CLAIMS

1. Method for manufacturing a sound-absorbing panel (10) with a sandwich structure and having the shape of portions of cylindrical surfaces for reducing the noise impact of an aeronautic engine, comprising the following steps in sequence:

a) providing a first skin (12) made of a thermoplastic polymeric material;

b) making a plurality of micro-holes (18) through the first skin (12) by mechanical punching of the first skin (12);

c) having the first skin (12) undergo a process of thermoforming on a mold;

d) securing the first skin (12) to a central layer (14) by arranging a structural adhesive layer between the first skin (12) and the central layer (14); and

e) securing the central layer (14) to a second skin (16) by arranging a structural adhesive layer between the central layer (14) and the second skin (16),

wherein at least two adjacent components among the first skin (12), the central layer (14) and the second skin (16) comprise uncured polymerizable material; and

wherein step d) and/or step e) further comprise the step of:

f) having the first skin (12), the central layer (14), and the second skin (16) undergo a curing process in autoclave with vacuum bag, according to a specific pressure and temperature cycle, for co-curing the uncured components.

2. The method according to claim 1:

wherein the step d) further comprises securing the first skin (12) to the central layer (14) by a thermal weld between the first skin (12) and the central layer (14); and

wherein the step e) further comprises securing the central layer (14) to the second skin (16) by a thermal weld between the central layer (14) and the second skin (16).

3. Sound-absorbing panel (10) obtained by a method according to any one of the preceding claims.

4. Sound-absorbing panel according to claim 3, wherein the central layer (14) is made of at least one of:

a) a thermoplastic material;

b) aluminium;

c) a material with a meta-aramid base; and

d) a composite material with a phenolic resin base reinforced with glass fibres.

5. Sound-absorbing panel according to claim 3 or to claim 4, wherein the central layer (14) has a honeycomb structure.

6. Sound-absorbing panel according to any one of claims 3 to 5, wherein the second skin (16) is made of at least one of:

a) a polymeric material; and

b) a composite material with a thermosetting polymeric matrix and a fibre reinforcement.

7. Sound-absorbing panel according to any one of claims 3 to 6, wherein the thermoplastic polymer material of the first skin (12) is made of at least one of: PEEK (poly ether-ether-ketone), PEK (poly ether-ketone), PEI (polyether-imide), nylon, PET (polyethylene terephthalate), PAEK (poly-aryl-ether-ketone), PPS (poly-para-phenyl-sulphide), PA (poly amide), PPSU (poly-phenyl-sulfone), PC (poly-carbonate), and PP (polypropylene).

8. Sound-absorbing panel according to any one of claims 3 to 7, wherein the first skin (12) has a thickness comprised between about 300 and about 1500 micrometres, more preferably between about 500 and about 1200 micrometres.

9. Sound-absorbing panel according to any one of claims 3 to 8, wherein the micro-holes (18) cover a percentage of the area of the first skin (12) comprised between about 3% and about 50%, more preferably comprised between about 3% and about 15%.

10. Sound-absorbing panel according to any one of claims 3 to 9, wherein the diameter of the micro-holes (18) is comprised between about 100 micrometres and about 3000 micro metres, preferably between about 1000 and about 1500 micrometres.

11. Sound-absorbing panel according to claim 4, wherein the central layer (14):

a) is made of the thermoplastic material; and

b) includes a three-dimensional structure formed by a plurality of walls that are mutually converging and/or intersecting, adapted to distance the first skin (12) from the

second skin (16), and to define, between them, a plurality of resonance chambers (20) of variable geometry, each resonance chamber (20) being in communication with the outside of the sound-absorbing panel (10) through at least one micro-hole (18) of the first skin (12).

12. Aircraft engine nacelle (22) comprising a sound-absorbing panel (10) according to any one of claims 3 to 11.