

they then have a good homogeneity of the properties within the thickness; as concerns thicknesses exceeding 40 mm, the very good structural stability permits retaining high levels of resilience and ductility within the thickness.

Owing to its mechanical properties, its resistance to corrosion, its aptitude for welding and the manufacture of thick parts, the steel according to the invention may be used advantageously in particular for manufacturing:

tubes, flanges, collectors, oil pipelines, gas pipelines, separators, pumps, compressors, exchangers adapted to be used in contact with sea water or fluids containing chlorides and H<sub>2</sub>S, in particular for any equipment for firefighting processes or circuits conducting sea water on marine oil platforms,

tubes, flanges, tanks, reactors, pumps, compressors and more generally any part or wall of equipment for the chemical industry, for manufacturing paper pulp, hydrometallurgy, depollution operating in contact with fluids or corrosive effluents and in particular when it concerns corrosion by acid chlorinated media; concerned in the paper pulp industry are in particular chlorination filters, whitening towers, in particular, whitening towers with oxygen peroxide and ozone, mixers, washers, impregnators,

tanks for road, rail or maritime transport of corrosive products,

hulls of ships,

equipment operating at elevated temperature and in particular equipment for the petrochemical industry, cement industry, incineration of garbage, smoke flues, chimney stacks.

These applications are not intended to be exhaustive and more generally this steel permits obtaining an improved behaviour in service over steels of the prior art and at a lower cost than with nickel-base alloys for all the applications:

in an oxidizing chlorinated medium,

in a medium containing chlorides and H<sub>2</sub>S,

in an acid chlorinated medium,

in particular when the parts produced must be thick or massive or when the temperature of utilization is elevated.

What is claimed is:

1. Austenitic stainless steel having high mechanical properties, high resistance to corrosion and a high structural stability, and a chemical composition comprising by weight:

$$23\% \leq Cr \leq 28\%;$$

$$15\% \leq Ni \leq 28\%;$$

$$0.5\% \leq Mn \leq 6\%;$$

$$0\% \leq Cu \leq 5\%;$$

$$0\% \leq C \leq 0.06\%;$$

$$0\% \leq Si \leq 1\%;$$

$$0\% \leq Nb \leq 0.5\%;$$

$$0\% \leq V \leq 0.5\%;$$

$$0\% \leq Al \leq 0.1\%;$$

$$3\% \leq Mo \leq 8\%;$$

$$0.35\% \leq N \leq 0.8\%;$$

$$1\% \leq W \leq 5\%; \text{ and}$$

the remainder being iron and impurities related to the preparation thereof.

2. An austenitic stainless steel according to claim 1, wherein the amount of Cr is less than 26% by weight.

3. An austenitic stainless steel according to claim 1, wherein the amount of Ni is more than 21% by weight but less than 23% by weight.

4. An austenitic stainless steel according to claim 1, wherein the amount of Mn is more than 2% by weight and less than 3.5% by weight.

5. An austenitic stainless steel according to claim 1, wherein the amount of Cu is more than 1% by weight and less than 2% by weight.

6. An austenitic stainless steel according to claim 1, wherein the amount of C is less than 0.03% by weight.

7. An austenitic stainless steel according to claim 1, wherein the amount of Si is less than 0.4% by weight.

8. An austenitic stainless steel according to claim 1, wherein the amount of Mo is more than 4.5% by weight and less than 6.5% by weight.

9. An austenitic stainless steel according to claim 1, wherein the amount of N is more than 0.4% by weight and less than 0.55% by weight.

10. An austenitic stainless steel according to claim 1, wherein the amount of W is more than 2% by weight and less than 3.5% by weight.

11. Stainless steel according to claim 1, wherein its chemical composition comprises by weight:

$$23\% \leq Cr \leq 26\%$$

$$21\% \leq Ni \leq 23\%$$

$$2\% \leq Mn \leq 3.5\%$$

$$1\% \leq Cu \leq 2\%$$

$$0\% \leq C \leq 0.03\%$$

$$0\% \leq Si \leq 0.4\%$$

$$0\% \leq Nb \leq 0.5\%$$

$$0\% \leq Al \leq 0.1\%$$

$$4.5\% \leq Mo \leq 6.5\%$$

$$0.4\% \leq N \leq 0.55\%$$

$$2\% \leq W \leq 3.5\%$$

the remainder being constituted by iron and impurities relating to the preparation.

12. Stainless steel according to claim 1, wherein its chemical composition satisfies the following relation:

$$CP = 20 \times \%Cr + 0.3 \times \%Ni + 30 \times \%Si + 40 \times \%Mo + 5 \times \%W + 10 \times \%Mn + 50 \times \%C - 200 \times \%N < 710.$$

13. Stainless steel according to claim 12, wherein its chemical composition satisfies the following relation:

$$PREN =$$

$$CR + 3.3 \times \%Mo + 1.6 \times \%N + 1.7 \%W > 47.$$

14. Stainless steel according to claim 13, wherein its chemical composition satisfies the following relation:

$$113 + 16 (\% Mo + 0.7\% W) + 525\% N > 420.$$

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