

ERRCS GUIDELINES FOR PROJECTS IN CCSF



*Technical and Applicable Codes Guidelines for Design and Installation of
Emergency Responders Radio Coverage Systems (ERRCS) in the City and
County of San Francisco (CCSF) per the San Francisco Fire Department
(SFFD) and the Department of Technology (DT) - Effective 8.17.2020*



INTRODUCTION

Effective 17 August 2020, The San Francisco Fire Department (SFFD) has published specific requirements for approved 2-HR fire resistive coaxial cables to be used in the jurisdiction for ERRC Systems (ERRCS).

You must comply with ALL of the applicable requirements listed when you submit ERRCS permit plans for 2-HR fire resistive coaxial cable.

You should include a copy of these requirements on your ERRCS permit plans and indicate how you comply with each specific applicable requirement (you could use a checklist format).

RFS has gathered and provided you the DragonSkin information that is required in the sections listed below. To access the documents, click or copy-paste the hyperlink provided in this document.

SECTION F: SFFD AB#2.01-2019 ADDENDUM G SECTION F: PUBLISHED ON THE [SFFD WEBSITE](#)

All ERRCS wires and cables (coax, fiber optic, etc.) shall comply with the required pathway survivability level based on the building's type of construction. In all building's portions/areas having 2-HR construction (such as Type IA or IB construction AND 2-HR rated vertical enclosures such as stairways or shafts in Type III and Type V buildings or portions of buildings) pathway survivability level 2 (or 3) shall be required. In all building's portions/areas having less than 2-HR construction (such as Type III or V construction) pathway survivability Level 1 shall be permitted.

(F1) Per NFPA 1221-2016 Section 9.6.2, pathway survivability shall comply with Section 5.10.

(F2) Where a Pathway Survivability Level 2 or 3 is required per item F of this Addendum G, it shall comply with any of the options listed in NFPA 1221-2016 Section 5.10.3 or 5.10.4 respectively.

(F3) If option # 1 of Section 5.10.3 or 5.10.4 is proposed which is "2-HR fire rated circuit integrity (CI) or fire-resistive Cable" – the following items shall be provided on the ERRCS (FIRE ONLY) Permit Plans submittal to be reviewed and approved by the SFFD Plan-Review Section inspector during the ERRCS permit review process:

SECTION F.3.1

Scanned copy of the cable manufacturer's cut sheets showing the specific UL 2196 (or other approved equivalent) listing for the proposed cable as a 2-HR fire resistive cable.

[DOWNLOAD THE CUT SHEET](#)



2HB12-50JPLR*

dragon skin
Radio Frequency Systems

RFS
Radio Frequency Systems

DRAGONSKIN™ 1/2" FIRE-RESISTANT UL 2196 CERTIFIED STANDALONE COAXIAL CABLE, MEETS NFPA 72 & NFPA 1221 SURVIVABILITY, MAINTAINS IN-BUILDING COMMUNICATIONS DURING FIRES, MADE IN THE USA

Standalone coaxial cable that is certified to meet the UL 2196 Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables.

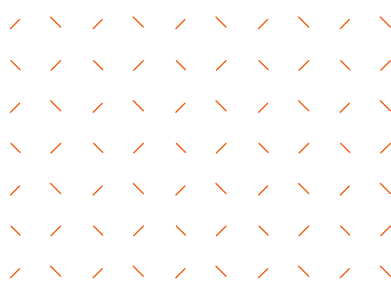
FEATURES/BENEFITS

- FIRE-TESTED STANDALONE COMMUNICATIONS CABLE MEETING NFPA 72 AND 1221 SURVIVABILITY STANDARDS**
VERIFIED THE CABLE SURVIVES 2 HOURS AT TEMPERATURES UP TO 1800 DEGREES F AND THE WIRE SPIN TEST WITHOUT CONDUIT OR ADDITIONAL WRAPPING
- ENABLES CELLULAR AND PUBLIC SAFETY RADIO COMMUNICATIONS TO AND FROM ALL FLOORS OF A BURNING BUILDING**
ENSURES EMERGENCY RESPONDERS AND BUILDING OCCUPANTS HAVE RELIABLE ACCESS TO COMMUNICATIONS DURING SEVERE FIRES
- NO CONDUIT OR CABLE WRAPPING REQUIRED**
REDUCES CABLE SIZE AND WEIGHT, SIMPLIFIES INSTALLATION
- CUTUP PLUMBING CERTIFIED**
MEETS CERTIFICATION FOR USE IN THE ENVIRONMENTAL AIR HANDLING SPACE IN BUILDINGS
- COAXIAL CABLE FEATURES SOLID INNER AND OUTER CONDUCTORS**
VIRTUALLY ELIMINATES INTERMODULATION
- MAINTAINS MINIMUM BENDING RADIUS AT ALL TIMES**
ACCELERATED INSTALLATION, ESPECIALLY IN SMALLER SPACES AND CLOSE FITTINGS
- USES STANDARD RFS CONNECTORS AND INSTALLATION TECHNIQUES**
ELIMINATES THE NEED FOR SPECIALIZED PARTS OR EXPERTISE

TECHNICAL FEATURES

APPLICATIONS		Ideal for public safety applications with the most stringent fire codes
STRUCTURE		
Cable Type	40' Electrically Corrugated	
Size	1/2"	
Inner Conductor	mm (mil)	4.8 (378) Copper Wire
Dielectric	mm (mil)	0.04 (1.018)
Outer Conductor	mm (mil)	12.8 (354) Corrugated Copper
Jacket	mm (mil)	16 (0.75) Plenum-Rated / Color Red
ELECTRICAL SPECIFICATIONS		
Impedance	Ω	50 ± 2
Maximum Frequency	GHz	1.195 (will extend to a higher frequency during the next phase)
Velocity	%	85
Capacitance	pF/m (pF/ft)	70.8 (21.5)
Inductance	μH/m (μH/ft)	270 (82.6)
Peak Power Rating	Watt	400
RF Peak Voltage	Volts	2000
Shielding	dB SHIELD	80/100
Inner Conductor die Resistance	ΩA/1000 m (ΩA/1000 ft)	0.06 (0.18)
Outer Conductor die Resistance	ΩA/1000 m (ΩA/1000 ft)	1.0 (3.0)
Maximum Return Loss	dB (RETURN)	16 (1.5)
Mechanical Specifications		
Cable Weight, Nominal	kg/m (lb/ft)	0.01 (0.34)
Minimum Bending Radius, Single Bend	mm (in)	100 (4)
Minimum Bending Radius, Repeated Bends	mm (in)	200 (8)
Bending Moment	Nm (lb-ft)	0.1 (0.07)
Tensile Strength	N (lb)	890 (200)
Clamp Spacing	mm (in)	0.01 (1.0)
Crimp Strength	N/g (mm 30/ft)	30/20 (10/5)

*Values Varying



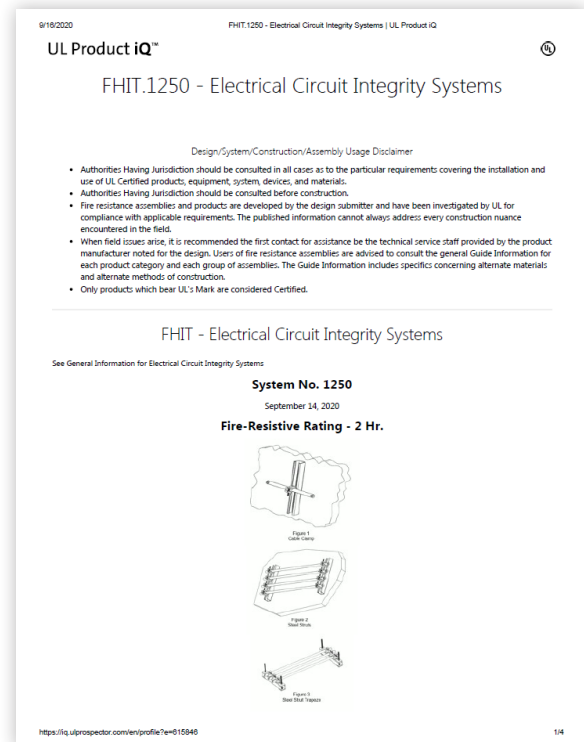
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SECTION F.3.2

Scanned copy of the associated UL Fire-Resistive Cable category - FHIT system 1250 (or other approved equivalent) including all specific Manufacturers' Installation Instructions for the proposed cable and its associated attachments to the building structure.

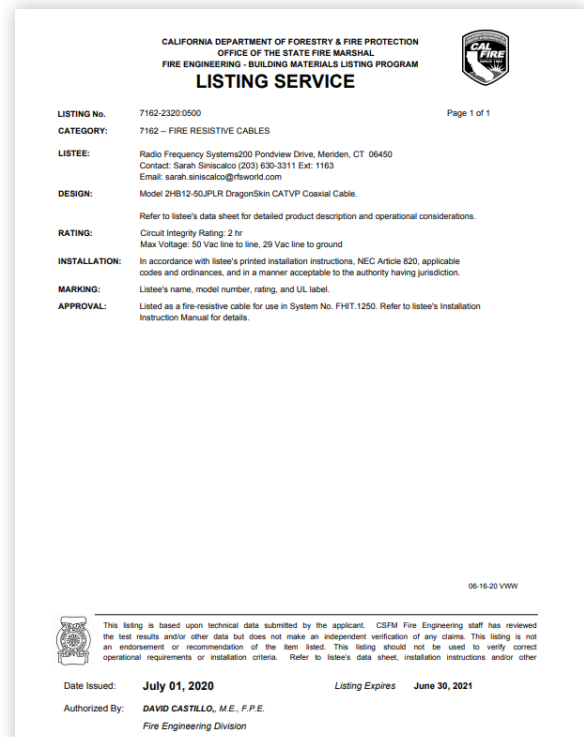
[DOWNLOAD THE FHIT SYSTEM 1250 DOCUMENT](#)
[DOWNLOAD THE INSTALLATION INSTRUCTIONS](#)

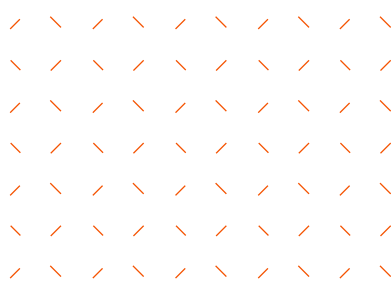


SECTION F.33

Scanned current copy of the CSFM listing sheet for the proposed cable.

[DOWNLOAD THE CSFM LISTING SHEET](#)





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SECTION F.3.4

Statement of compliance, from the cable manufacturer, with CEC-2019 Article 820 with specific indication for the UL listing (or other approved equivalent) of this cable as a "Plenum Rated Cable Assembly" - not required to be installed in metallic raceway.

[DOWNLOAD DECLARATION OF CONFORMITY](#)

RADIO FREQUENCY SYSTEMS
The Clear Choice™

Declaration of Conformity

We, Radio Frequency Systems, 200 Pond View Drive, Meriden, CT 06450, USA, and the undersigned hereby declare under our sole responsibility that the below product(s) conform with the stated standards provided that they are installed, maintained and used in the application for which they are made, with respect of the "professional practices", relevant installation standards and manufacturer's instructions.

APPLICATION OF EC COUNCIL DIRECTIVE(S):

- Directive 2014/53/EU - Radio Equipment
- Directive 2011/65/EU - Restriction of the use of certain hazardous substances (RoHS)

CABLE TYPE:

- Radio Frequency DRAGONSKIN™ 1/2" FIRE-RESISTANT UL 2196 CERTIFIED COAXIAL CABLE

CABLE MODEL NO.:

- 2HB12-60JPLX - Dragonskin fire-resistive cable

STANDARD(S) TO WHICH CONFORMITY IS DECLARED:

- NFPA 70: National Electrical Code 820 CATVP Cable.
- NFPA 70: National Electrical Code Article 300 to Article 382.
- UL1555, Standard for Community-Antenna Television Cables
- Listed for FRR 2.0 Hours and CATVP, files number R40176, E239351, UL System FHIT 1250
- NFPA262 Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces
- NFPA130 Standard for Fixed Guideway Transit and Passenger Rail Systems
- NFPA 72 National Fire Alarm and Signaling Code.
- NFPA 1221 2019 (section 5.5.1.1) Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems
- Canadian CSA C.22.2/FT6, UL
- American Society for Testing & Materials ASTM B-3.

28 September 2020
Date of Issue

Asaad Elsadani, Mechanical Engineer

Timothy Bernhardt, Mechanical Engineering Manager

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