This is because, during heat treatment, dewetting of the useful layer 4 rather than creep is observed.

Embodiments of the invention seek to provide a method for manufacturing a composite substrate that makes it possible to execute a step of creep of the useful layer 4 so as to cover the exposed surface of the covering layer 2 and of the dielectric layer 3 at the step.

**BRIEF DESCRIPTION OF THE INVENTION**

An aspect of the present invention provides a method for manufacturing a composite structure comprising, from its rear face towards its front face, a supporting substrate, a covering layer, at least one dielectric layer and a useful layer, said method comprising the following steps:

a) providing a donor substrate and the supporting substrate;

b) forming the dielectric layer such that the dielectric layer has a contour contained within a peripheral surface of the donor substrate, the dielectric layer comprising:

- a first surface in contact with the donor substrate,
- a second surface opposite to the first surface,
- a peripheral surface connecting the first and second surfaces together;

c) forming the covering layer after forming the dielectric layer, the covering layer arranged so as to cover the second surface and the peripheral surface of the dielectric layer;

d) forming a weakened zone in the donor substrate delimiting the useful layer in contact with the first surface of the dielectric layer;

e) assembling the supporting substrate and the donor substrate such that the supporting substrate and the covering layer are in contact along a contact surface having a contour, and such that the contour of the dielectric layer fits within the contour of the contact surface; and

f) breaking the donor substrate along the weakened zone;

Thus, after the transfer step f), the stack of layers is transferred onto the supporting substrate.

The stack of transferred layers comprises a central portion and a peripheral portion.

The central portion of the stack comprises the useful layer, the dielectric layer and the covering layer.

The peripheral portion comprises only the useful layer and the covering layer.

It is then observed that a simple step is obtained. The peripheral portion corresponds to the transfer of a stack comprising a single intermediate layer.

Thus the fracture step leads to a single step at the peripheral ring.

1. A method for manufacturing a composite structure comprising, from its rear face toward its front face, a supporting substrate, a covering layer, at least one dielectric layer and a useful layer, the method comprising the following steps:

a) providing a donor substrate and the supporting substrate;

b) forming the dielectric layer such that the dielectric layer has a contour contained within a peripheral surface of the donor substrate, the dielectric layer comprising:
– a first surface in contact with the donor substrate,
– a second surface opposite to the first surface,
– a peripheral surface connecting the first and second surfaces together;

c) forming the covering layer after forming the dielectric layer, the covering layer arranged so as to cover the second surface and the peripheral surface of the dielectric layer;

d) forming a weakened zone in the donor substrate delimiting the useful layer in contact with the first surface of the dielectric layer;

e) assembling the supporting substrate and the donor substrate such that the supporting substrate and the covering layer are in contact along a contact surface having a contour, and such that the contour of the dielectric layer fits within the contour of the contact surface; and

f) breaking the donor substrate along the weakened zone.

2. The manufacturing method of claim 1, wherein the supporting substrate comprises:

– a top surface onto which the covering layer, the dielectric layer and the useful layer are transferred;

– a bottom surface opposite to the top surface;

– a peripheral zone connecting the bottom surface and the top surface; and

wherein the contour of the contact surface and the peripheral zone of the supporting substrate delimit an essentially annular surface of width $L_1$, and steps b) and e) are executed such that the contour of the dielectric layer and the peripheral zone of the supporting substrate delimit an

essentially annular surface with a width $L_2$ of between 105% and 150% of the width $L_1$.

3. The manufacturing method of claim 1,wherein forming the dielectric layer comprises the following steps:

b1) forming a layer of dielectric material on the donor substrate; and

b2) partially removing the layer of dielectric material such that the residual layer of dielectric material forms the dielectric layer and the contour of the dielectric layer is contained within the peripheral surface of the donor substrate.

4. The manufacturing method of claim 1, wherein the dielectric layer comprises silicon nitride and has a thickness of between 10 nm and 80 nm, and wherein the covering layer comprises silicon dioxide and has a thickness greater than 80 nm.

5. The manufacturing method of claim 1, wherein the dielectric layer comprises silicon oxide, and wherein the covering layer comprises polycrystalline silicon or amorphous silicon.

6. The manufacturing method of claim 1, wherein the donor substrate comprises at least one of the following materials: silicon, germanium, and silicon germanium alloy.

7. The manufacturing method of claim 1, wherein step f) is followed by a heat treatment step for encapsulating the covering layer and the dielectric layer with the useful layer.

8. The manufacturing method of claim 1, wherein the donor substrate comprises an additional layer, the additional layer being in contact with the dielectric layer, the additional layer having the same chemical composition as the covering layer.

9. The manufacturing method of claim 8, wherein the donor substrate comprises silicon, the additional layer comprises silicon dioxide, the dielectric layer comprises silicon nitride, and the covering layer comprises silicon dioxide.

10. The manufacturing method of claim 2, wherein the contour of the dielectric layer and the peripheral zone of the supporting substrate delimit an essentially annular surface with a width $L_2$ of between 110% and 140% of the width $L_1$.

11. The manufacturing method of claim 10, wherein the contour of the dielectric layer and the peripheral zone of the supporting substrate delimit an essentially annular surface with a width $L_2$ of between 115% and 130% of the width $L_1$.

12. The manufacturing method of claim 2, wherein forming at least the dielectric layer comprises the following steps:

b1) forming a layer of dielectric material on the donor substrate; and

b2) partially removing the layer of dielectric material such that the residual layer of dielectric material forms the dielectric layer and the contour of the dielectric layer is contained within the peripheral surface of the donor substrate.