Patent claims

1. Process for the production of a fragmentation projectile (1-1") partially consisting of defined nearly form fitting segments (F_A,F_B;F1-F3) of medium to high density, having connecting spots (6) between consecutive longitudinally and/or radially oriented segments (F_A,F_B;F1-F3), whereby said segments (F_A,F_B;F1-F3) and spots (6) are produced by additive manufacturing (AM), so that the segments (F_A,F_B;F1-F3) are nearly form fitting and partly material fitting to keep together to form a compact projectile (1-1") until its impact on the target.

2. Process for the production of a fragmentation projectile (1-1") according to claim 1, characterized in that the projectile (1-1") is produced by "Powder Bed Laser Beam Technology" (LBM) process, whereby crevices (8) are created with the radiation source temporarily switched off for such a length of time that, of the fed or existing metal or ceramic or polymer powder, 1 to 6 grains are not melted or sintered.

3. Process for the production of a fragmentation projectile (1-1") according to claim 1 or 2, characterized in that the projectile (1-1") is produced by the "Powder Bed Laser Beam Technology" (LBM) process with a grain size of 53 µm to 99%, consisting of Cu 77.0%, Ni 14.7%, Sn 6.8% and P 1.5% (percent by weight).

4. Process for the production of a fragmentation projectile (1-1") according to claim 1, characterized in that the projectile (1-1") is produced on the basis of "Direct Metal Deposition" (DMD) with "Multipowder Feeder" and/or by "Laser Powder-Spray Manufacturing" (LPM).

5. Process for the production of a fragmentation projectile (1-1") according to one of the claims 1 to 4, characterized in that, prior to its fitting into a cartridge (2), the projectile (1-1") is smoothened by grinding and/or barrel finishing.

6. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claims 1 to 4, with defined nearly form fitting segments (F_A,F_B,F_C;Fl-F3) of medium to high density, characterized in that consecutive segments (F_A,F_B,F_C;Fl-F3) are nearly form fitting with crevices (8) ranging from 3 µm to 100 µm preferably from 8 µm to 10 µm and that with partially material fitting connecting spots (6) form a compact projectile until its impact on the target.

7. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 6, characterized by a frontal cavity (7) and spots (6) between defined segments (F_A,F_B,F_C), whereby the segments (F_A,F_B,F_C) are nearly form fitting together to form a compact projectile until its impact on the target.

8. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 7 characterized in that the cavity (7) has at least in its front area the shape of an equilateral triangle.

9. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 7, characterized in that the cavity (7) is at least in one front segment (F1) of spiral shape in opposite direction of the projectile's twist (D).

10. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 7 or 8 or 9 characterized in that the frontal cavity (7) features a maximum aperture amounting to 0,2-times of the projectile's caliber.

11. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 6, characterized in that the segments (F_A,F_B,F_C;F1-F3) consist of brass or bronze and/or of a lead-free alloy of both.

12. Fragmentation projectile (1") produced by additive manufacturing (AM) according to claim 6, characterized in that the segments (F_A,F_B,F_C;F1-F3) extend around a dart(13) of tungsten or that central segments are of tungsten and/or an alloy thereof.

13. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 6, characterized in that the projectile (1-1") consists of a steel alloy and that its surface is coated.

14. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 13, characterized in that the coating consists of tin, copper or an alloy thereof.

15. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 6, characterized in that the segments (F_A,F_B,F_C;F1-F3) form a frame of at least two parts which frame (F_A,F_B) remains connected until the impact on the target and which features a decreasing resistance to fracture towards the tip (F1).

16. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 6, characterized in that at least a part of the segments consist of a composite material.

17. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 16, characterized in that the composite material contains ceramics and/or polymers.

18. Fragmentation projectile (1-1") produced by additive manufacturing (AM) according to claim 7, characterized in that in the cavity (7) the tip of a dart projectile is located.

19. Use of a projectile (1-1") according to at least one of the claims 6 to 17 as pistol ammunition.

20. Use of a projectile (1-1") according to at least one of the claims 6 to 17 as police ammunition.

21. Use of a projectile (1-1") according to at least one of the claims 6 to 17 as military small-caliber ammunition.

22. Use of a projectile (1-1") according to at least one of the claims 6 to 17 as ammunition for hunting purposes.

23. Use of a projectile (1-1") according to at least one of the claims 6 to 16 as mortar or artillery ammunition.

24. Use of a projectile (1-1") according to claim 18 as ammunition for underwater targets.