

February 7, 2020

Mr. Ed Davis
Empire West, Inc.
9270 Graton Road
P.O. Box 511
Graton, CA 95444

RE: Interactions of Drop-out Ceiling Panels with Fire Sprinkler Systems
Jensen Hughes Project No.: 1AJP00285.000

Dear Mr. Davis,

JENSEN HUGHES has completed our engineering analysis of the building code requirements for the use of Empire West's Ceilume drop-out ceiling tiles and panels when installed with a fire sprinkler system. Empire West (Ceilume) produces polymeric ceiling panels in two thicknesses; 0.013-inch and 0.030-inch. The ceiling tiles and panels are mounted in a ceiling grid system to provide a finished ceiling appearance and a sprinkler system located in the interstitial space above the drop-out panels will be installed in accordance with NFPA 13. The ceiling panels are intended to fall out prior to sprinkler activation such that the ceiling tiles do not impede or delay sprinkler activation.

BACKGROUND

Empire West (Ceilume) has conducted extensive testing and evaluation on the two different ceiling tile thicknesses to demonstrate compliance with the IBC and NFPA 13, along with Factory Mutual (FM) Approval Standard No. 4651, *Approval Standard for Plastic Suspended Ceiling Panels*. Testing was conducted on both panel thicknesses at Southwest Research Institute (SwRI) in accordance with FM 4651. The results indicated very similar behavior in standardized fire testing with no distinguishable differences relative to the drop-out performance.

The data from the SwRI and FM test reports have been used as the technical substantiation for the IAPMO Uniform Evaluation Service (UES) Evaluation Report No. 310 and UES Listing Report No. UEL-5021, providing a basis for the installation and use requirements for the Ceilume ceiling tiles and panels as drop-out panels for use under a building sprinkler system. These UES documents are supplemented by two engineering analysis reports.

HAI report dated October 20, 2011 describes testing conducted in accordance with the UBC 26-3 room-corner test and extends the results to other drop-out ceiling tile products. The JENSEN HUGHES report dated December 3, 2015 further addressed the use of the Ceilume Drop-out panels and the NFPA 13 requirements.

Rolf Jensen & Associates (RJA, now part of JENSEN HUGHES) prepared a report discussing the use of drop-out ceiling panels and their use with sprinklers. The objective of the RJA report was to document the applicable code and standard requirements for the product usage as well as document occupancy use limitations, use under allowable sprinkler types, inappropriate installations, and provide useful links to third-party agencies who may test and/or regulate the drop-out ceiling panels. The RJA report has been updated and is included in Appendix A of this analysis letter report.

The content of all reports has been updated to reflect the latest requirements contained in the 2018 edition of the International Building Code (IBC) and the 2019 Edition of NFPA 13, *Standard for the Installation of Sprinkler Systems* and incorporated into this report. The information in this engineering analysis report also aligns with the UES Evaluation documents.

CODE REQUIREMENTS

Empire West, Inc. manufactures several types of ceiling panels that can be installed below ceiling sprinklers and are designed such that they will drop-out in the event of a fire and allow the ceiling sprinklers to activate in a timely manner. These products have been evaluated for compliance with the IBC and NFPA 13, along with Factory Mutual (FM) Approval Standard No. 4651, *Approval Standard for Plastic Suspended Ceiling Panels*.

UES Evaluation Report No. 310 provides the evaluation of the Empire West Ceilume Ceiling Tiles and Panels for compliance with the applicable code sections of the IBC (2012, 2015, and 2018 Editions) for interior finish, thermal stability, and various physical properties. The results of the evaluation report demonstrate compliance with the applicable sections of the IBC for the use of this product with a sprinkler system.

UES Listing Report UEL-5021 provides the requirements for the Ceilume Ceiling Tiles and Panels usage and installation to comply with FM Approval Standard No. 4651.

The installation of the drop-out panels is also required to comply with requirements specified in NFPA 13.

The 2019 Edition of NFPA 13 defines a drop-out ceiling in Section 3.3.58 as “A suspended ceiling system, which is installed below the sprinklers, with listed translucent or opaque panels that are heat sensitive and fall from their setting when exposed to heat.”

Additional requirements for drop-out ceilings are specified in Section 9.3.11 of the 2019 edition of NFPA 13 which states:

9.3.11.1 Drop out ceiling and ceiling materials shall be permitted to be installed beneath sprinklers where the ceiling panels or ceiling materials are listed for that service and are installed in accordance with their listings.

9.3.11.2 Drop-out ceilings and ceiling materials meeting the criteria of 9.3.11.1 shall not be installed below quick-response or extended coverage sprinklers unless specifically listed for that application.

9.3.11.3 Drop-out ceilings and ceiling materials meeting the criteria of 9.3.11.1 shall not be considered ceilings within the context of this standard.

9.3.11.4 Piping installed above drop-out ceilings and ceiling materials meeting the criteria of 9.3.11.1 shall not be considered concealed piping.

9.3.11.5 Sprinklers shall not be installed beneath drop-out ceilings or ceiling materials meeting the criteria in 9.3.11.1.

Section 9.3.11.1 of NFPA 13 allows drop-out ceilings to be installed below sprinklers if the drop-out ceiling materials are listed for that application. The other Sections of 9.3.11 address issues such as limits on use of drop-out ceiling when certain sprinklers are used and other issues with respect to installation.

The Empire West Ceilume Drop-out ceiling tiles are “listed” for use as drop-out ceiling tiles by both Underwriters Laboratories, Inc. (UL) and Factory Mutual Approvals. The attached Figure 1 provides a copy of the listing information from UL and Figure 2 provide a copy of the approvals listing by Factory Mutual Approvals.

These “listings” demonstrate that the Ceilume ceiling tiles meet the requirements of both organizations for use as drop-out ceiling tiles. Therefore, based on these listings, the Ceilume tiles meet both the definition of drop-out ceiling tiles and the requirements of Section 9.3.11 of NFPA 13 (2019 Edition).

In summary, use of the Ceilume ceiling tiles as described in UES Listing Report No. UEL-5021 meets the requirements of NFPA 13 for use as drop-out ceiling tiles installed below ceiling sprinklers. It should be noted that the limitations of use in Sections 9.3.11.2 through 9.3.11.5 of NFPA 13 as well as any limitations in the listings shall be followed.

The UL Listing was promulgated through testing conducted in accordance with UL 723/ASTM E84 to verify the surface burning characteristics of the ceiling panels. All panels tested are Class A materials per UL 723/ASTM E84. The FM listing, for use of the ceiling panels tested in accordance with FM Approval Standard No. 4651, evaluated the ability of the ceiling panels to drop out under a direct fire exposure and any delay in the ceiling panel fallout from an operating water sprinkler.

CONCLUSIONS

The Ceilume Drop-Out Ceiling Tiles and Panels comply with the applicable requirements in the IBC and NFPA 13. UES Evaluation Report No. 310 and UES Listing Report UEL-5021 demonstrate that when installed in accordance with the manufacturer’s installation instructions, the drop out ceiling panels comply with the applicable IBC and NFPA code requirements. The UL and FM listings support the surface burning characteristics of the ceiling panels and compliance with FM Approval Standard No. 4561. Appendix A provides a report detailing the practical uses, limitations, and considerations for the proper installation of the Ceilume Drop-Out Ceiling Panels under a sprinkler system.

We appreciate the opportunity to assist Empire West. If you have any questions, please contact me at 410-737-8677 or aparker@jensenhughes.com.

Sincerely,



Dale Nicholson
Senior Fire Protection Designer



Arthur J. Parker, P.E.
Senior Fire Protection Engineer

UL Product iQ™



BLME.R4036 - CEILING PANELS FOR USE BENEATH SPRINKLERS

Ceiling Panels for Use Beneath Sprinklers

See General Information for Ceiling Panels for Use Beneath Sprinklers

EMPIRE WEST INC DBA CEILUME

R4036

9270 GRATON RD
 PO BOX 511
 GRATON, CA 95444-0511 USA

Molded plastic in the form of translucent panels.

	Type 1 Panel	Type 2 Panel
Flame spread	15-20*	25*
Smoke developed	125*	350*

*May be used beneath sprinklers, subject to the authorities having jurisdiction.

Last Updated on 2002-10-07

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Figure 1. UL Listing for Ceilume Drop-Out Ceiling Tiles and Panels

Approval Guide



Building Insulations - Walls and Ceilings (FM Approval Class Numbers 4411, 4651, 4880, 4881, 4882)

Insulating materials may occur in building construction to reduce heat or sound transmission through a wall, roof or floor-ceiling assembly. See Roofing Products and Assemblies Category for roof insulations.

The insulation listed below may be a surface treatment exposed to the building occupancy or as core material faced with metal, gypsum wallboard, concrete or masonry.

The listed assemblies are not intended as long-term fire walls or barriers since fire endurance was not evaluated. See SPECIFICATION TESTED PRODUCTS, ASTM E119 Standard, for hourly rated systems.

Suspended Plastic Ceilings (Class Number 4651)

Plastic suspended ceilings of translucent or opaque panels are used to conceal ducts, sprinkler piping, lighting fixtures or for decorative purposes. All products are of low combustibility. Because they are designed to be heat sensitive, promptly moving out of their setting, they will not significantly interfere with the operation of automatic sprinklers located above. When other building components and occupancy do not require sprinkler protection, these products may be used without creating such a need.

Restraining clips must not be used to hold the panels in their metal suspension frame. Clips which have been tested and FM Approved may be used for this purpose. Painting or coating the panels is prohibited since this may insulate and therefore hinder the immediate drop-out response to the early stage of a fire. However, panels which have been tested and FM Approved with a factory-applied coating may be used. Suspended plastic ceilings must be installed in accordance with all of the recommendations described in FM Global Loss Prevention Data Sheet 1-12.

The polystyrene ceiling tiles listed in Section B are expanded from the modified grade bead resins produced by the manufacturers listed in Section A. These products have met the fire test requirements of FM Approval Standard No. 4651.

Unless otherwise indicated in the listings, all polystyrene panels are nominal 1.0 lb/ft³ (16.0 kg/m³) density.

Panels

Ceilume Ceiling Tiles & Panels

Ceilume Ceiling Tiles & Panels. Polyvinyl chloride plastic (PVC/vinyl) panels

“0.013 inch” Ceiling Tiles. Nominal thickness of .013 inch (0.33 mm)
15 mil (0.381 mm) max thickness with optional dust covers.

Min 2x2 ft (0.6x0.6 m) Tile/panels. In white, opaque, all colors & finishes (Better Than Tin & Faux Wood)

Ceilume Tile/Panel Styles Including , but not limited to the following:

“0.013 inch” Ceiling Tile Styles

AcostaTherm (dust cover/back panel) , Anza, Apollo, Aristocrat, Astral, Circle Star, Catalina, Contempo, Convex, Dart, Diamond Plate, Domino, Doric, Dots, Electra, Fargo, Florentine, Four Square, Franciscan, Gradient, Grange, Grecian Square, Harlequin, Herman, Ivanhoe, Juniper, Medallion, Memo, Metro, Modulelux, Monterey, Moorish, Neptune, Orange, Orb, Petal, Plaza, Pluto, Polyline, Polysquare, Primitive, Regency, Ripple, Roman Circle, Roman Square, San Anselmo, Saturn, Septaline, Skyens, Southland, Stratford, Teahouse, Victorian, Wedgewood, Westchester, Westminster, Woodward, Zee

Company Name:	Empire West Inc DBA Ceilume the Smart Ceiling Tile
Company Address:	9270 Graton Rd, Box 511, Graton, California 95444, USA
Company Website:	http://www.empirewest.com
New/Updated Product Listing:	Yes
Listing Country:	United States of America
Certification Type:	FM Approved

Figure 2. FM Approval for Ceilume Ceiling Tiles & Panels

**APPENDIX A – DROP-OUT CEILING PANELS AND THEIR INSTALLATION
BENEATH SPRINKLER SYSTEMS**

Drop-Out Ceiling Panels – A Discussion on Their Use with Fire Sprinklers

In 2014, RJA prepared a white paper intended to be used as an introduction for the use of drop-out ceiling panels, also referred to as tiles. The original report has been updated to reference the latest codes and standards.

Drop-out ceiling panels and tiles have many useful applications where their “drop-out” feature from a standard T-bar ceiling grid offers advantages over the commonly used acoustic ceiling tile. They are especially useful when used with fire sprinklers. This paper is a resource and is intended to educate potential users as to the best applications for dropout panels. It is not intended to be a substitute for checking the applicable listings, codes and standards and encourages users to consult with their authorities having jurisdiction. Authority Having Jurisdiction is abbreviated as AHJ and refers to building officials, fire code officials and in some instances, insurers.

Advantages, Codes and Standards

Approved drop-out ceiling panels can be installed beneath fire sprinklers. When exposed to heat from a developing fire, drop-out ceiling panels soften, distort, and fall from the ceiling grid. Heat from the growing fire activates the sprinkler which, unimpeded by the panels, controls or extinguishes the fire.

Drop-out ceilings have several significant advantages:

1. They offer a visually uncluttered appearance.
2. They provide protection for the sprinklers – making them less prone to accidental knocks and potential water damage.
3. They simplify sprinkler design at clouds and other design features as the sprinklers are located above the dropped ceiling.
4. They're cost effective as they eliminate the need to “drop” (lower) the sprinklers and allow for the use of less costly, non-appearance grade sprinklers.

Use of drop-out ceiling panels is governed by the local building and fire codes, which address acceptable interior finish elements like ceiling panels. The International Building Code (IBC) is often used as the model building code from which many building codes are based. The 2018 Edition of the IBC covers interior finish elements like ceiling panels in Chapter 8 and addresses fire sprinklers in Chapter 9. When requiring fire sprinkler systems, the code refers to National Fire Protection Association (NFPA) 13, Standard for the Installation of Sprinkler Systems. That standard addresses drop-out ceilings in Section 9.2.16 (2019 Edition), permitting their installation beneath sprinklers where ceilings are listed and installed for that service. In a similar way, NFPA 13R, Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies, permits drop-out ceilings in Section 6.15.

NFPA does not approve, inspect, or certify drop-out ceiling panels; nor does it approve testing laboratories. The Authority Having Jurisdiction refers to listings of an organization that is concerned with product evaluations to determine compliance with appropriate standards. Details are available in an evaluation report prepared by a recognized independent listing agency, such as IAPMO, FM Global, and UL. Links to these reports are included at the end of this discussion. Of course, the Building Official and / or Fire Code Official have the final approval authority. It is well to contact these authorities early in the design to get their input, answer their questions and address any concerns.

OCCUPANCY

In general, the design of a drop-out ceiling system begins with identification of the building occupancy. Approved drop-out panels are currently available that have been evaluated for use in areas classified as Light Hazard and Ordinary Hazard, Group 1, as indicated in IAPMO UEL-5021. Factory Mutual approves drop-out ceiling panels for use in Light Hazard Occupancies, as indicated in FM Data Sheet 1-12 (May 2008). Reports by other agencies allow for use of ceiling panels in Ordinary Hazard Group 1 occupancies. Always check the product evaluation report to confirm where the ceiling panel may be used. In addition, confirm the agency is acceptable to your AHJ. Light Hazard Occupancies are where combustibility and / or quantity of contents is low and fires with relatively low heat release are expected. Ordinary Hazard Group 1 Occupancies are where combustibility is low and the quantity of combustibles is moderate, stockpiles don't exceed 8 feet and fires with moderate rates of heat release are expected. Attached with this white paper is an Application Table for Drop-out Ceiling Panels. It provides examples of typical occupancies where the use of these panels is either appropriate or inappropriate.

SPRINKLER TYPES

Next is selection of sprinkler types. All drop-out panels currently available have been evaluated for use with SR (standard-response) sprinklers. Standard-response sprinklers are a type of spray sprinkler that has a thermal element with an RTI (Response Time Index, a measure of thermal sensitivity) of more than 50 (meter-seconds)^{1/2}. The Ceilume drop-out panels are also recognized for use with QR (quick-response) sprinklers (see IAPMO Evaluation Report No. 310). This is a significant development as quick-response sprinklers have been required in Light Hazard Occupancies since the 1996 edition of NFPA 13. Quick-response sprinklers have an RTI of 50 (meter-seconds)^{1/2} or less. Currently, no drop-out panels have been tested with other types of sprinklers, such as extended coverage, residential and dry barrel type sprinklers. IAPMO ER 310 also recognizes the use of the Ceilume drop-out ceiling panels with dry pipe systems.

Evaluation Reports specify allowable sprinkler heights above the ceiling panels and require identification of the report on packaging. Examples are:

1. Ceilume 0.013-inch thick vinyl drop-out panels listed for use with quick-response sprinklers rated at 135°F or higher requires that the sprinkler be installed not less than 1-inch and not more than 5-feet above the drop-out tiles and panels, when installed above the drop-out tiles and panels.
2. Ceilume 0.013-inch thick vinyl drop-out panels listed for use with standard-response sprinklers rated at 135°F or higher requires that the sprinkler be installed not less than 1-inch and not more than 5-feet above the drop-out tiles and panels, when installed above the drop-out tiles and panels.
3. Ceilume 0.030-inch thick vinyl drop-out panels listed for use with quick-response sprinklers rated at 135°F or higher requires that the sprinkler be installed not less than 1-inch and not more than 5-feet above the drop-out tiles and panels, when installed above the drop-out tiles and panels.
4. Ceilume 0.030-inch thick vinyl drop-out panels listed for use with standard-response sprinklers rated at 135°F or higher requires that the sprinkler be installed not less than 1-inch and not more than 5-feet above the drop-out tiles and panels, when installed above the drop-out tiles and panels.
5. Sprinklers must be installed in compliance with all of the NFPA 13 (or 13R) requirements, including obstructions with structural elements, HVAC ducts, and other above-ceiling elements.
6. Prior to installation, verify that packages are marked with evaluation report and appropriate agency listing numbers.

NON-COMPLIANT APPLICATIONS

Finally, check for the following conditions, as any of them will preclude the use of drop-out ceilings:

1. As defined in Chapter 10 of the IBC (2018 Edition), use is prohibited in applicable exits, corridors, stairways, horizontal exits, pressurized enclosures, and exit passageways. A copy of the selected Chapter 10 definitions is listed at the end of this discussion.
2. Where sprinklers are installed below panels, except when oversized holes are provided in the ceiling tiles per Section 3.2.3 of IAPMO Evaluation Report No. 310. A ¼-inch clearance around the sprinkler or outer sprinkler escutcheon trim ring shall be provided.
3. Where insulation is located between ceiling panels and sprinklers (exception: insulating panel arrangement as mentioned in the specific ceiling panel listing).
4. Based on current listings, any drop-out panels that are not Class A rated (flame spread index of less than 25 and a smoke developed index of less than 450), would be prohibited in some locations based on Chapter 8 of the IBC (2018 Edition).
5. Where piping is required to be concealed due to the listing and/or NFPA 13 requirements (e.g. soft-soldered copper pipe or combustible plastic pipe). A drop-out ceiling is not considered to provide concealment, as it will drop early in a fire.
6. Where the ceiling is required to be a part of fire-resistance rated assembly. Note that drop-out ceilings can be installed below a rated assembly, they just can't be a part of that assembly.
7. Where the space above the panels is used as an air circulation plenum.
8. Ceiling is non-horizontal, including ceilings on floating, waterborne structures (i.e., boats and ships per NFPA 13 (2019 Edition)), as they have not been tested.
9. Where the suspended ceiling system is not the 1-inch nominal (15/16-inch) face grid system or slim line width nominal 9/16-inch wide grid system, or the system is not in compliance with Building Code requirements. Specialty systems, such as Concealed Grid, have not been tested for use with drop-out ceilings.
10. Clips that prevent downward movement of the panel. Uplift prevention clips are permitted but not required. Be sure to follow the requirements of the ceiling panel's appropriate approval / listing document.

The following Application Table helps quickly identify those applications where drop-out ceiling panels should be considered and those applications where they would be inappropriate. The table is not meant to be definitive but rather illustrative, as occupancies can vary significantly.

Consider these two examples:

1. A dairy processing facility, in its typical configuration, would offer an appropriate application for drop-out ceiling panels. However, if that same facility incorporated significant quantities of cardboard packaging stored in piles more than 8 feet high, it would not be an appropriate application.
2. Mercantile operations, in their typical configuration, are considered to be Ordinary Hazard Group II occupancies, and are therefore not appropriate for drop-out ceiling panels. Yet in some jurisdictions for

operations like a pottery store, where the combustibility of the contents is low, the quantity of combustibles is moderate, and stockpiles don't exceed 8 feet, the use of drop-out ceiling panels might be appropriate and acceptable to the AHJ.

Drop-Out Ceiling Panels with Sprinklers – Application Table

Application	Currently Compliant	Currently Non-Compliant
Product	Meets IBC Section 803. Recognized as approved by agencies such as IAPMO, UL, Factory Mutual (FM recognizes Light Hazard occupancy use only)	When product is not compliant with IBC Section 803. Not recognized by an independent, accredited third-party evaluation agency.
Occupancy	As defined in NFPA 13: Light Hazard (Per FM-4651 & IAPMO ER-310) Ordinary Hazard Group 1 (Per IAPMO ER-310)	Ordinary Hazard Group II Extra Hazard Group I Extra Hazard Group II Special Hazards Ordinary Hazard group I (FM Applications only)
Sprinklers	Quick-Response 135°F or higher Standard-Response 135°F or higher	Extended coverage Residential Dry barrel
Installation	Horizontal orientation only. Code compliant suspension system 1" (15/16") face grid or slim line width, (nominal 9/16" wide) grid system Sprinklers above panels Uplift prevention clips allowed. If FM installation, must be approved for application Sprinklers below panels when oversize holes are provided in the ceiling tiles per Section 3.2.3 of IAPMO Report 310. ¼" clearance around the sprinkler or outer sprinkler escutcheon trim ring shall be provided.	Sloped ceilings (including ships). As part of a fire rated assembly. When space above ceiling is used as an air plenum. sprinkler > 5ft. above panel sprinkler < 1-inch above grid. Sprinklers installed below panels without ¼" oversized hole per IAPMO Report 310. Insulation between panels and sprinkler, unless recommended (i.e., Acousto Therm Backpanel or Soniguard drop ceiling insulation). Clips that would hinder panel's ability to drop. Material affected by high temp is required by code to be "concealed" by ceiling.
Sprinklered Occupancy Some Examples:	NFPA 13, Annex 4.3.2 through 4.3.6: Light Hazard Animal shelters Churches Clubs Kennels Libraries (except large stack) Museums Offices, including data processing Restaurants seating areas Theaters/auditoriums, excluding stages Ordinary Hazard Group 1 Auto showrooms Bakeries & Laundries Canneries Dairy products manufacturing/processing Electronic Plants	Chemical Plants Distilleries Machine Shops Auto Repair Stages (theater) Paper processing Residential (see notes next page) Mercantile (see notes next page) Manufacturing Saw Mills

NOTES

1. Light-transmitting plastics are regulated in Chapter 26 of the IBC (2018 Edition). When drop-out ceiling panels are used in illuminated ceiling applications be sure to consult with the AHJ (often the Building Official) relative to your specific use. Drop-out ceiling panels must never be used as diffusers within light fixtures.
2. The building owner must maintain their sprinkler and ceiling systems. Replace drop-out ceiling panels in kind, just like one would a sprinkler. Drop-out panels beneath sprinklers cannot be painted. Ceilume offers signage reminding users to replace panels in kind. This signage should be posted at the sprinkler control valve (next to the hydraulic nameplate).

SELECTED DEFINITIONS FROM THE 2018 IBC

EXIT – That portion of a means of egress system between the exit access and the exit discharge or public way. Exit components include exterior exit doors at the level of exit discharge, interior exit stairways, interior exit ramps, exit passageways, exterior exit stairways and exterior exit ramps and horizontal exits.

CORRIDOR – An enclosed exit access component that defines and provides a path of egress travel.

STAIRWAY – One or more flights of stairs, either exterior or interior, with the necessary landings and platforms connecting them, to form a continuous and uninterrupted passage from one level to another.

EXIT, HORIZONTAL – An exit component consisting of a fire-resistance rated construction and opening protectives intended to compartmentalize portions of a building thereby creating refuge areas that afford safety from the fire and smoke from the area of fire origin.

EXIT PASSAGEWAY – An exit component that is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives and provides for a protected path of egress travel in a horizontal direction to an exit or to the exit discharge.

LINKS

Links with a bold title are directly to the third-party agencies site, those links without a bold title are to a site hosted by the respective manufacturer:

UL - Ceiling Panels for Use Beneath Sprinklers: <https://iq.ulprospector.com/en/profile?e=206630>

IAPMO Evaluation Report 310: http://www.iapmoes.org/media/22950/er_0310.pdf

IAPMO UEL-5021: http://www.iapmoes.org/media/22946/uel_5021.pdf

FM Approvals, FM Test Standard: <https://www.fmaprovals.com/products-we-certify/products-we-certify/walls-ceilings-and-associated-equipment/suspended-ceilings>

Manufacturer's supporting documentation:

<https://static.ceilume.com/static/pdfs/ceilume-ul-r4036.pdf>

<http://www.ceilume.com/staticShared/pdfs/fm.pdf>

NOTES

OCCUPANCY

Light Hazard occupancies are appropriate for the use of drop-out ceiling panels due to the low quantity and / or combustibility of their contents and the expected low heat release rate fires. Some examples of occupancies having uses and conditions consistent with Light Hazard are most movie theaters, bowling alleys, pool parlors, roller rinks, swim centers, gyms, and work out facilities.

A number of types of light manufacturing facilities might be appropriate to consider for drop-out panels as they would be similar to electronic plants. NFPA 13 deems such plants as Ordinary Hazard Group 1 and would allow the use of drop-out ceiling panels (FM only allows the use of drop-out ceiling panels with Light Hazard occupancies). However, many manufacturing facilities such as plastics fabrication, wood machining, and machine shops are classified as Ordinary Hazard Group 2 and would not be appropriate for drop-out panels. Key concerns to avoid when considering drop-out panels are stockpiles of combustibles over 8 feet high, stockpiles of contents with high rates of heat release, or the probability of rapidly developing fires.

Mercantile Occupancies are classified in NFPA 13 as being Ordinary Hazard Group 2 and are defined as those occupancies used for “the display and sale of merchandise”. This is a very broad definition that, on its face, would appear to make the use of drop-out ceiling tiles inappropriate for all operations that display and sell merchandise. That is clearly not its intent (see the pottery store example under Mercantile Operations on Page 8). The intent is to prohibit use of drop-out ceiling tiles where combustibility, quantity, and storage height of fuel is higher than that allowed in Ordinary Hazard Group 1 occupancies. When researching your specific application, it is helpful to locate your fire sprinkler riser and check its hydraulic nameplate data. It should list the occupancy classification. This information may be helpful in determining if the area in question is Light Hazard, Ordinary Hazard Group 1, Group 2, Extra Hazard Group 1, Group 2 or Special Hazard. Check with your AHJ and be ready to provide this nameplate information as it may help them in determining your occupancy and whether a drop-out ceiling panel is appropriate.

RESIDENTIAL

As defined in NFPA 13 and 13R, drop-out ceilings are permitted in residential occupancies. Drop-out ceilings can be used in those applications having standard-response, 135°F or higher sprinklers. Where the sprinkler protection involves quick-response sprinklers, Ceilume drop-out panels are listed for use with 135°F or higher quick-response sprinklers. Currently, there are no drop-out ceiling panels tested or listed for use with residential sprinklers.

Note: Certain drop-out panels have Evaluation Reports by accredited third party agencies that follow NFPA 13 standards and recognize the use of those panels in both Light Hazard and Ordinary Hazard Group 1 occupancies. If the installation must meet FM Insurance standards, you are limited to Light Hazard occupancies, and any FM limitation should be applied to the drop-out panel use. Drop-out panel use is always subject to approval by the building/fire code AHJ.

TOP TEN FREQUENTLY ASKED QUESTIONS (FAQ'S) FOR DROP-OUT CEILING PANELS

The following are frequently asked questions (FAQ's) regarding the use of drop-out ceiling panels.

#1

Q: Will panels be dropping onto occupants or firefighters in the event of a fire?

A: No. This is extremely unlikely to occur as panels drop-out quickly in the presence of heat from a fire. They drop at a temperature which is too hot for occupants and which will be exceeded well before firefighters are on the scene.

#2

Q: Will water spray from adjacent sprinklers cool panels which have not yet dropped, preventing them from falling and blocking spray from sprinklers above them?

A: No. Panel drop-out function is tested (FM Approvals 4651) by spraying sprinkler water onto the back side of the panels prior to ignition of the heat source. This testing assures that panels drop out even if sprinkler water gets to them before the heat of the fire.

#3

Q: In a large, rapidly accelerating fire, will panels ignite before dropping from the grid?

A: No. Drop-out ceiling panels are only approved for use in Light Hazard and Ordinary Hazard Group 1 Occupancies, where only fires with moderate rates of heat release are expected. The panel material ignition temperatures are many hundreds of degrees Fahrenheit higher than their drop-out temperatures. The panel will drop out long before ignition temperature is reached.

#4

Q: Will falling panels harm occupants who are injured and cannot self-evacuated, or hamper rescue and fire suppression efforts by firefighters?

A: No. Panels are very light weight, move easily out of the way, and are not allowed for use in restricted areas as defined in Chapter 10 of the IBC (2018 Edition). These include applicable exits, corridors, stairways, horizontal exits, pressurized enclosures and exit passageways.

#5

Q: Will falling panels become entangled with sprinklers?

A: No. Sprinklers are located above the panels or sprinklers below panels are provided with oversize holes in the ceiling tiles per Section 3.2.3 of IAPMO Report No. 310. ¼" clearance around the sprinkler or outer sprinkler escutcheon trim ring shall be provided.

#6

Q: Will falling panels add to the fire load?

A: No. Panels are Class A rated materials with low flame spread and smoke developed indexes. Sprinklers are expected to discharge long before panels reach their ignition temperature. As the panels are quite light, their

contribution to the overall fuel load is extremely low. As they drop out early in the fire, their location should make them likely to be receiving the cooling spray from flowing sprinklers and unlikely to contribute to the fire load.

#7

Q: Are panels “sticky” when they are on the floor, and do they make the floor slippery?

A: The fire’s heat deforms the panels so they will drop from the grid, but it does not melt them. Once on the floor the panels are semi-rigid, are not sticky, and are being cooled by the sprinkler spray---which is making the floor slippery whether or not the panels are there.

#8

Q: Can drop-out panels be used with any type of fire suppression sprinklers?

A: No. Ceilume drop-out panels are currently recognized for use with standard-response sprinklers having an activation temperature of 135°F or above and with quick-response sprinklers having an activation temperature of 135°F or above. Check the panel’s installation instructions and approvals for specific details. There are currently no drop-out panels approved for use with extended coverage sprinklers, residential, or dry barrel type sprinklers.

#9

Q: Do all panels or tiles marketed as “drop-out” or “melt out” tiles qualify for drop-out installation?

A: No. In order for panels to be acceptable, products must be tested, approved and recognized by accredited third party agencies specifically for drop-out use. Some panels have no listings or approvals and are therefore unacceptable. The AHJ determines if the third-party agency is acceptable.

#10

Q: Because a drop-out panel has a third-party product recognition (e.g. IAPMO, UL, and/or FM), does that mean that a building inspector or fire official must accept its use if the installation complies with the recognition and all applicable codes?

A: No. The local Authority Having Jurisdiction (AHJ) always has the final say with any building product, so it is always recommended to check with them before proceeding.