

Claims

1. An electrical submersible pumping (“ESP”) assembly (45) having a pump (58) driven by an electrical motor (10), the motor having a stack of stator laminations (16), the stator laminations having slots (20) formed therethrough, and magnet wires (22) wound through the slots, characterized by:

an encapsulate (24) that bonds the magnet wires within each of the slots together, the encapsulate comprising ceramic particles (25) bonded together within a polymer matrix (27).

2. The ESP assembly of claim 1, wherein the ceramic particles have a size of 20 mesh to 140 mesh.
3. The ESP assembly of claim 1, wherein the polymer matrix comprises a fluoropolymer that is selected from a group consisting of perfluoroalkoxy (“PFA”), fluorinated ethylene propylene (“FEP”), polytetrafluoroethylene (“PTFE”), and combinations thereof.
4. The ESP assembly of claim 1, wherein each of the magnet wires comprises an electrical insulation layer (22b) surrounding a copper core (22a).
5. The ESP assembly of claim 1, wherein the ceramic particles are generally spherical.
6. The ESP assembly of claim 1, wherein each of the ceramic particles has a cross-sectional area much smaller than a cross-sectional area of each of the magnet wires.
7. The ESP assembly of claim 1, wherein:
 - each of the slots has a perimeter (21); and
 - at least some of the magnet wires are in contact with the perimeter.

8. The ESP assembly of claim 1, wherein:
the polymer matrix fills all voids within each of the slots.
9. The ESP assembly of claim 1, wherein:
the polymer matrix is formed of an electrical insulation material.
10. The ESP assembly of claim 1, wherein the ceramic particles are porous.
11. The ESP assembly according to claim 1, wherein:
the polymer matrix comprises a fluoropolymer adhesive.
12. The ESP assembly of claim 1, wherein:
each of the slots has a perimeter;
at least some of the magnet wires are in contact with the perimeter; and
a portion of the polymer matrix is in contact with the perimeter.