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**Technical code for hydrochloric acid regeneration engineering
according to spraying and roasting technology of iron and steel
enterprises**

钢铁企业喷雾焙烧法盐酸废液再生工程技术规范
(English Translation)

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1 General

1.0.1

In order to improve the technical level of the hydrochloric acid waste liquid regeneration project of the spray roasting method in iron and steel enterprises, ensure the project quality, achieve advanced technology, reasonable economy and environmental protection, this specification is formulated.

1.0.2

This specification is applicable to the construction, operation and maintenance management of newly-built and reconstructed spray-roasting hydrochloric acid waste liquid regeneration projects in iron and steel enterprises.

1.0.3

The construction of the hydrochloric acid waste liquid regeneration project of the spray roasting method in iron and steel enterprises shall not only comply with this specification, but also comply with the current relevant national standards.

2.0.1 Hydrochloric acid regeneration process

The hydrochloric acid waste liquid produced by the pickling unit is treated, and a series of chemical reactions are performed to generate regenerated acid that can be used again in the pickling unit.

2.0.2 Spraying and roasting technology

The waste hydrochloric acid is sprayed into the roasting furnace in the form of mist, and the chemical reaction is carried out in a high-temperature environment to generate regeneration acid and iron oxide powder.

2.0.3 Tank farm

Area for setting up liquid storage tanks for fresh acid, spent acid, regenerated acid, rinse water, etc.

2.0.4 Waste acid

The waste hydrochloric acid produced by the pickling unit.

2.0.5 Regenerated acid regenerated acid

The hydrochloric acid produced by the hydrochloric acid regeneration unit can be used again for the pickling unit.

2.0.6 Fresh acid

Purchased commodity hydrochloric acid.

2.0.7 Rinse water rinse water

The discharge water after cleaning the strip in the rinsing process section of the pickling unit.

2.0.8 Ferric oxide

Powdered iron oxide produced by spray roasting.

2.0.9 Concentrated acid

After heat exchange in the pre-concentrator, the concentrated waste acid is circulated.

2.0.10 Roaster

In a high-temperature environment, the sprayed concentrated acid is vaporized and chemically reacted to generate hydrogen chloride gas and iron oxide powder.

2.0.11 Acid gun spray boom

A device that sprays concentrated acid in mist form from the top of the roaster.

2.0.12 Cyclone separator

It is installed between the roasting furnace and the pre-concentrator to separate the iron oxide powder in the flue gas.

2.0.13 Preconcentrator

It is used to cool down and remove dust from the flue gas of the roaster, and to concentrate the waste acid.

2.0.14 Absorption column

Equipment that absorbs hydrogen chloride in flue gas to generate regenerative acid.

2.0.15 Scrubber

Equipment for removing hydrogen chloride and iron oxide powder remaining in the flue gas by washing.

2.0.16 Chlorine remover

Equipment for reducing the chlorine content in iron oxide powder by heating.

2.0.17 Acid operation mode

After the waste acid passes through the pre-concentrator, it is sprayed into the production mode of the roaster.

2.0.18 Rinse water operation mode rinse water operation mode

After the rinse water passes through the pre-concentrator, it is sprayed into the production method of the roaster.

2.0.19 Demineralized water operation mode

A production method in which desalinated water is sprayed directly into the roaster.

3 Basic Regulations

3.0.1

The hydrochloric acid waste liquid regeneration project of the spray roasting method in iron and steel enterprises should be constructed simultaneously with the pickling unit.

3.0.2

The hydrochloric acid waste liquid regeneration engineering design shall adopt advanced, mature and reliable technology, process and equipment, and shall comply with the following regulations.

- 1 The design capacity should match the processing capacity of the pickling unit it serves;
- 2 The equipment level of process equipment and automatic control system should meet the requirements of production process;
- 3 Exhaust gas emission indicators should comply with the relevant provisions of the current national standard "Emission Standard of Air Pollutants for Steel Rolling Industry" GB 28665;
- 4 The quality of iron oxide powder should comply with the relevant provisions of the current national standard "Iron Oxide for Ferrite" GB/T 24244;
- 5 Neoacid should meet the relevant provisions of the current national standard "Industrial Synthetic Hydrochloric Acid" GB 320.

3.0.3

The hydrochloric acid regeneration device should be arranged in the station building.

3.0.4

The installation of the waste acid purification device in the hydrochloric acid regeneration project should be determined after technical and economic comparison according to the content of impurities such as silicon in the waste acid and the quality requirements of iron oxide powder.

3.0.5

The selection of equipment and materials in the hydrochloric acid regeneration station shall meet the working conditions and environmental requirements.

4.1 Process parameters

4.1.1

The design annual working time of the hydrochloric acid regeneration unit should not be less than 6200h.