CLAIMS

1. A method of coating a pipe (1) in its interior, wherein the pipe (1) to be coated in its interior has

- an outside (a) and an inside (b),

- a first outer end (e_1) at the first end of the pipe (1) and a second outer end (e_2) at the second end of the pipe (1),

- a length (L),

- a first inside diameter (D_1) at the first outer end of the pipe (1) and a second inside diameter (D_2) at the second outer end of the pipe (1), and

- a central axis (M),

wherein the method according to the invention is characterised in that the method has at least the following method steps:

(i.) providing an immersion basin (2) which

- is filled with a coating liquid (3) up to a filling level (h) and

- is suitable for receiving over its full length (L) the pipe (1) to be coated,

(ii.) first immersion of the pipe (1) to be coated into the coating liquid (3),

(iii.) first removal of the pipe (1) to be coated from the coating liquid (3) ensuring an angle (α) between the central axis (M) and the surface of the coating liquid (3) with $1° < (\alpha) < 30°$,

(iv.) second immersion of the pipe (1) to be coated into the coating liquid (3),

(v.) second removal of the pipe (1) to be coated from the coating liquid (3) ensuring an angle (β) between the central axis (M) and the surface of the coating liquid (3) with $-30° < (\beta) < -1°$, and

(vi.) ensuring a filling level of the coating liquid (3) in the immersion basin (2) with $(h) > (L) \bullet \sin(\alpha)$ and $(h) > (L) \bullet \sin(\beta)$.

2. A method of coating a pipe (1) in its interior according to claim 1 characterised in that a plurality of pipes (1) are simultaneously subjected to method steps (ii.) to (vi.).

3. A method of coating a pipe (1) in its interior according to one of claims 1 and 2 characterised in that the four method steps (ii.) first immersion, (iii.) first removal, (iv.) second immersion and (v.) second removal are repeated with a repetition frequency of between 1 and 7.

4. A method of coating a pipe (1) in its interior according to one of claims 1 and 2 characterised in that the four method steps (ii.) first immersion, (iii.) first removal, (iv.) second immersion and (v.) second removal are repeated with a repetition frequency of between 1 and 3.

5. A method of coating a pipe (1) in its interior according to one of claims 1 to 4 characterised in that the angle (α) is within the range of 1.8° and 5.5°.

6. A method of coating a pipe (1) in its interior according to one of claims 1 to 4 characterised in that the angle (α) is within the range of 1.8° and 3.5°.

7. A method of coating a pipe (1) in its interior according to one of claims 1 to 6 characterised in that the angle (β) is within the range of -1.8° and -5.5°.

8. A method of coating a pipe (1) in its interior according to one of claims 1 to 6 characterised in that the angle (β) is within the range of -1.8° and -3.5°.

9. A method of coating a pipe (1) in its interior according to one of claims 1 to 8 characterised in that the angles (α) and (β) within the four method steps (ii.) first immersion, (iii.) first removal, (iv.) second immersion and (v.) second removal are identical.

10. A method of coating a pipe (1) in its interior according to one of claims 1 to 9 characterised in that the first inside diameter (D_1) at the first

end of the pipe (1) and the second inside diameter (D_2) at the second end of the pipe (1) are identical.

11. A method of coating a pipe (1) in its interior according to one of claims 1 to 10 characterised in that the coating liquid (3) is an epoxy/acrylic-based Aquence™ coating material.

12. A method of coating a pipe (1) in its interior according to one of claims 1 to 11 characterised in that the coating liquid (3) is kept in motion in the immersion basin (2) by means of a circulating device (6).

13. A method of coating a pipe (1) in its interior according to one of claims 1 to 12 characterised in that

- the immersion speed (v_1) for first immersion,
- the speed (v_2) for the first removal,
- the immersion speed (v_3) for the second immersion, and
- the speed (v_4) for the second removal

are respectively in a range of 6 to 12 m/min.

14. A method of coating a pipe (1) in its interior according to claim 13 characterised in that the filling level (h) is so selected to ensure internal wetting over the entire periphery with the coating liquid (3) over the entire pipe length (L) of the pipe (1) to be coated during an entire immersion and removal cycle (ii., iii., /// iv., v.) having regard to the speeds (v_1, v_2, v_3, v_4) over a period of 60 sec to 210 sec.

15. A method of coating a pipe (1) in its interior according to claim 13 characterised in that the filling level (h) is so selected to ensure internal wetting over the entire periphery with the coating liquid (3) over the entire pipe length (L) of the pipe (1) to be coated during an entire immersion and removal cycle (ii., iii., /// iv., v.) having regard to the speeds (v_1, v_2, v_3, v_4) over a period of 85 sec to 105 sec.

16. A method of coating a pipe (1) in its interior according to one of claims 1 to 15 characterised in that the pipe (1) is of a nominal width (n) in a range of DN 32 to DN 65.

17. A method of coating a pipe (1) in its interior according to one of claims 1 to 16 characterised in that the pipe (1) is in the form of a mild steel metal pipe of a length (L) in a range of 7 m to 12 m.

18. A method of coating a pipe (1) in its interior according to one of claims 1 to 17 characterised in that the pipe (1) to be coated is held by means of bar-like support holders (4) at least during the four method steps (ii.) first immersion, (iii.) first removal, (iv.) second immersion and (v.) second removal.

19. A method of coating a pipe (1) in its interior according to claim 18 characterised in that such bar-like support holders (4) are parts of an immersion frame (5).

20. A method of coating a pipe (1) in its interior according to one of claims 18 and 19 characterised in that the bar-like support holders (4) and/or the immersion frame (5) are Teflon-coated.

21. A pipe (1) produced according to a method according to one of claims 1 to 20 having an outside and an inside anti-corrosion coating.

22. A pipe (1) according to claim 21 characterised in that the anti-corrosion coating is an epoxy/acrylic-based Anquence™ coating.

23. A pipe according to claim 22 characterised in that the anti-corrosion coating is of a layer thickness in a range of 15 to 28 µm.

24. Use of a pipe (1) produced according to a method according to one of claims 1 to 20 as a transport pipe for fire extinguishing media within a fire extinguishing system.

The invention claimed is:

1. A method of coating a pipe (**1**) in its interior, wherein the pipe (**1**) to be coated in its interior has

an outside (a) and an inside (b),

a first outer end (e_1) at the first end of the pipe (**1**) and a second outer end (e_2) at the second end of the pipe (**1**),

a length (L),

a first inside diameter (D_1) at the first outer end of the pipe (**1**) and a second inside diameter (D_2) at the second outer end of the pipe (**1**), and

a central axis (M),

wherein the method according to the disclosure is characterised in that the method has at least the following method steps:

(i.) providing an immersion basin (**2**) which

is filled with a coating liquid (**3**) up to a filling level (h), the coating liquid containing FeF_3iron fluoride and paint particles in dispersion and

is suitable for receiving over its full length (L) the pipe (**1**) to be coated,

(ii.) first immersion of the pipe (**1**) to be coated into the coating liquid (**3**) in a chemical-based process,

(iii.) first removal of the pipe (1) to be coated from the coating liquid (**3**) ensuring an angle (α) between the central axis (M) and the surface of the coating liquid (**3**) with $1° < (\alpha) < 30°$,

(iv.) second immersion of the pipe (**1**) to be coated into the coating liquid (**3**) in a chemical-based process,

(v.) second removal of the pipe (**1**) to be coated from the coating liquid (**3**) ensuring an angle (β) between the central axis (M) and the surface of the coating liquid (**3**) with $-30° < (\beta) < -1°$, and

(vi.) ensuring a filling level of the coating liquid (**3**) in the immersion basin (**2**) with $(h) > (L) \cdot \sin(\alpha)$ and $(h) > (L) \cdot \sin(\beta)$.

2. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein a plurality of pipes (**1**) are simultaneously subjected to method steps (ii.) to (vi.).

3. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein the four method steps (ii.) first immersion,

(iii.) first removal, (iv.) second immersion and (v.) second removal are repeated with a repetition frequency of between 1 and 7.

4. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein the four method steps (ii.) first immersion, (iii.) first removal, (iv.) second immersion and (v.) second removal are repeated with a repetition frequency of between 1 and 3.

5. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein the angle (α) is within the range of 1.8° and 5.5°.

6. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein the angle (α) is within the range of 1.8° and 3.5°.

7. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein the angle (β) is within the range of −1.8° and −5.5°.

8. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein the angle (β) is within the range of −1.8° and −3.5°.

9. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein the angles (α) and (β) within the four method steps (ii.) first immersion, (iii.) first removal, (iv.) second immersion and (v.) second removal are identical.

10. A method of coating a pipe (**1**) in its interior according to claim 1, wherein the first inside diameter (D_1) at the first end of the pipe (**1**) and the second inside diameter (D_2) at the second end of the pipe (**1**) are identical.

11. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein the coating liquid (**3**) is kept in motion in the immersion basin (**2**) by means of a circulating device (**6**).

12. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein

the immersion speed (v_1) for first immersion,
the speed (v_2) for the first removal,
the immersion speed (v_3) for the second immersion, and
the speed (v_4) for the second removal

are respectively in a range of 6 to 12 m/min.

13. A method of coating a pipe (**1**) in its interior according to claim **12**, wherein the filling level (h) is so selected to ensure internal wetting over the entire periphery with the coating liquid (**3**) over the entire pipe length (L) of the pipe (**1**) to be coated during an entire immersion and removal cycle (ii., iii., /// iv., v.) having regard to the speeds (v_1, v_2, v_3, v_4) over a period of 60 sec to 210 sec.

14. A method of coating a pipe (**1**) in its interior according to claim **12**, wherein the filling level (h) is so selected to ensure internal wetting over the entire periphery with the coating liquid (**3**) over the entire pipe length (L) of the pipe (**1**) to be coated during an entire immersion and removal cycle (ii., iii., /// iv., v.) having regard to the speeds (v_1, v_2, v_3, v_4) over a period of 85 sec to 105 sec.

15. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein the pipe (**1**) is of a nominal width (n) in a range of DN **32** to DN **65**.

16. A method of coating a pipe (**1**) in its interior according to claim **1**, wherein the pipe (**1**) is in the form of a mild steel metal pipe of a length (L) in a range of 7 m to 12 m.