Claims

1. Method for producing a thermostructural monolithic fibres/matrix composite part (10), comprising two skins (11, 12) of composite material which are spaced apart from one another and interconnected by a plurality of thread-like spacers (13) of composite material, said method comprising at least:

A/ producing a fibrous preform (1) provided with a sandwich structure comprising an intermediate flexible core (4) and two outer fibrous frames (2, 3) arranged on opposed outer faces of said flexible core (4) and joined by thread portions (8, 9) that pass through said fibrous frames (2, 3), said preform (1) being impregnated with resin;

B/ curing said preform and removing said core (4); and

C/ densifying the resulting structure,

characterised in that, in step B/, pre-densification is carried out by gas-phase infiltration so as to pre-densify said preform (1) and thus said thread through-portions (8, 9) intended for forming said spacers (13), and in step C/, said structure is densified by liquid-phase infiltration.

2. Method according to claim 1,

characterised in that, in an intermediate step between steps B/ and C/, the preform that was pre-densified in step B/ is machined.

3. Method according to claim 2,

characterised in that, in said intermediate step, threaded holes and/or bores are machined.

4. Method according to claim 3,

characterised in that, at least during the densification step, step C/, plugs (15) are arranged in said threaded holes and said bores.

5. Method according to any of the preceding claims, characterised in that, in step C/, in order to achieve liquid-phase densification, silicon is introduced in liquid paste form and spreads out under the effect of heat and pressure in a densification furnace.

6. Method according to any of the preceding claims, characterised in that, in step A/, a fibrous preform having variable thickness is produced.

7. Method according to any of the preceding claims, characterised in that, in step A/:

a) a flexible sandwich structure (1) is formed that comprises an intermediate flexible core (4), which is made of a material that is capable of being penetrated by a needle and is impervious to the resin having to create the matrix, and two outer flexible fibrous frames (2, 3) arranged on opposed outer faces of said flexible core (4);

b) said fibrous frames (2, 3) and said core (4) of said sandwich structure (1) are joined by stitching by means of a thread (5) forming stitches that include thread portions (8, 9) that pass through said fibrous frames (2, 3) and said core (4), said stitching thread (5) consisting of a roving comprising a plurality of filaments that are not linked together, said thread portions (8, 9) that pass through said fibrous frames (2, 3) and said core (4) having, following said stitching operation, longitudinal channels in said core that are provided between said filaments and extend from one of said fibrous frames to the other; and

c) said sandwich structure (1) is impregnated with said resin, said impregnation operation being carried out such that said curable resin is made to penetrate said longitudinal channels of said thread through-portions (8, 9) in order to form, at the location of each of said portions, a resin bridge, of which the opposed ends are in contact with the resin impregnating said flexible fibrous frames (2, 3).

8. Monolithic fibres/matrix composite part (10) which comprises two skins (11, 12) of composite material which are spaced apart from one another and interconnected by a plurality of thread-like spacers (13) of composite material, and is produced by carrying out the method according to any of claims 1 to 7.

9. Monolithic part according to claim 8,
characterised in that at least one coating is applied on the outside of at least one of said skins (11, 12).