



OVERVIEW OF THE DRAGONSKIN SYSTEM FOR 2-HR PATHWAY SURVIVABILITY

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NATIONWIDE:

All **nationwide** branches are focused on getting our products to the end user as quickly as possible. We offer local delivery, messenger service, next day delivery on nearly all orders. Our top priority is getting customers what they need, when they need it.

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Bristol, PA 19007

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5217 Linbar Drive, Suite 304
Nashville, TN 37211

Texas

1800 10th Street, Suite 400
Plano, TX 75074

9210 Highway 6 North, Bldg. B
Houston, TX 77095

Utah

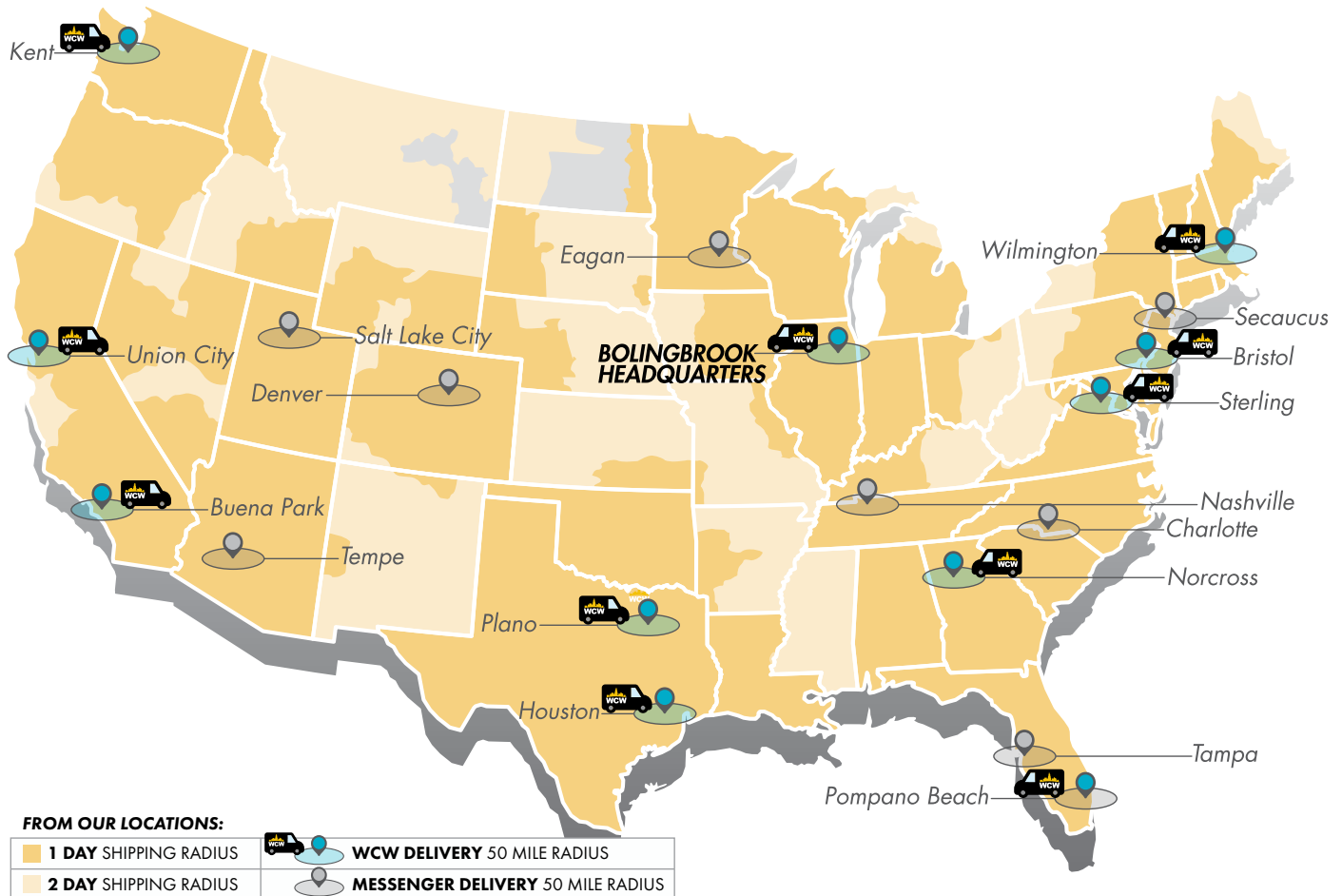
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Virginia

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Sterling, VA 20166

Washington

21246 68th Ave S
Kent, WA 98032



IT TAKES A DRAGON TO TAME A BEAST:

THE FIRST AND ONLY IN-BUILDING COAXIAL CABLE CERTIFIED BY UL WITHOUT ADDING METAL CONDUIT AND EXTENSIVE WRAPPING, OR BUILDING A FIRE-RESISTANT ENCLOSURE.



Keep communications alive to save lives. Fire doesn't stop it. Water doesn't slow it. DragonSkin protects mission-critical public safety communications, meeting the NFPA 72 Survivability standards, to prevail over "the beast" that is fire in a building. It is the first 2-hour fire-rated circuit integrity cable available. DragonSkin also bends like a slithering creature, to make installation (even when retrofitting an existing building) easier and faster and much less expensive.

It's exactly what you would expect from RFS Technologies, the leader in industry firsts that last. RFS Technologies invents and innovates, introducing new ways and bold improvements that so often remain the best approach to solving problems.



THE FOLLOWING ITEMS REQUIRED TO INSTALL DRAGONSKIN™ UL-2196 RATED CABLE.

Other connector types are available if connectors other than N Type are required.

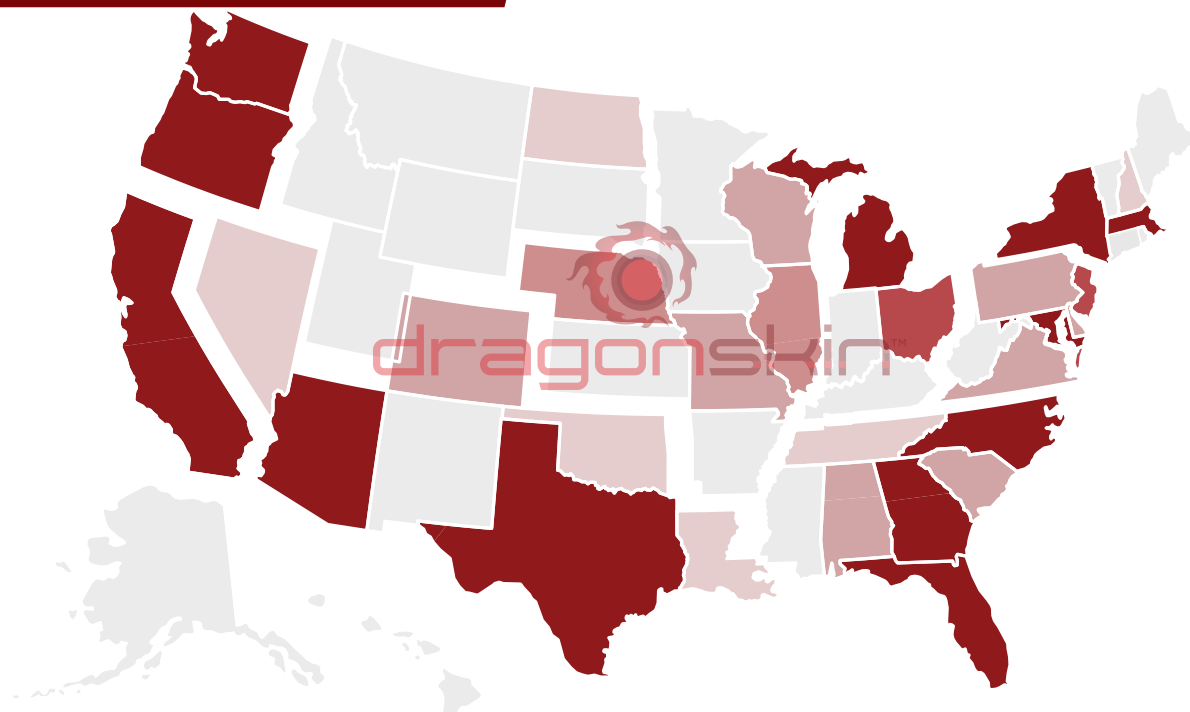
PART NUMBER	DESCRIPTION	PACK/NOTES
DRAGONSKIN™ 2-HOUR UL-2196 SYSTEM		
WCW-2HB12-50JPLR	DragonSkin™ ½" ClearFill® Line UL-2196 Plenum Air Dielectric Coax	Ordered per Foot
WCW-CLAMP-12	Cable Hanger, Non-insulated, Bolt-on, for ½" Coaxial Cable and Elliptical Waveguide [One clamp required every 2 feet]	10 Pack
WCW-HEAT-2HB-20	Heat Shrink Tubes, for the OMNI FIT™ Connectors (C02, C03, D01, E01) that works on RFS DragonSkin™ [One heat shrink tube required per connector]	20 Pack
WCW-NF-LCF12-C02-6	N Female Connector for ½" Coaxial Cable, OMNI FIT™ Standard, Extended Frequency Range	
WCW-NM-LCF12-C02-6	N Male Connector for ½" Coaxial Cable, OMNI FIT™ Standard, Extended Frequency Range	
WCW-TRIM-ICA12-C02	Automated Trimming Tool, ICA & LCF 12 OMNI FIT™ Standard, Trim Series C02	
WCW-TRIMSET-2HB12E01	RFS Combination Preparation Tool (<i>Universal Trimming Tool</i>) DragonSkin™ Cable ½" (2HB) for Connector Family OMNI FIT™ Premium D01 & E01.	Minimum of 1
WCW-NF-LCF12-D01	N Male Connector for ½" Coaxial Cable, OMNI FIT™ Premium	2 Connectors per Cable Run
WCW-NM-LCF12-D01	N Female Connector for ½" Coaxial Cable, OMNI FIT™ Premium	2 Connectors per Cable Run

ON THE CONTRARY, DRAGONSKIN SLAYS ALL OTHER ALTERNATIVES.

PROTECTS MISSION-CRITICAL COMMUNICATIONS WITH SUPERIOR, BUILT-IN PERFORMANCE:



527 DEPLOYMENTS • 31 STATES



MARKET REQUIREMENTS:

Local AHJ's are enforcing the requirements of the NFPA 72 and IFC Standard for the installation, maintenance and use of emergency services communications systems NFPA 1221 and 1225 Evolution

2016 EDITION OF NFPA 1221:

Included requirements regarding two-way radio communications enhancement systems and pathway survivability from NFPA 72 that the committees of both standards felt were more appropriate to NFPA 1221.

2019 EDITION OF NFPA 1221:

Section 5.5.1.1 Where fire survivability is required, a listed electrical circuit protective system or a fire-rated cable that is listed to maintain circuit integrity shall be used.

2022 EDITION OF NFPA 1225:

No requirements for a fully sprinklered building under 75 feet. All buildings over 75 feet or without a fully sprinklered building will require 2-HR Pathway Survivability. Must be NFPA 13, not 13R.

12.4.1 PATHWAY SURVIVABILITY LEVEL 0:

Shall not be required to have any provisions for pathway survivability.

12.4.2 PATHWAY SURVIVABILITY LEVEL 1:

Shall consist of pathways in buildings fully protected by an automatic sprinkler system in accordance with NFPA 13 with any interconnecting conductors, cables, or other physical pathways installed in metal raceways.

12.4.3 * PATHWAY SURVIVABILITY LEVEL 2:

Shall consist of one or more of the following:

- 2-HR fire-rated circuit integrity (CI – CIIC) or fire-resistive cable
- 2-HR fire-rated cable system electrical circuit protective system
- 2-HR fire-rated enclosure or protected area
- *Performance alternatives approved by the authority having jurisdiction

12.4.4 PATHWAY SURVIVABILITY LEVEL 3:

Shall consist of pathways in buildings fully protected by an automatic sprinkler system in accordance with NFPA 13 and one or more of the following:

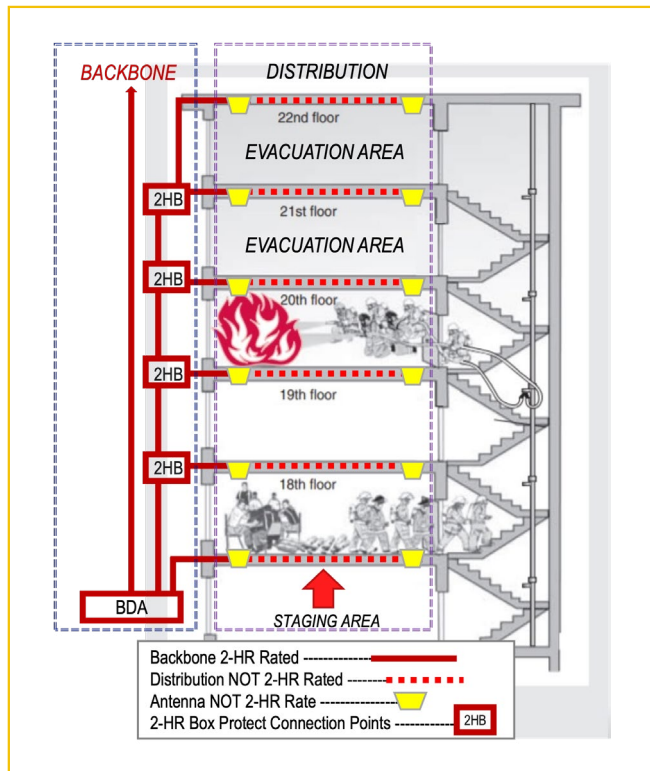
- 2-HR fire-rated circuit integrity (CI – CIIC) or fire-resistive cable
- 2-HR fire-rated cable system electrical circuit protective system
- 2-HR fire-rated enclosure or protected area
- *Performance alternatives approved by the authority having jurisdiction

UNDERSTANDING THE INTENT OF NFPA-72:

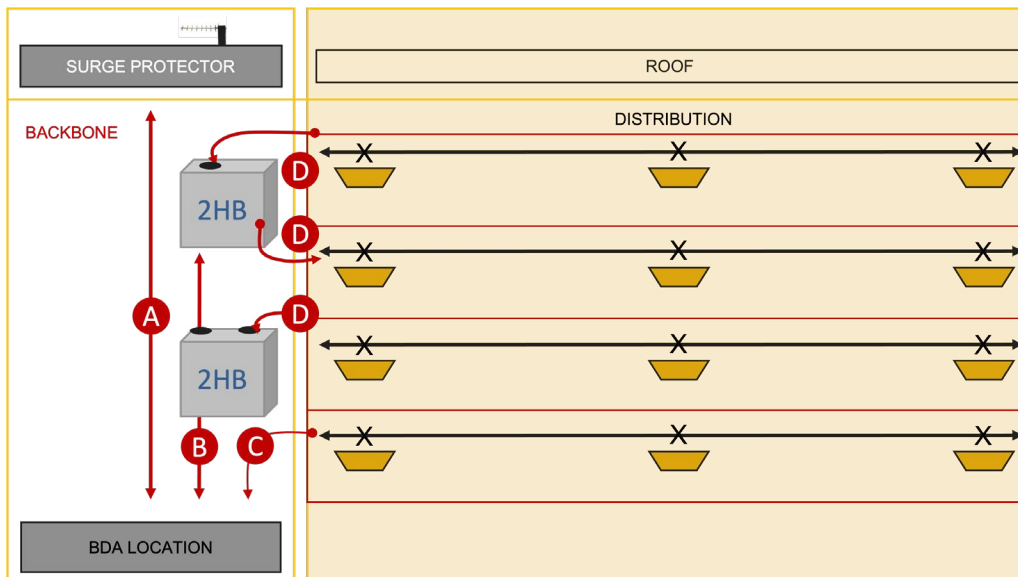
Intent of NFPA 72 is to assure:

- Staging Area (Usually 1-2 floors below active fire)
 - Fire Attack Planning
 - Evacuation Coordinating
 - Requires Functional ERRCS
- Active Fire Area
 - Focus is on Confinement and Extinguish of the fire
 - Understand the ERRCS could be impaired in the distribution areas
- Evacuation Zone (Usually 1-2 floors above active fire)
 - Focus is on Control of Occupant & Evacuation
 - Requires Functional ERRCS

The Intent of NFPA-72 is to have no single point of failure in the backbone of the ERRCS during a fire



AN UP-CLOSE LOOK AT INSTALLATION OPTIONS



- A DONER RUN TO BDA
- B BDA TO 2HB
- C HOMERUN
- D JUMPER TO DISTRIBUTION



DRAGONSKIN™ SYSTEM SOLUTION:

With the new Flamebar cabinets for DragonSkin cables, it's the most cost-effective and complete modular solution for 2-hour pathway survivability.

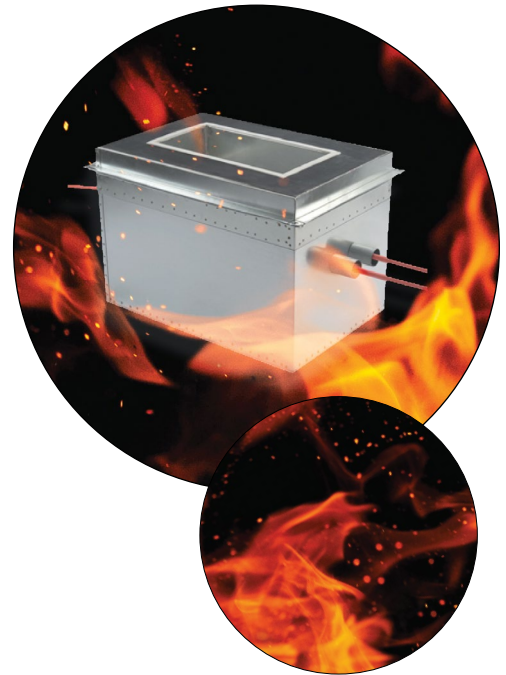


SOLUTION INCLUDES:

- DragonSKin UL-2196 certified, fire-resistant half inch coax cables
- Flamebar UL 263 certified cabinet that meets NFPA 72 and NFPA 1221 / 1225 standards
- RFS IP-rated components and connectors in the cabinet

SIMPLIFY FIRE-RESISTANT COMMUNICATIONS:

- Reduce risks with a complete, UL-tested approved, certified and listed solution for 2-hour pathway survivability
- Perform maintenance tasks without compromising the UL 263 rating or wrapping cables.
- Rely on a system that's proven continuously operate at temperatures up to 1850°F (1010°C) for 2 hours.



COMQUEST FLAMEBAR

TESTED & LISTED 2-HR CABINET PROTECTS DRAGONSKIN CABLE & COMPONENTS:

Flamebar® 2-hour fire-rated DragonSkin cabinets offer fire and temperature protection for connector, taper and splitter components used in cellular and Emergency Responder Communication Enhancement Systems (ERCES). They are UL 263 certified, meet NFPA 72 & NFPA 1221 / 1225 when used with UL 2196 certified RFS DragonSkin fire-resistive coaxial cables and standard RFS components. It is made in the USA. The cabinet:

- Enables cellular and public safety radio communications to and from all floors in a burning building.
- Reduces costs by eliminating multiple UL 2196 rated "home run" cable runs, or costly construction of 2-hour enclosures.

FEATURES/BENEFITS:

- Temperature control provides circuit integrity at the connector/tapper/splitter
- Enables flexible cable routing of connectors/tapper/splitters anywhere in the building
- Allows splitting: single cable in; dual cable out
- Easy to install; readily serviceable
- Mount on floor, wall, ceiling
- Laboratory Tested & Listed to assure AHJ acceptance

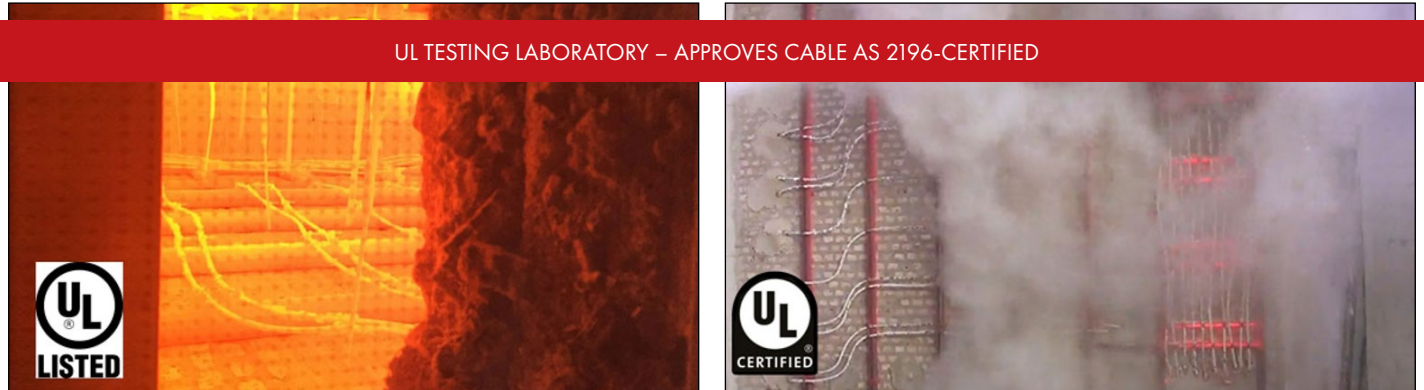


APPLICATIONS:

These Flamebar 2-hour DragonSkin cabinets are Laboratory tested and listed. They comply with requirements of the International Building Code (IBC), the International Fire Code (IFC), and NFPA 1221 and 1225 standards for Emergency Services Communications Systems.

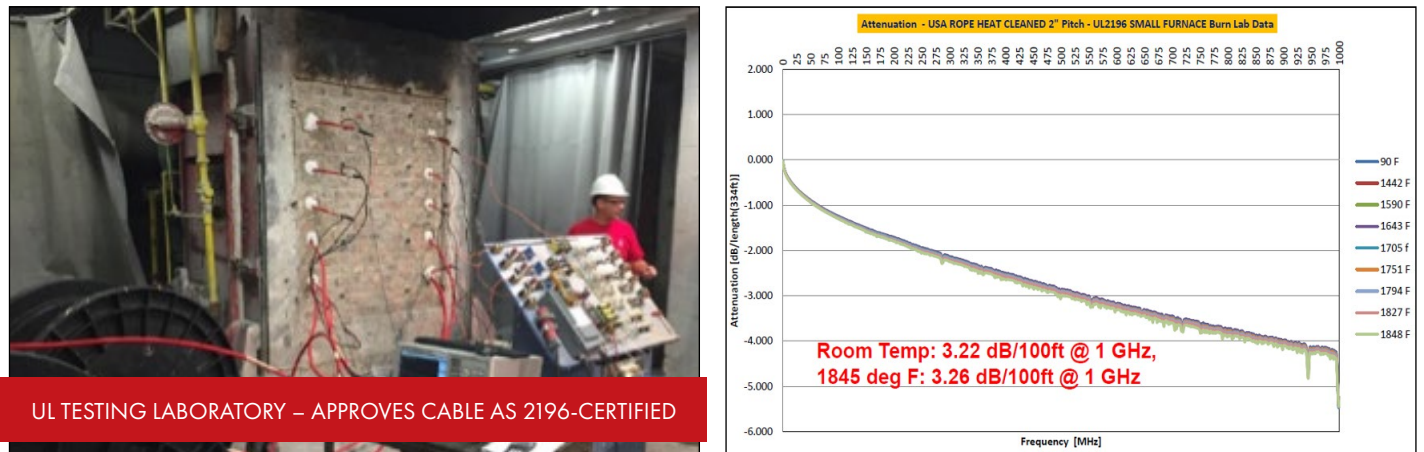
STANDARD 2196:

- Fire Test for Circuit Integrity In Conduit of Fire-Resistive Power, Instrumentation, Control and Data Cables Fire Safety Standards: CMP, CATVP, CPR, Canadian CSA C.22.2/FT6 requirements, ETL-listed to UL 444.



STANDARD 2196:

- RFS measured the following RF parameters while in the UL burn chamber during the UL-2196 Certification. These tests followed IEEE standards for testing Coaxial cables for RF performance. Insertion Loss and Return Loss.



DURING THE UL TESTING

UNDERWRITERS LABORATORIES:

RFS 2HB12-50JPLR DragonSkin was tested at the Underwriters Laboratories and achieved the following UL Certificates of Compliance and are both Certified and Listed.

- Plenum Rated
- System FHIT.1250
- Certificate Number R40176 (UL 2196 Fire Rated)
- FHIT.1250 - Electrical Circuit Integrity Systems; UL Product IQ
- UL 2196 Fire Rated
- Certificate Number E239351 (Plenum Rated)
- DragonSkin System FHIT.1250

STATE FIRE MARSHAL FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM

- Approved for the California BML by CalFire.
- California BML by CalFire LISTING No. 7162-2320:0500
- INSTALLATION: In accordance with listee's printed installation instructions, NEC Article 820, applicable codes and ordinances, and in a manner acceptable to the authority having jurisdiction.

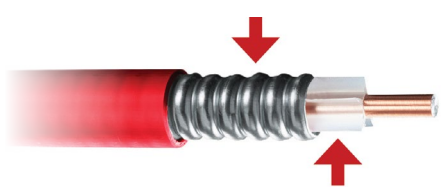

DRAGONSKIN FLAMEBAR FIRE RATED CABINET:

- 2-HR Burn Cabinet for Component Protection • ICC-ES Listed to UL 263/ASTM E119 Standard • Certificate Number ESL-1483

PERFORMANCE

- DragonSkin has the best RF Performance at 2.44dB/100'
- AFW's insertion loss of 7.89dB/100' which is 1/4th the power coming out of the cable vs DragonSkin
- Comtran's insertion loss of 15.34dB/100' means there is 1/10th the power coming out of their cable vs DragonSkin
- Trilogy insertion loss 3.56dB/100', more than 1 dB at room temperature
- Losses under fire are not listed on any competitor datasheet
- DragonSkin has the best Fire resistiveness 1850° for 2-HRs. This is the UL2196 Standard
- Design with confidence. Design with DragonSkin

COMPARING DESIGN, PERFORMANCE AND MANUFACTURING CAPABILITIES

WCW-ICA12-50JPLL	TRILOGY AP6012J50-RD
	
RFS design features a robust aluminum outer conductor and continuous star-shaped dielectric	Aluminum outer conductor and star-shaped dielectric disks with spacing gaps
Star-shaped continuous dielectric provides total support through the cable run.	Dielectric disks spaced at certain intervals provides non-continuous support.
Aluminum outer conductor ensures outstanding electrical performance – 24 dB return loss (most bands), 20 dB in other bands, 18 dB in CBRs and LAA	Aluminum outer conductor 19.0 dB min., 24.3 dB typ. 700-960/1700-2200 MHz – Trilogy does NOT publish specifications for CBRs or LAA.
White, blue & black jacket options available, ideal for MIMO applications.	White jacket option limits application flexibility.
RFS design uses a continuous dielectric spline that provides superior structural integrity around tight bending radius.	Design uses dielectric disks spaced at certain intervals – could lead to kink causing poor electrical performance.
ICA 12 jacketing contains UV inhibitors protecting the cable from sunlight damage during outdoor storage.	Trilogy cable does not incorporate UV inhibitors subjecting the cable jacket to damage from sunlight during outdoor storage.
RFS sells in bulk or custom cut lengths providing flexibility to customers, fast deployment and less cable scrap .	Trilogy sells in predefined lengths increasing the number of reels needed and driving up logistics costs .
RFS positions cable on the east and west coast through its distribution network reducing transportation charges, delivery time and providing a single source for all project material.	Trilogy Typically sells factory-direct driving shipping and transportation costs up –and forcing customers to seek out additional suppliers for remaining project material.
RFS offers a complete end-to-end passive solution including plenum cable, connectors, tools, antennas, power splitters, dividers and combiners, all optimized for ICA12 plenum cable. Made in the USA.	Trilogy's limited portfolio means multiple sources for project materials and mixing vendors could reduce the overall customer experience and support should a problem develop. Made in the USA.

2 HOUR COAX COMPETITOR COMPARISON

COMPETITOR COMPARISON				
PARAMETERS	DRAGONSKIN	AFW	COMTRAN	TRILOGY
Certification	UL2196 Certified and Listed	ASTM-E119-Evaluated	UL2196 Certified	UL2196 Certified
Inner Conductor	Solid Copper	Stranded Copper	Solid Copper	Solid Copper
Outer Conductor	Corrugated Copper	Tinned Copper Braid	Copper Braid/Corrugated Copper	Corrugated Copper
Jacket	PVC Plenum Rated	Polyolefin	Red Non-Halogen Flame Retardant	Plenum Rated
Outer Conductor Diameter	.54 inch	.645 inch	.58 inch Braid; 1.07 inch Armor	.55 Inch
Outer Diameter	.71 inch	.9 inch	1.17 inch	.63 inch
Return Loss @800 MHz	Max 14 dB	Not Listed	20.9 dB	14.0 dB
Insertion Loss/ 100 Ft @800 MHz	2.44 dB	7.89 dB	15.34 dB	3.56dB
Operating Temp Listed on datasheet	1850° F	185° F	Not Listed	194deg F

DragonSkin has the best RF Performance at 2.44 dB/100' • DragonSkin has the best Fire resistiveness 1850° for 2 hours. This is the UL2196 Standard. • AFW has redesigned their cable so the listed specs are no longer valid. The new cable has the exact same specs as the Trilogy cable. • Comtran's insertion loss of 15.34 dB means there is 1/10th the power coming out of their cable vs DragonSkin.

HOW THIS ALL BENEFITS END USERS

- Significantly reduces labor and material costs
- Stocking and staging capabilities
- Fast turnaround times and deliveries
- WCW messenger and delivery services available

WINDY CITY WIRE BEST PRACTICES

- You will receive a personal account representative to assist you in every aspect of the ordering process. Our team will help you make cost effective choices and ensure the correct use of all of products, saving you time and money.
- Access to our online portal to place and track orders, view frequently purchased devices, check current inventory levels, review and order projects quoted, get account and payment status plus much more.

CONTACT US TODAY

We look forward to working with your team and showing you **The Windy City Wire Difference** in everything that we do.

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