CLAIMS

1. Composite material comprising:

- Boron nitride (BN(C)) in the form of a porous material consisting of BN possibly doped with carbon (BNC) of continuous 3D structure, not dispersed;
- An internal layer of a Phase Change Material (PCM) (5) incorporated within said continuous structure of BN(C) (1), and
- A surface portion (1') of BN(C) devoid of PCM, under each of the upper and lower external faces of the composite material, with thickness E1 and E2,

said material being characterized in that:

the layer of PCM (5) is embedded by a coating layer of polymer (10) of thickness E', and said surface portions (1') devoid of PCM, are each located on either side of the internal layer of embedded PCM.

2. Material according to claim 1 such that said polymer is polydimethylsiloxane (PDMS).

3. Composite material according to claim 1 or 2, such that the continuous structure of BN(C) is a foam of BN(C).

4. Composite material according to any one of the preceding claims, such that the continuous structure of BN(C) (1) is a continuous foam of BNC.

5. Method for preparing the composite material according to any one of the preceding claims, said method comprising:

i. the formation of an internal layer of PCM (5) within the continuous structure of BN(C) (1) by a strategy of protection/deprotection of the surface layers and/or by a strategy of selective etching of PCM;

ii. embedding of the PCM layer (5) with a polymer coating layer (10).

6. Method according to claim 5, such that the formation of the internal layer by protection/deprotection comprises the following steps:

- The prior protection of each surface portion under the lower and upper external faces of the continuous structure of BN(C) over a thickness E1'' and E2'', respectively;

- The impregnation of the continuous structure of BN(C) with a PCM in liquid form;
- Selective deprotection of the protected surface portions (1’’); from which results a continuous structure of BN(C) in which is incorporated an internal layer of PCM (5), with the exception of said surface portions (1’’) of thickness E1’’ and E2’’, stripped of PCM.

7. Method according to claim 5 by selective etching of the PCM comprising the following steps:

- The impregnation of the continuous structure of BN(C) (1) with a PCM (5) in liquid form;
- Selective etching of the PCM within at least one surface portion (1’).

8. Method according to claim 5 comprising:

- The prior protection of at least a surface portion (1’) of the continuous structure of BN(C) (1) with a protective material having a different etching speed than that of PCM;
- The impregnation of the continuous structure of BN(C) (1) with a PCM (5) in liquid form; and
- The etching of the PCM by immersion of the impregnated surface area (s) (1’) of the material in an etching solvent.

9. Method according to claim 5 wherein the embedding ii) comprises the following steps:

- Partial protection of each surface portion (1’’) under each lower and upper face of a composite material obtained in step (i), over a thickness E1 and E2 that are respectively less than E1’’ and E2’’, resulting in two superficial portions (1’);
- The impregnation of the composite material thus protected on each of these two surface portions (1’) by the coating polymer (10) in liquid form’;
- Selective deprotection of the protected portions (1’);

thus forming a continuous BN structure (C) in which is incorporated an internal layer of PCM (5) embedded by a polymer (10) of thickness E’, said internal embedded layer 5 being situated between two surface portions (1') of BN(C) devoid of PCM of thickness E1 and E2.

10. Electronic component (7) comprising a composite material according to any one of claims 1 to 4.

11. Method for manufacturing the component (7) according to claim 10 comprising the step of applying the composite to a component