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USACE / NAVFAC / AFCEC / NASA **UFGS-21 21 03.00 10 February 2009)**

Preparing Activity: USACE **Superseding**
UFGS-21 21 03.00 10 (April 2006)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated October 2022
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SECTION TABLE OF CONTENTS

DIVISION 21 - FIRE SUPPRESSION

SECTION 21 21 03.00 10

WET CHEMICAL FIRE EXTINGUISHING SYSTEM

02/09

-- End of Section Table of Contents --

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SECTION 21 21 03.00 10

WET CHEMICAL FIRE EXTINGUISHING SYSTEM
02/09

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NOTE: This guide specification covers the requirements for wet chemical fire extinguishing systems that protect kitchen equipment and exhaust system.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).
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PART 1 GENERAL

1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also

use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

FM GLOBAL (FM)

FM APP GUIDE	(updated on-line) Approval Guide http://www.approvalguide.com/

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 17A	(2021) Standard for Wet Chemical Extinguishing Systems
NFPA 96	(2021) Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

UNDERWRITERS LABORATORIES (UL)

UL Fire Prot Dir	(2012) Fire Protection Equipment Directory

1.2 SYSTEM DESCRIPTION

1.2.1 General

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NOTE: List each item of equipment requiring protection. The location of wet chemical containers, system release panels, manual actuation stations, wiring and connection to the building fire alarm control panel, fuel shut-off valves, power shut-down equipment and wiring, and ductwork access doors will be indicated on the drawings.

Where it is not clear which or to what extent exhaust systems should be protected, the designer will indicate on the drawings the extent of protection required.

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Protect each of the following cooking equipment items [_____], including the exhaust hood, [grease extractor,] [grease filter,] and exhaust duct serving the item by preengineered wet chemical fire extinguishing system. Install system with all accessories necessary for system to operate in accordance with manufacturer's instructions and as specified herein.

1.2.2 Design and instllation Requirements

Provide system application, design, and installation complying with

NFPA 17A and NFPA 96, except as follows:

a. System components shalmustlisted in UL Fire Prot Dir or approved by FM APP GUIDE for use with wet chemical fire extinguishing systems.

c. Interpret reference to the "authority having jurisdiction" to mean the Contracting Officer.

d. The use of grease extractors does not eliminate the requirement that duct systems, grease removal devices, and hoods be protected by the wet chemical extinguishing system.

1.2.3 System Controls

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NOTE: The system will be connected to the building fire alarm system. If the building has no alarm system, the designer will consider connecting the system to the base fire alarm system.

The remote manual actuation station and equipment and wiring required for connection to building fire alarm panel and to shut off fuel flow and power will be shown on the drawings. Generally, the cable length to a manual actuation will not exceed 15 m 50 feet.
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Actuate each system by fusible link and by a remote manual actuation station connected to the extinguishing system release mechanism by cable. Locate remote manual actuation stations along the path of egress and automatically actuate the [building] [base] fire alarm system. Provide system controls that automatically shut off fuel flow and electrical power to the protected appliances and other appliances located under the ventilating system protected by the extinguishing system upon system actuation. Use stainless steel cables with corner pulleys employing stainless steel ball bearings at all corners. Enclose all cable and wiring in conduit.

1.2.4 Existing Building Fire Alarm Control Panel

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NOTE: Use this paragraph only where connection to an existing building fire alarm system is required.
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The existing building fire alarm control panel was manufactured by [_____], Model [_____], and presently has [_____] spare zone modules. Connect the wet chemical fire extinguishing system to [the zone currently serving [_____]] [a spare zone module].

1.3 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification

technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Installation Drawings; G[, [_____]]

SD-03 Product Data

Similar Services

Standard Products; G[, [_____]]

Preliminary Tests; G[, [_____]]

Final Acceptance Tests; G[, [_____]]

Field Training

SD-06 Test Reports

Preliminary Tests

Final Acceptance Tests

SD-07 Certificates

Installation Technician; G[, [_____]]

Installation Drawings; G[, [_____]]

SD-10 Operation and Maintenance Data

Operation and Maintenance Instructions; G[, [_____]]

1.4 QUALITY ASSURANCE

Submit a statement demonstrating successful completion of similar services on at least five projects of similar size and scope, at least 2 weeks before submittal of other items required by this section.

1.4.1 Coordination of Trades

Coordinate each system with the equipment, hood, and exhaust ducts that it protects along with other construction in order to eliminate any interference.

1.4.2 Installation Technician

The installation technician will have been trained by the system manufacturer for system installation, operation, and maintenance. Concurrent with statement of similar services, submit manufacturer's certification of installation technician.

1.4.3 Installation Drawings

Provide installation drawings prepared by a representative of the manufacturer to ensure compliance with the requirements listed herein and with all manufacturer's requirements and recommendations. Submit drawings consisting of system layout including assembly and installation details and electrical connection diagrams; piping layout showing pipe sizes, lengths, and supports. Include any information required to demonstrate that the system has been coordinated and will function as intended and show system relationship to items it protects and clearances required for operation and maintenance. Submit manufacturer's certification of the drawings. Also include conduit, cables, manual actuation stations and fusible links. Include detail drawings for the following items:

a. Storage containers and mounting brackets

b. Fusible links, cables, conduit, corner pulleys, and link mounting frames/brackets

c. Release mechanisms

d. Valves

e. Discharge nozzles

f. Piping components

g. Remote manual actuation stations

h. Fuel and power shutoff

i. Alarms, alarm devices, alarm interface(s), control panels

1.5 DELIVERY, STORAGE, AND HANDLING

Protect equipment delivered and placed in storage from the weather, humidity and temperature variations, dirt and dust, or other contaminants.

PART 2 PRODUCTS

2.1 STANDARD PRODUCTS

a. Provide system components which are the standard products of a manufacturer regularly engaged in the manufacturing of products that are of similar material, design and workmanship and that have been in satisfactory commercial or industrial use for 2 years before bid opening. Include installations of systems under similar circumstances and of similar size. Provide systems that are supported by a service organization.

b. Submit manufacturer's catalog data. Highlight data to show model, size, options, etc., that are intended for consideration and are adequate to demonstrate compliance with contract requirements.

c. Locate identification signs at each remote manual actuation station. Provide signs fabricated of rigid plastic, red in color, with engraved white letters that are a minimum 6.5 mm 0.25 inches in height. Engrave each sign with "Fire Extinguishing System" and with a brief description of the equipment protected.

d. Replace the fire alarm panel zone identification label with a new label of similar construction which indicates the equipment is connected to the zone module. Discharge of the extinguishing system must actuate the fire alarm control panel in the same manner as other actuating devices. Supervise extinguishing system wiring in the same manner as other devices connected to the fire alarm system.

2.2 PIPING COMPONENTS

2.2.1 Pipe and Fittings

Pipe and fittings must be Schedule 40 stainless steel. Stainless steel tubing may be used in accordance with manufacturer's recommendations. Do not use galvanized pipe.

2.2.2 Nozzles

Provide stainless steel nozzles and equip with an integral strainer to prevent matter inside the distribution piping from clogging the nozzle orifice. Provide each nozzle orifice with a seal to protect the nozzle from clogging by grease or other obstructions. This seal must detach upon actuation.

2.3 WET CHEMICAL

The wet chemical must not have an adverse effect on stainless steel during exposure periods of up to 24 hours.

PART 3 EXECUTION

3.1 INSTALLATION

Perform installation in accordance with system manufacturer's instructions. Provide ductwork access doors where indicated and at any items requiring service and inspection, including nozzles and fusible links. Provide ductwork access doors in accordance with Section 23 30 00 HVAC AIR DISTRIBUTION.

3.2 PRELIMINARY TESTS

Submit proposed test procedures for preliminary test, at least 2 weeks before the start of related testing. Frame system diagrams that show system layout and typed condensed normal and emergency operating procedures, methods for checking the system for normal, safe operation, and procedures for manual actuation under glass or laminated plastic. After approval, post these items where directed. After installation has been completed, actuate each system by both fusible link and by remote actuation station to demonstrate proper function of all components, including alarms and fuel flow and power shut off. Actuate by fusible link as approved by the system manufacturer. Discharge test containers, pressurized with either nitrogen or air to normal system operating pressure and of the same size as actual operating containers into system. The seals must release as during normal actuation. After each discharge, remove and disassemble the nozzles , and clean the strainers. Inspect and clean system piping as necessary. Verify all functions of system operation, including switches, shutdown of fuel and power to appliances protected by the system or served by the same ventilation system, uniform delivery of air or nitrogen, and activation of alarms. Replace nozzle seals/covers after the preliminary tests are complete. In the event portions of the tests are unsuccessful, make repairs and repeat the entire test until successful. Submit test report for the preliminary tests in booklet form, upon completion of testing. Document test results including repairs and adjustments made, and final test results.

3.3 FINAL ACCEPTANCE TESTS

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NOTE: The requirement for plastic containers, hoses, and hose fittings should be deleted if wet chemical is not used in testing.
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Submit proposed test procedures for final acceptance test, at least 2 weeks before the start of related testing and proposed test schedule for acceptance test, at least 2 weeks before the start of related testing. Actuate system by both fusible link and remote manual actuation station and verify all system functions as described in Paragraph PRELIMINARY TESTS [using test containers specified for preliminary tests] [except use actual system containers fully charged with wet chemical]. Provide each nozzle with a plastic container, hose, and hose fitting to capture all wet chemical discharged. Also, perform all tests or checks recommended by the manufacturer. In the event portions of the tests are unsuccessful, make repairs and repeat the entire test until successful. Replace nozzle seals/covers after the final acceptance tests are complete. Return the systemto normal operating condition after the completion of testing, recharge expended wet chemical containers, and verify leak tight. Clean extinguishing system and equipment and duct protected by the extinguishing

after completion of testing. Repair damage. Record the weight of each storage container before final acceptance test and after test has been completed and containers recharged. Submit test report for the final acceptance tests in booklet form, upon completion of testing. Document test results including repairs and adjustments made, and final test results. Record the weight of each storage container before final acceptance test and after test has been completed and containers recharged.

3.4 FIELD TRAINING

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NOTE: The number of hours of instruction should be determined by the number and complexity of the systems specified.
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Submit proposed schedule for field training, at least 2 weeks before the start of related training. Conduct a training course for operating and maintenance personnel as designated by the Contracting Officer. Provide training for a period of [_____] hours of normal working time and start after the system is functionally complete and after the Final Acceptance Test. Cover all of the items contained in the approved Operation and Maintenance Instructions. Submit [6] [_____] manuals listing step-by-step procedures required for system actuation (automatic and manual), recharging, and routine maintenance, at least 2 weeks before field training. Include the manufacturer's name, model number, parts list, list of tools and parts that should be kept in stock by the owner for routine maintenance including the name of a local supplier, simplified wiring and control diagrams, troubleshooting guide, and recommended service organization (including address and telephone number). Provide service organization capable of providing [4] [_____] hour onsite response to a service call on an emergency basis.

-- End of Section --