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**Code for Installation and Acceptance of
Fire Resistant Shutters, Fire Resistant
Doorsets and Fire Resistant Windows**

防火卷帘、防火门、防火窗施工及验收规范

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Code for Installation and Acceptance of Fire Resistant Shutters, Fire Resistant Doorsets and Fire Resistant Windows

1 General Provisions

1.0.1 This code is formulated in order to the quality and service function during the installation of fire resistant shutters, fire resistant doorsets and fire resistant windows, reduce fire hazards and protect personal and property safety.

1.0.2 This code is applicable to the installation, acceptance and maintenance management of fire resistant shutters, fire resistant doorsets and fire resistant windows for construction, extension and renovation.

1.0.3 The requirements for installation and acceptance specified in relevant engineering documents and contracts for installing and acceptance of fire resistant shutters, fire resistant doorsets and fire resistant windows shall at least meet those specified in this code.

1.0.4 Installation, acceptance and maintenance management of fire resistant shutters, fire resistant doorsets and fire resistant windows shall not only meet the requirements stipulated in this code, but also comply with those specified in the current relevant national standards.

3 Basic Requirement

3.0.1 Corresponding technical standard for installation, process specification and implementation scheme, quality management system, installation quality control and inspection system shall be available for management of construction site. The quality control on construction site shall be inspected and recorded in accordance with the requirements of Appendix A.

3.0.2 Prior to installation of fire resistant shutters, fire resistant doorsets and fire resistant windows, the following technical information shall be available:

- 1 Approved installation drawing, design instruction, design alteration notice and other documents relating to design.
- 2 Product delivery certificates of main parts and accessories as well as valid documentation conforming to the regulations of market-access system.
- 3 Maintenance and management instructions for main parts and accessories.

3.0.3 Prior to installation of fire resistant shutters, fire resistant doorsets and fire resistant windows, the following conditions shall be available:

- 1 Installation conditions on site are applicable for continuous operation.
- 2 Main parts and accessories are intact and complete, and their type, specification and model meet the design requirements.
- 3 Embedded parts and holes reserved for installation meet the design requirements.
- 4 Related conditions at construction site meet the design requirements.
- 5 Design organization has made technical disclosure to installation organization.

3.0.4 Subsection project, sub-subsection project and sub-item project relating to fire resistant shutters, fire resistant doorsets and fire resistant windows may be categorized in accordance with Appendix B of this code.

3.0.5 Installation quality control and acceptance of fire resistant shutters, fire resistant doorsets and fire resistant windows shall be performed in accordance with the requirements of Chapter 4~Chapter 7.

4 Inspection

4.1 General Requirement

4.1.1 Site inspection held by installation organization and supervised by supervision organization shall be performed for main parts and accessories of fire resistant shutters, fire resistant doorsets and fire resistant windows. If sampling for re-inspection is required, samples shall be drawn by supervision engineer and sent to legal inspection organization authorized by market-access system for re-inspection; installation shall not be performed if the re-inspection is deemed as unqualified.

4.1.2 Records of site inspection for main parts and accessories of fire resistant shutter, fire resistant doorset and fire resistant window shall be filled in accordance with Table C.0.1-1 in Appendix C of this code. Only when the inspection is qualified and confirmed by supervision engineer can installation be performed.

4.2 Fire Resistant Shutters Inspection

4.2.1 Fire resistant shutter and its corresponding smoke and heat detectors shall be provided with delivery certificate and valid documentation conforming to the requirements of market-access system. Its model/specification and fire resistance shall meet the design requirements.

Inspection quantity: 100% inspection.

Inspection method: inspecting whether name, model/specification and fire resistance of the product comply with the valid documentation and design requirements specified by market-access system.

4.2.2 Permanent labels shall be installed obviously on each set of fire resistant shutter and its corresponding door roller, controller, manual button box and thermal release device., on which the name and model/specification, fire resistance and trademark of product, as well as name and address of production unit (manufacturer), delivery date, product No. or production batch No., and executive standard shall be marked.

Inspection quantity: 100% inspection.

Inspection method: visual inspection.

4.2.3 Fire resistant shutter's steel shutter surface, door roller, controller and other

5 Installation

5.1 General Requirement

5.1.1 Fire resistant shutters, fire resistant doorsets and fire resistant windows shall be installed in accordance with the requirements of installation drawing, design instructions, design alteration notice and other technical documents.

5.1.2 Quality control on installation of fire resistant shutters, fire resistant doorsets and fire resistant windows shall be performed, and quality inspection shall also be carried out at the end of each procedure, which shall be organized by installation organization and supervised by supervision organization. Concealed work shall be checked and accepted by relevant organization informed by the installation organization before concealment.

5.1.3 Records on inspection and acceptance of fire resistant shutters, fire resistant doorsets and fire resistant windows shall be filled in accordance with Table C.0.1-2 and Table C.0.1-3 in Appendix C of this code respectively. Only when the inspection is qualified and confirmed by supervision engineer can the commissioning be performed.

5.2 Fire Resistant Shutters Installation

5.2.1 Fire resistant shutter surface and slat shall be installed according to the following requirements:

- 1 Adjacent slats of steel fire resistant shutter after tandem connection shall be flexible in rotation and shall not shed after being swung 90°.

Inspection quantity: 100% inspection.

Inspection method: visual inspection; inspecting by L-square.

- 2 Slats of steel fire resistant shutter shall be straight and even after being assembled and shall be free from holes or gaps.

Inspection quantity: 100% inspection.

Inspection method: visual inspection.

- 3 Back plate or fleeing proof mechanism on both ends of steel fire resistant shutter slat shall be assembled firmly and the displacement of adjacent slats

Inspection method: visual inspection.

- 3 Sliding surface of guide rail shall smooth, straight and flat. Shutter slat or surface, and roller shall operate smoothly in guide rail and shall be free from collision and impact.

Inspection quantity: 100% inspection.

Inspection method: visual examination; manual test.

- 4 Two guide rails of single-shutter surface shutter shall be parallel to one another and guide rails on different shutter surfaces of double-shutter surface shutter shall also be mutually parallel and the parallelism error shall not be greater than 5 mm.

Inspection quantity: 100% inspection.

Inspection method: visual inspection; measuring by steel tape at three points that are respectively 200mm away from the top and bottom of guide rail, and half the length of guide rail and 200mm away from the bottom of guide rail, taking the difference of the minimum and maximum.

- 5 After installation of shutter's guide rail, the error of verticality against foundation surface shall not be greater than 1.5 mm/m and the total length shall not be greater than 20mm.

Inspection quantity: 100% inspection.

Inspection method: visual inspection; adopting plumbing method and inspecting by straight ruler or steel tape.

- 6 The smoke control device and shutter surface shall be uniformly and closely contacted with one another; the length of contact area shall not be less than 4/5 of the length of guide rail.

Inspection quantity: 100% inspection.

Inspection method: visual inspection; measuring the gap between shutter surface or slat and smoke control device by 0.1mm feeler gauge after closing fire resistant shutter, and the failure of feeler gauge to penetrate the smoke control device indicates that shutter surface or slat is closely contacted with the device.

- 7 Guide rail of fire resistant shutter shall be installed on building structure and

fire resistant shutter, and the failure of feeler gauge to penetrate the smoke control device indicates that shutter surface or slat is closely contacted with the device; as for the part not closely contacted, measure by 2.0mm feeler gauge.

5.2.5 Driving device shall be installed according to the following requirements:

- 1 Shaft and support plate shall be firmly installed on concrete structure or embedded steelworks.

Inspection quantity: 100% inspection.

Inspection method: visual inspection.

- 2 Deflection of shaft under normal operation shall be less than 1/400 the length of shaft.

Inspection quantity: 1~2 pieces randomly taken from the same kind of shafts for the same project.

Inspection method: visual inspection; inspecting by test block and deflectometer.

5.2.6 Door roller shall be installed according to the following requirements:

- 1 Door roller shall be installed in accordance with product instructions, firm and reliable.

Inspection quantity: 100% inspection.

Inspection method: visual inspection; inspecting according to product instructions.

- 2 Door rollers shall be equipped with manual zipper and manual speed switch which shall be well installed for smooth operation and have clear marks. They shall not be locked and shall be made of incombustible or nonflammable materials.

Inspection quantity: 100% inspection.

Inspection method: visual inspection.

5.2.7 Protective cover (box) shall be installed according to the following requirements:

installed on its inner wall and outer wall; if nobody is on either side of the shutter, they may be installed on either side of the wall in accordance with the design requirements. Controller and manual button box shall be installed where it is convenient for identification with such functions as "up", "down" and "stop", etc. marked.

Inspection quantity: 100% inspection.

Inspection method: visual inspection.

- 2 Controller and manual button box of fire resistant shutter shall be installed firmly and reliably with the height between their bottom edges and the ground within 1.3 m~1.5 m.

Inspection quantity: 100% inspection.

Inspection method: visual inspection; measuring by ruler.

- 3 Metal pieces of fire resistant shutter controller shall have earth point with obvious earthing mark provided; screw of connecting earth wire shall not be fastened for other purposes.

Inspection quantity: 100% inspection.

Inspection method: visual inspection.

5.2.11 For fire resistant shutter linked with fire alarm system (FAS), its fire detector and manual button box shall be installed according to the following requirements:

- 1 Fire detector group and manual button box shall be installed on both sides of the fire resistant shutter. If nobody is on either side of the fire resistant shutter, they shall be installed on the side of fire resistant shutter with somebody.

Inspection quantity: 100% inspection.

Inspection method: visual inspection.

- 2 For fire detector applicable to link with fire resistant shutter, its type, quantity and spacing shall meet the relevant requirements of the current national standard *Code for Design of Automatic Fire Alarm System* (GB 50116).

Inspection quantity: 100% inspection.

Inspection method: inspecting design and installation documents; measuring

5.3.4 Motor-driven control device of fire resistant doorset shall be installed according to the requirements of design and product instructions.

Inspection quantity: 100% inspection.

Inspection method: visual inspection; inspecting according to design drawing and installation document.

5.3.5 Fire resistant bolt shall be installed on the door leaf of relatively fixed side of double-leaf door or multi-leaf door.

Inspection quantity: 100% inspection.

Inspection method: visual inspection; checking design drawing.

5.3.6 Fire resistant sealing element embedded on the gap between door frame and door leaf, and that between door leaves of fire resistant doorset shall be firm and intact.

Inspection quantity: 100% inspection.

Inspection method: visual inspection.

5.3.7 Fire resistant doorset arranged nearby deformation joint shall be installed on the side with more floors, and shall not cross over the deformation joint after opening door leaf.

Inspection quantity: 100% inspection.

Inspection method: visual inspection.

5.3.8 Cement mortar shall be filled in the door frame of steel fire resistant doorset. Door frame and wall shall be firmly connected with embedded steel or expansion bolt etc., and spacing between fixed points should not be greater than 600 mm.

Inspection quantity: 100% inspection.

Inspection method: inspecting according to design drawings and installation documents; measuring by ruler.

5.3.9 Lapping dimension between door leaf and door frame of fire resistant doorset shall not be less than 12mm.

Inspection quantity: 100% inspection.

5.4 Fire Resistant Windows Installation

5.4.1 For fire resistant windows with sealing requirements, fire resistant sealing element inset in their window frame seal groove shall be firm and intact.

Inspection quantity: 100% inspection.

Inspection method: visual inspection.

5.4.2 Cement mortar shall be filled in the window frame of steel fire resistant window. Window frame and wall shall be firmly connected with embedded steel or expansion bolt etc., and spacing between fixed points should not be greater than 600 mm.

Inspection quantity: 100% inspection.

Inspection method: inspecting according to design drawings and installation documents; measuring by ruler.

5.4.3 Open-close control device of automatic controlled fire window sash shall be installed according to the requirements of design and product instructions on obvious position convenient for operation.

Inspection quantity: 100% inspection.

Inspection method: visual inspection; manual test.

5.4.4 Automatic controlled fire window shall be equipped with thermal release device which has control over automatically closing window sash according to the requirements of design and product instructions in case of fire.

Inspection quantity: 100% inspection.

Inspection method: visual inspection; inspecting according to design drawing and installation document.

6 Commissioning

6.1 General Requirement

6.1.1 Commissioning shall be carried out after installation of fire resistant shutters, fire resistant doorsets and fire resistant windows; if there is fire alarm system, commissioning shall be carried out after commissioning of relevant fire alarm system and linkage control equipment is qualified, which is in the charge of installation organization and under the supervision of supervision organization.

6.1.2 Commissioning of fire resistant shutters, fire resistant doorsets and fire resistant windows shall meet the following requirements:

- 1 Before commissioning, technical information specified in 3.0.2 of this code, inspection records in installation process and other information necessary for commissioning shall be provided.
- 2 Before commissioning, commissioning plan shall be established according to commissioning content and method specified in this code and approved by supervision organization.
- 3 Commissioning personnel shall carry out commissioning by procedures according to approved commissioning plan.

6.1.3 For commissioning of fire resistant shutters, fire resistant doorsets and fire resistant windows, inspection record about commissioning process shall be filled in according to Table C.0.1-4 in Appendix C of this code. Construction organization shall apply for acceptance to installation organization after commissioning is qualified.

6.2 Fire Resistant Shutters Commissioning

6.2.1 Commissioning shall be carried out for energization, standby power supply, fire alarm, fault alarm, automatic control, manual control and dead-weight dropping of controller of fire resistant shutter, and the following requirements shall be met:

- 1 During energization commissioning, controller of fire resistant shutter shall be connected with fire alarm controller or fire linkage control equipment of fire control room, relevant fire detectors, and door roller, etc. and energized; it shall be under normal working condition.

Inspection quantity: 100% inspection.

shall output signal which can control fire resistant shutter to complete corresponding operation after receiving fire alarm signal and shall meet the following requirements:.

- 1) Fire resistant shutter which controls to separate fire compartment shall close automatically from upper limit to full-off.
- 2) Controller of fire resistant shutter controls fire resistant shutter to close automatically to mid-position (1.8 m) and stop after receiving alarm signal of smoke fire detector, and continues to close to full-off after receiving alarm signal of heat fire detector.
- 3) Action status signal of semi-drop and full drop of fire resistant shutter shall be fed back to fire control room.

Inspection quantity: 100% inspection.

Inspection method: respectively make fire detector group send out semi-drop and full-drop signal, observe audible and visual alarm of the controller and operations of fire resistant shutter as well as signal display of action status for fire resistant shutter in the fire control room.

- 6 During commissioning of manual control, rise, drop and stop of fire resistant shutter may be controlled by manually operating button on controller of the fire resistant shutter and that on manual button box.

Inspection quantity: 100% inspection.

Inspection method: manual test.

- 7 During commissioning of deadweight dropping, power supply of door roller shall be arranged under fault conditions; fire resistant shutter shall drop to full-off position depending on deadweight under the control of controller of the fire resistant shutter.

Inspection quantity: 100% inspection.

Inspection method: cut off the power supply of door roller, press "down" button of the controller, then observe operations of the fire resistant shutter.

6.2.2 Commissioning of door roller for fire resistant shutter shall meet the following requirements:

- 1 Manual operation device (manual zipper) of door roller shall be flexible and

m/min.

Inspection quantity: 100% inspection.

Inspection method: measuring with stopwatch and steel tape.

- 3** Average noise of on/off operation of fire resistant shutter shall not be greater than 85dB.

Inspection quantity: 100% inspection.

Inspection method: during operation of fire resistant shutter, horizontally measure with sound level meter three times 1 m (vertical distance) away from the surface of shutter and 1.5 m (vertical distance) from the ground, take the average.

- 4** After operation of thermal release device installed on fire resistant shutter, fire resistant shutter shall automatically drop to full-off position.

Inspection quantity: 1~2 thermal release device(s) of the same kind for the same works.

Inspection method: after installation and commissioning of fire resistant shutter, cut off the power supply, heat thermal release device for operation of its temperature-sensing element, then observe operations of the fire resistant shutter. Before the test, a thermal release device for standby shall be prepared; after the test, it shall be re-installed.

6.3 Fire Resistant Doorsets Commissioning

6.3.1 Normally-closed fire resistant doorsets shall close automatically when they are opened manually from any side. If signal feedback device is installed, it shall feedback on/off status to the fire control room.

Inspection quantity: 100% inspection.

Inspection method: manual test.

6.3.2 Normally-open fire resistant doorsets shall close automatically after fire detector on any side alarms, and shall feedback off signal to the fire control room.

Inspection quantity: 100% inspection.

Inspection method: make fire detector on one side of the normally-open fire resistant

7 Acceptance Test

7.1 General Requirement

7.1.1 After fire resistant shutters, fire resistant doorsets and fire resistant windows have been commissioned, acceptance of project quality shall be performed on the basis of qualified assessment of self-inspection by the installation organization. Acceptance shall be applied by the installation organization, and shall be implemented together by the organizations of supervision, design and installation which are organized by the construction organization.

7.1.2 Before acceptance of project quality of fire resistant shutters, fire resistant doorsets and fire resistant windows, the installation organization shall provide the following document information and fill in the information verification record according to D.0.1-1 in Appendix D of this code:

- 1** Application report of project quality acceptance.
- 2** Records of quality management and inspection in construction site, specified in 3.0.1 of this code.
- 3** Technical information specified in 3.0.2 of this code.
- 4** Completion drawing and relevant document information.
- 5** Inspection records of installation process (including site inspection, installation and commissioning process).
- 6** Acceptance record of concealed work.

7.1.3 Before project quality acceptance of fire resistant shutters, fire resistant doorsets and fire resistant windows, the acceptance scheme shall be established according to the content and method of acceptance specified in this code; the acceptance personnel shall operate according to the procedure of acceptance scheme and fill in the project quality acceptance record according to Table D.0.1-2 of Appendix D in this code.

7.2 Fire Resistant Shutters Acceptance

7.2.1 Model, specification and quantity of fire resistant shutter, as well as installation position, etc., shall meet the design requirements.

8 Maintenance and Management

8.0.1 Before fire resistant shutters, fire resistant doorsets and fire resistant windows are put into service, the following document information shall be available:

- 1 Project completion drawing, and product instructions of main equipment and parts and accessories.
- 2 Equipment working flow diagram and operation specifications.
- 3 Inspection and maintenance management system of equipment.
- 4 Inspection and maintenance management records of equipment.
- 5 Operator register and corresponding responsibilities.

8.0.2 The service organization shall be equipped with special personnel, who are specially trained and qualified for fire control, to take the responsibility of regular inspection and maintenance management of fire resistant shutters, fire resistant doorsets and fire resistant windows.

8.0.3 The service organization shall establish the maintenance and management files for fire resistant shutters, fire resistant doorsets and fire resistant windows, including the document information specified in 8.0.1 of this code; the files shall be equipped with electronic backup.

8.0.4 Regular inspection and maintenance shall be conducted for fire resistant shutters, fire resistant doorsets and fire resistant windows and their control equipment; the inspection, service and management records of equipment shall be filled in according to Table E of Appendix E in this code.

8.0.5 Inspection shall be conducted for the lower part of fire resistant shutter, the gate of fire resistant doorset, the opening of automatic controlled fire window once a day; those articles hampering the equipment to start and stop shall be cleaned up.

8.0.6 The following functions of fire resistant shutter, fire resistant doorset and automatic controlled fire window shall be inspected once a quarter:

- 1 Manually startup the controller at both inner and outer sides of fire resistant shutter, or the control button on the button box to check the lifting, dropping and stopping functions of fire resistant shutter.

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