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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 10606-2023

Replacing GB/T 10606-2008

Vocabulary of air separation units

空气分离设备术语

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. This document replaces GB/T 10606-2008 "Terminology for Air Separation Equipment". Compared with GB/T 10606-2008, except for structural adjustments and In addition to editorial changes, the main technical changes are as follows:

---Added standard state, pressurized air, low purity oxygen, pure oxygen, ultrapure oxygen, oxygen-rich air, oxygen-poor liquid air, forward flow, hot flow, return flow, cold flow, and more Stage distillation, LNG cold energy air separation equipment, air separation island, exempt materials, exempt pressure, cold backup, dry evaporation, heating, protection Wall and protective cover terms (see 3.1, 3.6, 3.8, 3.10, 3.12, 3.24, 3.25, 3.28, 3.29, 3.30, 3.31, 3.40, 3.70, 3.71, 3.72, 3.73, 3.74, 3.75, 3.76, 3.77);

---Changed the standard status, process air, industrial oxygen, medical oxygen, aviation breathing oxygen, industrial nitrogen, ultrapure nitrogen, oxygen-rich liquid air, self-cleaning In addition, non-freezing, low-temperature adsorption, liquid leakage, liquid flooding, nitrogen plug, expansion air entering the upper tower, cooling loss, extraction rate, high-pressure air flow, Terminology for medium-pressure air process, low-pressure air process, and liquid oxygen self-pressurizing process (see 3.1, 3.5, 3.9, 3.13, 3.14, 3.16, 3.19, 3.23, 3.35, 3.36, 3.41, 3.42, 3.43, 3.44, 3.46, 3.49, 3.50, 3.54, 3.55, 3.56, 3.60, 2008 version of 2.1, 2.5, 2.8, 2.10, 2.11, 2.13, 2.16, 2.20, 2.33, 2.34, 2.39, 2.41, 2.42, 2.43, 2.45, 2.48, 2.49, 2.58, 2.60, 2.61, 2.68);

---Deleted industrial process oxygen, kettle liquid, distillate liquid nitrogen, waste gas, waste liquid, throttling, isothermal throttling effect, Joule-Thomson effect, expansion Expansion, isentropic expansion effect, central temperature difference, sublimation, distillation, gas-liquid ratio, reflux ratio, Lachman air, primary throttling liquefaction cycle, Lin German cycle, high-pressure liquefaction cycle with expander, Hyland cycle, medium-pressure

liquefaction cycle with expander, Kraut cycle, expansion cycle The low-pressure liquefaction cycle, Kapitsa cycle, Stirling cycle, high-low pressure process, high-nitrogen process, and low-pressure cycle with switching heat exchanger of the expansion machine Pressure process, low-pressure process terminology with molecular sieve adsorber (see 2.7, 2.19, 2.21, 2.23, 2.24, 2.25, 2008 edition 2.26, 2.27, 2.30, 2.32, 2.36, 2.40, 2.45, 2.51, 2.52, 2.53, 2.54, 2.55, 2.59, 2.63, 2.64, 2.65);

---Added random packing, film condensing evaporator, immersion bath condensing evaporator, single bed, double bed, switching cycle, demister, whole Install cold box, steel-aluminum transition joint, buffer tank, lift gas, air separation start time, low-temperature nitrogen compressor terminology (see 4.1.24, 4.2.16, 4.2.17, 4.3.20, 4.3.21, 4.3.22, 4.3.24, 4.4.5, 4.4.8, 4.4.9, 4.4.10, 4.4.11, 4.4.12);

---Changed the terms of structured packing, distributor, plate-fin heat exchanger core, liquid oxygen evaporator, electric heater, and muffler tower (see 4.1.23, 4.1.25, 4.2.6, 4.2.19, 4.2.23, 4.4.7, 2008 version of 3.1.25, 3.1.26, 3.2.6, 3.2.26, 3.2.30, 3.4.7);

---Deleted the distillation tower, low-temperature distillation tower, orifice tower, partition, seal, fin, straight fin, porous fin, sawtooth fin, corrugated fin fins, guide fins, double-layer condensing evaporator, vaporizer, air separation cold box, fractionation tower terms (see 3.1.1, 3.1.2, 2008 edition, 3.1.9, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13, 3.2.14, 3.2.24, 3.2.32, 3.4.4);

--- Added high-purity argon, high-purity neon, high-purity helium, ultra-pure helium, high-purity krypton, electronic grade krypton, aerospace krypton, high-purity xenon, electronic grade xenon, aerospace xenon, Terminology for enhanced argon tower, argon recoverer, crude neon-helium adsorber, pure neon-helium tower, pure neon-helium evaporator, and lean krypton condenser (see 5.1.5, 5.1.9, 5.1.13, 5.1.14, 5.1.18, 5.1.19, 5.1.20, 5.1.23, 5.1.24, 5.1.25, 5.2.3, 5.2.7, 5.2.20, 5.2.twenty one, 5.2.22, 5.2.29);

---Changed the terms of lean krypton xenon, crude krypton xenon, pure argon condenser, pure argon evaporator (see 5.1.36, 5.1.37, 5.2.8, 5.2.9, 2008 edition 4.1.27, 4.1.28, 4.2.6, 4.2.7);

---Deleted the terms neon-helium fraction, process xenon, argon heat exchanger, and catalyst furnace (see 4.1.24, 4.1.29, 4.2.8, and 4.2.10 of the 2008 edition);

--- Added terms for vacuum composite insulation, rated filling rate, interlayer vacuum degree, strain-strengthened container, electric reheater, and bottle filling device (see 6.1.5, 6.1.11, 6.1.16, 6.2.20, 6.3.8, 6.3.9);

---Changed high vacuum multi-layer insulation, geometric volume, effective volume, filling rate, static evaporation rate, vacuum sandwich air leakage rate, mobile type Terminology of tank car, car tank car, tank trailer, railway tank car (see 6.1.4, 6.1.8, 6.1.9, 6.1.10, 6.1.14,

6.1.17, 6.2.13, 6.2.14, 6.2.15, 6.2.16,.2008 version 5.1.4, 5.1.7, 5.1.8, 5.1.9, 5.1.12, 5.1.14, 5.2.13, 5.2.14, 5.2.15, 5.2.16);

1 Scope

China's national vocabulary for air separation plant - the cryogenic units that liquefy air and distil it into oxygen, nitrogen and argon, and which stand beside every steelworks, every large chemical complex and every industrial gas terminal in the country. This document defines the basic terms of cryogenic air separation equipment and the terms in common use for its unit equipment, together with those for rare gas extraction equipment, cryogenic liquid storage and transport equipment, turboexpanders, cryogenic liquid pumps, instrumentation and electronic control, steam turbines and the associated auxiliary machinery. It is a large vocabulary because an air separation unit is not one machine but a plant: the air compression and purification train, the main heat exchanger, the distillation columns and their reboiler-condenser, the expansion turbine that provides the refrigeration, the liquid pumps and storage, the argon and rare gas recovery, and the control system that holds a distillation running at cryogenic temperature in balance for months at a time without being stopped. Such plants are bought by international tender, built by consortia and commissioned by people who did not design them, so the terms in which the specification is written have to mean the same thing to the process designer, the fabricator, the erector and the operator - and to their counterparts in another language. That is what a vocabulary of this kind is for, and it is why it is cited so heavily in the contracts and the design documents of a sector that has very few of its own product standards. Issued on 7 September 2023 and in force since 1 April 2024, it replaces GB/T 10606-2008.

This document defines the basic terms of cryogenic air separation equipment (referred to as air separation equipment) as well as the unit equipment and rare equipment in air separation equipment. Common terms used for gas extraction equipment, cryogenic liquid storage and transportation equipment, turbine expanders, cryogenic liquid pumps, instrument and electronic controls, steam turbines and related auxiliary machines. This document is applicable to various applications in air separation equipment-related fields that involve citing or standardizing the use of air separation equipment terminology.

2 Normative reference documents

This document has no normative references.

3 Basic terminology

3.1 standard state normalstate standardconditions The state when the temperature is 273.15K (0°C) and the pressure is 101.325kPa.

3.2 air separation airseparation Cryogenics are used to separate air into the required

components.

3.3 air A mixture of gases present on the Earth's surface.

Note. It is mainly composed of oxygen (about 20.95%), nitrogen (about 78.09%) and argon (about 0.932%). It also contains trace amounts of hydrogen and rare gases such as neon, helium, krypton and xenon. body. Depending on regional conditions, it also contains varying amounts of carbon dioxide, water vapor, acetylene and other hydrocarbons. The density of air under standard conditions is 1.293kg/m³.

3.4 Raw air feedair Air sucked into the air compressor for air separation.

3.5 process air processair The air entering the cold box of the air separation plant.

3.6 booster air boosterair The processing air is pressurized to a certain pressure through the booster end of the supercharger or expander.

3.7 oxygenoxygen Molecular formula O₂, relative molecular mass 31.999 (calculated according to 2018 IUPAC international relative atomic mass), colorless, odorless gas. The density under standard conditions is 1.429kg/m³

3. The boiling point at 101.325kPa pressure is 90.17K. Very reactive chemical properties, yes