CLAIMS

1. A non-metallic flexible pipe, sequentially comprising, from the inside to the outside, an inner liner, a pressure-bearing layer, an isolation layer, a tensile layer, a functional layer, and a protective layer, with non-rigid bonding being between two adjacent layers,

wherein the material of the inner liner is a thermoplastic polymer, the material of the pressure-bearing layer is a fiber-reinforced resin-based composite, the material of the isolation layer is a thermoplastic polymer, the material of the tensile layer is a resin-reinforced fiber, at least one of an optical fiber, a cable, a tracing ribbon, a pipe for conveying a heat transfer medium, a pressure sensor, and a temperature sensor is provided in the functional layer, and the material of the protective layer is a thermoplastic polymer;

the pressure-bearing layer is formed by at least one pair of pressure-bearing belts being wrapped on the inner liner successively and extending along the axial direction of the inner liner,

in each pair of pressure-bearing belts, the inner surface of the later wrapped pressure-bearing belt covers the outer surface of the first wrapped pressure-bearing belt, and an interlocking structure is formed between the two surfaces, so that relative displacements do not occur between the two bearing belts in the axial direction;

in each pair of pressure-bearing belts, the pressure-bearing belts wrapped successively are staggered, with inlaid connection being between the two surfaces that contact each other;

the pressure-bearing belt is obtained by twisting fibers into bundles, extruding and impregnating with a resin, and curing the impregnating resin;

the isolation layer and the tensile layer disposed adjacent to each other are set as a

group, and 1-3 groups of the isolation layer and the tensile layer are disposed between the pressure-bearing layer and the functional layer.

2. The non-metallic flexible pipe according to claim 1, wherein the thermoplastic polymer used for the inner liner is an engineering thermoplastic, and the inner liner has a thickness of 1-20 mm.

3. The non-metallic flexible pipe according to claim 1, wherein the pressure-bearing layer has a width of 10-100 mm and a thickness of 1-20 mm.

4. The non-metallic flexible pipe according to claim 1, wherein the tensile layer is a single-layer structure, or a multi-layer structure with non-rigid bonding between the layers, wherein the tensile layer has a thickness of 1-25 mm.

5. The non-metallic flexible pipe according to claim 4, wherein each layer of the tensile layer is formed by coating a fiber cloth woven from fibers on the surface of the isolation layer, impregnating the fiber cloth with a resin, and curing the resin.

6. A manufacturing method for the non-metallic flexible pipe of any one of claims 1-5, comprising the following steps:

(1) a thermoplastic polymer is melt-extruded, and shaped and cooled to obtain an inner lining pipe with a preset size, namely, the inner liner;

(2) two pressure-bearing belts made of a fiber-reinforced resin-based composite are wrapped on the surface of the inner lining pipe successively and extend along the axial direction of the inner lining pipe to form the pressure-bearing layer;

(3) a thermoplastic polymer is melt-extruded and wrapped on the surface of the pressure-bearing layer, and then shaped and cooled to form the isolation layer;

(4) fibers are woven onto the surface of the isolation layer, so that the woven fiber cloth is coated on the surface of the isolation layer; the fiber cloth is impregnated with or coated with a resin, and the resin is cured to form the tensile layer;

(5) at least one of an optical fiber, a cable, a tracing ribbon, a pipe for conveying a heat transfer medium, a pressure sensor, and a temperature sensor is wrapped on the surface of the tensile layer to obtain the functional layer; and

(6) a thermoplastic polymer is extruded outside the functional layer, and shaped and cooled to complete the coating of the protective layer;

wherein the step (2) is carried out for 1-5 times, wherein the pressure-bearing belt is obtained by twisting fibers into bundles, extruding and impregnating with a resin, and curing the impregnating resin.