CLAIMS

1. A method of fabricating a hydrophobic coating on a surface of a solid substrate which includes a layer-integrable material, the method comprising:

depositing a deformable layer of the layer-integrable material onto the surface of the solid substrate;

forcibly spraying a plurality of particles within the deformable layer; and

solidifying the deformable layer including the plurality of particles so as to be integral with the surface of the solid substrate,

in which at least a portion of the plurality of particles is embedded at a threshold depth within the deformable layer in a range of one quarter of the average diameter of the plurality of particles to 100 times an average diameter of the plurality of particles prior to solidification,

in which upon solidification of the deformable layer a first portion of the plurality of particles are exposed on a surface of the solidified deformable layer, and another portion of the plurality of particles are fully embedded within the solidified deformable layer.

2. A method according to Claim 1, in which the step of forcibly embedding a plurality of particles within the deformable layer includes bombarding the deformable layer with a stream of particles at selected momenta.

3. A method according to Claim 1, in which the plurality of particles have a size in a range of 1 nm to 50 μm.

4. A method according to Claim 3, in which the plurality of particles have a size in the range of 5 nm to 50 nm.

5. A method according to Claim 1, in which the plurality of particles has a size distribution ranging between 1 and 50 percent from an average size value.

6. A method according to Claim 1, in which the plurality of particles has a multimodal size distribution.

7. A method according to Claim 1, in which the deformable layer is deposited in one of a fluid, semi-viscous or viscous form.

8. A method according to Claim 1, in which the layer-integrable material comprises an epoxy resin.

9. A method according to Claim 8, in which the plurality of particles are composed of silica.

10. A method according to Claim 1, in which upon solidification of the deformable layer, the plurality of particles have a hierarchical morphology such that a portion of the plurality of particles are exposed on a surface of the solidified deformable layer, and a portion of the plurality of particles are fully embedded with the solidified deformable layer.