QC

AUTOMOTIVE INDUSTRY STANDARD

OF THE PEOPLE'S REPUBLIC OF CHINA

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Replacing JB 4072.3-85

Car cleanliness working guideline - People, objects and environments

汽车清洁度工作导则 人、物和环境

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Car cleanliness working guideline - People, objects and environments

This Standard specifies the requirements for people, objects and environments during the determination of the cleanliness of auto parts, assemblies and vehicles.

1 People

1.1 Quality: They shall be full-time staffs who are trained and familiar with the structure of the test object and master the cleanliness determination technique.

1.2 Clothing: Wear special long-fiber work clothes. Wear a hooded tight-fitting work cap that is made of long-fiber fabric; do not expose hair outside the cap. Work soles shall be oil-resistant, wear-resistant and not dusty (such as plastic shoes, tennis shoes). Work clothes, shoes and caps shall be cleaned regularly.

1.3 Hands: Wash hands before work; keep them clean during operation; do not touch the filter and membrane; avoid touching the cleaned parts.

1.4 Operation

1.4.1 According to the operating procedures that are specified in QC/T 572-1999 "Directives for motor vehicle cleaness - Measuring method", QC/T 574-1999 "Car cleanliness for the work of the sampling rules" and QC/T 575-1999 "Work guide for automobile cleanness - Analysis method for impurity", perform sampling, cleaning, filtering, drying, weighing, and impurity analysis.

1.4.2 Operate in accordance with the requirements of Chapter 2 of this Standard; always keep it clean. Used appliances shall be cleaned in time and placed in an airtight container or a place with reliable cover.

1.4.3 The operation shall be carried out in a cleanliness testing room, a local clean area or a room close to the testing room.

1.4.4 There shall not be dusty and large-scale movements (such as head scratching, brisk walking, running).

2 Objects

2.1 Filter membrane

2.1.1 Specifications and quality requirements

Clamp flat to avoid leakage.

2.3 Cleaning solution

2.3.1 Types of cleaning solution

a) NY-120 solvent naphthas, in accordance with GB 1922-1980 “Solvent naphthas”;

b) 95% ethanol, in accordance with GB 689-80 “Ethanol for industrial use”;

c) distilled water: one-time distillation;

d) cleaning mixture.

2.3.2 Filtration method of cleaning solution

2.3.2.1 Use toothless tweezers to remove a 0.45 μm membrane from the container (or select according to the needs of use); then, use a clean cleaning solution to wet the two surfaces of the filter membrane.

2.3.2.2 Use the same tweezers to place the filter membrane on the bracket of the clean microporous membrane filter device; install the upper funnel on the filter membrane; then, use a metal clip to firmly clamp and cover the funnel cap.

2.3.2.3 Start the vacuum pump when 1/3 of the cleaning solution is poured; then, always maintain a certain pressure head in the funnel; suction the cleaning solution; pour the filtered cleaning solution into a clean container with a lid; cover the container for use.

2.3.3 Recovery of waste cleaning solution: according to the device that is shown in B.1 in Appendix B, use the method that is specified in B.2 for recovery.

2.4 Appliances

2.4.1 Microporous membrane filtration device and solvent filter.

2.4.1.1 Function and structure

The microporous membrane filtration device is used to filter the cleaning solution that has impurities; its structure is shown in Figure 1, where ① funnel with scale; ② filter membrane; ③ filter membrane support frame; ④ funnel seat; ⑤ oil-resistant rubber plug; ⑥ suction filter bottle; ⑦ vacuum pump; ⑧ metal clip.

The solvent filter is used to filter the cleaning solution and the impurities on the flusher wall; its structure is shown in Figure 2, where ① glass bottle; ② inlet valve; ③ ⑤ support frame, ④ filter membrane, ⑥ spray solvent line, ⑦

2.4.2.2 Clean according to the methods that is specified in 2.4.1.2a) and c).

2.4.3 Porcelain crucible

2.4.3.1 Specifications: glazed, capacity of 50 mL; or selected as required.

2.4.3.2 Cleaning: use 50% hydrochloric acid solution to boil the porcelain crucible for 10 ~ 20 minutes; take it out; use tap water to wash it; then, use distilled water to wash it 2 ~ 3 times.

2.4.3.3 Constant weight: first dry in an oven at 105 ± 5 °C; then, put it in a high-temperature furnace and gradually heat to 800 °C for 1 hour; air-cool for 3 min; then, transfer to a dryer to cool for 30 min; take out and weigh. Repeat this way until the difference between two successive weights is not more than 0.4 mg. Finally, record the weight value according to the porcelain crucible number.

2.4.4 Magnet

The magnet is in the shape of a rod; when using it, use a clean cellophane or a plastic film to wrap the used end.

2.4.5 Other appliances

2.4.5.1 Types and specifications: including white nylon round brushes, flat brushes, paintbrushes, toothless stainless-steel tweezers whose ends are flat, enamel or plastic covered plates, pots, buckets and oil-resistant rubber gloves, wiping silk, deerskin, whose specifications are determined according to the requirements for use.

2.4.5.2 Cleaning method: refer to the method that is specified in 2.4.1.2b) and c) for cleaning.

2.5 Instruments

2.5.1 Analytical balance

2.5.1.1 Main technical parameters: maximum weighing of 200 g; division value of 0.1 mg; automatic code addition; weighing tray diameter of not less than 50 mm.

2.5.1.2 Requirements for use: the balance is installed on a solid cement or terrazzo table in the cleanliness testing room without strong magnetic source, vibration source and corrosive gas; the room temperature is 20 ± 2 °C. The weighing tray shall be cleaned according to the method that is specified in 2.4.1.2b) and c); it can be used 24 hours after installation; open the front door before use; start work after 20 minutes; place a hygroscopic agent in the frame cover.

3 Environments

3.1 Requirements for cleanliness testing room

3.1.1 Requirements for the general plan: it should be in the area of cleaner surroundings or better greening; it should not be in the area where there are sand blown by the wind, severe dust, smoke, and corrosive gases; it shall be far away from the vibration source.

3.1.2 Requirements for plane layout: there shall be ventilation, water supply and drainage devices; the layout shall be compact, so as to reduce the floor height as much as possible. Set up the necessary equipment; the distance between the disintegration, cleaning, filtering, drying and weighing sites shall be as small as possible; they shall be separated from each other.

3.1.3 Requirements for the building: the testing room shall be arranged at the place of the least flow of people; personnel must first pass through the indoor preparation room, which shall include rain gear storage, shoe change, dressing, toilet, lounge. The testing room can be equipped with air conditioner; the indoor graphic shall be as simple as possible; the walls and ceiling shall be covered with polyurethane. Indoor colors shall be soft to avoid glare; explosion-proof measures shall be taken to install electrical equipment; double-windows and closed doors shall be used in the testing room; fire protection measures shall be given special attention, such as the installation of safety doors, automatic alarm devices and firefighting equipment.

3.2 Modes of cleanliness testing room: see Appendix A.

3.3 Monitoring of the testing room

3.3.1 Determination of temperature

3.3.1.1 Selection of measuring point: generally, it is on a plane 2 m above the ground; the measuring point shall be more than 0.5 m away from the wall. There are no less than 3 indoor measuring points; several points are measured near the heating equipment such as the oven.

3.3.1.2 Measurement: the temperature can be measured by a mercury thermometer whose division is 0.1°C; the temperature change can be measured by a DWJ-1 bimetallic thermometer.

3.3.2 Determination of dustfall

3.3.2.1 Use 3 ~ 5 250 mm x 250 mm clean white enamel plates; apply a clean and very thin layer of engine oil on the plates.

3.3.2.2 Place the enamel plate on the work surface; let it stand for 24 hours.

Appendix A

Three modes of cleanliness testing room

(Reference)

A.1 Mini cleanliness testing room

A.1.1 Design principles

The mini cleanliness testing room is based on the principle of economy, application, safety, reasonableness, and small size; it shall meet the requirements of 3.1 of this Standard. The disassembly, cleaning, and reassembly of the test object must be completed in the assembly shop.

A.1.2 The recommended mini cleanliness testing room applies to the auto parts factory; the plane layout is shown in Figure A.1; the total area is about 20 ~ 30 m^2.

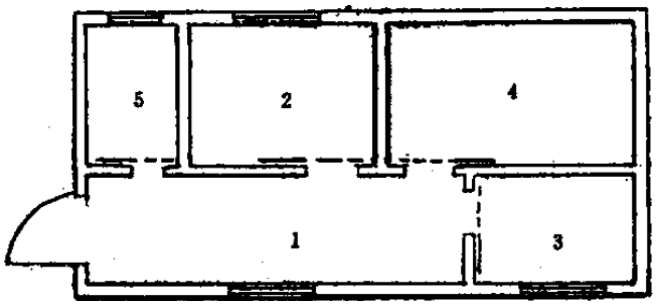

Figure A.1 -- Mini cleanliness testing room

① Corridor: it can also be used as a preparation room for changing work clothes, hats and shoes.

②Filtration room: it is used for suction filtration of the turbid liquid, placing pressure washing equipment and storing dryer that has the filter membrane and filter screen of constant weight.

③Drying room: it is used to dry filter membrane, filter screen with impurities and place electric furnace for gravimetric analysis.

④Analysis room: weighing, impurities, analysis and storage of measurement report.

⑤Toilet: staff toilets, washroom, rain gear storage; if it is not used as a toilet, it can be changed to an office and a lounge.

A.1.2.1 Instruments and equipment are in accordance with Chapter 2.

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