CLAIMS

1. Hybrid structure for surface acoustic wave device comprising a working layer of piezoelectric material assembled with a support substrate having a lower coefficient of thermal expansion than that of the working layer, and an intermediate layer located between the working layer and the support substrate, the hybrid structure being characterized in that the intermediate layer is a sintered composite layer, formed from powders of at least a first material and a second material different from the first.

2. Hybrid structure for surface acoustic wave device according to the preceding claim, in which:
   - the first material has a similar acoustic impedance to that of the working layer,
   - the ratio between the acoustic impedance of the working layer and the acoustic impedance of the second material is greater than 2,
   - the mean size of the particles of the powders of the first and the second material is greater than or equal to a quarter of the wavelength of the acoustic signal intended to propagate at the surface of the surface acoustic wave device.

3. Hybrid structure for surface acoustic wave device according to Claim 1, in which:
   - the first material and the second material are selected so as to form an acoustic impedance matching layer between the working layer and the support substrate,

- the mean size of the particles of the powders of the first and the second material is less than a quarter of the wavelength of the acoustic signal intended to propagate at the surface of the surface acoustic wave device.

4. Hybrid structure for surface acoustic wave device according to one of the preceding claims, in which the support substrate comprises a material selected from silicon, glass, silica, sapphire, alumina, aluminium nitride.

5. Hybrid structure for surface acoustic wave device according to one of the preceding claims, in which the working layer comprises a piezoelectric material selected from lithium tantalate ($LiTaO_3$), lithium niobate ($LiNbO_3$), quartz, zinc oxide (ZnO).

6. Hybrid structure for surface acoustic wave device according to one of the preceding claims, in which the first and second materials are selected from silicon oxide, silicon nitride, silicon, silicon carbide, alumina, germanium, sapphire, zirconium.

7. Process for manufacturing a hybrid structure for a surface acoustic wave device characterized in that it comprises the following steps:
   i) providing a working layer of piezoelectric material and a support substrate having a lower coefficient of thermal expansion than that of the working layer;
   ii) depositing a layer formed from a mixture of powders of at least a first material and a second material different from the first on a first face of the working layer and/or on a first face of the support substrate;

iii) sintering the layer formed from the mixture of powders to obtain a sintered composite layer firmly attached to the first face of the working layer and/or to the first face of the support substrate;

iv) assembling the working layer and the support substrate, so that the composite layer is positioned between the working layer and the support substrate.

8. Process for manufacturing a hybrid structure for a surface acoustic wave device according to the preceding claim, in which the first face of the working layer and/or the first face of the support substrate comprises a protective layer, prior to the deposition of the layer formed from the mixture of powders from step ii).

9. Process for manufacturing a hybrid structure for a surface acoustic wave device according to the preceding claim, in which the protective layer is formed by at least one material selected from silicon nitride, a silicon oxynitride, a silicon oxide and alumina.

10. Process for manufacturing a hybrid structure for a surface acoustic wave device according to one of the preceding three claims, in which the mixture of powders is in the form of a viscous paste, and the deposition of the layer formed by said mixture in step ii) is carried out by spin coating.

11. Process for manufacturing a hybrid structure for a surface acoustic wave device according to the preceding claim, in which the deposition of the layer formed by the mixture of powders is followed by a low-temperature heat treatment in order to discharge at least one liquid component of the viscous paste.

12. Process for manufacturing a hybrid structure for a surface acoustic wave device according to one of the preceding five claims, in which a bonding layer is deposited on the composite layer, prior to the assembly step iv).

13. Process for manufacturing a hybrid structure for a surface acoustic wave device according to one of the preceding six claims, in which the working layer provided in step i) is a piezoelectric material donor substrate.

14. Process for manufacturing a hybrid structure for a surface acoustic wave device according to the preceding claim, comprising a step v) of thinning the donor substrate to the desired thickness of the working layer for the manufacture of the acoustic wave device.