properties at a low processing price. The mass of the composite load-bearing structure produced this way is one fifth of the steel product having similar geometry, and its specific mechanical properties are nearly as good as that of the most commonly applied semiproduct and structural component, the welded steel profile.