

# UL Evaluation Report



**UL ER8078-01**

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**UL Category Code: ULEX**

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**DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION**

**Sub-level 2: 07 20 00 – Thermal Protection**

**Sub-level 3: 07 21 00 – Thermal Insulation**

**Sub-level 4: 07 21 23 – Loose Fill Insulation**

**Sub-level 4: 07 21 26 – Blown Insulation**

**COMPANY:**

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**2472 Port Sheldon St**  
**Jenison, MI 49428**  
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**1. SUBJECT:**

**NU-WOOL PREMIUM CELLULOSE INSULATION, NU-WOOL ENERGY CARE CELLULOSE INSULATION AND NU-WOOL WALLSEAL FIRE & SOUND INSULATION**

Throughout this report, the reference to Nu-Wool Insulation will apply to all products described above, except where indicated otherwise, and except for Nu-Wool Wallseal Fire & Sound Insulation.

## 2. SCOPE OF EVALUATION

- 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2015, 2012 and 2009 *International Energy Conservation Code*® (IECC)
- 2015, 2012, and 2009 *International Mechanical Code*® (IMC)
- NFPA 70 National Electric Code® , 2014 Edition
- ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated June 2014

### The products were evaluated for the following properties:

- Surface Burning Characteristics (ANSI/UL723, ASTM E84)
- Physical Properties (ASTM C739)
- Thermal Resistance (ASTM C739, ASTM C518)
- Sound Transmission (ASTM E90, ASTM E413)
- Fireblocking
- Fire-Resistance Rated Construction (ANSI/UL263)
- Ignition Barrier – Attics
- Attic and crawlspace applications

## 3. REFERENCED DOCUMENTS

- ANSI/UL723, 10<sup>th</sup> Ed. (ASTM E84), Test for Surface Burning Characteristics of Building Materials
- ANSI/UL263, 14<sup>th</sup> Ed. (ASTM E119), Fire Test of Building Construction and Materials
- ASTM C739-11, Standard Specification for Cellulosic Fiber Loose Fill Thermal Insulation
- ASTM C518-10, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- ASTM C1015-06, Standard Practice for Installation of Cellulosic and Mineral Fiber Loose Fill Thermal Insulation
- ASTM E90-09, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- ASTM E413-10, Classification for Rating Sound Insulation
- ASTM C840-13, Standard Specification for Application and Finishing of Gypsum Board
- CPSC 16 CFR Part 1209 (2002), Interim Safety Standard for Cellulose Insulation
- CPSC 16 CFR Part 1404 (2002), Cellulose Insulation
- ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated June 2014

## 4. USES

Nu-Wool Insulation is used as nonstructural thermal insulating material in buildings of all types of construction. The insulation is for use as an interior finish on or within floors, floor-ceiling or roof-ceiling assemblies, attics, crawl spaces, walls and partitions. See Sections 5 and 6 for specific applications for each product. The insulation is recognized for use in sound transmission assemblies, as fire blocking material, in both non-fire-resistance rated construction and fire-resistance rated construction in accordance with [Section 703](#) of the 2015, 2012, or 2009 IBC, and as an ignition barrier over foam plastic in accordance with [Section R316.5.3](#) of the 2015, 2012, or 2009 IRC.

Nu-Wool Wallseal Fire & Sound Insulation is for use in specific fire-resistance rated construction in accordance with [Section 703](#) of the 2015, 2012, or 2009 IBC, as described in Section 6.10.

## 5. PRODUCT DESCRIPTION

### 5.1 General:

Nu-Wool Insulation consists of a uniform low density mixture of recycled cellulosic fibers and borate-based fire retardant chemicals. Product application methods include wall spray (spray-applied), loose fill, and dry dense-pack, as described in Section 6. Spray-applied applications are applied with water. Loose fill and dry dense-pack applications are applied without water. Fire-blocking, and fire-resistance rated applications are non-thermal insulation applications for use in various structures.

Nu-Wool Wallseal Fire & Sound Insulation is a spray-applied, uniform, low density mixture of recycled cellulosic fibers and borate-based fire retardant chemicals.

### 5.2 Surface Burning Characteristics

The products meet the requirements of CPSC 16 CFR Part 1209 and have a flame spread index of not more than 25, and a smoke developed index of not more than 50 when tested in accordance with ANSI/UL 723 (ASTM E84) in accordance with the requirements set forth in [Section 720](#) of the 2015 or 2012 IBC (Section 719 of the 2009 code) and [Section 302.10](#) of the 2015, 2012, or 2009 IRC.

### 5.3 ASTM C739 Properties

Nu-Wool insulation has a thermal resistance R-value of 3.8 F-ft<sup>2</sup>-h/Btu at a nominal density of 1.6 lb/ft<sup>3</sup> when tested in accordance with ASTM C739 and C518, at a mean sample temperature of 75°F. In addition, the insulation has been evaluated in accordance with ASTM C739 for the following properties:

Property	Tested in Accordance with
Settled Density	ASTM C739 / CPSC 16 CFR 1209
Smoldering Combustion	ASTM C739 / CPSC 16 CFR 1209
Odor Emission	ASTM C739 / ASTM C1304
Critical Radiant Flux	ASTM C739 / ASTM E970 / CPSC 16 CFR 1209
Corrosiveness	ASTM C739 / CPSC 16 CFR 1209
Fungi Resistance	ASTM C739 / ASTM C1338
Moisture Vapor Sorption	ASTM C739

## 5.4 Sound Transmission:

The products described in this section have been evaluated in accordance with ASTM E90 and ASTM E413 for use as part of the Sound Transmission Rated Assemblies as summarized below:

Product	In accordance with	UL Design Assembly	STC rating
Nu-Wool Insulation	ASTM E90 ASTM E413	U360	50 or greater
Nu-Wool Wallseal Fire & Sound Insulation	ASTM E90 ASTM E413	U382	50 or greater

Refer to the UL Fire Resistance Directory, File R8078 ([CCAZ](#)), for details of the sound assemblies above.

## 6. INSTALLATION

### 6.1 General:

Installation of Nu-Wool Insulation and Nu-Wool Wallseal Fire & Sound Insulation must comply with ASTM C1015, as applicable, this report, and the manufacturer's published installation instructions.

Installation must be in accordance with CPSC 16 CFR 1404, [Section E4004](#) of the 2015, 2012, or 2009 IRC, and NFPA 70 (NEC) 410.116 when installation is above or adjacent to recessed luminaires (lighting fixtures) or other heat-producing elements. A permanent barrier is necessary to maintain a 3 inch (76 mm) clearance between the item and the insulation, unless the recessed luminaire is identified as Type IC and is listed in accordance with the applicable code for direct contact with insulation, or the heat-producing element is listed for zero clearance to combustibles. The insulation is limited to areas where the temperature will not exceed 194°F (90°C) in accordance with [Section E4003.2](#) of the 2015, 2012, or 2009 IRC.

When Nu-Wool Insulation or Nu-Wool Wallseal Fire & Sound Insulation is installed within a plenum, the installation must be in accordance with [Section 602.2.1](#) of the 2015, 2012, or 2009 IMC. Installation is not permitted in the area from the exit of the cooling coil to the downstream end of the drain pan, in accordance with [Section 604.13](#) of the 2015, 2012, or 2009 IMC.

The code official may require an approved vapor retarder to be installed in accordance with [Section 1405.3](#) of the 2015, 2012, or 2009 IBC, [Section R702.7](#) of the 2015 or 2012 IRC, [Section R601.3](#) of the 2009 IRC, or [Section 402.1.1](#) of the 2015 IECC. Protection against condensation in exterior wall assemblies must be provided in accordance with these sections of the code.

Attic ventilation, when required by the code, must not be blocked by the application of the insulation when installed in accordance with [Section R806.3](#) of the 2015, 2012, or 2009 IRC.

### 6.2 Wall Spray (Spray-Applied):

Nu-Wool Insulation may be used in spray-applied, exposed applications as an interior finish and in concealed applications within walls and partitions at a density of between 3 and 4.6 lbs/ft<sup>3</sup> (43.2 and 73.7 kg/m<sup>3</sup>).

Before enclosing spray applied Nu-Wool insulation in walls, the insulation must be left uncovered for a minimum of 24 hours.

Spray-applied Nu-Wool insulation must be installed in accordance with the manufacturer's detailed instructions, published by Nu-Wool, Co. Inc.

Nu-Wool Wallseal Fire & Sound Insulation is a spray-applied, uniform, low density mixture of recycled cellulosic fibers and borate based fire retardant chemicals used for UL fire wall design designation U382. The product is spray-applied with water at a minimum density of 4.58 lbs/ft<sup>3</sup> (73.4 kg/m<sup>3</sup>), and is assembly specific.

Before enclosing Nu-Wool Wallseal Fire & Sound Insulation in walls, the insulation must be left uncovered for a minimum of 24 hours.

### **6.3 Loose Fill:**

Nu-Wool Insulation is used for exposed loose fill applications on horizontal or sloped attic floors at a density of between 1.5 and 3.0 lbs/ft<sup>3</sup> (19.2 and 48.0 kg/m<sup>3</sup>) when installed in accordance with Section [R806.3](#) of the 2015, 2009, or 2009 IRC.

Nu-Wool Loose Fill Insulation is installed into its final position using a pneumatic device. The insulation may be applied to sloped attic floors having a maximum slope of 5:12 (41.7 percent slope).

Loose fill Nu-Wool Insulation applications must be installed in accordance with the manufacturer's detailed instructions, published by Nu-Wool Co., Inc.

### **6.4 Dry Dense-Pack:**

Nu-Wool Insulation is used in dry dense-pack applications for concealed spaces of walls, partitions, and roof-ceiling or floor-ceiling assemblies. Dry dense-pack products are installed at a density of between 3.5 and 5.0 lbs/ft<sup>3</sup> (56.1 and 80.0 kg/m<sup>3</sup>) when installed in accordance with Section [R806.5](#) of the 2015 or 2012 IRC or Section [R806.4](#) of the 2009 IRC, as applicable.

Dry dense-pack installation requires pneumatic application of the product in closed or netted cavities. Nu-Wool Insulation installed in dry dense-pack applications must be installed in accordance with the manufacturer's detailed instructions, published by Nu-Wool Co., Inc.

### **6.5 Installation Directly Beneath the Roof:**

Nu-Wool Insulation may be installed beneath the roof deck when installed in accordance with Section [R806.5](#) of the 2015 or 2012 IRC, or Section [R806.4](#) of the 2009 IRC, for the following applications using the dry dense-pack methodology:

- **Exposed Roof Decks and Roof Framing Members:**

May be installed beneath exposed roof decks when dry dense-packed behind netting at a minimum density of 3.5 lbs/ft<sup>3</sup>. Climate Zones 2B and 3B do not require an air impermeable insulation layer to the roof deck per Section [R806.5](#) of the IRC. The use of Nu-Wool products in cathedralized attics outside of Zones 2B and 3B needs to be reviewed by a hygric / thermal analysis evaluation tool, such as WUFI (Wärme und Feuchtetransport Instationär, or Transient Heat and Moisture Transport), to determine the need for air barriers on the exposed side of the insulation.

- **Enclosed Rafter Spaces (Insulated Cathedral Ceilings):**

Insulated cathedral ceilings are rafter spaces, formed where ceilings are applied directly to the underside of the roof framing members, which fully encapsulate the thermal insulation on all sides. In applications with vented rafter spaces, Nu-Wool insulation is dry dense-packed to a density of 3.5 to 5.0 lbs/ft<sup>3</sup> (56.1 to 80.0 kg/m<sup>3</sup>) and installed in accordance with [Section 1203.2](#) of the 2015, 2012, or 2009 IBC and Section [R806.5](#) of the 2015 or 2012 IRC or Section [R806.4](#) of the 2009 IRC, as applicable.

In applications with unvented rafter spaces, Nu-Wool Insulation may be dry dense-packed over an air impermeable insulation in accordance with Section [R806.5](#) of the 2015 or 2012 IRC or Section [R806.4](#) of the 2009 IRC, as applicable. The air impermeable insulation must be of a thickness necessary to comply with the R-Value specified in Table [R806.5](#) of the 2015 or 2012 IRC or Table [R806.4](#) of the 2009 IRC, as applicable.

#### **6.6 Metal Construction:**

Nu-Wool Insulation may be used in construction using metal studs, metal buildings, or any construction in which Nu-Wool Insulation will be in contact with metal structural or sheathing members.

#### **6.7 Crawl Spaces:**

Nu-Wool Insulation can be applied to foundation walls in unvented crawl spaces. Nu-Wool Insulation may be used as floor / ceiling insulation over a crawl space.

#### **6.8 Fireblocking:**

Nu-Wool Insulation may be used as fireblocking materials in accordance with Section [718.2.1](#) of the 2015 or 2012 IBC, [Section 717.2.1](#) of the 2009 IBC, Sections [R302.11.1](#) and [R602.8](#) of the 2015, 2012 or 2009 IRC, and may be used as alternatives to the fireblocking materials required in Section [R302.11.1](#) of the 2015, 2012 or 2009 IRC.

The insulation may be placed in concealed spaces of wood or steel stud walls and partitions of combustible construction with stud spacing up to 24 inches (610 mm) on center. When the walls and partitions have existing insulation in the spaces between the studs, access holes measuring from 1 inch (25.4 mm) in diameter to 6 inches (152 mm) square are cut in the wall covering at each space between studs, and the plugs are removed. The existing insulation is cut and pushed away to form a space with a minimum height of 16-inches (406 mm) above the floor level. Nu-Wool Insulation is then installed into the open space, filling from the floor a full 16-inch (406 mm) (or greater) height, and contacting all surfaces. After installation has been completed, the plugs are replaced and the wall covering is repaired with tape and joint compound in accordance with ASTM C840 or GA 216.

When there is no insulation in the wall or partition, insulation must completely fill the stud cavity to a minimum depth of 16 inches (406 mm).

#### **6.9 Installation in Attics when used as a Prescribed Ignition Barrier:**

Nu-Wool Insulation may be used as an ignition barrier over foam plastics on attic floors in accordance with [Section R316.5.3](#) of the 2015, 2012, or 2009 IRC, when applied at a minimum thickness of 1-1/2 inches (38.1 mm) and a minimum installed density of 1.6 lbs/ft<sup>3</sup> (25.6 kg/m<sup>3</sup>).

## 6.10 Fire-Resistance:

### 6.10.1 Calculated Fire-Resistance

The fire-resistance rating of wood-stud walls is increased by 15 minutes when calculating fire-resistance in accordance with Table [722.6.2\(5\)](#) of the 2015 or 2012 IBC, or [Table 721.6.2\(5\)](#) of the 2009 IBC, when the spaces between wood studs are completely filled with Nu-Wool Insulation having a nominal density not less than 2.6 pcf (41.6 kg/m<sup>3</sup>).

### 6.10.2 Fire-Resistance Ratings

Refer to the UL Fire Resistance Certification information for File R8078 ([CCAZ](#)) for applicable design coverage and details of the fire-resistance wall assemblies covered by this report. Fire-resistance ratings are only applicable when the assemblies are constructed in accordance with the published designs.

Nu-Wool Wallseal Fire & Sound Insulation is for use only in UL Fire Resistive Design No. U382. All other designs specified in the File R8078 ([CCAZ](#)) Classification Card are applicable for Nu-Wool Insulation.

## 7. CONDITIONS OF USE

### 7.1 General:

The products described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 2.0 of this report, subject to the following conditions:

- 7.2 Installation must comply with this report, the manufacturer's published installation instructions, and the applicable code. If there is a conflict between this report and the manufacturer's published installation instructions, this report governs.
- 7.3 Nu-Wool Insulation and Nu-Wool Wallseal Fire & Sound Insulation may be installed in noncombustible construction without affecting the noncombustible classification as described in [Section 603.1](#) of the 2015, 2012, or 2009 IBC.
- 7.4 The installer must provide the code official a signed and dated statement describing the type of insulation installed, including thickness, coverage area, *R*-value and number of bags or pounds of insulation installed.
- 7.5 When the fire-resistance rated wall or floor-ceiling assemblies described in Section 6 are used in multi-family applications, design and details to verify compliance with all of the applicable requirements of any code must be prepared by a registered design professional where required by state or local jurisdictions in which the project is constructed and submitted to the local code official for approval.
- 7.6 Nu-Wool Insulation and Nu-Wool Wallseal Fire & Sound Insulation are manufactured under the UL LLC Classification and Follow-Up Service Program at the following Nu-Wool Co. Inc. plant, which includes audits in accordance with ICC-ES Acceptance Criteria for Quality Documentation, AC10:

Jenison, Michigan

## 8. SUPPORTING EVIDENCE

- 8.1 Manufacturer's published installation instructions.
- 8.2 UL test reports and Classification in accordance with the following:
- Surface Burning Characteristics in accordance with ANSI/UL 723 (ASTM E84). See UL Product Certification Category for Loose Fill Materials ([BNST](#)) Thermal transmission testing in accordance with ASTM C518
  - Physical properties testing in accordance with ASTM C739. See UL Product Certification Category for Loose Fill Materials ([BPHX](#))
  - Fire Resistance in accordance with ANSI/UL 263 (ASTM E119). See UL Product Certification Category for Sprayed Fiber ([CCAZ](#))
- 8.3 Reports of physical property testing in accordance with CPSC 16CFR Parts 1209 and 1404
- 8.4 Reports of sound transmission testing in accordance with ASTM E90 and ASTM E413
- 8.5 Reports of fireblocking testing
- 8.6 Documentation of quality system elements described in AC10, ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated June 2014

## 9. IDENTIFICATION

Each package of Nu-Wool Insulation and Nu-Wool Wallseal Fire & Sound Insulation described in this evaluation report is identified by a marking bearing the report holder's name (Nu-Wool Co. Inc.), the product name, the address of the manufacturing plant, the date of manufacture, the UL Classification Mark, and the evaluation report number UL ER8078-01. Additionally, each package must bear a label with information required by FTC 16 CFR Part 460 and CPSC 16 CFR, Parts 1209 and 1404.

The validity of the evaluation report is contingent upon this identification appearing on the product or UL Classification Mark certificate.

Jobsite labeling for the insulation must comply with Section [N1101.10.1.1](#) of the 2015 IRC or [Section N1101.12.1.1](#) of the 2012 IRC.

## 10. USE OF UL EVALUATION REPORT

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