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Code for acceptance of engineering installation for mechanical equipment of rolling mill

轧机机械设备工程安装验收规范

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Table of Contents

2 Installation of host rolling mill column equipment and the accessory devices, pipeline, etc. shall be completed; installation quality records and data shall be completed. Debugging and inspection of hydraulic, lubrication, pneumatic, water, steam, emulsion, electrical and other systems shall be completed and conform to requirements for test run.

3 Required materials, machines and tools, detesting instruments, etc. for test run shall conform to requirements for test run.

4 Security facilities of equipment must be complete and reliable; reaction of limit switch shall be accurate and errorless.

5 Action of clutch and braking device shall be sensitive and reliable.

6 Low-speed screw-down gear and high-speed screw-down gear of rolling mill moves back and forth for 5 to 10 times; high-low limit position is accurate.

7 Main drive motor without load is in test run for 30 min; motor drives reduction gear for test run of 30 min; motor drives reduction gear and gear seat for test run of 30 min; motor drives reduction gear, gear seat and rolling mill for test run for 2 h to 4 h, respectively at speeds of 25%, 50%, 75% and 100% of maximum working speed. Reversible mill runs forward and backward respectively for 1 h to 2 h based on these 4 grades. When several mills are driven by one transmission gear, the second mill may be driven only after the first mill starts test run; the rest shall be done in the same manner, until last mill completes test run.

8 Roll changing device and other equipment move back and forth for 5 to 10 times; stroke, speed and predetermined stop position shall conform to requirements in design technical document.

9 In operation, transmission parts shall move flexibly and stably, without abnormal vibration or noise.

10 Bearing temperature shall be normal. Rolling bearing temperature rise is less than 40°C and maximum temperature is less than 80°C; sliding bearing temperature rise is less than 35°C and maximum temperature is less than 70°C.

11 Fasteners and connectors may not become loose.

12 In test run of region or unit, there are no faults after 3 continuous operation based on design linkage procedures.

Inspection method: Observe to inspect; check test run record.

7.7 Test Run of Coiling Machine and Uncoiling Machine Auxiliary Equipment

7.1.1 Coiling machine and uncoiling machine auxiliary equipment shall conform to following provisions:

1 Installation of coiling machine and uncoiling machine auxiliary equipment shall be completed; installation quality records and data shall be completed. Debugging and inspection of hydraulic, lubrication, pneumatic, electrical and other systems shall be completed and conform to requirements for test run.

2 Required materials, machines and tools, detesting instruments, etc. for test run shall conform to requirements for test run.

3 Security facilities of equipment must be complete and reliable; action of limit switch shall be accurate and errorless.

4 Stroke and speed of upper hydraulic cylinder and pneumatic cylinder of equipment shall conform to the provisions of design technical document, which move back and forth for 5 to 10 times respectively.

5 Uncoiling knife is flexible and free of jamming phenomenon; lifting position conforms to the provisions of design technical document.

6 Pressure roller and deep bending roller have flexible action and flexible rotation; lifting position conforms to the provisions of design technical document.

7 Wrapper moves flexibly; contact with coiler mandrel is close and uniform.

8 Lifting movement of outboard bearing frame is flexible; bearing clearance under contact with coiling drum shall conform to requirements of design technical document and be uniform around and can ensure that levelness of coiling drum is within allowable deviation range.

9 Bearing temperature shall be normal. Rolling bearing temperature rise is less than 40°C and maximum temperature is less than 80°C; sliding bearing temperature rise is less than 35°C and maximum temperature is less than 70°C.

10 Fasteners and connectors may not become loose.

11 In test run of region or unit, there are no faults after 3 continuous operation based on design linkage procedures.

Inspection method: Observe to inspect and check test run record.

shall be completed and conform to requirements for test run.

2 Required materials, machines and tools, detesting instruments, etc. for test run shall conform to requirements for test run.

3 Security facilities of equipment must be complete and reliable; action of limit switch shall be accurate and errorless.

4 Several groups of drive platforms do test run according to test rune procedures prescribed in design technical document; transmission mechanisms shall have same revolving direction and revolving speed.

5 Continuous test run of monomer without load for 4 h.

6 Test run respectively at low speed, acceleration and deceleration speed and high speed for 3 times according to provisions of design technical document.

7 Bearing temperature shall be normal. Rolling bearing temperature rise is less than 40°C and maximum temperature is less than 80°C; sliding bearing temperature rise is less than 35°C and maximum temperature is less than 70°C.

8 Operation of chain and chain wheel shall be smooth and free of blocking phenomenon.

9 Action of clutch and braking device shall be sensitive and reliable.

10 In test run of region or unit, there are no faults after 3 continuous operation based on design linkage procedures.

Inspection method: Observe to inspect; check test run record.

10.6 Double Chained Scraper Conveyor Installation

General Items

10.6.1 Radial displacement of two axes, tilt of two axes and clearance value of two ends of coupler during coupler assembly shall conform to requirements in design technical document or existing national standard *General Code for Construction and Acceptance of Mechanical Equipment Installation Engineering* GB 50231.

Inspection quantity: 30% for random inspection, not less than 1 set.

Inspection method: Inspect installation quality record; use a dial indicator and a feeler gauge for rotation measurement.

10.6.2 Scraper is installed behind chain; fastening bolt head shall receive anti-loose point welding; pin head is heated for ramming and riveting.

Inspection quantity: 110% for random inspection, not less than 5 sites.

same speed. The action speed of the tipping device and angle of the limit switch shall comply with the provisions of the design and technology documents.

6 For test run of turnover devices of rolling mill guide plate, mill roll, etc., the tipping device shall be within the full stroke or turning scope, including 5~10 shuttles. Each component shall act stably without abnormal sounds, and the clamping device shall be flexible and reliable.

7 During the test run of the turnover devices of slabs and steel pipes, the transmission shaft drives the lever (or inspection mouth) to turn for 0.5~1h; each component shall act stably without being stuck or collided and without abnormal sounds. All V-shaped brackets of steel pipe turnover device must be aligned on a straight line and rise up uniformly.

8 The steel corbels at the two sides of the steel plate turnover device shall be adjusted in the same plane. When the distance become minimum during the moving of the two corbels, the distance value shall comply with the provisions of the design and technology documents, and the initial and terminal positions of the corbels at the two sides shall comply with the provisions of the design and technology documents. After the above adjustment, simulate the steel plate turnover 5~10 times, each component shall act stably without being stuck or collided and without abnormal sounds.

9 The bearing temperature shall be normal, the rolling bearing temperature rise shall be less than 40°C, and the maximum temperature shall be less than 80°C; the sliding bearing temperature rise shall be less than 35°C, and the maximum temperature shall be less than 70°C.

10 Fasteners and connecters shall not be loose.

Inspection method: observation; check the test run records.

11.12 Installation of revolving platform

General items

11.12.1 General items of revolving platform specified in this section shall be implemented according to Article 11.2.3 of this Code.

11.12.2 For the revolving mechanism and roller transmission mechanism of the steel ingot revolving platform, the bearing clearance and gear mesh shall conform to the requirements of the design and technology documents or the existing national standard -- *General code for construction and acceptance of mechanical equipment installation engineering* GB 50231.

Check quantity: 30% spot-check test, and no less than 1 set.

Inspection method: check installation quality records.

11.12.3 For the lifting device and revolving mechanism of steel coil revolving platform, the

13.8 Test run of looping devices

13.8.1 Test run of looping devices shall comply with the following provisions:

1 Looping devices, structures and their accessories, pipelines, etc. shall all be well installed. The installation quality records and documentations shall be complete. Lubrication, pneumatic and electrical systems shall be well debugged and inspected, and conform to the test run requirements.

2 Materials, machines & tools, detecting instrument, etc. needed for test run shall conform to the test run requirements.

3 Devices' security and protection measures shall be complete and reliable.

4 Before the installation of steel wires, the looping winch shall run for continuous 2~4h, and speed increase and decrease tests shall be conducted. The reducer's tooth shall be well meshed without abnormal vibration or sound. The brake shall act sensitively and reliably.

5 The horizontal looping car shall run back and forth for 5~10 times during the full travel, and speed increase and decrease tests shall be conducted. The looping car shall run stably without being obviously stuck in the track or jumping; the opening and closing of the swing gate shall be sensitive and reliable without being collided; each limit switch shall act accurately and reliably.

6 The intermediate carrier roller car shall follow the looping car to run back and forth for 5~10 times during the full travel, and speed increase and decrease tests shall be conducted. The lock device of the carrier roller car shall be sensitive and reliable, and the lock position shall comply with the requirements of the design and technology documents; the running shall be stable without being obviously stuck in the track, jumping or collision; each limit switch shall act accurately and reliably.

7 The vertical looping car shall run up and down for 5~10 times during the full travel, and speed increase and decrease tests shall be conducted. The looping car shall run stably without being obviously stuck in the track or vibration; the counter weight shall move smoothly in the slide track, and its weight shall comply with the requirements of the design and technology documents.

8 The turning roller and horizontal band steel carrier roller shall rotate flexibly.

9 The bearing temperature shall be normal, the rolling bearing temperature rise shall be less than 40°C, and the maximum temperature shall be less than 80°C; the sliding bearing temperature rise shall be less than 35°C, and the maximum temperature shall be less than 70°C.

10 Fasteners and connecters shall not be loose.

11 Participating area or unit's linked test run shall be conducted according the designed

14 Installation engineering of heating furnace

14.1 General provisions

14.1.1 This chapter is applicable to the acceptance of engineering installation quality of heating furnace of slabs, square billets and round billets, as well as continuous annealing furnace of cold-rolled band steels.

14.2 Installation of stepping heating furnace

I Main-controlled Items

14.2.1 Before installation, the water beam of the furnace door frame, the water-cooling furnace door and other water-cooling devices and components shall take hydraulic tests according to the provisions of the design and technology documents.

Check quantity: exhaustive check.

Inspection method: observation; check the test records.

14.2.2 The welding of furnace bottom plate and furnace bottom beam must conform to the requirements of the design and technology documents, and meet the furnace body's thermal expansion needs.

Check quantity: 30% spot-check, and no less than 10 places.

Inspection method: observation.

14.2.3 The internal quality of the on-site assembled butt-jointed seam of the stepping water beam shall take nondestructive inspection according to the provisions of the design and technology documents.

Check quantity: 30% spot-check, and no less than 10 places.

Inspection method: inspect the nondestructive inspection reports.

14.2.4 After the installation of the stepping water beam and its cooling water system and before the delivery of refractory for construction, hydraulic tests shall be conducted according to the provisions of the design and technology documents.

Check quantity: exhaustive check.

Inspection method: observation; inspect the test records.

II General Items

14.2.5 Allowable installation deviation of the steel structure of the stepping heating

5) During the simulated running by using slabs, the offset of the slabs shall conform to the provisions of the design and technology documents.

7 Annular heating furnaces:

1) The furnace door at the charging and discharging ends shall be opened and closed normally without being stuck, the limit switch shall act accurately, sensitively and reliably, there shall normally be 3~5 shuttles, and the speed shall comply with the provisions of the design and technology documents;

2) While running, the trolley shall be normally contacted with the supporting roller and centering roller;

3) The trolley shall run stably without being jammed or crawling phenomenon, the speed shall conform to the requirements of the design and technology documents, and the trolley shall run for continuous 3~5 weeks;

4) The transmission components shall run flexibly and stably without abnormal vibration or sound.

8 Band steel continuous annealing furnaces:

1) The single roller driven by motor shall conduct test run with no load for continuous 2h;

2) The hydraulic system of the correction roller shall work normally and the alignment function shall be normal;

3) When the furnace roller is running, each component shall act flexibly and stably without abnormal vibration or sound;

4) There is no leakage phenomenon in the water-cooling roller.

9 Roller-bottom heating furnaces:

1) The furnace door at the charging and discharging ends of the heating furnace shall be opened and closed normally without being stuck, the counter weight shall be proper, the limit switch shall act accurately, sensitively and reliably, there shall normally be 3~5 shuttles, and the speed shall comply with the provisions of the design and technology documents;

2) The single roller shall conduct test run with no load for continuous 2h;

3) When the furnace roller is running, each component shall act flexibly and stably without abnormal vibration or sound, and there is no leakage phenomenon;

4) During the simulated running by using thin slabs, the offset of the slabs shall comply with the provisions of the design and technology documents.

10 The bearing temperature shall be normal, the rolling bearing temperature rise shall be

to the test run requirements.

3 Devices' security and protection measures shall be complete and reliable, and the limit switch shall act accurately without errors.

4 For test run of fixed or movable sawing machine, the saw blade feeding device, material clamping device, saw cover opening device, rail clamping device, saw blade rotating device and other components shall, according to the technological action procedures, run back and forth for 3~5 times within the full travel or the rotating scope. The saw blade shall rotate for 1h. Each component shall act stably without abnormal sound or being collided or stuck. Rotation, speed and travel shall all comply with the provisions of the design and technology documents.

5 The running mechanism of the movable hot sawing machine shall run back and forth for 3~5 times within the full travel. The gear of the rack shall act stably without being stuck. The gap between the centering guide roller and the track shall comply with the requirements of the design and technology documents. The clamping device shall act flexibly and be firmly fastened.

6 For the test run of circular saw, the saw blade feeding device, material clamping device, clamping center position adjustment device, saw blade rotating and transmission device, spraying and cooling device and other components shall, according to the technological action procedures, run back and forth for 3~5 times within the full travel or rotating scope. The saw blade shall rotate for 1h. Each component shall act stably without abnormal sound or being stuck. Rotation, speed and travel shall all comply with the provisions of the design and technology documents.

7 The bearing temperature shall be normal, the rolling bearing temperature rise shall be less than 40°C, and the maximum temperature shall be less than 80°C; the sliding bearing temperature rise shall be less than 35°C, and the maximum temperature shall be less than 70°C.

8 Fasteners and connecters shall not be loose.

Inspection method: observation; check the test run records.

15.4 Installation of shear gauge

General items

15.4.1 The radial displacement of two axle centers, two axis inclinations and gap value of two end faces of coupling during the assembly of the coupling shall conform to the requirements of the design and technology documents or the existing national standard -- *General code for construction and acceptance of mechanical equipment installation engineering* GB 50231.

Check quantity: 30% spot-check test, and no less than 1 set.

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