File: ULC-S101-14
ULC-G5.2

September 2, 2015

INFORMATION BULLETIN 2015-01A

CAN/ULC-S101-14, 5th Edition of the Standard Methods of Fire Endurance Tests of Building Construction & Materials

Load Restriction Requirements when specified in ULC Fire Resistive Designs

To: Subscribers to ULC's Classification Service for Standard Methods of Fire Endurance Tests of Building Construction & Materials, CAN/ULC-S101-14, members of the ULC Advisory Council and others interested.

BXUVC - Fire Resistance Ratings
BYITC - Acoustical Materials
BYWRC - Adhesives
BZGUC - Air Terminal Units
BZJZC - Batts and Blankets
BZYWC - Caulking and Sealants
CABSC - Ceiling Firestop Flap Assemblies
CATXC - Coatings
CAVCC - Intumescent Coatings, Thin-Film
CAVNC - Mastic Coatings
CAWCC - Protective Coatings
CAWOC - Protective Coverings for Foamed Plastic
CAZCC - Accessories for Coatings
CAZTC - Concrete Blocks
CBXQC - Fibre Reinforcement and Concrete Additives
CBZZC - Factory-Assembled Exterior Wall Panels
CCETC - Fire Resistant Glazing Materials
CCJVC - Floor Access Doors
CCOXC - Floor-Topping Mixtures
CCQUC - Floor Mat Materials
CCVWC - Foamed Plastic
CDELC - Insulated Concrete Forms
CDETC - Insulation, Rigid Roof
CDHWC - Luminaires and Luminaire Assemblies Listed for Fire Resistance
CERZC - Mineral and Fibre Boards
CEYDC - Nonmetallic Plumbing System Components Listed for Fire Resistance
CEYYC - Outlet Boxes and Fittings Classified for Fire Resistance
CHIZC - Sheathing Materials
CHPXC - Spray-Applied Fire Resistive Material
CHWXC - Steel Floor Units
CIKVC - Steel Framing Members
CIYTC - Structural Cement-Fibre Units
CIZQC - Structural Concrete Fibre - Reinforced Composite Systems
CIZTC - Structural Components
CIZZC - Structural Insulated Panels
CJMRC - Units, Partition Panel
CJZZC - Vermiculite Aggregate
CKNXC - Wallboard
CLBVC - Wall and Partition Facings and Accessories

This Information Bulletin supersedes Information Bulletin 2015-01, issued on February 2, 2015 necessitating additional clarification in response to various queries received by Underwriters Laboratories of Canada Inc. (ULC) concerning the effect of using ULC Fire Resistive Designs (published in ULC's Fire Resistance Directory) without considering the Load Restriction requirements when specified in the ULC Fire Resistive Designs. ULC Fire Resistance Ratings that include the statement "Load Restricted — Assembly evaluated in accordance with Working Stress Design methods, for use under Limit States Design methods; refer to information under Guide BXUVC." are only acceptable when the required load restriction is taken into consideration in the design of the structure.

Standards and Codes transitioned from applying Working Stress Design (WSD) principles to applying Limit States Design (LSD) principles over a number of years. With the advent of the 2005 National Building Code of Canada (NBCC) this transition was completed. Prior to this transition a significant quantity of ULC Fire Resistive Designs were calculated using WSD, and because these two principles (WSD and LSD) provide different results, ULC Fire Resistive Designs that were once unrestricted now fall under Load Restriction.

The load restriction is based on the fact that an assembly fire tested with loading determined under LSD principles would result in a lower fire endurance period when compared to the same assembly fire tested with loading determined under WSD principles.

Normally, during a fire test, the superimposed test load on an assembly evaluated in accordance with the LSD principles results in a higher test load than under WSD principles. Considering that the amount of load applied to an assembly has an influence in the fire endurance time (the greater the load the shorter the endurance time), rated assemblies based upon tests for which the assembly was loaded using the working stress design method must be identified as "Load Restricted" as required by Sections 6.2.3, 8.2.3, 10.4.3 and 11.3.3 of CAN/ULC S101-04(and in subsequent editions).

Accordingly ULC issued a ULC Bulletin dated June 14, 2006 that provided the rationale for requiring a "Load Restriction" on ULC Fire Resistive Designs when a test assembly during the Fire Test is evaluated under a superimposed test load determined in accordance with Working Stress Design (WSD) principles rather than the Limit States Design (LSD) principles. This Information

Underwriters Laboratories of Canada Inc.
7 Underwriters Road, Toronto, ON M1R 3A9, Canada
T: 416.757.3611 / F: 416.757.9540 / W:ULC.ca

Bulletin is within context of the aforesaid ULC Bulletin. It should be noted that a Load Restriction may also be specified in a ULC Fire Restive Design if the fire test is conducted under a superimposed test load less than the full specified test load determined in accordance with LSD principles.

The table which appeared in the June 14, 2006 ULC Bulletin as well as in guide information BXUVC and BXUV7 is reproduced below. If a Load Restriction factor is not stated in the design, then it is recommended the values be calculated by the Structural Engineer of record. The below Table can be used for the member sizes indicated in the Table.

Type of Assembly	Percent Load Reduction (LSD-WSD) / LSD	Load Restricted Factor
W200x42 Noncomposite steel beam	12%	0.88
W200x42 Composite steel beam	29%	0.71
Floor / Roof supported by open web steel joists	4%	0.96
Floor supported by cold formed steel channels	4%	0.96
Floor supported by 38 by 235 mm wood joists	35%	0.65
Wall supported by 38 by 89 mm wood studs	18%	0.82
Steel columns	0%	None

The percent load reductions for typical assemblies presented in this table are based upon loading calculated in accordance with the working stress design method as compared to loading calculated in accordance with the limit states design method.

The engineer/architect of record shall be consulted whenever fire resistive assemblies with “Load Restricted Factors” are selected. The indicated percent load reductions are based upon factored load effects that are governed by the reduced factored resistance of the structural elements. The selection of structural elements is, at times, based upon service limits, such as deflection and vibration. These factors and others, such as the change in material strength properties as a function of temperature, should be considered when selecting fire-resistive assemblies with Load Restricted ratings.

To conclude, ULC Fire Resistance Ratings that include the statement “Load Restricted — Assembly evaluated in accordance with Working Stress Design methods, for use under Limit States Design methods refer to information under BXUVC.” are only acceptable when the required load restriction is taken into consideration in the design of the structure. The above information is also applicable to cUL Fire Resistive Designs that contain the statement “This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7”.

If load restriction is applicable to a specific design, then each ULC and cUL fire resistive design will have the above statements indicated at the beginning of the design between the Design No. and before the component descriptions.

Should you have any questions or comments pertaining to ULC certifications, please contact Mr. G. Abbas Nanji (Abbas.G.Nanji@ul.com) or Mr. Ahmad F. Mangou (Ahmad.mangou@ul.com).

Sincerely,

Underwriters Laboratories of Canada Inc.

Gunsimar Paintal
Regional Manager – Accreditations & Quality
ULC Mark Program Owner

Underwriters Laboratories of Canada Inc.

G. Abbas Nanji
Senior Staff Engineer
Building Materials & Systems