

Translated English of Chinese Standard: YS/T851-2012

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

YS

NONFERROUS INDUSTRY STANDARD

OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 77.180

H 93

YS/T 851-2012

**Technical Specification for On-Line Rotating Degassing
System Used for Aluminum and Aluminum Alloys Melts**

铝熔体在线连续除气装置

Issued on: December 28, 2012

Implemented on: June 1, 2013

**Issued by: Ministry of Industry and Information Technology of the People's
Republic of China**

Table of Contents

Foreword.....	3
1 Scope.....	4
2 Normative References.....	4
3 Classification of Degassing and Filtering Devices	5
4 Naming Rules for Devices.....	5
5 Technical Requirements.....	7
6 Inspection Methods.....	10
7 Inspection Rules.....	12
8 Marking, Packaging, Transportation and Storage.....	13
9 Random Files	14
10 Contents of Order Form (or Contract)	14

Technical Specification for On-Line Rotating Degassing System Used for Aluminum and Aluminum Alloys Melts

1 Scope

This Standard specifies the classification, naming rules, technical requirements, inspection methods, inspection rules and markings, packaging, transportation, storage, random documents, order forms (or contracts) contents of aluminum melt online degassing and filtering devices.

This Standard applies to aluminum and aluminum alloy box-type online rotary spray degassing and filtering devices (hereinafter referred to as degassing and filtering devices).

2 Normative References

The following documents are essential to the application of this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB/T 3274 Hot-rolled plates/sheets and strips of carbon structural steels and high strength low alloy structural steels

GB 3766 Hydraulic Fluid Power - General Rules Relating to Systems

GB 11984 Safety Regulation for Chlorine

GB 30078 Safety Specification for Wrought Aluminum and Aluminum Alloy Ingots Production

GB 30079.1 Safety Specification for Aluminum and Aluminum Alloys Plates, Sheets and Foils and Foils Production - Part 1: Cast-rolling

JB/T 5943 Construction machinery - General specifications for welding parts

YS/T 601 Technical Specification for Process of On-line Degassing and Filtering for Aluminum and Aluminum Alloy Melts

3 Classification of Degassing and Filtering Devices

3.1 Classification of degassing devices

3.1.1 Classification according to the number of rotors

It is divided into single rotor, double rotor and multi-rotor degassing devices.

3.1.2 Classification according to box type

It is divided into fixed box type, pouring box type, rotating box type and vacuum box type degassing devices.

3.2 Classification of filtering devices

3.2.1 Classification according to filtering levels

It is divided into single-stage, double-stage and multi-stage filtering devices.

3.2.2 Classification according to used filter media

It is divided into glass fiber cloth, foam ceramic plate, alumina ball and ceramic tube filtering device.

3.2.3 Classification according to box type

It is divided into fixed box type, tilting box type and tube type filtering devices.

4 Naming Rules for Devices

4.1 Degassing device

4.1.1 The naming of the degassing device should include the equipment code, number of rotors, maximum processing capacity of aluminum melt and box type.

4.1.2 The equipment code is represented by the English "APR" (APR is the English abbreviation of Aluminum purification by rotating degas bank).

4.1.3 The number of rotors is represented by lowercase Arabic letters. Single rotors are marked with "1", double rotors are marked with "2", and so on.

4.1.4 The maximum processing capacity of aluminum melt is expressed by numbers, in "t/h".

4.1.5 The box type is indicated by uppercase English letters. The fixed box type device is marked with "F", the pouring box type device is marked with "P", the rotating box device is marked with "R", and the vacuum box device is marked with "V".

5 Technical Requirements

5.1 Design requirements for degassing and filtering devices

5.1.1 General requirements

5.1.1.1 The design of degassing and filtering devices shall comply with the relevant provisions of GB 11984, GB 30078, GB 30079.1, and YS/T 601.

5.1.1.2 The degassing and filtering device generally consists of the box and upper cover, upper cover lifting mechanism, pouring mechanism, heater, automatic control system, rotor and driving mechanism, gas control system, etc. The design of the degassing device should meet the requirements of 5.1.2~5.1.8, the design of the filtering device shall meet the requirements of 5.1.2~5.1.6.

5.1.2 Box and upper cover

The box body and upper cover are generally composed of lining, insulation layer and iron shell.

5.1.2.1 Lining

5.1.2.1.1 The lining is made of integrally sintered refractory materials, which shall be non-stick to aluminum, resistant to high temperatures, washing, and thermal vibration, good thermal insulation and not prone to chemical reactions with molten aluminum.

5.1.2.1.2 The shape and structure of the lining make it easy to manually clean the slag accumulation.

5.1.2.1.3 The normal service life of the lining shall be ≥ 24 months.

5.1.2.2 Insulation layer

5.1.2.2.1 The insulation layer between the lining and the iron shell shall be filled tightly to ensure that the lining is not loose.

5.1.2.2.2 The insulation layer between the lining and the iron shell has good thermal insulation performance. The temperature rise of the iron shell during operation shall be $< 45^{\circ}\text{C}$.

5.1.2.3 Iron shell

5.1.2.3.1 The steel used for the iron shell shall meet the requirements of GB/T 3274.

5.1.2.3.2 Iron shell welds shall meet the requirements of JB/T 5943.

5.1.2.3.3 The surface of the iron shell shall be conducted anti-rust treatment.

5.1.2.3.4 The overall metal frame of the iron shell is firmly welded and does not deform.

5.1.2.4 Sealing

The matching surface between the bottom of the upper cover and the box is inlaid with high-temperature sealing strips, and the contact surfaces are flush and seamless to ensure that the hot air in the box does not leak out.

5.1.2.5 Functional parts

5.1.2.5.1 The box shall be equipped with a drainage device.

5.1.2.5.2 The degassing box shall have good sealing performance and isolate gas from entering and exiting.

5.1.2.5.3 When using chlorine gas, the upper cover shall be equipped with a safe discharge device for treated gas.

5.1.3 Upper cover lifting mechanism

5.1.3.1 The upper cover lifting mechanism shall operate stably, safely and reliably.

5.1.3.2 The connection between the upper cover lifting mechanism and the upper cover shall be safe and reliable.

5.1.4 Pouring mechanism

5.1.4.1 The pouring mechanism shall facilitate complete emptying of the metal in the box.

5.1.4.2 The pouring mechanism shall operate stably, be safe and reliable.

5.1.4.3 The pouring mechanism shall adopt a hydraulic system, and the hydraulic system shall comply with the provisions of GB 3766.

5.1.5 Heater

5.1.5.1 The heater shall operate stably, be sturdy and durable.

5.1.5.2 Each component of the heater shall be easy to assemble and disassemble.

5.1.6 Automation control system

5.1.6.1 The automatic control system shall integrate the control electrical system, temperature control system, etc., and the control accuracy shall comply with the provisions of YS/T 601.

5.1.6.2 The automated control system should include a human-machine display operation interface, and the display, setting and monitoring content shall comply with the provisions in Table 1.

5.3.1.3 The pouring mechanism of the degassing and filtering device has a stable pouring speed and no jamming, and the hydraulic system has no leakage.

5.3.1.4 The heater and control temperature of the degassing and filtering devices are adjustable.

5.3.1.5 The rotor driving mechanism of the degassing device operates at a stable and adjustable speed without swinging.

5.3.1.6 The gas control system of the degassing device has no leakage, and the gas flow is stable and adjustable.

5.3.1.7 The automated system detection of degassing and filtering devices is normal.

5.3.2 Load test run

5.3.2.1 The loaded test run is carried out on the basis of the successful no-load test run.

5.3.2.2 The insulation layer between the box and upper cover lining of the degassing and filtering device and the iron shell has good thermal insulation performance.

5.3.2.3 There is no aluminum leakage from the degassing and filtering device boxes.

5.3.2.4 The static temperature control accuracy and temperature rising capacity of the aluminum melt of the degassing and filtering devices comply with the provisions of YS/T 601.

5.3.2.5 The rotor of the degassing device operates stably, with adjustable speed and no swing or shedding.

5.3.2.6 In the degassing device, the bubbles in the aluminum melt are finely dispersed, and the gas flow is stable and adjustable.

5.3.2.7 The degassing rate of the degassing device, the alkali metal removal rate, and the filtration effect of the filtering device shall comply with the provisions of YS/T 601.

6 Inspection Methods

6.1 Design requirements for degassing and filtering devices

According to the requirements in the order form (or contract) signed by the supplier and the purchaser, the basic parameters of the degassing and filtering devices, the design function consisting of box and upper cover, the upper cover lifting mechanism, the pouring mechanism, the heater, the automatic control system, the rotor and the drive mechanism, and gas control system shall be reviewed.

6.2 Manufacturing requirements for degassing and filtering devices

After the manufacturing of the degassing and filtering devices is completed, the supplier shall assemble the corresponding mechanisms and conduct trial operation before the degassing and filtering devices leave the factory. During the manufacturing process of the degassing and filtering devices, the parts of the degassing and filtering devices shall be inspected. After the parts are manufactured, they shall be assembled at the supplier. After the assembly is completed, a single machine trial operation shall be carried out.

6.3 Commissioning requirements for degassing and filtering devices

6.3.1 No-load test run

6.3.1.1 The supplier shall provide the preheating curve of the degassing and filtering device, which shall be preheated after confirmation by the purchaser. The supplier shall be responsible for the quality of preheating.

6.3.1.2 Use a thermometer to measure the temperature rise of the iron shell; and check the sealing and heat insulation conditions of the degassing and filtering device boxes and upper covers.

6.3.1.3 The mechanical and hydraulic systems of the degassing and filtering devices shall be conducting test running for no less than 3 times, and the operation status shall be visually inspected.

6.3.1.4 The temperature of the heater of the degassing and filtering device is read from the human-machine interface and calibrated with a standard thermocouple.

6.3.1.5 Use a tachometer to measure the rotor speed of the degassing device, and visually inspect the operating condition of the rotor drive mechanism.

6.3.1.6 Conduct a pressure test on the gas control system of the degassing device to check whether there are leaks in each circuit and whether the gas flow is stable and adjustable.

6.3.1.7 Conduct individual and linkage testing, parameter setting, detection and alarm inspection of each part of the automated system of degassing and filtering devices.

6.3.2 Load test run

6.3.2.1 Use a thermometer to detect the temperature rise of the iron shell of the degassing and filtering device boxes and upper covers.

6.3.2.2 During the test run, visually check whether the degassing and filtering device boxes are leaking aluminum.

6.3.2.3 Adjust the rotation speed of the rotor of the degassing device, and visually check whether the rotor is running stably, the speed is adjustable, and there is no swing or shedding.

6.3.2.4 Adjust the gas flow and pressure in the degassing device, visually inspect the bubble

meet the design or production process requirements, the relevant components of the device shall be modified, and the relevant matters shall be resolved through negotiation between the supplier and the purchaser. When the degassing and filtering devices do not comply with the provisions of YS/T 601, they shall be further adjusted until they meet the requirements.

8 Marking, Packaging, Transportation and Storage

8.1 Marking

8.1.1 The marking content of the equipment label shall include:

- a) Name and address of the manufacturer;
- b) Name and model of degassing and filtering devices;
- c) Processing capacity;
- d) Exit-factory date.

8.1.2 Marking of the packaging

There shall be obvious text or symbols on the outer wall of the packaging box, including:

- a) Name and address of the manufacturer;
- b) Model of the degassing and filtering devices;
- c) Receiving organization and address;
- d) Net weight, gross weight, box number;
- e) Outer dimensions and words and symbols such as handling with care, rain protection, upwards, lifting line position, etc.

8.2 Packaging

The packaging of degassing and filtering devices shall meet the requirements for land and water transportation and loading.

8.3 Transportation

The transportation of degassing and filtering devices shall meet the requirements for land and water transportation and loading.

8.4 Storage

After the degassing and filtering device is manufactured and installed at the user site, it shall

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----