o

CLAIMS

1. A sound-absorbing panel (1) comprising a padding layer (20) with heat-bonded synthetic fibers (10), wherein said padding layer (20) has a first outer surface (20A), a second outer surface (20B) and a first thickness (SP1), wherein said panel(1) is made of said padding layer (20) with no further layers of a different material between said first outer surface (20A) and said second outer surface (20B), wherein said padding layer in at least one portion (P) of panel has a variable density in a direction transverse to the first and second outer surfaces (20A, 20B), said density being higher in proximity of said first and second outer surfaces (20A, 20B) thereof and being lower in proximity of its innermost layer, wherein said padding layer (20) is configured to comprise an edge (14) with a second thickness (SP2) which is smaller than the first thickness (SP1), the edge (14) extending along an entire perimeter of said panel (1); wherein the first outer surface and the second outer surface are symmetrical in the transverse direction from the at least one portion (P) to the edge (14) of the panel; and wherein said panel (1) is outwardly convex in the transition (SP3) between said first thickness (SP1) and said second thickness (SP2) for improving acoustic performance.

2. The sound-absorbing panel (1) according to claim 1, wherein said density in proximity of said first outer surface (20A) is substantially as said density in proximity of said second outer surface (20B).

3. The sound-absorbing panel (1) according to claim 1 or 2, wherein, in said at least one portion (P) of said panel (1), the weight of an outer layer having a thickness of about 10% of said first thickness (SP1) is between about 20% and 30% of the weight of the panel in said at least one portion (P).

4. The sound-absorbing panel (1) according to claim 1 or 2, wherein, in said at least one portion (P) of said panel (1), the weight of an outer layer having a thickness of about 20% of said first thickness (SP1) is between about 25% and 45% of the weight of the panel.

o

5. The sound-absorbing panel (1) according to any one of the preceding claims, wherein it further comprises a first layer of fabric (11) facing said first outer surface (20A) of said padding layer (20) and a second layer of fabric (12) facing said second outer surface (20B) of said padding layer (20).

6. The sound-absorbing panel (1) according to claim 1, wherein the second thickness (SP2) is between about 5% and about 20% of said first thickness (SP1) measured at a central location (P) of said panel (1).

7. The sound-absorbing panel (1) according to claim 1, wherein said edge (14) has a density substantially as, or higher than, the density in proximity of said first and second outer layers.

8. The sound-absorbing panel (1) according to any one of the preceding claims, wherein said heat-bonded synthetic fibers (10) comprise polyester fibers.

9. The sound-absorbing panel (1) according to claim 5, which further comprises an adhesive layer (13) arranged between said first and second outer surfaces (20A, 20B) of the padding layer (20) and each of said layers of fabric (11, 12).

10. The sound-absorbing panel (1) according to any one of the preceding claims, comprising one or more depressions (110, 120) having a thickness (SP2, SP4) smaller than the first thickness (SP1).

11. The sound-absorbing panel (1) according to claim 10, wherein said one or more depressions (110, 120) comprise one or more holes for fixing members.

12. The sound-absorbing panel (1) according to any one of the preceding claims, comprising fins (15) configured to penetrate into holes (17) of a support frame (16, 16a, 16b).

o

13. A method for manufacturing a sound-absorbing panel (1), comprising the steps of:

a) providing a padding layer (20) with heat-bonded synthetic fibers, wherein said padding layer (20) has a first outer surface (20A) and a second outer surface (20B) and has an initial thickness (SPO), wherein, in at least one portion (p) of said panel (1), said panel (1) is made of said padding layer (20) with no further layers of a different material between said first outer surface and said second outer surface;

b) treating said padding layer (20) so that, in said at least one portion (p) thereof, it changes from the initial thickness (SPO) to a first thickness (SP1) and so that, in said at least one portion of the panel (P), said panel has a variable density in a direction transverse to the first and second outer surfaces (20A, 20B), said density being higher in proximity of said first and second outer layers thereof and being lower in proximity of its innermost layer, wherein said padding layer (20) is treated to comprise an edge (14) with a second thickness (SP2) which is smaller than the first thickness (SP1), the edge (14) extending along an entire perimeter of said panel (1); wherein the first outer surface and the second outer surface are symmetrical in the transverse direction from the at least one portion (P) to the edge (14) of the panel; and wherein said panel (1) is outwardly convex in the transition (SP3) between said first thickness (SP1) and said second thickness (SP2) for improving acoustic performance.

14. The method according to claim 13, wherein said treatment step comprises the steps of:

c) laying a first layer of fabric (11) facing said first outer surface (20A) of said padding layer (20) and a second layer of fabric (12) facing said second outer surface (20B) of said padding layer (20);

d) pre-heating said padding layer 20);

e) forming said padding layer (20) by exerting a pressure (p1) on said padding layer (20) associated with the first and second layers of fabric (11, 12) at least in a portion of the perimeter of said panel (1) so that the thickness of the padding layer (20) changes, at least in said portion of the panel (P), from the initial thickness (SPO) to a first thickness (SP1).

o

15. The method according to claim 13 or 14, further comprising one or more of the following steps:

f) depositing an adhesive layer (13) between said padding layer (20) and each of said layers of fabric (11, 12);

g) shaping the edge in order to finish the ends of said edges (14, 15); and

h) drilling at least one hole where at least one depression with a reduced thickness (110, 120) is present.