SECTION 23 NON-FIBROUS, CLOSED CELL, EXTERIOR DUCT®

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Basis of Design: **Thermaduct®, LLC**

   Contact: (855) 809-6903 | www.thermaduct.com

2. Product included in this guide specification:

   1. Thermaduct®
   2. Thermaround®
   3. Thermaduct® Architectural
   4. Thermaround® Architectural

3. Factory prefabricated and pre-insulated rectangular or round outdoor duct systems, incorporating closed-cell Thermatuff® rigid phenolic foam insulation panel of either vinyl cladded (Thermaduct® or Thermaround®) or sheet metal duct with Thermatuff's closed cell phenolic foam liner (Thermaduct® or Thermaround® Architectural) .
4. Thermaduct's Airtruss® structural framework and/or mechanically retained Thermatuff® phenolic panel system for lined sheet metal systems to address dynamic and static load conditions experienced in exterior applications.

## 1.2 SUBMITTALS

A. Product Data: Manufacturer's technical literature, insulation performance data, and code compliance documentation.

B. Shop drawings: Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work including:

1. Duct layout indicating sizes and pressure classes.
2. CAD drawings in plan and iso view
3. Dimensions of main duct runs from building grid lines.
4. Fittings.
5. Penetrations through fire-rated and other partitions.

C. Coordination Drawings: Plans, drawn to scale, showing coordination general construction, building components, and other building services.

## 1.3 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installation must be performed by competent HVAC Contractors that have also completed Thermaduct's certification course at the following link: training.thermaduct.com.
2. Installation must adhere to SMACNA Duct Construction Standards and the Thermaduct® Contractor Installation Manual. Latest manual is available at www.thermaduct.com/literature

## 1.4 SPECIFICATION COMPLIANCE

A. SMACNA leakage, Class 3 or less

B. ASTM E 84 / UL 723 Tunnel Test, Does not exceed 25 flame spread, 50 smoke developed

C. NRTL product approval

D. ASTM C 423 noise reduction

E. ASTM C 1071 for erosion

F. ASTM C 518: 2004, Standard Test Method for Steady–State Thermal

G. Transmission Properties by Means of the Heat Flow Meter Apparatus

H. NFPA Compliance:

1. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."

2. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

3. NFPA 255, “Standard Method of Test of Surface Burning Characteristics of Building Materials

## 1.5 PRODUCT DELIVERY AND STORAGE

A. Protect ductwork from moisture, UV exposure, and physical damage during storage and transport.

B. Prevent objectionable aesthetic damage to the outer surface of duct segments during transport and storage.

C. Store in covered, dry environments until installation is complete.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: **Thermaduct®, LLC**

Contact: (855) 809-6903 | www.thermaduct.com

2.2 PHENOLIC-PREFABRACATED CLADDED AND LINED METAL DUCT SYSTEMS

A. Pre-fabricated Phenolic Duct Products:

1. Thermaduct®
2. Thermaround®
3. Thermaduct® Architectural
4. Thermaround® Architectural

B. Description: Pre-fabricated rectangular and round duct systems utilizing closed-cell Thermatuff® phenolic insulation, glueless and mechanically retained utilizing Thermaduct's Airtruss® reinforcement or Tuff-lock® retention clips and factory fabricated and assembled using Thermaduct® approved sealing and closure methods.

C. Duct Types: Round and Rectangular

D. Thermatuff's Insulation Characteristics

1. Closed-cell phenolic insulation
2. Aluminum facings of 80 micron on both inner and outer surfaces
3. No perforations in facings on either side

4. R-values: R-6, R-8, R-12, (R16, R20, R-24 with stacked panel construction)

6. Max Operating Temperature Range: -15 to +185 °F (continuous)

7. Max Velocity: 6000 FPM

8. Max Pressure: Maximum operating pressure shall be based on duct geometry, reinforcement method, and Thermaduct® fabrication standards. Reinforced assemblies may be designed up to +10" w.g. / -8" w.g. where applicable.

## 2.3 MATERIALS

A. Exterior Duct Materials Utilized:

1. Thermaduct® - Vinyl clad laminated directly onto the Thermatuff® panel.

2. Thermaduct® Architectural Kynar 500 Finish – Regal White Standard Color

Available in multiple colors (Refer to Thermaduct® Architectural color chart)

3. Optional Phenolic Lined Duct Construction: Aluminized Steel, G90 Galvanized Steel, Paint-Grip Galvanized Steel, Aluminum, or Stainless Steel

B. Interior Insulation:

1. Factory-applied, non-fibrous, aluminum faced Thermatuff® phenolic insulation

2. Connection ends are sealed with UL 181 A-P tape and silicone-free sealants approved for use with Thermatuff® systems.

C. Closure Materials

1. UL 181A-P listed aluminum foil tape with required markings (min. width: 2-7/8”)

2. Sealants: Silicone Free UL Compliant Sealant

3. Thermatuff® Phenolic Retention – Rectangular Ductwork

a. Tuff-lock® Mechanical Liner Retention Clips - Free of any glue or adhesives

b. Thermaduct Airtruss® System (required for high static or large duct sizes) – Free of any glue or adhesives

4. Thermatuff® Phenolic Retention – Round Ductwork

a. Compression Secure – Free of any glue or adhesives

b. Thermaduct Airtruss® System (required for high static or large duct sizes) – Free of any glue or adhesives

D. Marking and Identification:

1. Duct components shall be identified with applicable insulation values, material type, and approved closure system markings where required.

## PART 3 – EXECUTION

### 3.1 SHOP FABRICATION

A. Thermaduct® Architectural Kynar 500 Finish Ductwork shall be fabricated to Thermaduct® standards with lining and retention clips installed.

B. Thermaduct, Thermaround and Thermaround Architectural shall be fabricated in accordance with the latest SMACNA Duct Construction Standards and incorporate Thermaduct® Fabrication Guidelines.

C. Joints and flanges shall be gasketed and mechanically fastened (TDF, TDC, Spiral Flange, or Coupled) per Thermaduct® Contractor Installation Manual.

D. Apply sealant continuously at all Thermatuff® phenolic insulation seams.

E. Thermatuff® Phenolic panels shall be secured using either Airtruss™ reinforcement or Tuff-lock® retention clips depending on duct span and pressure.

F. Elbows and transitions to be fabricated with turning vane and reinforcement as specified.

G. Straight duct standard length- Rectangular: 44” and 47.25". For additional materials; shorter cut-joint lengths allowed where needed.

H. Straight duct standard length – Round: 47.25". Shorter cut-joint lengths allowed where needed.

### 3.2 INSTALLATION

A. Ductwork shall be installed in accordance with contract drawings by the latest SMACNA Duct Construction Standards and Thermaduct® Contractor Installation

Manual. Installers shall be familiar with Thermaduct® published installation procedures and available training resources.

B. Maintain duct cleanliness and protect interior from contamination during installation.

C. Support all changes in direction, branch connections, and accessories independently.

D. Ensure that supports neutralize any imposed loads from connected equipment or devices.

E. Install ducts and fittings to comply with SMACNA Duct Construction Standards and Thermaduct® Contractor Installation Manual as follows:

1. Install ducts with fewest possible joints.

2. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

3. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

4. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct with required rated passage.

5. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Division 23 Section "Air Duct Accessories" for fire and smoke dampers.

6. Protect duct interiors from the moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

7. Support ductwork per Thermaduct® contractor installation manual.

## 3.3 FIELD QUALITY CONTROL

A. Verify installation integrity, duct sealing and support spacing complies with SMACNA Duct Construction Standards and Thermaduct Contractor Installation Manual.

B. Installer shall submit warranty paperwork and application photographs to warranty@thermaduct.com

C. Correct any installation deficiencies at installing contractor’s expense.

D. Provide owner with warranty registration certificate upon completion.