Claims

1. A hybrid rope, comprising a core element, a first and a second metallic closed layer surrounding said core element,
   wherein the core element includes a bundle or construction of synthetic yarns,
   the first metallic closed layer includes a plurality of first wirelike members helically twisted together around the core element in a first direction,
   the second metallic closed layer includes a plurality of second wirelike members helically twisted together round said core element and said first metallic closed layer in a second direction,
   and wherein the cross-sectional area of the core element is larger than the total cross-sectional area of the first and second metallic closed layers.
2. The hybrid rope as in claim 1, wherein the ratio of the cross-sectional area of the core element to the total cross-sectional area of the first and second metallic closed layers is 60:40.
3. The hybrid rope as in claim 1 or 2, wherein said hybrid rope has a diameter in the range of 10 to 400 millimeter.
4. The hybrid rope as in any one of preceding claims, further comprising a jacket surrounding the second metallic closed layer, said jacket comprising a plastomer, thermoplastic, a braided cover and/or elastomer.
5. The hybrid rope as in any one of preceding claims, wherein the wirelike metallic members are steel wires and/or steel wire strands.
6. The hybrid rope as in claim 5, wherein the steel wires and/or steel wire strands are coated with zinc and/or zinc alloy.
7. The hybrid rope as in claims 5 or 6, wherein the steel wires and/or steel wire strands are end galvanized.
8. The hybrid rope as in any one of preceding claims, wherein said first wirelike members have a first diameter, said second wirelike members have a second diameter, and the first diameter is different from the second diameter.
9. The hybrid rope as in any one of preceding claims, wherein said first wirelike members have a first diameter, said second wirelike members have a second diameter, and the first diameter is equal to the second diameter.
10. The hybrid rope as in any one of preceding claims, wherein the spin efficiency of the wirelike members is more than 90 %.

11. The hybrid rope as in any one of preceding claims, wherein the first twist direction and the second twist direction are different lay directions.
12. The hybrid rope as in any one of preceding claims, wherein the core has a laid or a braided construction and the core element is coated with a plastomer, thermoplastic, braided cover and/or elastomer.
13. An assembly of a hybrid rope and a socket, wherein the hybrid rope is as in any one of preceding claims and the rope is terminated at least at one of its ends by a socket having a conically shaped space, and wherein the conically shaped space of the socket has a conical angle α of between 2 and 8 ° and a length A of between 5D and 20D, D being the smallest diameter of the conically shaped space, the steel wires having been untwisted at said at least one of the ends, the open space around the untwisted wires and core in the hollow conical body of the socket being filled with a resin.
14. A method of producing a hybrid rope comprising a core element, a first and a second metallic closed layer, wherein the cross-sectional area of the core element is larger than the total cross-sectional area of the first and second metallic closed layers, comprising the steps of:
    (a) providing the core element, wherein said core element includes a bundle or construction of synthetic yarns;
    (b) twisting a plurality of first wirelike members together around the core element in a first direction to form the first metallic closed layer;
    (c) twisting a plurality of second wirelike members together around said core element and said first metallic closed layer in a second direction to form the second metallic closed layer.
15. A method of producing a hybrid rope as in claim 14, further comprising the step of:
    (d) extruding the rope with a plastomer , thermoplastic, a braided cover and/or elastomer to form a jacket outside the second metallic closed layer.

Claims

1. A hybrid rope (40,50,60), comprising a core element (42,52,62), a first (44,54,64) and a second (46,56,66) metallic closed layer surrounding said core element,

   wherein the core element (42,52,62) includes a bundle or construction of synthetic yarns,

   the first metallic closed layer (44,54,64) includes a plurality of first wirelike members helically twisted together around the core element in a first direction, the second metallic closed layer (46,56,66) includes a plurality of second wirelike members helically twisted together round said core element and said first metallic closed layer in a second direction,

   and wherein the cross-sectional area of the core element is larger than the total cross-sectional area of the first (44,54,64) and second (46,56,66) metallic closed layers.

2. The hybrid rope as in claim 1, wherein the ratio of the cross-sectional area of the core element (42,52,62) to the total cross-sectional area of the first (44,54,64) and second (46,56,66) metallic closed layers is 60:40.
3. The hybrid rope as in claim 1 or 2, wherein said hybrid rope (40,50,60) has a diameter in the range of 10 to 400 millimeter.
4. The hybrid rope as in any one of preceding claims, further comprising a jacket (68) surrounding the second metallic closed layer (46,56,66), said jacket (68) comprising a plastomer, thermoplastic, a braided cover and/or elastorner.
5. The hybrid rope as in any one of preceding claims, wherein the wirelike metallic members are steel wires and/or steel wire strands.
6. The hybrid rope as in claim 5, wherein the steel wires and/or steel wire strands are coated with zinc and/or zinc alloy.
7. The hybrid rope as in claims 5 or 6, wherein the steel wires and/or steel wire strands are end galvanized.
8. The hybrid rope as in any one of preceding claims, wherein said first wirelike members have a first diameter, said second wirelike members have a second diameter, and the first diameter is different from the second diameter.
9. The hybrid rope as in any one of claims 1 to 7, wherein said first wirelike members have a first diameter, said second wirelike members have a second diameter, and the first diameter is equal to the second diameter.

10. The hybrid rope as in any one of preceding claims, wherein the spin efficiency of the wirelike members is more than 90 %.

11. The hybrid rope as in any one of preceding claims, wherein the first twist direction and the second twist direction are different lay directions.

12. The hybrid rope as in any one of preceding claims, wherein the core has a laid or a braided construction and the core element is coated with a plastomer, thermoplastic, braided cover and/or elastomer.

13. An assembly (30) of a hybrid rope (40,50,60) and a socket, wherein the hybrid rope (40,50,60) is as in any one of preceding claims and the rope is terminated at least at one of its ends by a socket having a conically shaped space, and wherein the conically shaped space of the socket has a conical angle $\propto$ of between 2 and 8 ° and a length A of between 5D and 20D, D being the smallest diameter of the conically shaped space, the steel wires having been untwisted at said at least one of the ends, the open space around the untwisted wires and core in the hollow conical body of the socket being filled with a resin.

14. A method of producing a hybrid rope (40,50,60) comprising a core element (42,52,62), a first (44,54,64) and a second (46,56,66) metallic closed layer, wherein the cross-sectional area of the core element (42,52,62) is larger than the total cross-sectional area of the first (44,54,64) and second (46,56,66) metallic closed layers, comprising the steps of:

(a)providing the core element (42,52,62), wherein said core element (42,52,62) includes a bundle or construction of synthetic yarns;

(b)twisting a plurality of first wirelike members together around the core element in a first direction to form the first metallic closed layer (44,54,64);

(c)twisting a plurality of second wirelike members together around said core element and said first metallic closed layer in a second direction to form the second metallic closed layer (46,56,66).

15. A method of producing a hybrid rope (40,50,60) as in claim 14, further comprising the step of:

(d)extruding the rope with a plastomer , thermoplastic, a braided cover and/or elastomer to form a jacket (68) outside the second metallic closed layer(46,56,66).