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## BUILDINGS BULLETIN 2017-010

### OTCR

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**Supersedes:** None

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**Effective Date:** Immediately

**Purpose:** This document establishes acceptance criteria for evaluating Group C (200 ksi tensile strength) high strength structural bolts (referred to as *Group C high strength bolts*) conforming to ASTM F3043 or F3111 as an alternative material in the NYC Construction Codes.

**Related Code/Zoning Section(s):** AC 28-113      BC 2201.2  
BC 1704.3      1RCNY 101-06

**Subject(s):** Structural steel bolted connections, Group C; High strength bolts, Group C; High strength structural bolts

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**Background:** For structural steel bolted connections, the 2014 NYC BC Section 2204.2 references AISC 360-05 and AISC 341-05 which recognize Group A (120 ksi tensile strength) and Group B (150 ksi tensile strength) high strength bolts. Group C high strength bolts (200 ksi tensile strength) were added in a later version of AISC 360<sup>3</sup> (2016) and AISC 341<sup>4</sup> (2016). Group C high-strength bolts conform to ASTM F3043<sup>1</sup> (twist-off type) and ASTM F3111<sup>2</sup> (heavy hex structural bolting assemblies). This Bulletin establishes the criteria for acceptance, design, installation and inspection of Group C high strength bolts conforming to ASTM F3043 and ASTM F3111.

**Description:** Group C high strength bolts include ASTM F3043 twist-off type tension control bolt assemblies and ASTM F3111 heavy hex structural bolt assemblies, in diameters of 1-inch through 1-1/4-inch, and provide 200 ksi bolt tensile strength. They are supplied as a complete assembly with bolt, nut, and washer or washers as required including factory lubrication.

**Uses:** Group C high strength bolts, are specifically designed for connections where large diameter high strength structural bolts are typically used. These include connections for large bracing elements, long-span trusses, heavy column splices, heavy girders, bolted moment connections, and similar locations where thick plies of steel are being joined. Grade 1 assemblies with standard UNJ thread profiles are restricted to snug-tight joints; however Grade 2 assemblies with thread profile prescribed in accordance with Annex A1 of their ASTM standard are permitted to be used in snug-tight, pre-tensioned, and slip-critical joints. The fastener assemblies are intended for use in structural connections in the following environmental conditions:

- Interiors, normally dry, including interiors where structural steel is embedded in concrete, encased in masonry or protected by membrane or noncorrosive contact type fireproofing.

- Interiors and exteriors normally dry, under roof, where the installed assemblies are soundly protected by a shop-applied or field-applied coating to the structural steel system.

**Restrictions:** Group C high strength bolts are not intended for use in structural connections in the following environments, with or without protection by a shop-applied or field-applied coating to the structural steel system:

1. Exteriors not under roof.
2. Chemical environments in which strong concentrations of highly corrosive gases, fumes, or chemicals, either in solution or as concentrated liquids or solids, contact the bolting assemblies, or their protective coating.
3. Heavy industrial environments severe enough to be classified as a chemical environment as described in number two above.
4. Condensation and high humidity environments maintaining almost continuous condensation, including but not limited to submersion in water or soil or applications in close proximity to marine environments.
5. Cathodically protected environments, in which current is applied to the structural steel system by the sacrificial anode method or the DC power method.

**Evaluation Scope:** NYC Construction Codes

**Evaluation Criteria:** Pursuant to AC 28-113, the Office of Technical Certification and Research (OTCR) recognizes Group C high strength structural bolts conforming to ASTM F3043 and ASTM F3111.

**Conditions of Acceptance:** Group C high strength bolts conforming to ASTM F3043 or F3111 shall comply with the NYC Construction Codes and the following applicable provisions:

**A. Design**

1. Group C high strength bolts conforming to ASTM F3043 or F3111 shall be designed in accordance with the AISC 360-16 and AISC 341-16, NYC Construction Codes, manufacturer’s installation instructions, the applicable ASTM standard, and the conditions of this bulletin.

**B. Installation Requirements**

1. Installation requirements shall be in accordance with the NYC Construction Codes, manufacturer’s installation instructions, AISC 360-16, the applicable ASTM standard, and the conditions of this bulletin.
2. After removal of bolts from protected storage and achieving a snug tight condition, care shall be taken to torque bolts in a timely manner and follow practices to ensure bolts are not left exposed during construction.

**C. Inspections**

1. Pursuant to section BC 1704.3, the installation of Group C high strength bolts shall be subject to special inspection requirements of Chapter 17 of the Building Code and Department Rules covering special inspection. Special Inspectors of Group C high strength bolts shall:
  - a. Have duties and responsibilities in accordance with, but not limited to, 1 RCNY section 101-06, Section BC 1704.3, and verify that the installation does not include any of the restrictions listed above.

- b. Complete a statement of special inspection within which this bulletin shall be referenced under the Special Inspection Item for BC 1704.3 of the TR1 form.

**D. Labeling**

1. Group C high strength bolts shall be specified as per 28-113.4. All shipments and deliveries of materials shall be accompanied by a certificate or label certifying that the materials shipped or delivered are equivalent to those tested and approved.

- Referenced Standards:**
1. ASTM F3043-14 *Standard Specification for 'Twist Off' Type Tension Control Structural Bolt/Nut/Washer Assemblies, Alloy Steel, Heat Treated, 200 ksi Minimum Tensile Strength*
  2. ASTM F3111-14 *Standard Specification for Heavy Hex Structural Bolt/Nut/Washer Assemblies, Alloy Steel, Heat Treated, 200 ksi Minimum Tensile Strength*
  3. AISC 360-16 *Specification for Structural Steel Buildings*
  4. AISC 341-16 *Seismic Provisions for Structural Steel Buildings*