

**PROCESS FOR THE MANUFACTURE OF A COMPOSITE STRUCTURE COMPRISING
A THIN LAYER MADE OF MONOCRYSTALLINE SiC ON A CARRIER SUBSTRATE
MADE OF SiC**

ABSTRACT

The invention relates to a process for the manufacture of a composite structure comprising a thin layer made of monocrystalline silicon carbide arranged on a carrier substrate made of silicon carbide, the process comprising:

- a) a step of providing a donor substrate made of monocrystalline SiC, the donor substrate comprising a donor layer produced by epitaxial growth on an initial substrate, the donor layer exhibiting a density of crystal defects which is lower than that of the initial substrate,
- b) a step of ion implantation of light entities into the donor layer, in order to form a buried brittle plane delimiting the thin layer between said buried brittle plane and a free face of said donor layer,
- c) a succession of n steps of formation of carrier layers, with n greater than or equal to 2; the n carrier layers being arranged on the donor layer successively on one another, and forming the carrier substrate; each step of formation comprising a chemical vapour deposition, at a temperature of between 400°C and 1100°C, in order to form a carrier layer made of polycrystalline SiC; the n chemical vapour depositions being carried out at n different temperatures,
- d) a step of separation along the buried brittle plane, in order to form, on the one hand, a composite structure comprising the thin layer on the carrier substrate and, on the other hand, the remainder of the donor substrate,
- e) a step of mechanical and/or chemical treatment(s) of the composite structure.

[Fig. 2d]