

Method for manufacturing a composite structure including a grading step**ABSTRACT**

The invention relates to a method for manufacturing a composite structure comprising a thin film made of single-crystal silicon carbide disposed on a carrier substrate made of polycrystalline silicon carbide, the method comprising the following steps of:

- 1) providing at least one donor substrate made of single-crystal silicon carbide, having a front face and a rear face, with the front face potentially having defects, called primary defects;
- 2) checking the quality of the at least one donor substrate using a photoluminescence imaging technique so as to extract a map of the front face, called first map, listing the primary defects identified as being of the micro-pipe type, of the complex star-shaped stacking defect type or of the point defect type;
- 3) transferring a thin film, derived from a surface film of the at least one donor substrate, onto a carrier substrate made of polycrystalline silicon carbide, in order to obtain a composite structure and a residual donor substrate;
- 4) inspecting a free surface of the thin film of the composite structure using a defect inspection technique using ultraviolet laser beam scattering, so as to extract a map of the free surface, called second map, listing defects, called secondary defects;
- 5) grading the composite structure, including comparing the first map and the second map.

Figs. 3a-3f