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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 13577-2026

Replacing GB/T 13577-2006

Mills for rubber and plastics

开放式炼胶机炼塑机

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5 Requirements

5.1 General Requirements The open mill shall meet the requirements of this document and be manufactured in accordance with the drawings and technical documents approved through the prescribed procedures.

5.2 Technical Requirements

5.2.1 The open mill should have the function of manually, electrically, or hydraulically adjusting the roll gap. When hydraulic adjustment is used, it should have the function of setting the roll gap via a human-machine interface. The function of distance.

5.2.2 Semi-automatic and fully automatic open mills should be equipped with a human-machine interface (HMI).

5.2.3 Semi-automatic and fully automatic open mills should be equipped with an automatic rubber turning device with adjustable speed.

5.2.4 Fully automatic open mills should have communication interfaces for information and data exchange with other equipment.

5.2.5 Fully automatic open mills should have both single-action and linkage functions.

5.2.6 The speeds of the front and rear rollers of the dual-drive open mill should be individually adjustable through the control system.

5.2.7 When chilled cast iron is selected as the material for the open mill rollers, the chilled cast iron rollers shall comply with the provisions of HG/T 3108.

5.2.8 The surface roughness (Ra) of the working surface of the open mill rollers should be less than or equal to 1.6 μm, and the surface roughness (Ra) of the working surface of the grooved rollers should be... The surface roughness (Ra) of the groove should be less than or equal to 3.2 μm and less than or equal to 12.5 μm.

5.2.9 The surface roughness (Ra) of the open mill roller journal (bearing area) should be less than or equal to 1.6 μm.

5.2.10 The cylindrical surfaces inside the rollers of the open mill shall be machined.

5.2.11 The horizontal planes of the bearing housings mounted on the left and right stands of the open mill should be on the same plane, and their flatness should not be lower than GB/T 1184- The.1996 Table B1 specifies tolerance grade

7.The vertical force-bearing surfaces of the left and right frames in contact with the rear bearing housing should be on the same plane. The flatness shall not be lower than the tolerance grade 7 specified in Table B.1 of GB/T 1184-1996 (except when using spherical bearings).

5.2.12 The clearance between the bearing housing and the gland of the rubber open mill shall conform to the requirements of H9/f9 in GB/T 1800.1-2020. The clearance between the bearing and the gland of the open mill should be greater than or equal to the H9/d9 specification in GB/T 1800.1-2020.

5.2.13 The radial clearance of the roller bearings of the rubber open mill shall conform to the requirements of Group N or Group 3 clearance in Chapter 5 of GB/T 4604.1-2012. The radial clearance of the roller bearings of a plastic open mill shall conform to the requirements of Chapter 5, Group 5 clearance in GB/T 4604.1-2012.

5.3 No-load operation requirements

5.3.1 When the open mill is running idle, the following requirements shall be met.

a) The power consumed by an open mill using a DC motor during no-load operation should be less than or equal to 15% of the rated power of the main motor;

b) The power consumed by an open mill using an asynchronous motor during no-load operation should be less than or equal to 30% of the rated power of the main motor;

c) The power consumed by the open mill using a permanent magnet synchronous motor during no-load operation should be less than or equal to 8% of the rated power of the main motor.

5.3.2 When the open mill is running idle, the temperature of the roller bearing housing should not rise suddenly, and the maximum temperature rise should be less than or equal to 15°C.

5.3.3 The lubrication of all lubrication points, such as the roller bearings, transmission gears, and reducers of the open mill, should be sufficient, and the leakage at each seal should be less than or equal to the specified value. It equals 5 mL/h.

5.4 Load Operation Requirements

5.4.1 When the open mill is running under load, the power of the main motor should be less than or equal to the rated power (instantaneous overload is allowed).

5.4.2 When the open mill is operating under load, the maximum temperature rise of the reducer bearings should be less than or equal to 40°C; for rubber open mills, the bearing housing temperature rise... The temperature rise should be less than or equal to 30°C; for plastic open mills, when the working surface temperature of the rollers is 160°C, the temperature rise of the bearing housing should be less than or equal to 30°C. When the working surface temperature of the roller is 160°C~200°C, the temperature rise of its bearing body should be less than or equal to 90°C.

5.4.3 When the open mill is operating under load, the roller temperature regulating device should not leak.

5.5 Appearance and Painting Requirements

5.5.1 The appearance of the open mill should be neat and the colors should be harmonious. The appearance quality should meet the requirements of HG/T 3120.

5.5.2 The painted surface of the open mill shall comply with the provisions of

3.4.5 in HG/T 3228-2001.

5.6 Noise Requirements The noise level of the open mill during no-load operation should meet the following requirements.

a) The noise level of a large open mill is less than or equal to 83 dB(A);

b) The noise level of a medium-sized open mill is less than or equal to 80 dB(A);

c) The noise level of the small open mill is less than or equal to 76 dB(A).

Note. Large open mills refer to open mills with a roller diameter (D) greater than or equal to 400 mm, while medium open mills refer to open mills with a roller diameter (D) between.200 mm and.200 mm. A small open mill is one with a roll diameter (D) of.200 mm or less.

5.7 Safety Requirements

5.7.1 The safety requirements for open mills shall comply with the provisions of GB/T 20055.

5.7.2 Fixed protective devices or interlocking protective devices with or without protective locking should be installed around the automatic open mill and its auxiliary equipment. The interlocking protective devices should be positioned to prevent personnel from approaching dangerous areas. The positioning of these devices should comply with the requirements of GB/T 19876.

6.1 No-load test

6.1.1 Before the no-load test,

5.7 should be tested.

6.1.2 The no-load test shall be carried out after the complete assembly of the machine is completed and meets the requirements of 6.1.1.

6.1.3 The no-load test speed is the rated speed of the open mill.

6.1.4 The no-heat test should be conducted continuously for no less than 2 hours under no-heat conditions.

6.1.5 During the no-load test, the following items shall be tested.

a) Power of the main motor;

b) Temperature rise of the bearing housing;

c) Leakage in the lubrication system;

d) Safety requirements;

6.2 Load Operation Test

6.2.1 The load operation test can only be carried out after the no-load operation test is qualified, and the continuous load operation time should not be less than 2 hours.

6.2.2 Materials for load operation test. Rubber mixing mills should preferably use materials with a Mooney viscosity of 60 mL (1 4) at 100°C to 80 mL (1 4) at 100°C. Rubber compound; soft polyvinyl chloride (SPVC) with a viscosity of 135 mL/g to 127 mL/g is recommended for plastic open mixing mills.

6.2.3 The load operation test speed is the rated speed of the open mill.

6.2.4 During operation under load, the following items should be checked.

a) Power of the main motor;

b) Temperature rise of the bearing housing;