

# Technical Evaluation Report™

**TER 2001-01**

**SPAX® PowerTrim™ Screw Properties**

**Altenloh, Brinck & Company U.S., Inc.**

**Product:**

**SPAX® #8 and #9 PowerTrim™  
Screws (XTT-08, XTT-09, and  
XTT-08D)**

**Issue Date:**

January 14, 2021

**Revision Date:**

November 11, 2022

**Subject to Renewal:**

January 1, 2024



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COMPANY  
INFORMATION:

ADDITIONAL  
LISTEES:

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Altenloh, Brinck & Company U.S., Inc.  
2105 County Road 12C  
Bryan, OH 43506-8301

419-636-6715 or 800-443-9602

[www.spax.com](http://www.spax.com)

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 00 90 - Wood and Plastic Fastenings

SECTION: 06 05 23 - Wood, Plastic, and Composite Fastenings

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## 1 Product Evaluated<sup>1,2</sup>

- 1.1 SPAX® #8 and #9 PowerTrim™ Screws (XTT-08, XTT-09, and XTT-08D)

## 2 Applicable Codes and Standards<sup>3</sup>

### 2.1 Codes

- 2.1.1 *IBC—15, 18, 21: International Building Code®*
- 2.1.2 *IRC—15, 18, 21: International Residential Code®*
- 2.1.3 *IECC—15, 18, 21: International Energy Conservation Code®*
- 2.1.4 *FBC-B—17, 20: Florida Building Code – Building*
- 2.1.5 *FBC-R—17, 20: Florida Building Code – Residential*

### 2.2 Standards and Referenced Documents

- 2.2.1 *AISI S904: Standard Test Methods for Determining the Tensile and Shear Strengths of Screws*
- 2.2.2 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*
- 2.2.3 *ASTM A153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*
- 2.2.4 *ASTM A510: Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel*
- 2.2.5 *ASTM B117: Standard Practice for Operating Salt Spray (Fog) Apparatus*
- 2.2.6 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood*
- 2.2.7 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails*
- 2.2.8 *ASTM G85: Standard Practice for Modified Salt Spray (Fog) Testing*

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<sup>1</sup> For more information, visit [drjcertification.org](http://drjcertification.org) or call us at 608-310-6748.

<sup>2</sup> This TER is a code defined [research report](#) provided by an [approved source](#) (see [IBC Section 1703.4.2](#)) and an [approved agency](#) (see [IBC Section 1703.1](#)). Given that this TER is for new materials, as defined in [IBC Section 1702](#), for which there are no approved rules or standards, [IBC Section 1707.1](#) states that, "In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports (i.e. [research reports](#)) from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in [IBC Section 104.11](#). A professional engineer is approved as an approved source when that professional engineer is properly licensed to transact engineering commerce.

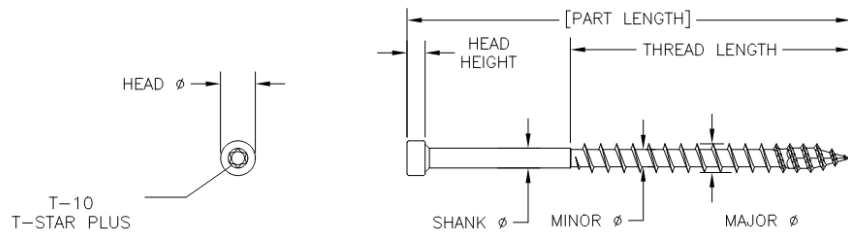
<sup>3</sup> Unless otherwise noted, all references in this TER are from the 2021 version of the codes and the standards referenced therein. This material, design, or method of construction also complies with the 2000-2018 versions of the referenced codes and the standards referenced therein.

### 3 Performance Evaluation

- 3.1 Testing and related engineering evaluations are defined as intellectual property and/or trade secrets.
- 3.2 SPAX® #8 and #9 PowerTrim™ Screws were tested and evaluated to determine their structural resistance properties, which are used to develop reference design values for allowable stress design (ASD). The following properties were evaluated:
  - 3.2.1 Bending yield in accordance with ASTM F1575,
  - 3.2.2 Tensile strength in accordance with AISI S904,
  - 3.2.3 Shear strength in accordance with AISI S904,
  - 3.2.4 Head pull-through polyvinyl chloride (PVC) trim in accordance with ASTM D1761,
  - 3.2.5 Withdrawal strength in accordance with ASTM D1761, and
  - 3.2.6 Corrosion resistance in accordance with ASTM B117 (modified) and ASTM G85.
- 3.3 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this TER.
- 3.4 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope, which are also its areas of professional engineering competence.
- 3.5 Any regulation specific issues not addressed in this section are outside the scope of this TER.

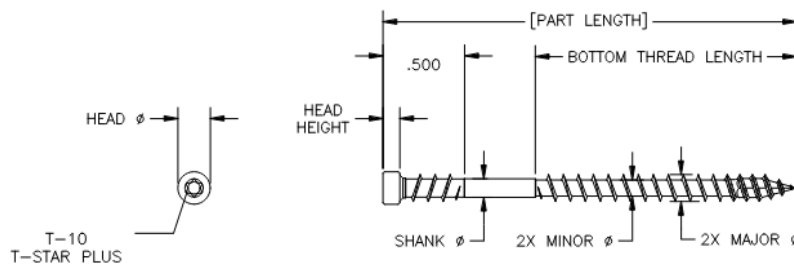
### 4 Product Description and Materials

- 4.1 The SPAX® #8 and #9 PowerTrim™ Screws are partially threaded with a cylinder head and a SPAX® T-10 T Star Plus drive (#8) or SPAX® T-15 T-Star Plus drive (#9). The point is a threaded tip.
- 4.2 The SPAX® #8 PowerTrim™ Screws are manufactured in a single thread and double thread option.
- 4.3 The products evaluated in this TER are shown in Figure 1.



**Figure 1. SPAX® XTT08 Fastener**

- 4.4 Figure 2 shows the XTT08D double thread SPAX® #8 PowerTrim™ Screw.



**Figure 2. SPAX® XTT08D Fastener**

- 4.5 SPAX® #8 and #9 PowerTrim™ Screws are made of hardened carbon steel grade 1022 or 10B21 wire conforming to ASTM A510, or grade 17MnB3 or 19MnB4 wire conforming to DIN 1654.
- 4.6 SPAX® #8 and #9 PowerTrim™ Screws are manufactured using a standard cold-formed process followed by heat treating and coating processes.
- 4.7 The single and double thread fasteners evaluated in this TER are designated in Table 1 and Table 2, respectively.



**Table 1. XTT08 and XTT09 Fastener Specifications<sup>5</sup>**

| Fastener Name | Head (in) |                 |         |          |        | Length (in)           |                     | Diameters (in) |       |       | Bending Yield Strength <sup>3</sup> , f <sub>yb</sub> (psi) | Allowable Steel Strength (lbs) |                    |
|---------------|-----------|-----------------|---------|----------|--------|-----------------------|---------------------|----------------|-------|-------|---|--------------------------------|--------------------|
|               | Style     | Drive Size/Type | Marking | Diameter | Height | Fastener <sup>1</sup> | Thread <sup>2</sup> | Shank          | Minor | Major |   | Tension                        | Shear <sup>4</sup> |
| #8 x 1¼"      | Trim      | T10 T-Star Plus | n/a     | 0.200    | 0.100  | 1.250                 | 0.815               | 0.112          | 0.100 | 0.160 | 181,000   | 390                            | 310                |
| #8 x 1½"      |           |                 |         |          |        | 1.500                 | 0.975               |                |       |       |   |                                |                    |
| #8 x 2"       |           |                 |         |          |        | 2.000                 | 1.270               |                |       |       |   |                                |                    |
| #8 x 2½"      |           |                 |         |          |        | 2.500                 | 1.565               |                |       |       |   |                                |                    |
| #8 x 2¾"      |           |                 |         |          |        | 2.750                 | 1.860               |                |       |       |   |                                |                    |
| #8 x 3⅛"      |           |                 |         |          |        | 3.125                 | 1.960               |                |       |       |   |                                |                    |
| #9 x 4"       |           |                 |         |          |        | T15 T-Star Plus       | n/a                 |                |       |       |   |                                |                    |
| #9 x 5"       | 5.000     |                 |         |          |        |                       |                     |                |       |       |   |                                |                    |

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 psi = 0.00689 MPa

1. Fastener length is measured from the topside of the head to the tip.
2. Thread length includes tapered tip (see Figure 1).
3. Bending yield strength, F<sub>yb</sub>, is determined in accordance with ASTM F1575 using minor thread diameter when fastener is tested in threaded section.
4. Shear strength is determined in accordance with AISI S904 using minor thread diameter when fastener is tested in threaded section.
5. Tabulated fastener dimensions are measured on uncoated fasteners. Finished dimensions are larger due to the proprietary coatings added.

**Table 2. XTT08D Fastener Specifications<sup>5</sup>**

| Fastener Name | Head (in) |                 |         |          |        | Length (in)           |                     | Diameters (in) |       |       | Bending Yield Strength <sup>3</sup> , f <sub>yb</sub> (psi) | Allowable Steel Strength (lbs) |                    |
|---------------|-----------|-----------------|---------|----------|--------|-----------------------|---------------------|----------------|-------|-------|---|--------------------------------|--------------------|
|               | Style     | Drive Size/Type | Marking | Diameter | Height | Fastener <sup>1</sup> | Thread <sup>2</sup> | Shank          | Minor | Major |   | Tension                        | Shear <sup>4</sup> |
| #8 x 2"       | Trim      | T10 T-Star Plus | n/a     | 0.200    | 0.100  | 2.000                 | 1.270               | 0.112          | 0.100 | 0.160 | 181,000   | 390                            | 310                |
| #8 x 2½"      |           |                 |         |          |        | 2.500                 | 1.565               |                |       |       |   |                                |                    |
| #8 x 2¾"      |           |                 |         |          |        | 2.750                 | 1.860               |                |       |       |   |                                |                    |
| #8 x 3⅛"      |           |                 |         |          |        | 3.125                 | 1.960               |                |       |       |   |                                |                    |

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 psi = 0.00689 MPa

1. Fastener length is measured from the topside of the head to the tip.
2. Thread length includes tapered tip (see Figure 2).
3. Bending yield strength, F<sub>yb</sub>, is determined in accordance with ASTM F1575 using minor thread diameter when fastener is tested in threaded section.
4. Shear strength is determined in accordance with AISI S904 using minor thread diameter when fastener is tested in threaded section.
5. Tabulated fastener dimensions are measured on uncoated fasteners. Finished dimensions are larger due to the proprietary coatings added.



- 4.8 SPAX® #8 and #9 PowerTrim™ Screws are available with a proprietary coating:
  - 4.8.1 Exterior Grade: Proprietary HCR™ coating that is equivalent to the protection provided by code-approved hot-dipped galvanized coatings meeting ASTM A153, Class D (IBC Section 2304.10.6<sup>4</sup> and IRC Section R317.3).
    - 4.8.1.1 HCR™ coating is tested and recognized for use in ground contact pressure treated lumber (ACQ-D), exterior, freshwater, general construction applications (e.g., Ground Contact AWPA UC1-UC4A ACQ-D).
    - 4.8.1.2 HCR™ coated fasteners are approved for use in Fire Retardant Treated (FRT) lumber provided the conditions set forth by the FRT lumber manufacturer are met, including appropriate strength reductions.

## 5 Applications

- 5.1 *Structural Applications*
  - 5.1.1 SPAX® #8 and #9 PowerTrim™ Screws are used to attach wood, composite wood, or composite (PVC) trim and fascia to wood main members in conventional light-frame construction and provide resistance against head pull through and withdrawal.
- 5.2 *Design*
  - 5.2.1 Design of SPAX® #8 and #9 PowerTrim™ Screws is governed by the applicable code and the provisions for dowel-type fasteners in NDS.
  - 5.2.2 Unless otherwise noted, adjustment of the design stresses for duration of load shall be in accordance with the applicable code.
- 5.3 *Head Pull-Through Design Values*
  - 5.3.1 Reference design values for head pull-through for SPAX® #8 and #9 PowerTrim™ Screws are specified in Table 3.

**Table 3.** Head Pull-Through Design Values for SPAX® PowerTrim™ Screw

| Trim Thickness <sup>1</sup> | Head Pull-Through Design Value (lbs) |
|-----------------------------|--------------------------------------|
| 1/2"                        | 26                                   |
| 3/4"                        | 37                                   |
| 1"                          | 37                                   |

SI: 1 in = 25.4 mm, 1 lb = 4.45 N

1. Any brand of trim board can be used provided it has a minimum head pull-through strength as shown in this table, using the SPAX® PowerTrim™ Screw when tested in accordance with ASTM D1761. Note that Royal® Mouldings Limited Royal Trim Board meets this requirement.

<sup>4</sup> 2018 IBC Section 2304.10.5

5.4 *Reference Withdrawal Design Values in Face Grain Applications*

5.4.1 Reference withdrawal Design Values for SPAX® #8 and #9 PowerTrim™ Screws are specified in Table 4.

**Table 4.** Reference Withdrawal Values for SPAX® PowerTrim™ Screw in Face Grain

| Member Type <sup>1</sup><br>(Specific Gravity) | Reference Withdrawal Value <sup>2,3</sup> (lbs/in) |
|--|--|
| SPF (0.42)                                     | 130  |
| DF-L (0.50)                                    | 160  |
| SP (0.55)                                      | 175  |

SI: 1 in = 25.4 mm, 1 lb = 4.45 N

- For wood species with an assigned specific gravity between 0.42 and 0.50, use the tabulated values for specific gravity of 0.42. For wood species with an assigned specific gravity between 0.50 and 0.55, use the tabulated values for specific gravity of 0.50. For wood species with an assigned specific gravity greater than or equal to 0.55, use the tabulated values for specific gravity of 0.55.
- Fastener penetration is the threaded length embedded in the wood member, including the tip.
- Tabulated withdrawal values shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.

5.5 Where the application falls outside of the performance evaluation, conditions of use and/or installation requirements set forth herein, alternative techniques shall be permitted in accordance with accepted engineering practice and experience. This includes but is not limited to the following areas of engineering: mechanics or materials, structural, building science and fire science.

**6 Installation**

- 6.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this TER, and the applicable building code.
- 6.2 In the event of a conflict between the manufacturer installation instructions and this TER, the more restrictive shall govern.
- 6.3 *Installation Procedure*
  - 6.3.1 The SPAX® PowerTrim™ Screw #8 shall be installed using a T-10 or SPAX® T-10 plus driver bit.
  - 6.3.2 The SPAX® PowerTrim™ Screw #9 shall be installed using a T-15 or SPAX® T-15 plus driver bit.
  - 6.3.3 Fasteners shall not be struck with a hammer during installation.
  - 6.3.4 Lead holes are not required.
  - 6.3.5 The fastener head must be installed flush with the surface of the wood, composite wood or composite (PVC) side member being connected. The fastener must not be overdriven.
  - 6.3.6 Minimum penetration is 1½" unless otherwise stated in this TER.

6.3.7 Minimum requirements for fastener spacing, edge distance, and end distance shall be in accordance with Table 5.

**Table 5.** Minimum Spacing, Edge Distance, and End Distance Requirements

| Connection Geometry   | Minimum Spacing/Distance <sup>1,2</sup> (in) |       |
|---|--|-------|
|   | #8   | #9    |
| Edge Distance – Load in any direction                       | 3/8  | 3/8   |
| End Distance – Load parallel to grain, towards end          | 1 3/4  | 1 7/8 |
| End Distance – Load parallel to grain, away from end        | 1 1/8  | 1 1/4 |
| End Distance – Load perpendicular to grain                  | 1 1/8  | 1 1/4 |
| Spacing between Fasteners in a Row – Parallel to grain      | 1 3/4  | 1 7/8 |
| Spacing between Fasteners in a Row – Perpendicular to grain | 1 1/8  | 1 1/4 |
| Spacing between Rows of Fasteners – In-line                 | 5/8  | 5/8   |
| Spacing between Rows of Fasteners – Staggered               | 3/8  | 3/8   |

SI: 1 in = 25.4 mm

- Edge distances, end distances, and spacing of fasteners shall be sufficient to prevent splitting of the wood or as shown in this table, whichever is the more restrictive.
- Values for “Spacing between Rows of Fasteners – Staggered” apply where the fasteners in adjacent rows are offset by one half of the “Spacing between Fasteners in a Row”

## 7 Substantiating Data

- Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:
  - Testing for bending yield by SBCRI in accordance with ASTM F1575,
  - Testing for tensile strength by SBCRI in accordance with AISI S904,
  - Testing for shear strength by SBCRI in accordance with AISI S904,
  - Testing for head pull-through by SBCRI in accordance with ASTM D1761,
  - Testing for withdrawal by SBCRI in accordance with ASTM D1761, and
  - Testing for corrosion by Element in accordance with ASTM B117 (modified) and ASTM G85.
- Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies (i.e. ANAB accredited agencies), approved sources (i.e., registered design professionals [RDP]) and/or professional engineering regulations. Accuracy of external test data and resulting analysis is relied upon
- Where pertinent, DrJ’s analysis is based upon provisions that have been codified into law through state or local adoption of codes and standards. The developers of these codes and standards are responsible for the reliability of published content. DrJ’s engineering practice may use a code-adopted provision as the control sample. A control sample versus a test sample establishes a product as being equivalent to the code-adopted provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.
- The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, Listings, certified reports, duly authenticated reports from approved agencies, and research reports prepared by approved agencies and/or approved sources provided by the suppliers of any raw materials. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ’s engineering practice, as contained in this TER, may be dependent upon published design properties by others.

- 7.5 Testing and engineering analysis. The strength, rigidity and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.<sup>5</sup>

## 8 Findings

- 8.1 As delineated in Section 3, the SPAX® #8 and #9 PowerTrim™ Screws (XTT-08, XTT-09, and XTT-08D) have performance characteristics that were tested and/or meet pertinent standards and is suitable for use pursuant to its specified purpose.
- 8.2 When used and installed in accordance with this TER and the manufacturer installation instructions, SPAX® #8 and #9 PowerTrim™ Screws (XTT-08, XTT-09, and XTT-08D) shall be approved for the following applications:
- 8.2.1 Provide resistance to head pull-through loads as shown in Table 3, and
- 8.2.2 Provide resistance to reference withdrawal loads as shown in Table 4.
- 8.3 These products have been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this TER, they are listed here.
- 8.3.1 No known variations
- 8.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Altenloh, Brinck & Company U.S., Inc.
- 8.5 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10<sup>6</sup> are similar) in pertinent part states:

**104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

- 8.6 Approved<sup>7</sup>: Building codes require that the building official shall accept duly authenticated reports<sup>8</sup> or research reports<sup>9</sup> from approved agencies and/or approved sources (i.e., licensed RDP) with respect to the quality and manner of use of new products, materials, designs, services, assemblies or methods of construction.
- 8.6.1 Acceptability of an approved agency, by a building official, is performed by verifying that the agency is accredited by a recognized accreditation body of the International Accreditation Forum (IAF).
- 8.6.2 Acceptability of a licensed RDP, by a building official, is performed by verifying that the RDP and/or their business entity is listed by the licensing board of the relevant jurisdiction.
- 8.6.3 Federal law, Title 18 US Code Section 242, requires that where the alternative product, material, service, design, assembly and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved, as denial without written reason deprives a protected right to free and fair competition in the marketplace.
- 8.7 DrJ is an engineering company, employs RDPs and is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131.
- 8.8 Through ANAB accreditation and the IAF Multilateral Agreements, this TER can be used to obtain product approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – “certified once, accepted everywhere.”

<sup>5</sup> See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.

<sup>6</sup> 2018 IFC Section 104.9

<sup>7</sup> Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

<sup>8</sup> <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>

<sup>9</sup> <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2>



## 9 Conditions of Use

- 9.1 Material properties shall not fall outside the boundaries defined in Section 3.
- 9.2 As defined in Section 3, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.
- 9.3 Wood main and side members must have a moisture content of less than or equal to 19 percent.
- 9.4 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this evaluation report.
- 9.5 When required by regulation and enforced by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:
  - 9.5.1 Any calculations, incorporated into the construction documents that are required to show compliance with this TER, shall conform to accepted engineering practice, and shall be approved when requirements of the pertinent regulations are met.
  - 9.5.2 This TER and the installation instructions shall be submitted at the time of permit application.
  - 9.5.3 These products have an internal quality control program and a third-party quality assurance program.
  - 9.5.4 At a minimum, these products shall be installed per Section 6 of this TER.
  - 9.5.5 The review of this TER, by the AHJ, shall be in compliance with IBC Section 104 and Section 105.4.
  - 9.5.6 These products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.4, Section 110.4, and Section 1703, and IRC Section R104.4 and Section R109.2.
  - 9.5.7 The application of these products in the context of this TER is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2 and any other regulatory requirements that may apply.
- 9.6 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (e.g., owner or RDP).
- 9.7 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent.

## 10 Identification

- 10.1 The products listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at www.spax.com.

## 11 Review Schedule

- 11.1 This TER is subject to periodic review and revision. For the most recent version, visit drjcertification.org.
- 11.2 For information on the current status of this TER, contact DrJ Certification.

## 12 Approved for Use Pursuant to US and International Legislation Defined in Appendix A Section 9

- 12.1 SPAX® #8 and #9 PowerTrim™ Screws (XTT-08, XTT-09, and XTT-08D) are included in this TER published by an approved agency concerned with evaluation of products or services that maintains periodic inspection of production of listed materials or periodic evaluation of services and whose TER Listing states either that the material, product, or service meets identified standards or has been tested and found suitable for a specified purpose. This TER meets the legislative intent and definition of being acceptable to the AHJ.

## 1 Appendix A: Legislation that Authorizes AHJ Approval

- 1.1 **Fair Competition:** State legislatures have adopted Federal regulations for the examination and approval of building code referenced and alternative products, materials, designs, services, assemblies and/or methods of construction that:
  - 1.1.1 Advance Innovation,
  - 1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints, and
  - 1.1.3 Benefit consumers through lower prices, better quality, and greater choice.
- 1.2 **Adopted Legislation:** The following local, state, and federal regulations affirmatively authorize SPAX® #8 and #9 PowerTrim™ Screws (XTT-08, XTT-09, and XTT-08D) to be approved by AHJs, delegates of building departments, and/or delegates of an agency of the federal government:
  - 1.2.1 Interstate commerce is governed by the Federal Department of Justice to encourage the use of innovative products, materials, designs, services, assemblies and/or methods of construction. The goal is to “protect economic freedom and opportunity by promoting free and fair competition in the marketplace.”
  - 1.2.2 Title 18 US Code Section 242 affirms and regulates the right of individuals and businesses to freely and fairly have new products, materials, designs, services, assemblies and/or methods of construction approved for use in commerce. Disapproval of alternatives shall be based upon non-conformance with respect to specific provisions of adopted legislation, and shall be provided in writing stating the reasons why the alternative was not approved, with reference to the specific legislation violated.
  - 1.2.3 The federal government and each state have a public records act. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2016 (DTSA).
    - 1.2.3.1 Compliance with public records and trade secret legislation requires approval through the use of Listings, certified reports, Technical Evaluation Reports, duly authenticated reports and/or research reports prepared by approved agencies and/or approved sources.
  - 1.2.4 For new materials<sup>10</sup> that are not specifically provided for in any building code, the design strengths and permissible stresses shall be established by tests, where suitable load tests simulate the actual loads and conditions of application that occur.
  - 1.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.<sup>11</sup>
- 1.3 **Approved**<sup>12</sup> **by Los Angeles:** The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device, or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards, which apply. Whenever tests or certificates of any material or fabricated assembly are required by Chapter IX of the LAMC, such tests or certification shall be made by a testing agency approved by the Superintendent of Building to conduct such tests or provide such certifications. The testing agency shall publish the scope and limitation(s) of the listed material or fabricated assembly.<sup>13</sup> The Superintendent of Building roster of approved testing agencies is provided by the Los Angeles Department of Building and Safety (LADBS). The Center for Building Innovation (CBI) Certificate of Approval License is TA24945. Tests and certifications found in a CBI Listings are LAMC approved. In addition, the Superintendent of Building shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the California Building Code (CBC) Section 1707.1.<sup>14</sup>

<sup>10</sup> <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>

<sup>11</sup> IBC 2021, Section 1706.1 Conformance to Standards

<sup>12</sup> See section 8.3 for the distilled building code definition of Approved.

<sup>13</sup> Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

<sup>14</sup> <https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1>

- 1.4 **Approved by Chicago:** The Municipal Code of Chicago (MCC) states in pertinent part that an Approved Agency is a Nationally Recognized Testing Laboratory (NRTL) acting within its recognized scope and/or a certification body accredited by the American National Standards Institute (ANSI) acting within its accredited scope. Construction materials and test procedures shall conform to the applicable standards listed in the MCC. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material, service, design, assembly and/or method of construction not specifically provided for in the MCC. This technical data shall consist of research reports from approved sources (i.e., MCC defined Approved Agencies).
- 1.5 **Approved by New York City:** The NYC Building Code 2022 (NYCBC) states in pertinent part that an approved agency shall be deemed<sup>15</sup> an approved testing agency via ISO/IEC 17025 accreditation, an approved inspection agency via ISO/IEC 17020 accreditation, and an approved product evaluation agency via ISO/IEC 17065 accreditation. Accrediting agencies, other than federal agencies, must be members of an internationally recognized cooperation of laboratory and inspection accreditation bodies subject to a mutual recognition agreement<sup>16</sup> (i.e., ANAB, International Accreditation Forum (IAF), etc.).
- 1.6 **Approved by Florida:** Statewide approval of products, methods, or systems of construction shall be approved, without further evaluation, by 1) A certification mark or listing of an approved certification agency, 2) A test report from an approved testing laboratory, 3) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity; 4) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a professional engineer or architect, licensed in Florida. For local product approval, products or systems of construction shall demonstrate compliance with the structural wind load requirements of the Florida Building Code (FBC) through one of the following methods; 1) A certification mark, listing, or label from a commission-approved certification agency indicating that the product complies with the code; 2) A test report from a commission-approved testing laboratory indicating that the product tested complies with the code; 3) A product-evaluation report based upon testing, comparative or rational analysis, or a combination thereof, from a commission-approved product evaluation entity which indicates that the product evaluated complies with the code; 4) A product-evaluation report or certification based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a Florida professional engineer or Florida registered architect, which indicates that the product complies with the code; 5) A statewide product approval issued by the Florida Building Commission. The Florida Department of Business and Professional Regulation (DBPR) website provides a listing of companies certified as a Product Evaluation Agency (i.e., EVLMiami 13692), a Product Certification Agency (i.e., CER10642), and as a Florida Registered Engineer (i.e., ANE13741).
- 1.7 **Approved by Miami-Dade County (i.e., Notice of Acceptance [NOA]):** A Florida statewide approval is an NOA. An NOA is a Florida local product approval. By Florida law, Miami-Dade County shall accept the statewide and local Florida Product Approval as provided for in Florida legislation 553.842 and 553.8425.

<sup>15</sup> New York City, The Rules of the City of New York, § 101-07 Approved Agencies

<sup>16</sup> New York City, The Rules of the City of New York, § 101-07 Approved Agencies

- 1.8 **Approved by New Jersey:** Pursuant to Building Code 2018 of New Jersey in [IBC Section 1707.1 General](#),<sup>17</sup> it states: “In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports from [approved agencies](#) in respect to the quality and manner of use of new materials or assemblies as provided for in the administrative provisions of the [Uniform Construction Code \(N.J.A.C. 5:23\)](#)”<sup>18</sup>. Furthermore N.J.A.C 5:23-3.7 states: Municipal approvals of alternative materials, equipment, or methods of construction. **(a) Approvals:** Alternative materials, equipment, or methods of construction shall be approved by the appropriate subcode official provided the proposed design is satisfactory and that the materials, equipment, or methods of construction are suitable for the intended use and are at least the equivalent in quality, strength, effectiveness, fire resistance, durability and safety of those conforming with the requirements of the regulations.
1. A field evaluation label and report or letter issued by a nationally recognized testing laboratory verifying that the specific material, equipment, or method of construction meets the identified standards or has been tested and found to be suitable for the intended use, shall be accepted by the appropriate subcode official as meeting the requirements of (a) above.
  2. Reports of engineering findings issued by nationally recognized evaluation service programs, such as, but not limited to, the Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), the Southern Building Code Congress International (SBCCI), the International Code Council (ICC), and the National Evaluation Service, Inc., shall be accepted by the appropriate subcode official as meeting the requirements of (a) above. The [New Jersey Department of Community Affairs](#) has confirmed that technical evaluation reports, from any accredited entity listed by [ANAB](#), meets the requirements of item 2 given that the listed entities are no longer in existence and/or do not provide “reports of engineering findings”.
- 1.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards:** Pursuant to Title 24, Subtitle B, Chapter XX, [Part 3282.14](#)<sup>19</sup> and [Part 3280](#),<sup>20</sup> the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform with the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow: 1) “All construction methods shall be in conformance with accepted engineering practices”; 2) “The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.”; and 3) “The design stresses of all materials shall conform to accepted engineering practice.”
- 1.10 **Approved by US, Local, and State Jurisdictions in General:** In all other local and state jurisdictions, the regulations require approval per Sections 8.3, 8.4, and 8.5 above.
- 1.11 **Approved by International Jurisdictions:** The [USMCA](#) and [GATT](#) agreements provide for approval of innovative materials, products, designs, services, assemblies and/or methods of construction through the [Technical Barriers to Trade](#) agreements and the [International Accreditation Forum \(IAF\) Multilateral Recognition Arrangement \(MLA\)](#), where these agreements:
- 1.11.1 Permit participation of [conformity assessment bodies](#) located in the territories of other Members (defined as GATT Countries) under conditions no less favourable than those accorded to bodies located within their territory or the territory of any other country,
  - 1.11.2 State that [conformity assessment procedures](#) (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.

<sup>17</sup> [https://up.codes/viewer/new\\_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1](https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1)

<sup>18</sup> <https://www.nj.gov/dca/divisions/codes/codereg/ucc.html>

<sup>19</sup> <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>

<sup>20</sup> <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>

- 1.11.3 State that conformity assessment procedures are not prepared, adopted, or applied with a view to or with the effect of creating unnecessary obstacles to international trade. This means that conformity assessment procedures shall not be more strict or be applied more strictly than is necessary to give the importing Member adequate confidence that products conform to the applicable technical regulations or standards.
- 1.11.4 **Approved:** The purpose of the IAF MLA is to ensure mutual recognition of accredited certification and validation/verification statements between signatories to the MLA, and subsequently acceptance of accredited certification and validation/verification statements in many markets based on one accreditation for the timely approval of innovative materials, products, designs, services, assemblies and/or methods of construction. Accreditations granted by IAF MLA signatories are recognised worldwide based on their equivalent accreditation programs, therefore reducing costs and adding value to businesses and consumers.