Stucco Information by and for Stucco Applicators
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Safe Attachment Tables For Metal Lath to Plywood, OSB and other Structural Panels for Code Compliance

Revised 01/09/2020

Florida Building Codes 6th Edition

ASTM C926-16 and C1063-16 Provisions

Referenced Tabulated Fastening Tables

Testing Data Included

For Designers, Contractors, Inspectors, Plans Examiners and Plastering Professionals

INTRODUCTION:

The fastening of metal lath seems like a simple enough task; the ICC and Florida Building and Residential codes state that the installation of metal lath conform to the requirements of **ASTM C-1063-16 "Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster"**

Section 7.10.2.1 of that standard states:

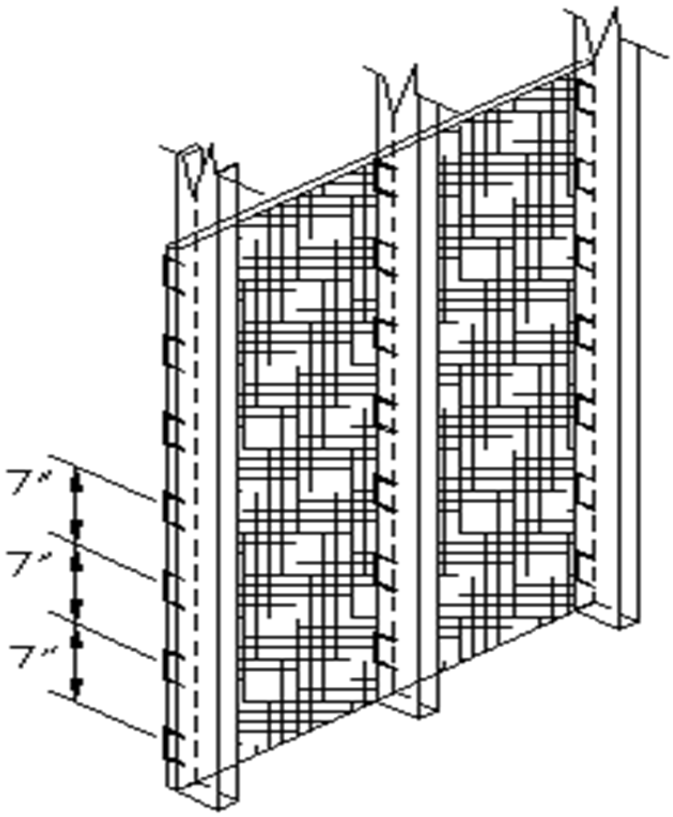

Figure 1 - ASTM C 1063-16; 7.10.2.1

"…. Metal plaster bases shall be attached to framing members at not more than 7 in. (178 mm) on center, along framing members …." See Figure 1 below.

ASTM C-1063 is simply requiring that the metal lath be attached to the studs (assumed horizontally spaced 16" on center) at intervals of 7 inches vertically.

Seems simple enough, but we will soon learn otherwise. First is the failure to understand that the ASTM C-1063 standard was (and is) written for installations without a substrate covering (open framing) or where the studs are covered with non-structural sheathing such as Styrofoam boards, Asphalt Impregnated sheathing, Thermo-ply sheathing, etc… So where else would the nails be placed? Into air between the studs? or into the non structural sheathing? The provision makes sense now, doesn't it.

These substrates are generally not acceptable for design in areas of high humidity or high-wind regions which require the appropriate wind loading requirements be determined and the attachment be specific for the applied loads. The standard does not factor placement over "Structural Rated Panels" (OSB or Plywood, etc...). The

standard's attachment provision was neither developed for use in high wind areas nor by approved testing or engineering data. The 7" on center requirement evolved from field applied line wire spacing (single metal wires were pulled taught for support and attachment - See Figure 1A). This application method was common in mid-western regions with a lower windspeed and humidity level than the climatic conditions such as those found in the southeast United States. These ASTM standards (C926 Cement Plaster and C1063 Installation of Metal Lath) were developed for plastering contractors to be used by those plastering contractors in "real application time". They were (and are) application standards - not design standards.

Accordingly, specific provisions were placed within these standards to permit

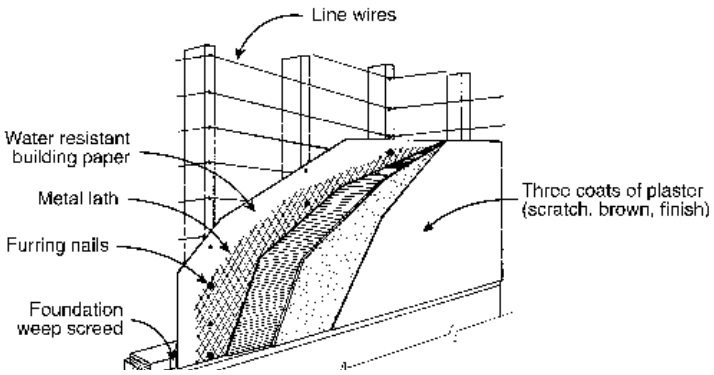

Figure 1A - Wire Line Application

the plastering specifier (design professional, plasterer or contractor) the ability to modify those provisions to accommodate proper application within differing regions.

Other specific adopted code provisions and requirements must always be evaluated for compliance in other regions. And, as we all know, when faced with conflicting provisions; the most restrictive provision applies.

It is herein that we will discover a major discrepancy that was always known to "old plasterers" and seasoned professionals - but relatively unknown to a new generation of design professionals, inspectors and contractors.

CODE PROVISIONS:

Provisions codified within the Codes and Standards are either written on a "prescriptive" basis or on a "performance" basis. The 7" fastener spacing provision (as previously stated) is an example of a simple "prescriptive" requirement.

A "performance" basis would state the requirement more simply such as; "Comply with Chapter 16, Structural" or "Design to limit the wall deflection to L/360 according to the wind provisions of ASCE 7" or similar language....

When stated as such, calculations would need to be performed to quantify the number of attachments necessary to ensure sufficient resistance for fastener withdrawal or cladding failure when the building is exposed to aerodynamic forces according to the wind loading provisions of Chapter 3 (residential code) or Chapter 16 (building code) and/or the referenced ASCE-7 standard used to determine such forces based upon the building's exposure category, location topography, risk category, height, etc.… all used to obtain the maximum positive and negative forces imposed upon various zones (areas) of the building or structure.

Application of prescriptive provisions can be applied only in areas that do not exceed their stated design pressure maximums. If the wind load is higher than the prescriptive design or allowable code provision, the attachment of the wall covering must be determined using the above references.

(Authors note; the Residential Code publishes these pressures in a Table with adjusting factors in Chapter 3. The Building code requires computation based upon varying spatial configurations)

To assure this is attachment is achieved (and verified for compliance), the code contains a separate performance compliance provision which overrides compliance with the prescriptive provision found in ASTM 1063 at Section 7.10.2.1. Refer to Florida Building Code, Residential:

(Authors note; The provisions of the Residential code are being cited for brevity. The Building Code contains similar provisions)

R301.2.1 Wind design criteria.
Buildings and portions thereof shall be constructed in accordance with the wind provisions of this code using the ultimate design wind speed in Table R301.2(1) as determined from Figure R301.2(4). Where different construction methods and structural materials are used for various portions of a building, the applicable requirements of this section for each portion shall apply. Where not otherwise specified, the wind loads listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) **shall be used to determine design load performance requirements for wall coverings,** curtain walls, roof coverings, exterior windows, skylights, and exterior doors (other than garage doors)…..

R301.2.1.1 Wind limitations and wind design required.
The prescriptive provisions of this code for wood construction, cold-formed steel light-frame construction, and masonry con-

struction **shall not apply** to the design of buildings where the ultimate design wind speed, V_{ult}, from Figure R301.2(4) equals or exceeds 115 miles per hour (51 m/s) ….

R601.2 Requirements.
Wall construction shall be capable of accommodating all loads imposed in accordance with Section R301 and of transmitting the resulting loads to the supporting structural elements.

R703.1.2 Wind resistance.
Wall coverings, backing materials and their attachments shall be capable of resisting wind loads in accordance with Tables R301.2(2) and R301.2(3) for walls using an effective wind area of 10 square feet. Wind-pressure resistance of the siding and backing materials shall be determined by **ASTM E330** or other applicable standard test methods where wind-pressure resistance is determined by design analysis,….. *(remaining text eliminated for brevity)*

R703.3.1 Wind limitations.
Where the design wind pressure exceeds **30 psf** or where the limits of Table R703.3.1 are exceeded, the attachment of wall coverings shall be designed to resist the component and cladding loads specified in Table R301.2(2), adjusted for height and exposure in accordance with Table R301.2(3). For the determination of wall covering attachment, component and cladding loads shall be determined using an effective wind area of 10 square feet (0.93 m2).

R703.7 Exterior plaster.
Installation of these materials shall be in compliance with ASTM C926, ASTM C1063 and the provisions of this code.

R703.7.1 Lath.
Lath and lath attachments shall be of corrosion-resistant materials. Expanded metal or woven wire lath shall be attached with 1-1/2-inch-long (38 mm), 11 gage nails having a 7/16-inch (11.1 mm) head, or 7/8-inch long (22.2 mm), 16 gage staples, spaced not more than 6 inches (152 mm), **or as otherwise approved**.

(Authors note: the standard does not say 6 inches on center vertically at each stud or 6 inches on-center each way)

Now, the questions at hand are; Will the prescriptive fastening requirements of the ASTM standard comply with the wind design performance criteria of the code? And, if they conflict, which provision prevails?

The latter question can be answered by referencing the following two code provisions:

102.4.1 Conflicts.
Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

102.4.2 Provisions in referenced codes and standards.
Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code or the Florida Codes listed in Section 101.4, the provisions of this code or the Florida Codes listed in Section 101.4, as applicable, shall take precedence over the provisions in the referenced code or standard.

So, we have learned that the code provisions apply over the standards for both content and conflict.

Since the current code does not provide a prescriptive fastener spacing requirement for metal lath for wind regions in excess of 115 mph V_{ult}, the performance requirement of the code defers determination of the fastener spacing, type and penetration points to the designer or specifier.

How did we comply in the past? Former codes contained a high wind attachment provision in the HVHZ section. Although restricted to the mandatory application area of Miami -Dade and Broward, any locale in Florida could electively use these provisions as well as product approvals.

This provision came from the South Florida Building Code and remained in the Florida Building Codes through the 2010 edition. Advocated by persons ignorant of its application necessity, it was deleted from the 5th edition for the sake of provision "unification". The provisions arguably can still be applied today since they were based off a higher wind speed than the remainder of the peninsula. I have included the fastening provision for your perusal.

HVHZ Section 4411.3 (residential code with a mirror provision in the building code):
"Fastenings into wood sheathing or wood framing shall be by galvanized nails, with heads not less than 3/8 inch (9.5 mm) in diameter, driven to full penetration. using a minimum of two nails per square foot (0.093 m2), or by approved staples having equal resistance to withdrawal."

These modified high wind attachment provisions (along with the prescriptive stucco application provisions) served south Florida for decades. Knowledgeable stucco designers and installers simply applied them as a minimum provision - regardless of where the building was sited within Florida.

Whether in the code today or not, they are still being used since the code requires compliance with high wind provisions and the ASTM documents contain "an otherwise specified" provision for necessary regional modifications such as these.

So, back to the Florida Building Codes, 6th. Edition. If your home is located in a region with wind speeds in excess of 115 mph V_{ult}, (most all of Florida) then you must verify the fastener resistance for its design pressures (negative and positive). Fastener spacing and length **must** be determined.

We will see that this is where "the devil truly is in the details". Except for a few rare instances, most all other products have their design pressure rating published or known—stucco lath attachment is one of these rare exceptions. Accordingly, the Attachment Tables published herein were developed by code approved testing methodology in order to answer the question of fastener requirements.

To understand why this and other (stucco and lath) related issues in the standards seem simple but in fact are complicated, one needs to remember that the ASTM C-926 (stucco) and C-1063 (metal lath) standards were never developed as a design code document, but rather as a plaster's installation standard based upon a specific installation criteria and method. Later on, they were referenced into the code, but were not modified for regional or other design code application—that would make the standard way too voluminous - they simply included the "unless other specified" or similar language to accommodate regional or needed modifications.

Simply put, they were developed (and internationally still are used today) as an installation standard for plasterers for application over open framing or non-structural sheathing using a 3 coat cement plaster application when installed over a metal lath or wire and 2 coat when installed over block or similar substrate.

In both cases the final coat is an 1/8" "colored" coat of cement - painting the surface is **not** contemplated whatsoever.

Painting the system when installed over wood framing changes the dynamics, accessories, detailing and curing properties of the system requiring major application adjustments by way of the "unless otherwise specified" provisions of the standards. Refer to other Stucco Institute newsletters for expanded discussions on other aspects of design and installation of stucco systems.

Summary

As developed and written for frame construction, the standard's application methodology was for developed for application over "open" stud framing (no exterior wall sheathing at all) or over non-structural sheathing such as foam boards, thermoply, asphalt impregnated sheathing, or other non-structural sheathing panels or heavy ply felts.

Originally, horizontal rows of wires were pulled taut and the wire lath was tied to them. With the development of more rigid laths that would span between studs, wire rows were eliminated. Since the wires had been commonly spaced 7" on center, the nailing spacing was continued.

Regardless of the origin - no testing, evaluation, or other factual basis for the fastening pattern in these ASTM documents has been codified. Until Now - See Attachment Tables contained herein.

Understanding that the standard contemplates "open framing" or "non-structural" sheathing, the ASTM provision requiring the metal lath fasteners be embedded 3/4 inch (standard minimum withdrawal depth) into "the vertical framing members" becomes self-evident.

And the requirement that the sheathing thickness be added to the fastener length? If the foam board sheathing was 3/4" thick, and the fasteners were 3/4" long, there would be no structural attachment whatsoever. So these provisions become self explanatory when you understand the basis, concept and application of the ASTM standards.

As of 2020, the ASTM documents do not address structural panels or their applications. That is up to the designer or specifier. The ASTM provisions assumes open framing or non-structural sheathing in regions where the wind speed is less than115 mph V_{ult} or where aerodynamically applied wall pressures are ≤ 30 psf.

So why doesn't the standard provide for a higher wind speed installation method? First of all, the use of full structural sheathed walls is only applicable in a miniscule area of the globe—we just happen to live in this tiny slice. So, although of great importance to us, it is of little importance to the international arena.

Secondly, it does address it indirectly. The standard has always contained a statement to follow its provisions "Unless Otherwise Specified". The standard, since its inception, knew its few pages of text could not possibly cover every application, on every building, in every climatic region, in every windspeed, in every seis-

mic zone on planet earth— remember it is an International standard.

So the “except as otherwise specified” provisions are used to allow the necessary regional modifications for successful installation of stucco assemblies and applications globally.

ASTM C1063 WITHDRAWAL TESTS:

So, back to the ASTM prescribed fasteners installed 3/4” into the vertical framing members spaced 7 inches on-center. Exactly what withdrawal value can be used when lath is installed as prescribed?

Two identical full size (4’ x 8’ each) wall specimens were prepared (one with a control joint and one without). 2.5 expanded metal lath sheets were attached per the ASTM C-926 and ASTM C-1063 requirements; fasteners penetrating 3/4 inch into studs at 7 inch on-center vertically. Studs spaced 16 inch horizontally. The specimens were properly plastered, (2 - 3/8” coats with a finish coat) cured (21 days) and tested in an accredited laboratory for static and cyclic loading. Testing was performed on 10/16/2016.

The test protocol was performed according to the code requirement of **ASTM E330.** (attached) The report was titled:

WIND RESISTANCE EVALUATION OF STUCCO FINISH APPLIED TO PAPER-BACKED STUCCO LATH ON A WOOD FRAMED WALL

Once cured, the specimens were attached to a wall that applies static pressure in both positive and negative modes with recovery times between each repetitive increased pressure cycle. The specimen is cycled through these pulses until failure.

The ASTM 330 states that all loads must be proofed to 1-1/2 times the published rating. This factor takes into account the variables of ideal assemblage in a controlled testing environment that rarely happens in real world installations (Refer to Fastening Tables for application of safety factors (FoS).

Testing was taken to failure on both specimens. Both held for a 50 psf rating (proofed at 75 psf but the 75 psf failed to proof at the next increment. This leaves the available rating at 50 psf using the test factor of 1.5.

See Stucco Institute **Figures 2, 3, 4 and 5.** Does the crack pattern in 4 and 5 look familiar? Have you seen these failures?

Note that failure of both specimens was from negative pressure between the

studs. In other words, the 7 inch on center fasteners held, but the horizontal interval of 16 inches was too great a span to keep the system from failing - it simply “cupped” and fractured.

Authors Note; There was some discussion if mass rupturing represented an absolute failure of the system since it did not detach from the wall altogether and might be subject to repair. Besides the testing classification of a failure - failure is certain for the following other reasons; (1) If applied over open framing or non-structural sheathing, repair would be impossible - if over structural panels, random screws might be installed at 6 inches on-center each way securing the ruptured system to its substrate. However if the wall has been painted, the application of new coat of stucco using a bonding agent over the repair would be problematic and attaching new metal lath at that point would represent more effort than removal and replacement. (2) the test was stopped at rupture - in a high wind event, the continued cycling would inevitably lead to detachment of cladding sections.

So to properly attach the lath there would need to be an intermediate vertical column of fasteners in between the stud spacing fastened into a structural panel (or a random pattern of placed fasteners) in order to resist higher withdrawal values. See Stucco Institute **Figures 6 and 7.**

You might say, “Well wouldn’t the 50 psf be ample since most wind loads are 30 - 50 psf?”

No. The answer lies in the fact that this is testing to failure data. We need appropriate safety factors. We look to the code for the appropriate factor. Although many designers use a factor of 3 for cladding attachment. However the code states at:

1709.3.1 Test procedure.
….. the test specimen shall be subjected to an increasing superimposed load until structural failure occurs or the load is equal to **two and one-half times** the desired superimposed design load. The allowable superimposed design load shall be taken as the lesser of:

1. The load at the deflection limitation given in Section 1709.3.2.

2. The failure load divided by 2.5.

3. The maximum load applied divided by 2.5.

So, adjusting for failure; 50 psf x 1.5 / 2.5 equals **30 psf** allowable load using the code prescribed safety factor.

Figure 2

Figure 3

Figure 4

Figure 5

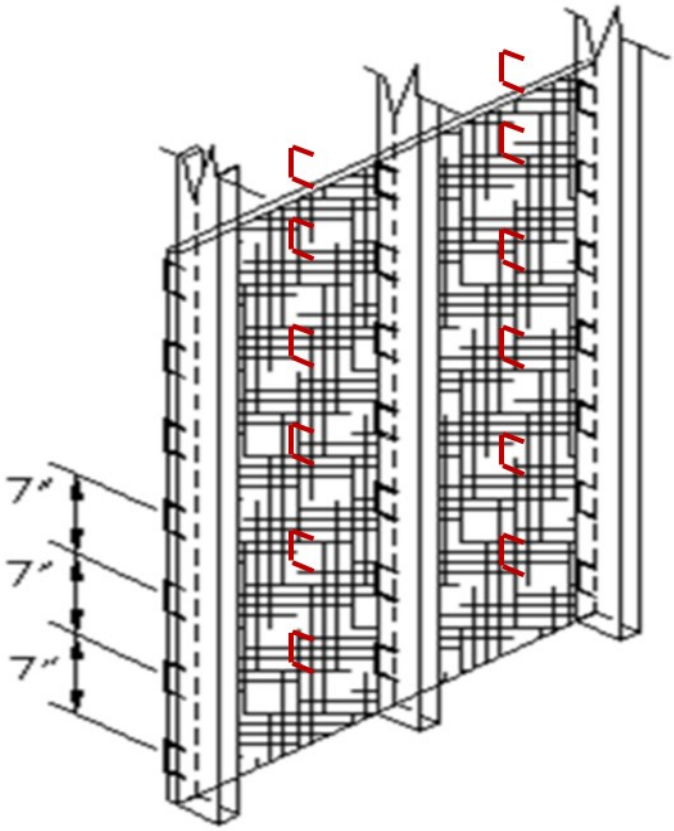

Figure 6

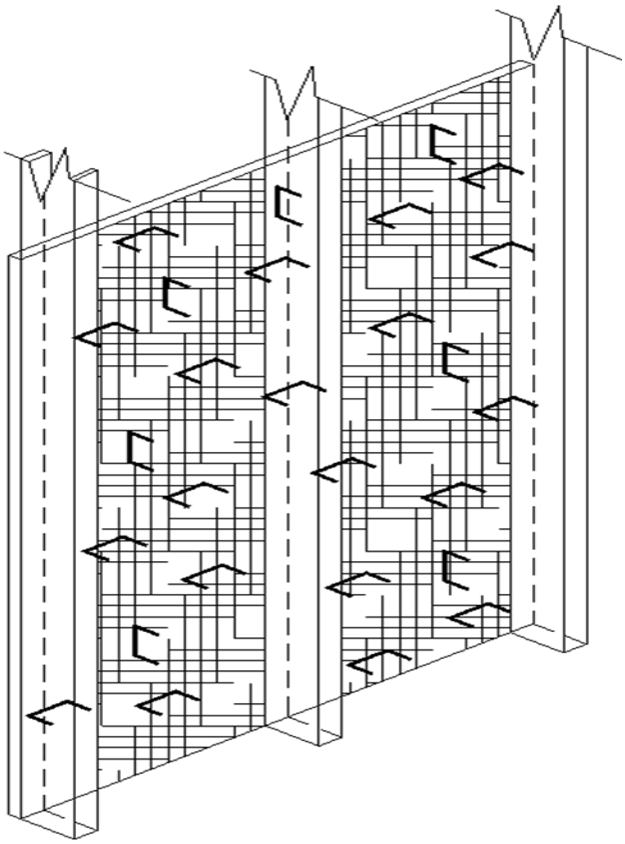

Figure 7

Hey! Wait! isn't that same maximum psf found in the code at **R703.3.1 Wind limitations?** Yes.

For a design pressure over 30 psf, prescriptive provisions of the standard are negated (unless prescriptively tested and approved for higher pressures) the designer is required to determine and design according to the applicable wind forces. Yep, now you're getting it.

In most national regions the 30 psf value is sufficient and prescriptive methods can be used since the windspeed is lower than high wind regions such as Florida.

Although structural components oftentimes have safety factors of 2 or in some cases 1.5, these items are interconnected in the Main Wind Force Resisting System (MWFRS) or are assembled in repetitive use combinations. Components and claddings are "stand alone" items and do not have interconnective or repetitive advantages and therefore are not subject to these more lenient factors.

So where does this knowledge leave us? How do we comply? The answer in the past was simple: If any portion of your wall area is subject to design pressures in excess of 30 psf, then you needed to add a row of intermediate fasteners in between the stud spacing to resist the cupping factor (See Figure 6) or do as we were taught 40 years ago by those "old trained" professionals and scatter your fasteners across the panel (≈ 6" o.c. each way) to ensure anchorage and to create a system wide monolithic force distribution panel (See Figure 7).

Although some "new" consultants say the "old-timers" were incorrect, the old method of attachment did not fail. As the old saying goes, "the proof is in the pudding". This pattern is shown in Figure 7.

Although the old method performed, there was still not full scale wall testing data to rely upon - Until Now. The **Safe Attachment Tables** that follow can be used for design data and all tests were performed using the code prescribed ASTM E330 in an accredited facility.

Now, when required spacing requires attachments between the studs, there will be those that say; "the fasteners must only be placed in the studs due to the sealing of the fastener legs into the wood". They contend that this method will keep water that is migrating downward behind the stucco façade (towards the weep screed) from entering the wall cavity during its migration.

First, hogwash. Note the word "weep

screed" as the discharge mechanism and exit point. It is not called a "drain" screed. The water migrating down the wall is miniscule. If you have quantities of water so vast that they are migrating horizontally around fastener legs through the water resistant barrier, then you have a serious bulk water intrusion problem in need of immediate repair.

Second, assuming water was actually draining down the water resistant barrier, in a high wind region, the last place you would want that water absorbing and creating fungal growth would be at the stud line. In our high wind regions, these vertical framing members serve not only to support the gravitational (dead) loads—but also resist and transfer wall shear, uplift and other horizontal (live) loads.

Accordingly these structural panels have an increased nailing pattern with 8d common or other approved nails at the stud line. The last thing we need is an additional line of fasteners driven into these already stressed locations.

Third, the argument fails to adjust for using a paint (coating) in lieu of a colored coat of 1/8" cement plaster. This process creates a face barrier system. Florida has used the face barrier system rather than the drain plane concept since the stuccoing of exteriors began. Notwithstanding the fact that when you paint the surface - you seal the weep screed interface preventing its functionality unless special accessories are employed. (see face barrier vs drain plane at the www.stuccoinstitute.com)

In our Florida region we usually use a face barrier system. Using a drain plane is much more difficult due to the amount of annual rainfall and average relative humidity. Not to mention the salt depositing itself on the wall surface and migrating behind the system.

Accordingly, long ago, our plasterers knew that we needed to seal the face of our stucco systems to prevent water intrusion and seal all penetrations to prevent the accumulation of salt laden vapor behind the stucco cladding. The face barrier system was employed and has successfully performed throughout the years.

The face barrier system depends upon proper details, sealants and proper application (especially regarding coating thickness) in order to perform successfully.

The face barrier system is a recognized ASTM protocol—but it is not mentioned in the ASTM stucco document. Why? Be-

cause the ASTM C-926 was developed for application of colored stucco finish that uses a required drain plane to manage infiltrating moisture. Simple as that.

With a proper face barrier system, the drain plane (underlayment) is necessary to provide protection of the wood during construction and to control initial hydration (curing) of the wet cement.

After that, its function is similar to shingle underlayment - to protect the substrate (structural wood panels) in the event of an emergency situation. If the shingles develop a leak or are partially blown off, the underlayment provides temporary or partial protection until necessary repairs can be made.

Can you install both? Yes, but the weep screed will be covered with the paint (coating) and that will render the drain plane useless unless a two piece flashing is used.

So, we return to the required fastening pattern and the "unless specified otherwise" provisions of the ASTM C-926 and C-1063.

WHO CAN "SPECIFY OTHERWISE?
Who is the intended authority? The architect, the engineer, the contractor, the stucco contractor, or the waterproofing contractor?

The answer is any or all of these professionals. Remember the standards are International standards so the "specifier" is intended to be the professional that was given the authority by the owner or a professional required by local regulations, if applicable.

Therefore the fastening pattern may be specified as prescribed by the code referenced standard, or if in excess of 30 psf, the attachment can be determined by the following **Safe Attachment Tables**.

Does the code require metal lath inspection?

Refer to the Florida Building Code:

110.3.5 - Lath, gypsum board and gypsum panel product inspection.
Lath, gypsum board and gypsum panel product inspections shall be made after lathing, gypsum board and gypsum panel products, interior and exterior, are in place, but before any plastering is applied or gypsum board and gypsum panel product joints and fasteners are taped and finished.

Exception: Gypsum board and gypsum panel products that are <u>not part of a fire-resistance-rated assembly or a shear assembly.</u>

Note; this requirement was always intended to be for rock (gypsum) lath (base for gypsum plaster) and gypsum boards. These are common components for interior fire partitions. The term lath (by uninformed practice) was extended to include "metal lath" which was not the intent of the provision without including the preface of "Metal or Wire".

So regardless of how you interpret the foregoing, the exception is clear. So, is the lath or gypsum part of a fire rated or shear assembly? If yes, then it needs to be inspected to ensure that the fire or shear requirements and components are properly placed and assembled in accordance with the compliance documents. If no, then no inspection is required.

Since local ordinances can amend the inspection list found in Chapter 1 of the Florida Building Code at will, inspection of the metal lath may have been included in the local code officials checklist.

If the fastening pattern is not specified on the approved plans, I would ask the builder to submit a fastening pattern diagram or statement of spacing intervals or simply reference the appropriate **Safe Attachment Table** contained herein.

Conclusion of Explanatory Text:

So, we see that simple attachment of metal lath is not simple at all. The issues are quite complex and interdependent upon other interfaces in order to perform to Florida's high wind regions. Accordingly, most provisions are under the auspices of the contractor of record or the Plastering Contractor - not the building official, unless local amendments require the code official to inspect or monitor for code compliance.

True, Building Officials have governance over the code and plan review, but that does not mean they are responsible for quality control, or responsible to inspect and ensure all the provisions of all codes and standards are met, especially regarding waterproofing of building envelopes. That is the responsibility of the contractor of record. Building Officials are given a prescribed list of components that they are to review for code compliance at time of plan review and a separate list of components they are to inspect - both lists contained in Chapter 1 of the Code (Administration). Therein is drawn the framework of their purview and responsibility.

Imagine if building inspectors were responsible for application of all of the codes, standards, publications and documents of the code, the requirements would fill a room with data. We would need a superhuman knowledgebase and an intimate understanding of thousands of technical documents in order to perform an inspection. Fortunately they have no such mandate.

Other newsletters and articles are posted online at www.stuccoinstitute.com . Additional articles such as “The Truth about Florida Stucco” and “Moisture Effects Behind Florida Stuccoed Walls”, “Drain Plane vs Face Barrier Systems”, “Inspecting Stucco Applications for Code Compliance” along with other articles including full scale testing building modeling, are posted at the same site.

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Safe Attachment Tables:

The following Safe Attachment Tables and their associated Fastening Placement Tables have been prepared according to testing results derived from ASTM 330 testing data as required (and prescribed) by the ICC and Florida Building Codes.

Each Table represents a specifically prepared full wall specimen that was prepared and tested in an accredited testing facility.

The ASTM 330 states that all loads must be proofed to 1-1/2 times the published rating. This factor takes into account the variables of ideal assemblage in a controlled testing environment that rarely happens in real world installations (Refer to Fastening Tables for application of code prescribed safety factors (FoS).

Safe Attachment Table T-1
See Fastener Placement Table F-1

Staple Attachment into 16" o.c. vertical wood framing members at 7" maximum vertical intervals (or steel[1])framing members with screw attachment

ASTM 330 TEST METHODOLOGY RESULTS

2.5 Expanded Metal Lath Installed over Wood Studs Spaced 16" on center. Lath Attached with Staple or Screw[1] Fasteners Vertically Spaced 7" on center

Attachment according to the ASTM C-1063

Attachment Data and Spacing	Listed Load Proofed for FoS of 1.5 per ASTM 330 Test Requirement	Allowable Load in psf Using Code Applied Load FoS of 2.5 per 1709.3	Allowable Load in psf Using Code Applied Load FoS of 3.0 per ASCE 7	Tributary Area in2	Fasteners p/s/f
16 ga.1" crown x 1" leg galvanized staples spaced 7" on center into vertical framing members spaced 16" horizontally on center	50	30	25	112	1.28
		Frequently fails for Higher Wind Areas or where modifiers adjust basic wind speed			

ASTM E 330: *Standard Test Method for Structural Performance of Exterior Windows - FoS = Factor of Safety - Allowable Loads are obtained by multiplying the laboratory published proofed load by 1.5 and dividing by FoS - Designers often require a FoS of 3 for claddings and may be required when designing buildings of higher importance as defined in ASCE 7*

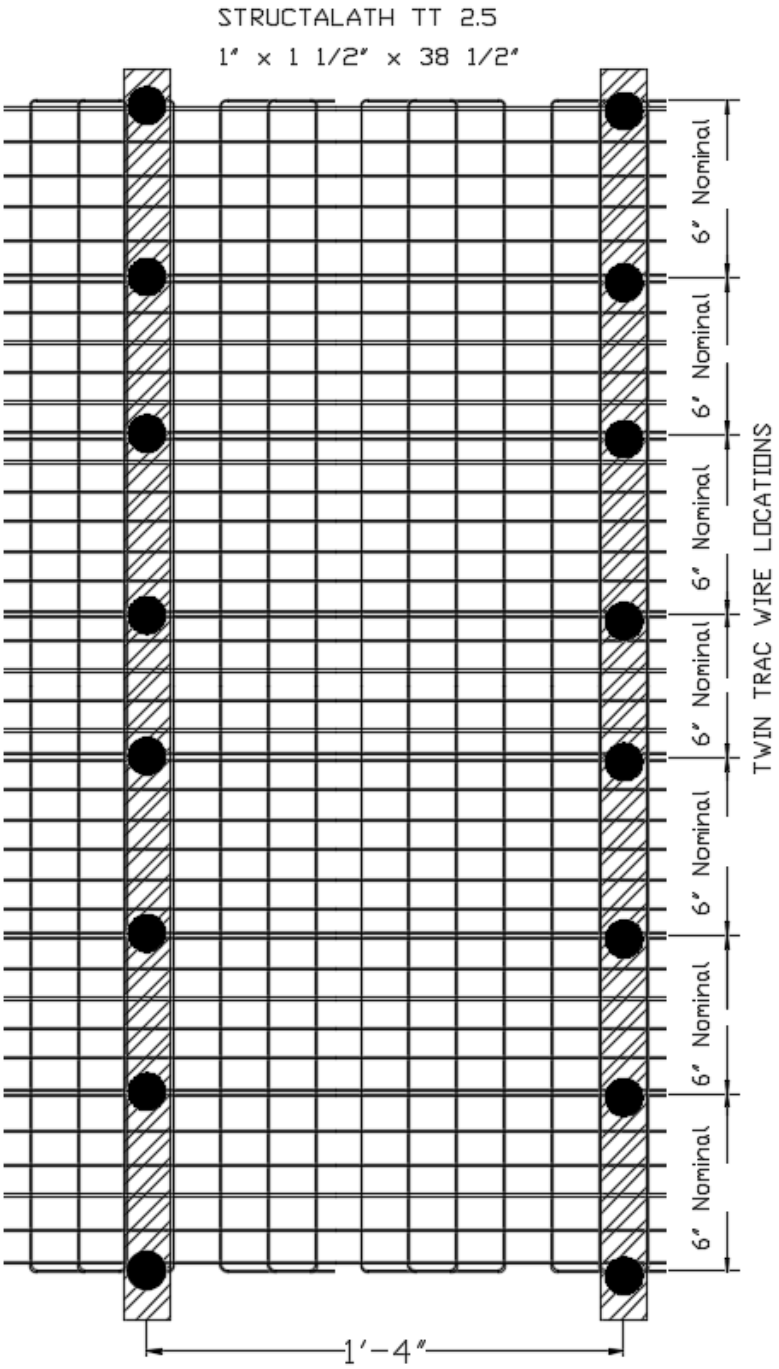
Author Note : Most ASTM installations are installed wholly or partially over open framing as tested in this specimen. Although there was no sheathing installed over the studs the results would have been the same since failure was in the negative direction. In other words , even if sheathing were to have been used, if the nails were placed in the same vertical stud lines, the effects would be the same since failing force was initiated on the negative pressure cycle.

[1] A 16" o.c. steel stud frame assembly was covered with 5/8" DensGlass sheathing. #8 x 1-1/4" Lath screws were used to attach the Metal Lath to the studs 6" o.c. vertically. 1 - "C" track was place horizontally at the 4' (midwall) point with screws attaching the lath to the midwall strap (track) 6" horizontally o.c. The wall failed to proof at a higher value than those listed above. See Table T-5 for Steel Framing configurations requiring higher values.

Fastening Placement Table F-1

See Table T-1 for Fasteners Specifications
Wood Studs with Staple Attachment at Vertical Studline
Steel Studs with Screws Placed in the Vertical Studline
Studs may be Covered with Wood, Gypsum, Foam, Fiberboard or Other Sheathing
If Expanded Metal Lath is Used, Fasteners May be vertically Spaced at 7” o.c.

Drawing NTS - Illustrative only



Safe Attachment Table T-2
Refer to Fastener Placement Table F-2

Staple Attachment to Structural Wood Panels ≈ 6" o.c. each way

ASTM 330 TEST METHODOLOGY RESULTS

StructaLath No. 17 SFRC Twin Trac 2.5 installed over 1/2 nominal (7/16 minimum) structural panel sheathing attached to studs or sub-framing per design using 1" leg x 1" crown, 16ga. galvanized steel staples spaced maximum 6" o.c. along the horizontal dimension on the twin track. The rows were spaced vertically a maximum 6" o.c. and offset 3" o.c. from the preceding row.

Attachment Data and Spacing	Listed Load Proofed for FoS of 1.5 per ASTM 330 Test Requirement	Allowable Load in psf Using Code Applied Load FoS of 2.5 per 1709.3	Allowable Load in psf Using Code Applied Load FoS of 3.0 per ASCE 7	Tributary Area in2	Fasteners p/s/f
16 ga.1" crown x 1" leg galvanized staples spaced 6" vertically into structural wood sheathing panel and fastener pacing of 6" horizontally on center with each row placement offset 3" to achieve a staggered pattern	60	36	30	36	4
		May meet basic load requirement for buildings sited in a "B" exposure classification where modifiers do not raise design pressures			

ASTM E 330: *Standard Test Method for Structural Performance of Exterior Windows - FoS = Factor of Safety - o.c. = on center - Allowable Loads are obtained by multiplying the laboratory published proofed load by 1.5 and dividing by FoS - Designers often require a FoS of 3 for claddings and may be required when designing buildings of higher importance as defined in ASCE 7.*

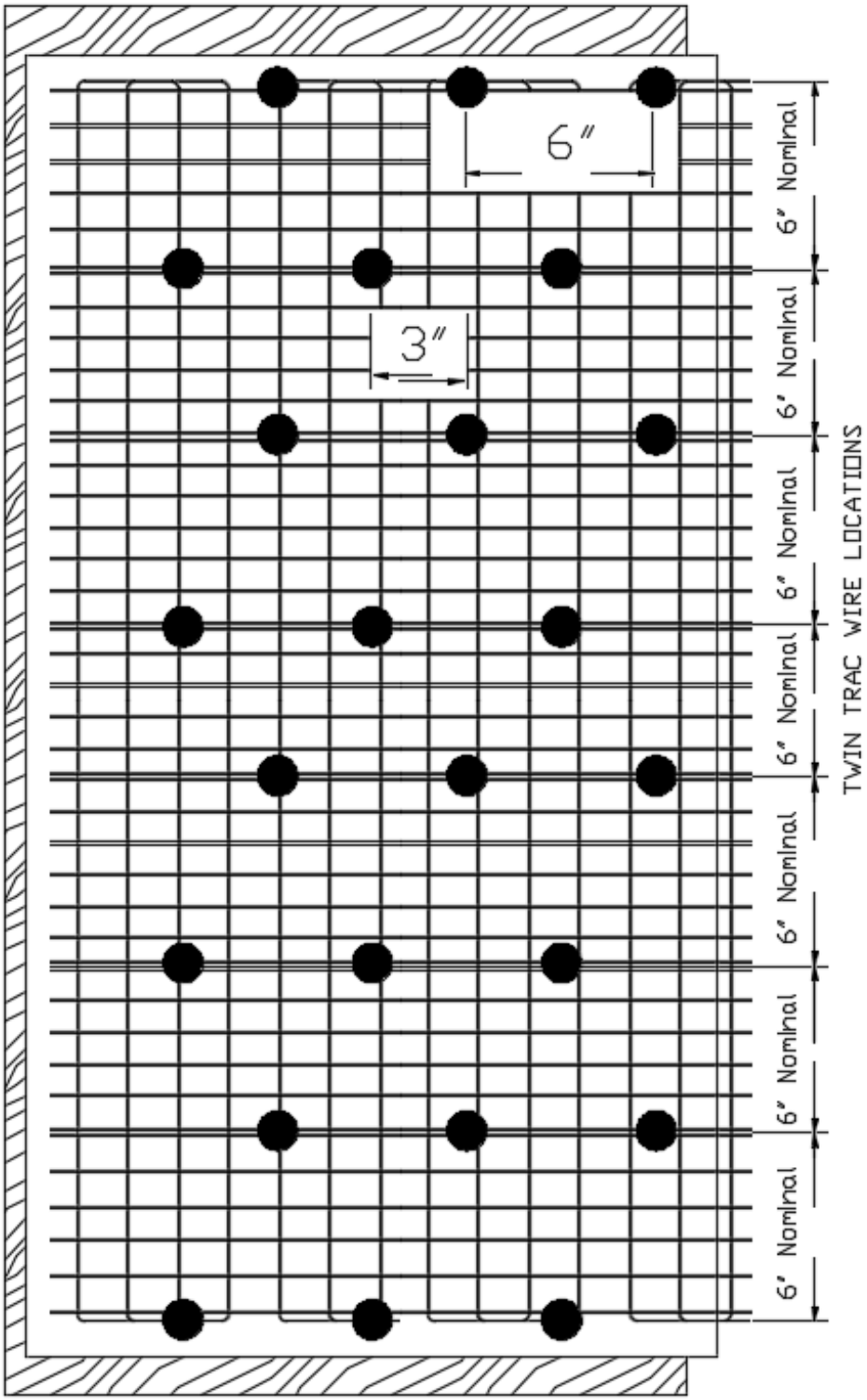
Fastening Placement Table F-2

See Table T-2 for Fasteners Specifications

Studs Covered with Structural Panel Sheathing; 1/2” Nominal Thickness

Staples Placed 6” O.C. Each Way - Fasteners Offset Every Other Row

Drawing NTS - Illustrative only



Safe Attachment Table T-3
Refer to Fastener Placement Table F-3

Screw Attachment to Structural Wood Panels ≈ 6" Vertical and 16" Horizontal

ASTM 330 TEST METHODOLOGY RESULTS

StructaLath No. 17 SFRC Twin Trac installed with screws spaced maximum 16" o.c. along the horizontal dimension. Attachment rows spaced vertically 6" o.c. and offset 8" o.c. from the preceding row.

Attachment Data and Spacing	Listed Load Proofed for FoS of 1.5 per ASTM 330 Test Requirement	Allowable Load in psf Using Code Applied Load FoS of 2.5 per 1709.3	Allowable Load in psf Using Code Applied Load FoS of 3.0 per ASCE 7	Tributary Area In2	Fas-teners p/s/f
StructaLath No. 17 SFRC Twin Trac 2.5 was installed with #8 x 1" truss-head, K-lath screws spaced maximum 16" o.c. along the horizontal dimension on the twin track. The attachment rows were spaced vertically a maximum 6" o.c. and offset 8" o.c. from the preceding row.	75	45	37.5	96	1.5
		Frequently meets design attachment requirements			

ASTM E 330: *Standard Test Method for Structural Performance of Exterior Windows - FoS = Factor of Safety - o.c. = on center - Allowable Loads are obtained by multiplying the laboratory published proofed load by 1.5 and dividing by FoS - Designers often require a FoS of 3 for claddings and may be required when designing buildings of higher importance as defined in ASCE 7*

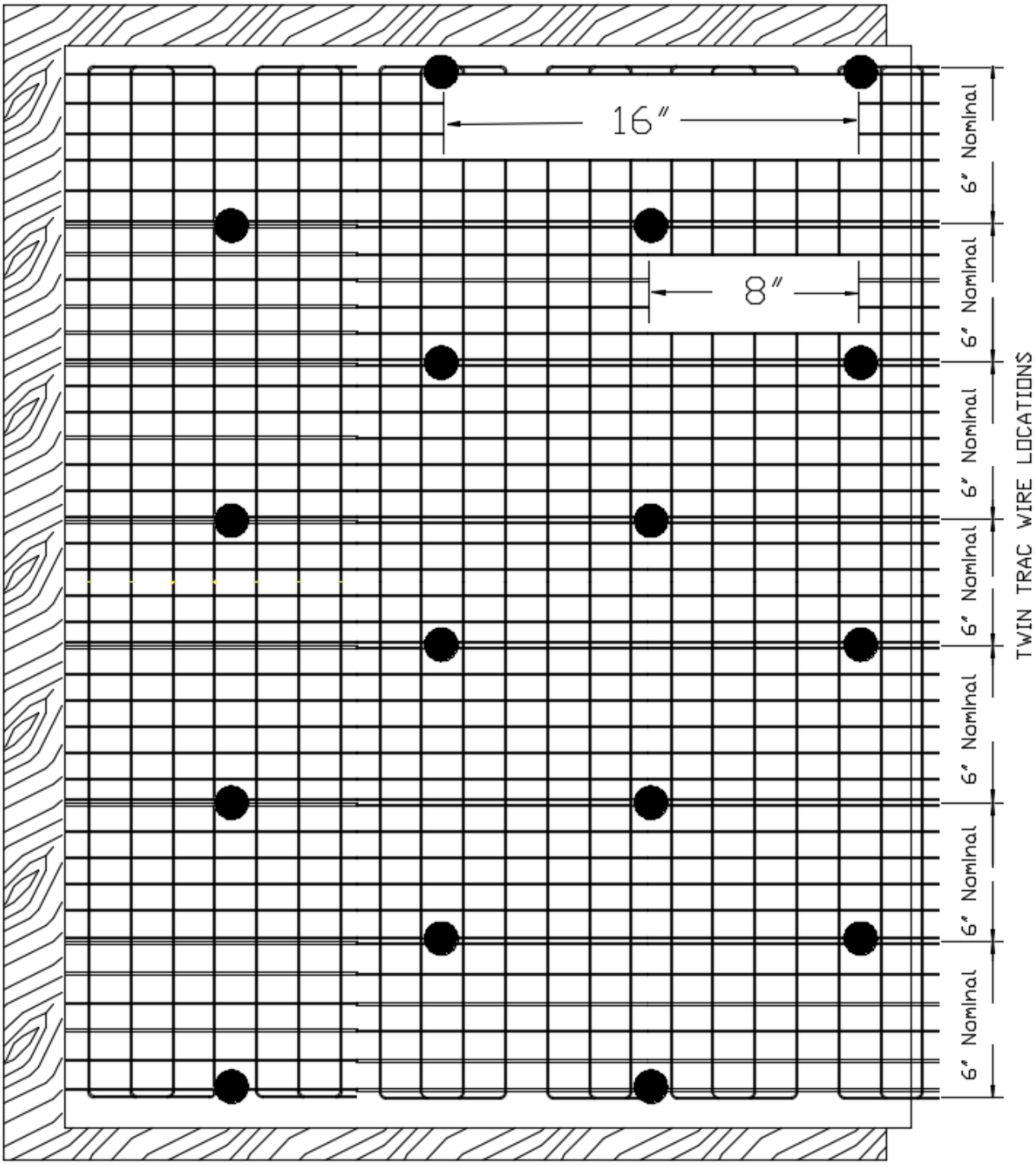
Fastening Placement Table F-3

See Table T-3 for Fasteners Specifications

Studs Covered with Structural Panel Sheathing; 1/2” Nominal Thickness

Screws Placed 16” O.C. Each Way - Fasteners Offset 8” Every Other Row

Drawing NTS - Illustrative only



Safe Attachment Table T-4
Refer to Fastener Placement Table F-4

Screw Attachment to Structural Wood Panels ≈ 6" Vertical and 12" Horizontal

ASTM 330 TEST METHODOLOGY RESULTS

StructaLath No. 17 SFRC Twin Trac installed with screws spaced maximum 12" o.c. along the horizontal dimension. Attachment rows spaced vertically 6" o.c. and offset 6" o.c. from the preceding row.

Attachment Data and Spacing	Listed Load Proofed for FoS of 1.5 per ASTM 330 Test Requirement	Allowable Load in psf Using Code Applied Load FoS of 2.5 per 1709.3	Allowable Load in psf Using Code Applied Load FoS of 3.0 per ASCE 7	Tributary Area In2	Fasteners p/s/f
StructaLath No. 17 SFRC Twin Trac 2.5 was installed with #8 x 1" truss-head, K-lath screws spaced maximum 12" o.c. along the horizontal dimension on the twin track. The attachment rows were spaced vertically a maximum 6" o.c. and offset 6" o.c. from the preceding row.	112.5	67.5	56.25	72	2
		Should meet any design attachment requirement			

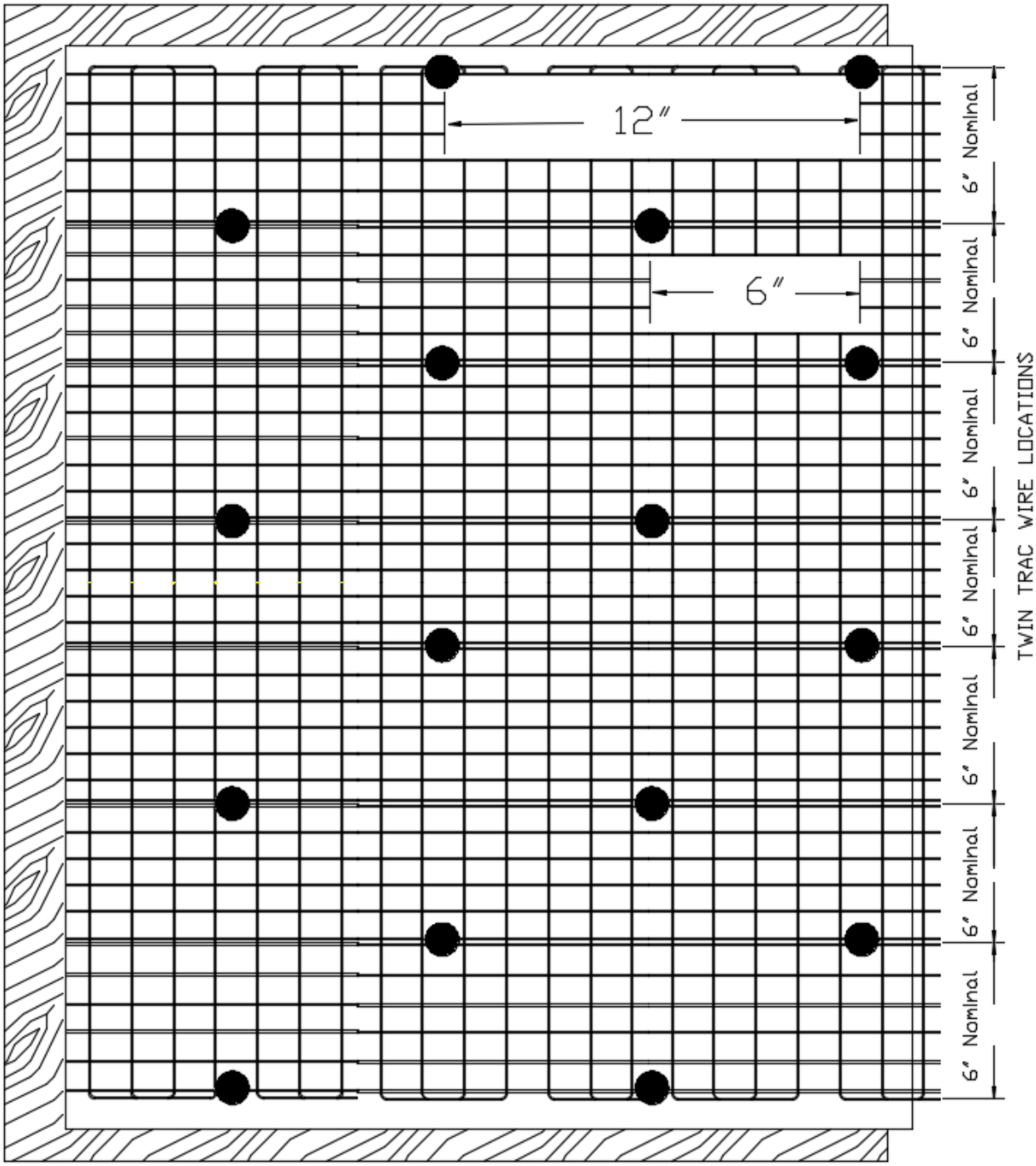
ASTM E 330: *Standard Test Method for Structural Performance of Exterior Windows - FoS = Factor of Safety - o.c. = on center - Allowable Loads are obtained by multiplying the laboratory published proofed load by 1.5 and dividing by FoS - Designers often require a FoS of 3 for claddings and may be required when designing buildings of higher importance as defined in ASCE 7*

The requirement for 2 fasteners p/s/f was a South Florida Building Code requirement for over 50 years. Unknowledgeable professionals lobbied for consolidation of text and it was eliminated by the Florida Code Commission in the 2010 Florida Building Code. That has proven to be a serious unintended error in Florida.

Fastening Placement Table F-4

See Table T-4 for Fasteners Specifications
Studs Covered with Structural Panel Sheathing; 1/2” Nominal Thickness
Screws Placed 12” O.C. Each Way - Fasteners Offset 6” Every Other Row
South Florida Building Code Pattern

Drawing NTS - Illustrative only



Safe Attachment Table T-5
Refer to Fastener Placement Table F-5

Screw Attachment to Steel Studs Covered with fiberglass mat gypsum sheathing (DensGlass®)

ASTM 330 TEST METHODOLOGY RESULTS

StructaLath No. 17 SFRC Twin Trac 2.5 installed with K-lath screws spaced a maximum 6" o.c. along Vertical Studs and 4" o.c spacing at Horizontal Rows spaced 2' o.c.

Attachment Data and Spacing	Listed Load Proofed for FoS of 1.5 per ASTM 330 Test Requirement	Allowable Load in psf Using Code Applied Load FoS of 2.5 per 1709.3	Allowable Load in psf Using Code Applied Load FoS of 3.0 per ASCE 7	Tributary Area In2 Fasteners p/s/f
StructaLath No. 17 SFRC Twin Trac 2.5 was installed with #8 x 1" truss-head K-lath screws installed into vertical steel studs spaced 16" o.c. Vertical attachment was 6" into the stud at each twin track (approximately 6" o.c.). In addition, the lath was attached at each c-stud strap placed horizontally 2' o.c. at 4" o.c. spacing between studs along the twin track.	120	90 Should meet most any design attachment requirement	60	96 1.5 Does not include the horizontal fasteners placed 4" o.c. at each horizontal strap placed 2' o.c.

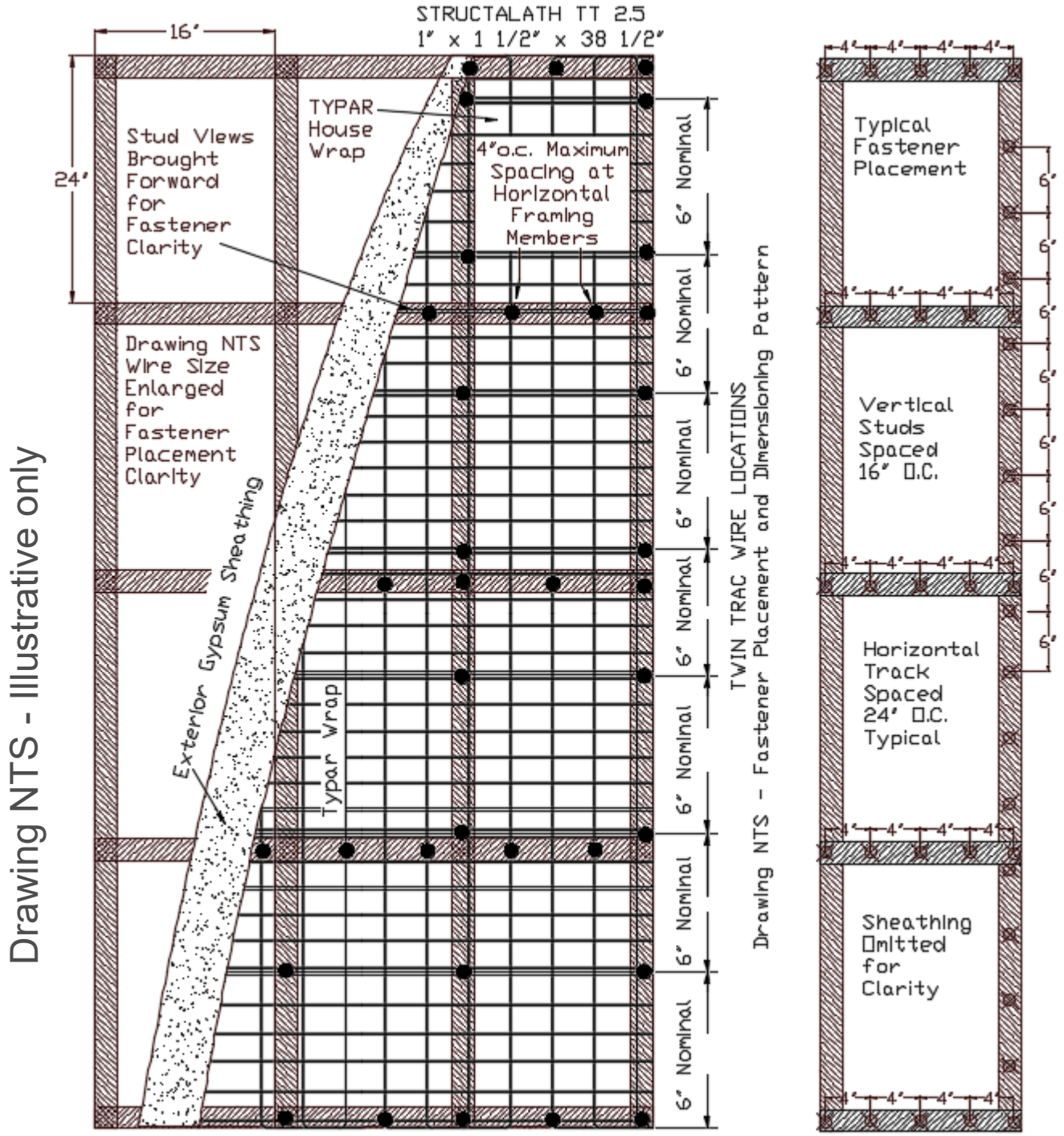
ASTM E 330: *Standard Test Method for Structural Performance of Exterior Windows - FoS = Factor of Safety - o.c. = on center - Allowable Loads are obtained by multiplying the laboratory published proofed load by 1.5 and dividing by FoS - Designers often require a FoS of 3 for claddings and may be required when designing buildings of higher importance as defined in ASCE 7*

Fastening Placement Table F-5

See Table T-5 for Fasteners Specifications

Studs Covered with Exterior Gypsum Panel Sheathing (DensGlass); 1/2" Nominal Thickness

Screws Placed 6" O.C. At Vertical Studs Spaced 16" o.c. and 4" o.c. at Horizontal Framing Spaced 2' o.c.



Drawing NTS - Illustrative only

Testing Reports and Data

CONSTRUCTION MATERIALS

T E C H N O L O G I E S

Table T-1

WIND RESISTANCE EVALUATION OF STUCCO FINISH APPLIED TO PAPERBACKED STUCCO LATH ON A WOOD FRAMED WALL

(PROJECT NO. KCCI-005-02-01)

For

KONING CONSTRUCTION CONSULTANTS
8301 JOLIET STREET
HUDSON, FL 34667

OCTOBER 20, 2016
REVISED JANUARY 14, 2019

Purpose: Evaluate the exterior finish assembly described herein for wind resistance in accordance with **ASTM E 330: *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference***.

Test Methods: Testing was conducted in accordance with ASTM E 330-02(2010): *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*. Specimens were tested in accordance with Procedure A. The selected test load was ±50 psf, which equates to a ±75 psf proof load when the typical 1.5 factor of safety is applied to the test result. The following sequence was used to evaluate the specimen:

1. +25 psf was applied for 10 seconds
2. Specimen was recovered for 1-5 minutes
3. +50 psf was applied for 10 seconds
4. Specimen was recovered for 1-5 minutes
5. -25 psf was applied for 10 seconds
6. Specimen was recovered for 1-5 minutes
7. -50 psf was applied for 10 seconds
8. Specimen was recovered for 1-5 minutes
9. +37.5 psf was applied for 10 seconds
10. Specimen was recovered for 1-5 minutes
11. +75 psf was applied for 10 seconds
12. Specimen was recovered for 1-5 minutes
13. -37.5 psf was applied for 10 seconds
14. Specimen was recovered for 1-5 minutes
15. -75 psf was applied for 10 seconds
16. Specimen was recovered for 1-5 minutes

Steps 17-23 were used to take the specimens to failure.

17. +56 psf was applied for 10 seconds
18. Specimen was recovered for 1-5 minutes
19. +112.5 psf was applied for 10 seconds
20. Specimen was recovered for 1-5 minutes
21. -56 psf was applied for 10 seconds
22. Specimen was recovered for 1-5 minutes
23. -112.5 psf was applied for 10 seconds

Sampling: All products applied to the wood studs were provided by Koning Construction Consultants. Below is an itemized list of products that are used in the Koning Exterior Finish Assembly.

Product Identification	Manufacturer
ClarkDietrich™ Expanded Diamond Mesh Metal Lath with Grade-D, Style 2 paper-backing water resistive barrier	ClarkDietrich™ Building Systems
Vinyl control joint	Not provided
Florida Super Stucco	Argos Cement LLC

Specimen: Specimen #1: A 4-ft x 8-ft mock-up was constructed from No.2 2x6 dimensional lumber with studs located 16-inch o.c. ClarkDietrich™ Expanded Diamond Mesh Metal Lath with Grade-D, Style 2 paper-backing water resistive barrier was installed over the studs with 16 ga., 1" crown x 1" leg galvanized staples spaced

7-inch o.c. The stucco finish was prepared by mixing Florida Super Stucco and sand at a 1:3 to 1:4 ratio and applied in a scratch coat, brown coat, and finish coat to a total thickness of 7/8-inch.

Specimen #2: A 4-ft x 8-ft mock-up was constructed from No.2 2x6 dimensional lumber with studs located 16-inch o.c. ClarkDietrich™ Expanded Diamond Mesh Metal Lath with Grade-D, Style 2 paper-backing water resistive barrier was installed over the studs with 16 ga., 1" crown x 1" leg galvanized staples spaced 7-inch o.c. A 5/8" vinyl control joint was secured to the lath by wire tying each flange 6-inch o.c. The stucco finish was prepared by mixing Florida Super Stucco and sand at a 1:3 to 1:4 ratio and applied in a scratch coat, brown coat, and finish coat to a total thickness of 7/8-inch.

Results: The specimen was tested October 18, 2016. Results of testing are shown below.

Table 1. Results from ASTM E 330, Procedure A for ±50 psf Test Load & ± 75 psf (1.5 Factor of Safety)

Pressure (psf)	Duration (s)	Result (Pass/Fail)	
		Specimen #1	Specimen #2
+25	10	Pass	Pass
0	60	Pass	Pass
+50	10	Pass	Pass
0	60	Pass	Pass
-25	10	Pass	Pass
0	60	Pass	Pass
-50	10	Pass	Pass
0	60	Pass	Pass
+37.5	10	Pass	Pass
0	60	Pass	Pass
+75	10	Pass	Pass
0	60	Pass	Pass
-37.5	10	Pass	Pass
0	60	Pass	Pass
-75	10	Pass	Pass
0	60	Pass	Pass

Note(s): Deflection measurements were not evaluated.

PRI Construction Materials Technologies LLC 6412 Badger Drive Tampa, FL 33610 Tel: 813-621-5777 Fax: 813-621-5840 e-mail: materialstesting@pricmt.com WebSite: http://www.pricmt.com

Table 2. Results from ASTM E 330, Procedure A – Loading to Failure

Pressure (psf)	Duration (s)	Result (Pass/Fail)	
		Specimen #1	Specimen #2
+56	10	Pass	Pass
0	60	Pass	Pass
+112.5	10	Pass	Pass
0	60	Pass	Pass
-56	10	Pass	Pass
0	60	Pass	Pass
-112.5	0	Fail	Fail

Note(s): Deflection measurements were not evaluated.

Specimen failure was determined by the presence of visible cracks in the stucco finish.

Statement of Attestation:

The performance evaluation of Koning Exterior Finish Assembly was conducted in accordance with ASTM E 330-02(2010): *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference* as described herein. The laboratory test results presented in this report are representative of the material supplied.

Signed: _____
Zachary Priest, P.E.
Director

Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	10/20/2016	10	NA
Rev 1	01/14/2019	10	Updated specimen description at client request

APPENDIX FOLLOWS

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Specimen #1 Construction Photos

Specimen #2 Construction Photos

ClarkDietrich BUILDING SYSTEMS

Product Submittal Sheet

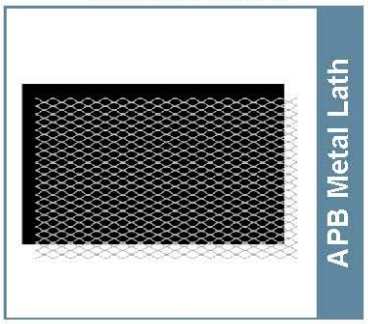
Tech Support: 888-437-3244
Engineering Services: 877-832-3206

Sales: 800-543-7140
clarkdietrich.com

09.22.36 (Metal Lath)

Paper-Backed Diamond Mesh Lath

A Galvanized Expanded Steel Plaster/Stucco Base



A superior diamond mesh multi-purpose expanded steel base with an approved Grade-D Breather sheet spot attached. Application of asphalt paper-backed (APB) metal lath is used behind stone, traditional stucco and tile installations as a certified breather sheet and also aids in preventing loss of plaster when applying. It is an excellent base for spray on structural fireproofing, ornamental work, and under ceramic tile. It provides protection against wet areas during stucco curing. The asphalt paper-backed breather sheet meets Federal Specification UUB790A; Type 1, Grade D, Style 2 and is printed on the face of the paper for easy identification. APB is also available with Dimple and V-Groove self furring metal lath.

- **Grade D paper available on Flat, Dimple & V-Groove Lath**

Product Data & Ordering Information:

Material: G-60 Galvanized Steel
Packaged: 25 bundles or 250 pieces per pallet

Finish	Wt. per Sq Yd.	Sheet Size	Pcs./Bdl.	Yds./Bdl.	Yds./Pallet
Galv.	2.5 lbs.	27" x 97"	10	20	500
Galv.	3.4 lbs.	27" x 97"	10	20	500

ASTM & Code Standards:

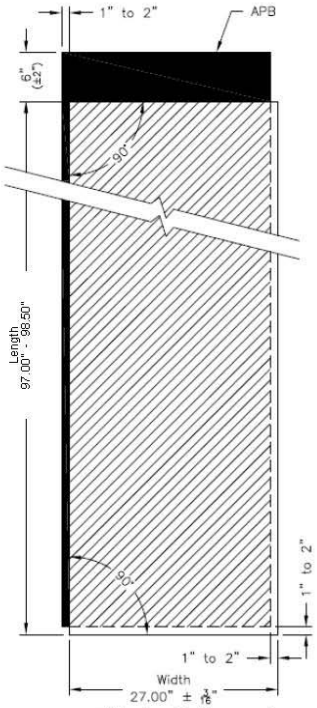
- ASTM C1063, C841, C847, CE 240.01 and ML/SFA-920
- All Expanded Metal Lath is fabricated from prime galvanized steel, G60 zinc coating by the hot dipped method, conforming to Specification ASTM A-653/A-653M.
- Asphalt paper-backed breather sheet meets Federal Specification UUB790A; Type 1, Grade D, Style 2.
- MSDS & Product Certification Information is available @ clarkdietrich.com
- For installation and placement instructions refer to ASTM C1063, C841 and C926.

Storage:

All stored materials shall be kept dry. Materials shall be stacked off the ground, supported on a level platform, and protected from the weather and surface contamination. Per ASTM C-1063

Limitations:

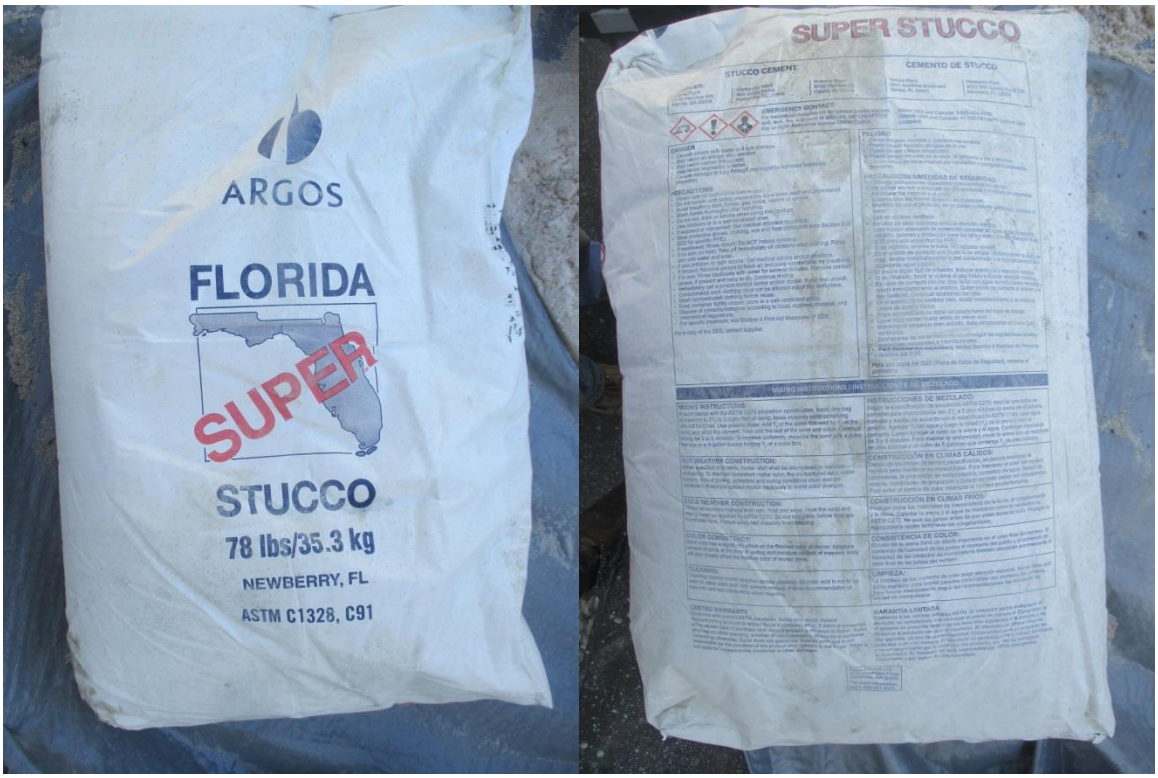
Galvanized steel products should not be used with magnesium oxychloride cement stucco or Portland cement stucco containing calcium chloride additives.



Full sized lath panel

Sustainability Credits:
For more details and LEED letters contact Technical Services at 888-437-3244 or visit www.clarkdietrich.com/LEED
LEED v4 MR Credit -- Building Product Disclosure and Optimization: EPD (up to 2 points) - Sourcing of Raw Materials (1 point) - Material Ingredients (1 point) - Construction and Demolition Waste Management (up to 2 points) - Innovation Credit (up to 2 points).
LEED 2009 Credit MR 2 & MR 4 -- ClarkDietrich's steel products are 100% recyclable and have a minimum recycled content of 34.2% (19.8% post-consumer and 14.4% pre-consumer). If seeking a higher number to meet Credit MR 5, please contact us at (info@clarkdietrich.com / 888-437-3244)

Project Information	Contractor Information	Architect Information
Name:	Name:	Name:
Address:	Contact:	Contact:
	Phone:	Phone:
	Fax:	Fax:



Specimen #1 Failure Photo

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Specimen #2 Failure Photo

PRI Construction Materials Technologies LLC 6412 Badger Drive Tampa, FL 33610 Tel: 813-621-5777 Fax: 813-621-5840 e-mail: materialstesting@pricmt.com WebSite: http://www.pricmt.com

PRI Construction Materials Technologies LLC
6412 Badger Drive
Tampa, FL 33610
813.621.5777
https://www.pri-group.com/

Laboratory Test Report

Table T-2

ASTM E 330 WIND RESISTANCE EVALUATION OF SEALED CLADDING SYSTEM ON A WOOD FRAMED WALL WITH LATH ATTACHED WITH STAPLES

(PROJECT NO. 1809T0003)

For

KONING CONSTRUCTION CONSULTANTS
8301 JOLIET STREET
HUDSON, FL 34667

DECEMBER 5, 2019

Purpose: Evaluate the exterior finish assembly described herein for wind resistance in accordance with **ASTM E 330:** ***Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference***.

Test Methods: Testing was conducted in accordance with ASTM E 330-02(2010): *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*. Specimens were tested in accordance with Procedure A. The selected test load was ±60 psf, which equates to a ±90 psf proof load when the typical 1.5 factor of safety is applied to the test result. The following sequence was used to evaluate the specimen:

1. +30 psf was applied for 10 seconds
2. Specimen was recovered for 1-5 minutes
3. +60 psf was applied for 10 seconds
4. Specimen was recovered for 1-5 minutes
5. -30 psf was applied for 10 seconds
6. Specimen was recovered for 1-5 minutes
7. -60 psf was applied for 10 seconds
8. Specimen was recovered for 1-5 minutes
9. +90 psf was applied for 10 seconds
10. Specimen was recovered for 1-5 minutes
11. -90 psf was applied for 10 seconds
12. Specimen was recovered for 1-5 minutes

Sampling: All products applied to the assembly were provided by Koning Construction Consultants. Below is an itemized list of products that are used in the Sealed Cladding System.

Product Identification	Manufacturer
TYPAR® BuildingWrap	Fiberweb, Inc.
TYPAR® Construction Tape	Fiberweb, Inc.
StructaLath No. 17 SFRC Twin Trac 2.5	Structa Wire Corp.
DRYLOK® Extreme Masonry Waterproofer	United Gilsonite Laboratories
Vinyl Corp E-Flange Casing Beads	ClarkDietrich
MasterSeal NP150	BASF
Florida Super Stucco	Argos Cement LLC

Specimen: A 4-ft x 8-ft mock-up was constructed from No.2 2x6 dimensional lumber with studs located 16-inch o.c. and sheathed with CAT 7/16 PS 2-10 OSB sheathing attached 6” o.c. with #8 x 2” bugle head wood screws. The OSB was installed with a single horizontal and single vertical joint. TYPAR® BuildingWrap was installed with a T-Joint, having a minimum 6” overlap. All joints were taped with 1-7/8” wide TYPAR® Construction Tape. The building wrap was tacked in place with 3/8” crown x 1/4” leg staple placed randomly to hold in place. Vinyl Corp 3/4” E-Flange Casing Beads was attached along the perimeter of the water with #8 x 1” lath screws spaced 24” o.c. The casing was sealed on the exterior to the wall with MasterSeal NP150. StructaLath No. 17 SFRC Twin Trac 2.5 was installed with 1” leg x 1” crown, 16ga. galvanized steel staples spaced maximum 6” o.c. along the horizontal dimension on the twin track. The rows were

spaced vertically a maximum 6" o.c. and offset 3" o.c. from the preceding row. The stucco finish was prepared by mixing Florida Super Stucco and sand at a 1:4 ratio and applied in two (2) 3/8" coats for a total thickness of 3/4". The final coat was densified with a green wet float. The walls were coated with DRYLOK® Extreme Masonry Waterproofer at a rate of 100 ft^2/gal applied in two coats (13-21 wet mils per coat).

Results: The specimen was tested December 5, 2019. Results of testing are shown below.

Table 1. Results from ASTM E 330, Procedure A for ±60 psf Test Load

Pressure (psf)	Duration (s)	Result (Pass/Fail)
+30	10	Pass
0	60	Pass
+60	10	Pass
0	60	Pass
-30	10	Pass
0	60	Pass
-60	10	Pass
0	60	Pass
+90	10	Pass
0	60	Pass
-90	10	Pass
0	60	Pass

Note(s): Deflection measurements were not evaluated.

PRI Construction Materials Technologies LLC 6412 Badger Drive Tampa, FL 33610 Tel: 813-621-5777 Fax: 813-621-5840 e-mail: materialstesting@pricmt.com WebSite: http://www.pricmt.com

Statement of Attestation:

The performance evaluation of the Sealed Cladding System was conducted in accordance with ASTM E 330-02(2010): *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference* as described herein. The laboratory test results presented in this report are representative of the material supplied.

Signed: _____

Zachary Priest, P.E.
Director

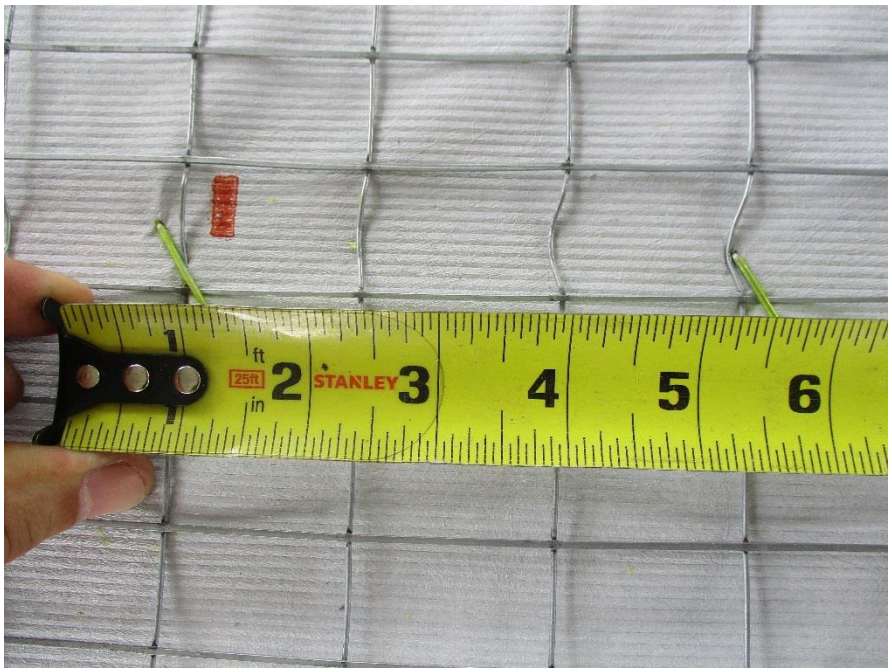
Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	12/05/2019	8	NA

APPENDIX FOLLOWS

PRI Construction Materials Technologies LLC 6412 Badger Drive Tampa, FL 33610 Tel: 813-621-5777 Fax: 813-621-5840 e-mail: materialstesting@pricmt.com WebSite: http://www.pricmt.com

Specimen #1 Construction Photos

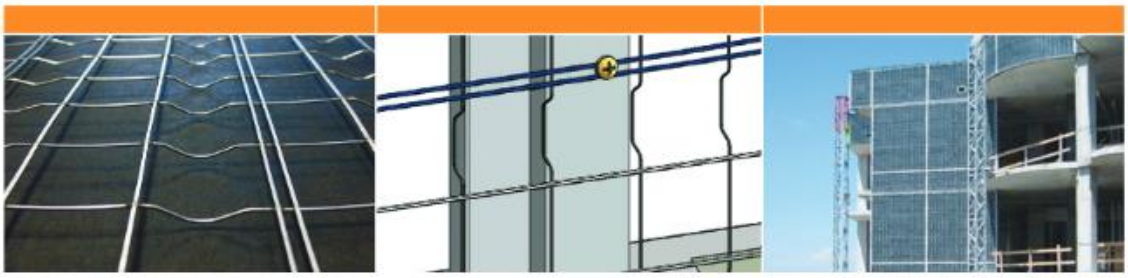


STRUCTA WIRE CORP

STRUCTALATH **TWIN TRAC**

SPECIFICATION SHEET

IAPMO UES 2017 US Patent # 6,305,424, B1 7,287,356, B2



Structalath Twin is a self furring welded wire lath for use as an alternative to the 2.5 lb/yd² diamond mesh metal lath as specified in ASTM C 847 and for use as an alternative to the 1.14 lb/yd² welded wire lath specified in ASTM C 933. Structalath Twin Trac is similar to Structalath No. 17 ga. with an addition of eight secondary cold–rolled longitudinal wires. Excellent for commercial construction, Twin Trac has been designed to simplify the attachment of wire lath to wood and steel studs.

FEATURES

- Designed to simplify attachment for both steel and wood stud construction
- 17 ga. galvanized steel wire is precision welded to form 1 ½" x 1 ½" openings
- Eight additional secondary cold rolled longitudinal wires form a twin trac that simplifies attachment
- The 3/16" Twin Trac spacing allows the easy penetration of screws, nails, and a wide base for automatic staples
- Rolls are 38 3/8" wide by 150 ft. long (50 square yards)
- Weight of roll is 1.14 lb/yd2
- Design promotes uniform plaster thickness
- Provides superior reinforcement and crack resistance
- Each and every cross wire is securely furred
- Hat channel furr provides for superior stucco embedment
- Longitudinal wires are cold rolled (flattened) to eliminate curvature memory
- Cold rolled (CR) process increases tensile and breaking load of wire
- Rolls out flat and stays flat
- Easy to fold around corners with clean bending lines

DETAILS

A. Width of furring leg 3/8"
B. Furring height 1/4" to the underside of the cross wire
C. Furring rows every 3" on centre
D. Every cross wire is furred
E. Tabs are aligned with edge wire and extend 1/4" beyond edge wires
F. Overall width is 38 3/8". Designed for full coverage of 9' - 3" wall heights including code required overlaps
G. Twin Trac for ease of attachment

PACKAGING

- 32 rolls per pallet
- Each rolls is banded with poly strapping indicating manufacturer and IAPMO UES 2017
- English/Spanish installation instructions available

GREEN ATTRIBUTES

- Made from 80% recycled steel – recycling conserves natural and energy resources
- Conservation of steel without reducing strength
- Less metal with no loss of performance
- Compact packaging means further reduction in total carbon footprint

ALSO AVAILABLE:

- Twin Trac - Stainless Steel T- 304/ANSI *Special Order Only*

Fully conforms to the requirements for stucco reinforcing as defined in UBC, IBC and IRC building codes

STRUCTA WIRE CORP. 1395 NORTH GRANDVIEW HWY, VANCOUVER, BC V5N 1N2 T 604-254-9868 E INFO@STRUCTAWIRE.COM

PRI Construction Materials Technologies LLC
6412 Badger Drive
Tampa, FL 33610
813.621.5777
https://www.pri-group.com/

Laboratory Test Report

Table T-3

ASTM E 330 WIND RESISTANCE EVALUATION OF SEALED CLADDING SYSTEM ON A WOOD FRAMED WALL WITH LATH ATTACHED WITH SCREWS

(PROJECT NO. 1809T0001)

For

KONING CONSTRUCTION CONSULTANTS
8301 JOLIET STREET
HUDSON, FL 34667

OCTOBER 8, 2019

Purpose: Evaluate the exterior finish assembly described herein for wind resistance in accordance with **ASTM E 330:** ***Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference***.

Test Methods: Testing was conducted in accordance with ASTM E 330-02(2010): *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*. Specimens were tested in accordance with Procedure A. The selected test load was ±50 psf, which equates to a ±75 psf proof load when the typical 1.5 factor of safety is applied to the test result. The following sequence was used to evaluate the specimen:

1. +75 psf was applied for 10 seconds
2. Specimen was recovered for 1-5 minutes
3. +150 psf was applied for 10 seconds
4. Specimen was recovered for 1-5 minutes
5. -75 psf was applied for 10 seconds
6. Specimen was recovered for 1-5 minutes
7. -150 psf was applied for 10 seconds
8. Specimen was recovered for 1-5 minutes

Sampling: All products applied to the wood studs were provided by Koning Construction Consultants. Below is an itemized list of products that are used in the Sealed Cladding System.

Product Identification	Manufacturer
TYPAR® BuildingWrap	Fiberweb, Inc.
TYPAR® Construction Tape	Fiberweb, Inc.
StructaLath No. 17 SFRC Twin Trac 2.5	Structa Wire Corp.
DRYLOK® Extreme Masonry Waterproofer	United Gilsonite Laboratories
Vinyl Corp E-Flange Casing Beads	ClarkDietrich
MasterSeal NP150	BASF
Florida Super Stucco	Argos Cement LLC

Specimen: A 4-ft x 8-ft mock-up was constructed from No.2 2x6 dimensional lumber with studs located 16-inch o.c. and sheathed with CAT 7/16 PS 2-10 OSB sheathing attached 6” o.c. with #8 x 2” bugle head wood screws. The OSB was installed with a single horizontal and single vertical joint. TYPAR® BuildingWrap was installed with a T-Joint, having a minimum 6” overlap. All joints were taped with 1-7/8” wide TYPAR® Construction Tape. The building wrap was tacked in place with 3/8” crown x 1/4” leg staple placed randomly to hold in place. Vinyl Corp 3/4” E-Flange Casing Beads was attached along the perimeter of the water with #8 x 1” lath screws spaced 24” o.c. The casing was sealed on the exterior to the wall with MasterSeal NP150. StructaLath No. 17 SFRC Twin Trac 2.5 was installed with #8 x 1” truss-head, K-lath screws spaced maximum 16” o.c. along the horizontal dimension on the twin track. The attachment rows were spaced vertically a maximum 6” o.c. and offset 8” o.c. from the preceding row. The stucco finish was prepared by mixing Florida Super Stucco and sand at a 1:4 ratio and applied in two (2) 3/8” coats for a total thickness of 3/4”. The final coat was densified with a green

wet float. The walls were coated with DRYLOK® Extreme Masonry Waterproofer at a rate of 100 ft^2/gal applied in two coats (13-21 wet mils per coat).

Results: The specimen was tested September 11, 2019. Results of testing are shown below.

Table 1. Results from ASTM E 330, Procedure A for ±75 psf Test Load

Pressure (psf)	Duration (s)	Result (Pass/Fail)
+75	10	Pass
0	60	Pass
+150	10	Pass
0	60	Pass
-75	10	Pass
0	60	Pass
-150	10	Pass
0	60	Pass

Note(s): Deflection measurements were not evaluated.

Specimen failure was determined by the presence of visible cracks in the stucco finish.

Statement of Attestation:

The performance evaluation of the Sealed Cladding System was conducted in accordance with ASTM E 330-02(2010): *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference* as described herein. The laboratory test results presented in this report are representative of the material supplied.

Signed:

Zachary Priest, P.E.
Director

Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	10/08/2019	8	NA
Rev 1	10/28/2019	8	Editorially revised

APPENDIX FOLLOWS

Specimen #1 Construction Photos

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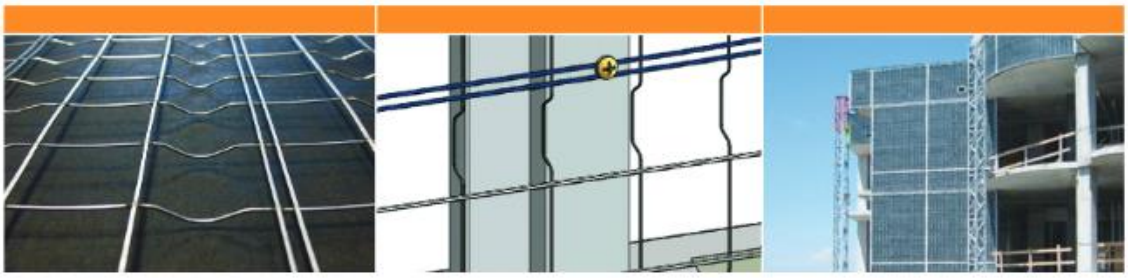
STRUCTA WIRE CORP

STRUCTALATH **TWIN TRAC**

SPECIFICATION SHEET

IAPMO UES 2017 US Patent # 6,305,424, B1 7,287,356, B2



Structalath Twin is a self furring welded wire lath for use as an alternative to the 2.5 lb/yd² diamond mesh metal lath as specified in ASTM C 847 and for use as an alternative to the 1.14 lb/yd² welded wire lath specified in ASTM C 933. Structalath Twin Trac is similar to Structalath No. 17 ga. with an addition of eight secondary cold–rolled longitudinal wires. Excellent for commercial construction, Twin Trac has been designed to simplify the attachment of wire lath to wood and steel studs.

FEATURES

- Designed to simplify attachment for both steel and wood stud construction
- 17 ga. galvanized steel wire is precision welded to form 1 ½" x 1 ½" openings
- Eight additional secondary cold rolled longitudinal wires form a twin trac that simplifies attachment
- The 3/16" Twin Trac spacing allows the easy penetration of screws, nails, and a wide base for automatic staples
- Rolls are 38 3/8" wide by 150 ft. long (50 square yards)
- Weight of roll is 1.14 lb/yd2
- Design promotes uniform plaster thickness
- Provides superior reinforcement and crack resistance
- Each and every cross wire is securely furred
- Hat channel furr provides for superior stucco embedment
- Longitudinal wires are cold rolled (flattened) to eliminate curvature memory
- Cold rolled (CR) process increases tensile and breaking load of wire
- Rolls out flat and stays flat
- Easy to fold around corners with clean bending lines

DETAILS

A. Width of furring leg 3/8"

B. Furring height 1/4" to the underside of the cross wire

C. Furring rows every 3" on centre

D. Every cross wire is furred

E. Tabs are aligned with edge wire and extend 1/4" beyond edge wires

F. Overall width is 38 3/8". Designed for full coverage of 9' - 3" wall heights including code required overlaps

G. Twin Trac for ease of attachment

PACKAGING

- 32 rolls per pallet
- Each rolls is banded with poly strapping indicating manufacturer and IAPMO UES 2017
- English/Spanish installation instructions available

GREEN ATTRIBUTES

- Made from 80% recycled steel – recycling conserves natural and energy resources
- Conservation of steel without reducing strength
- Less metal with no loss of performance
- Compact packaging means further reduction in total carbon footprint

ALSO AVAILABLE:

- Twin Trac - Stainless Steel T- 304/ANSI *Special Order Only*

Fully conforms to the requirements for stucco reinforcing as defined in UBC, IBC and IRC building codes

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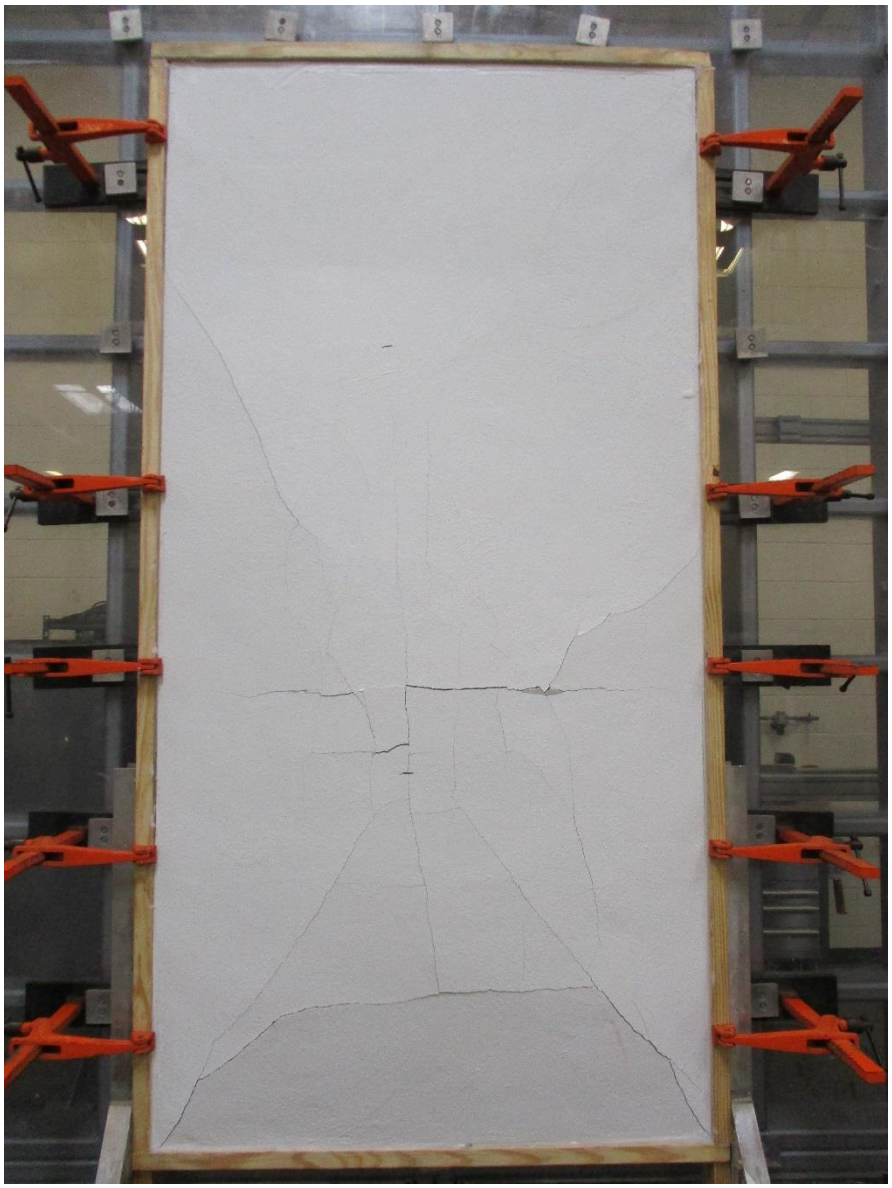
Specimen #1 Failure Photo



CONSTRUCTION MATERIALS

TECHNOLOGIES

Table T-4

WIND RESISTANCE EVALUATION OF THE KONING EXTERIOR FINISH ASSEMBLY IN ACCORDANCE WITH ASTM E 330

(PROJECT NO. KCCI-002-02-03)

For

KONING CONSTRUCTION CONSULTANTS
8301 JOLIET STREET
HUDSON, FL 34667

APRIL 4, 2016

Purpose: Evaluate the Koning Exterior Finish Assembly for wind resistance in accordance with **ASTM E 330:** ***Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference***.

Test Methods: Testing was conducted in accordance with ASTM E 330-02(2010): ***Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference***. Specimens were tested in accordance with Procedure A. The selected test load was ±150 psf, which equates to a ±225 psf proof load when the typical 1.5 factor of safety is applied to the test result. The following sequence was used to evaluate the specimen:

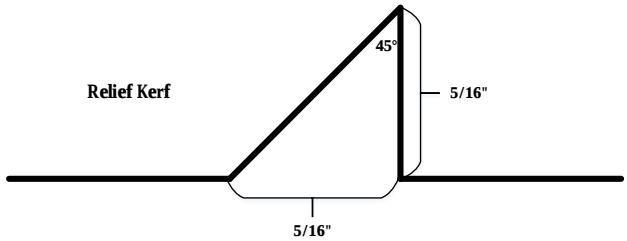
1. -75 psf was applied for 10 seconds
2. Specimen was recovered for 1-5 minutes
3. -150 psf was applied for 10 seconds
4. Specimen was recovered for 1-5 minutes
5. +75 psf was applied for 10 seconds
6. Specimen was recovered for 1-5 minutes
7. +50 psf was applied for 10 seconds
8. Specimen was recovered for 1-5 minutes
9. -112.5 psf was applied for 10 seconds
10. Specimen was recovered for 1-5 minutes
11. -225 psf was applied for 10 seconds
12. Specimen was recovered for 1-5 minutes
13. +112.5 psf was applied for 10 seconds
14. Specimen was recovered for 1-5 minutes
15. +225 psf was applied for 10 seconds
16. Specimen was recovered for 1-5 minutes

Sampling: All products applied to the exterior sheathing were provided by Koning Construction Consultants. Below is an itemized list of products that are used in the Koning Exterior Finish Assembly.

Product Identification	Manufacturer
Tyvek® HomeWrap	DuPont
Vinyl Casing Bead	Not provided
Structalath Twin Trac	Structa Wire Corporation
Florida Super Stucco	Argos Cement LLC
MasterSeal NP 150	BASF Corp.

Specimen: A 4-ft x 8-ft mock-up was constructed from No.2 2x6 dimensional lumber and sheathed with 7/16" OSB. The OSB sheathing was installed with two (2) offset vertical joints and one horizontal joint and was fastened to the framing with #8 x 2 wood screws spaced 6" o.c. along the edges and intermediate supports. DuPont Tyvek® HomeWrap was placed over the OSB using 1-1/2" plastic cap nails spaced 24" o.c. 5/8" ground x 1-3/4" flange, vinyl casing beads were located around perimeter of the specimen and attached 24" o.c with #8 x 1" PH wood screws. Structalath Twin Trac was secured through to the sheathing with #8 x 1" PH screws spaced 12" o.c. horizontally and 6 " o.c vertically in a staggered pattern. The stucco finish was prepared by mixing Florida Super Stucco and

sand at a 1:3 to 1:4 ratio and applied flush with the casing bead. A relief kerf, as shows below, was cut into the wet stucco at the casing bead. MasterSeal NP 150 was applied in the kerf to seal to the trim.



Results: The specimen was tested January 29, 2016. Results of testing are shown below.

Table 1. Results from ASTM E 330, Procedure A

Pressure (psf)	Duration (s)	Result (Pass/Fail)
-75	10	Pass
0	60	Pass
-150	10	Pass
0	60	Pass
+75	10	Pass
0	60	Pass
+150	10	Pass
0	60	Pass
-112.5	10	Pass
0	60	Pass
-225	10	Pass
0	60	Pass
+112.5	10	Pass
0	60	Pass
+225	10	Pass
0	60	Pass

Note(s): Deflection measurements were not evaluated.

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Statement of Attestation:

The performance evaluation of Koning Exterior Finish Assembly was conducted in accordance with ASTM E 330-02(2010): ***Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*** as described herein. The laboratory test results presented in this report are representative of the material supplied.

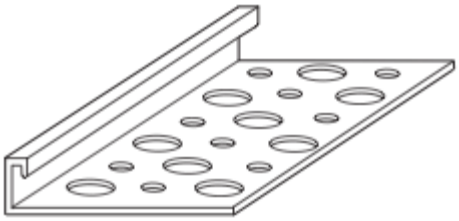
Signed: _____
Zachary Priest, P.E.
Director

Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	04/04/2016	13	NA

APPENDIX FOLLOWS

PRI Construction Materials Technologies LLC 6412 Badger Drive Tampa, FL 33610 Tel: 813-621-5777 Fax: 813-621-5840 e-mail: materialstesting@pricmt.com WebSite: http://www.pricmt.com



Vinyl Casing Bead

PRI Construction Materials Technologies LLC 6412 Badger Drive Tampa, FL 33610 Tel: 813-621-5777 Fax: 813-621-5840 e-mail: materialstesting@pricmt.com WebSite: http://www.pricmt.com

INTRODUCING

STRUCTALATH®

1 1/2" SF CR *TWIN TRAC*

Another natural innovation from Structa Wire Corp.
We've made our product even better!

- **Twin Trac** simplifies the attachment of wire lath to wood and steel studs for residential and commercial construction.
- **Twin Trac** provides convenient options for attachment of the lath that exceed all building code requirements.

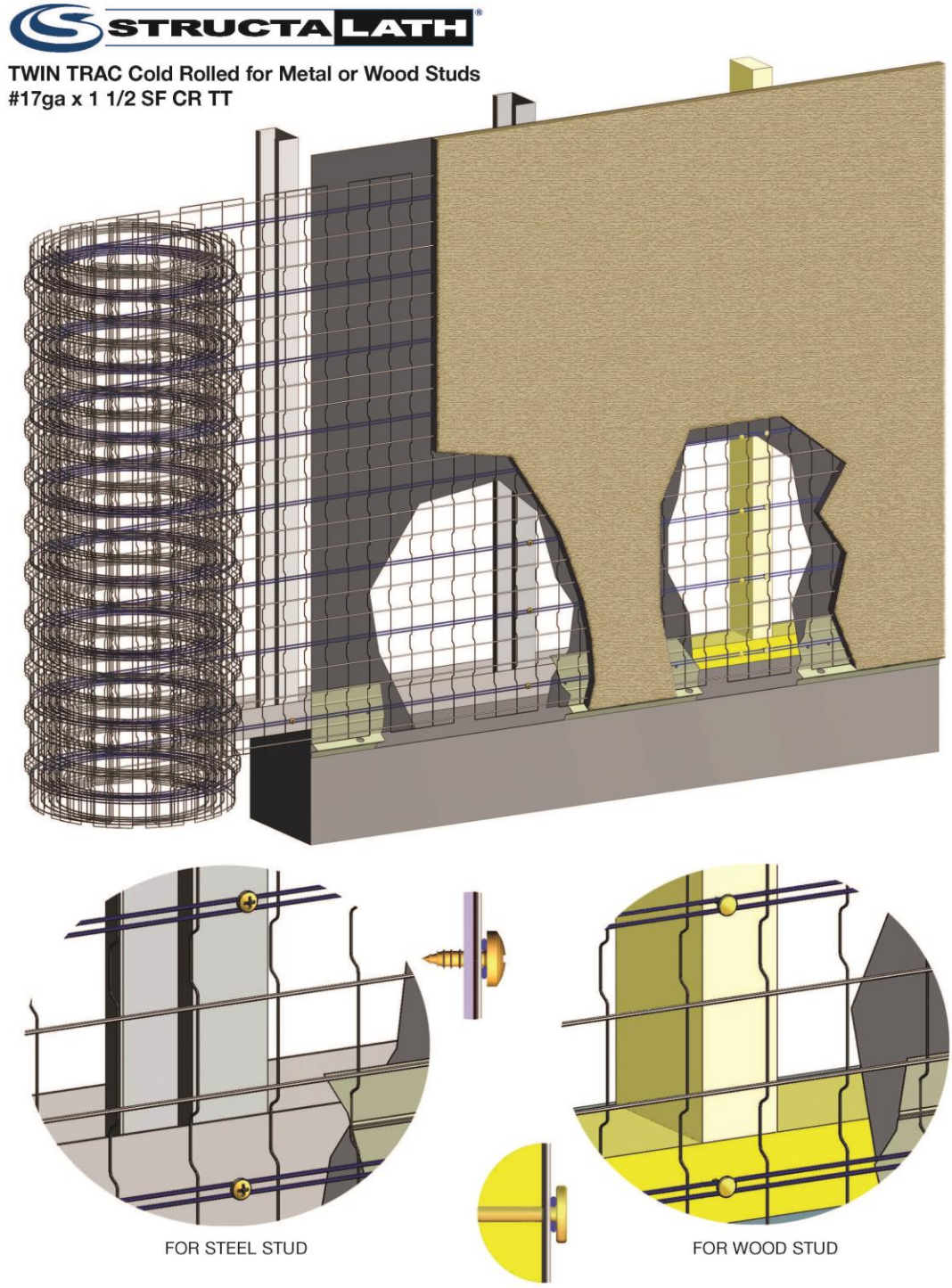
Features

- **Twin Trac** in rolls (compared to sheet) provides the most economical and cost effective metal base (wire lath) for 3 coat stucco on commerical buildings.
- **Twin Trac** creates a series of (8)-3/16" spacing bands which act as a continuous washer. This allows the easy penetration of self-tapping screws or hand nails, providing a wide flat base for automatic staples.
- **Twin Trac** flat wires provide a pressure seal at the fastener penetration point that serves to inhibit water leakage.
- **Twin Trac** secures and protects asphalt building paper from punctures.
- **Twin Trac** at a 38 3/8" width and 150' length requires 50% less side and end laps on average (compared to 27" x 101" metal lath sheets). This reduces overlaps which create weak points and are a significant source of shrinkage cracking.
- **Twin Trac** utilizes our cold rolled flat wire exclusively for longitudinal wires which provides greater tensile strength and additional surface area for keying purposes.
- Worker friendly **Twin Trac** unwinds from roll into the flat without curvature memory.

StructaLath provides a minimum of 28 (rugged) furring points per square foot that ensure superior embedment and crack resistance.

STRUCTA WIRE CORP.
Structa Wire Corp., Vancouver, BC Canada **1.800.887.4708**
www.structawire.com

PRI Construction Materials Technologies LLC 6412 Badger Drive Tampa, FL 33610 Tel: 813-621-5777 Fax: 813-621-5840 e-mail: materialstesting@pricmt.com WebSite: http://www.pricmt.com



BASF
We create chemistry

Technical Data Guide

7 | 07 92 00
Joint
Sealants

MasterSeal® NP 150

Low-modulus, non-sag, elastomeric, hybrid sealant

FORMERLY SONOLASTIC® 150 VLM

PACKAGING
– 300 ml (10.1 fl oz) cartridges, 30 cartridges per carton
– 20 oz (590 ml) ProPaks, 20 per carton

COLORS
White, Stone, Limestone, Black, Medium Bronze, Aluminum Gray, Tan, Off-White, Special Bronze, Precast White, Champagne

YIELD
See page 3 for charts

STORAGE
Store in original, unopened containers in a cool, dry area. Protect unopened containers from heat and direct sunlight. Storing at elevated temperatures will reduce shelf life.

SHELF LIFE
15 months when properly stored

VOC CONTENT
13.6 g/L
less water and exempt solvents

DESCRIPTION
MasterSeal NP 150 is a high performance, very low-modulus, high-movement, non-sag, fast-curing, hybrid sealant.

PRODUCT HIGHLIGHTS
- Superior adhesion results in a long-lasting bond, helping to reduce call backs
- Low modulus to accommodate for joint movement (100% extension in EIFS joints with little stress on bond line)
- Can be painted with elastomeric coatings soon after installation
- Easy to gun and tool, speeding up application
- Wide temperature application range
- Weather resistant for long-lasting weathertight seals
- Fast curing helps to speed up jobsite production
- Non-staining formula for use on stone and other sensitive substrates
- Available in ProPaks to reduce jobsite waste and lower disposal costs
- Meets all state and federal VOC regulations

SUBSTRATES
- EIFS
- Stucco
- Aluminum
- Concrete
- Masonry
- Wood
- Stone
- Metal
- Vinyl
- Fiber cement siding

APPLICATIONS
- Vertical or horizontal
- Exterior or interior
- Above grade
- Joints with high movement
- In place of silicone sealants
- Store front systems
- Expansion joints
- Panel walls
- Precast units
- Aluminum, vinyl and wood window frames
- Fascia
- Parapets
- Sanitary applications

HOW TO APPLY

JOINT PREPARATION
1. The product may be used in sealant joints designed in accordance with SWR Institute's Sealants - The Professional's Guide.
2. In optimal conditions, the depth of the sealant should be ½ the width of the joint. The sealant joint depth (measured at the center) should always fall between the maximum depth of ½" and the minimum depth of ¼". Refer to Table 1.

Master Builders Solutions by BASF
www.buildingsystems.basf.com

MASTER® BUILDERS SOLUTIONS

Technical Data Guide
MasterSeal® NP 150

Technical Data

Composition

MasterSeal NP 150 is a formulation based on hybrid polymer.

Compliances

- ASTM C 920, Type S, Grade NS, Class 50, Use NT, M, A, and O*
  -capable of +100/-50% movement under typical field conditions.
- ASTM C 1382 for use with EIFS wall systems at 100% Extension
- Federal Specification TT-S-001543A, Type II, Class A, Type Nonsag
- Federal Specification TT-S-00230C, Type II,Class A
- Corps of Engineers CRD-C-541, Type II, Class A
- CFI accepted
- USDA compliant for use in areas that handle meat and poultry

*Refer to substrates in Where to Use.

Typical Properties

PROPERTY	VALUE
Service temperature range, ° F (° C)	-40 to 180 (-40 to 82)
Shrinkage	None

SEALANT • WATERPROOFING & RESTORATION INSTITUTE

Issued to: **BASF Corporation**
Product: **Sonolastic 150 W/VLM**

C719: Pass ✔ Ext:+50% Comp:-50%

Substrate: Primed Mortar, Unprimed Aluminum and Glass
[mortar substrates were primed with Sonneborn Primer 2000]

C661: Rating 17

Validation Date: 10/12/13 – 10/11/17

No. 1013-VLM1017 *Copyright © 2013*

SEALANT VALIDATION
www.swrionline.org

Test Data

PROPERTY	RESULTS	TEST METHOD
Movement capability, %	±50	ASTM C 719
Extention	100%	ASTM C 1382
100% modulus, psi (MPa)	35 (0.24)	ASTM C 412
Tensile strength, psi (MPa)	140–180	ASTM D 412
Tear strength, lb/in (kg/cm)	40 (7.1)	ASTM D 1004
Ultimate elongation at break, %	800–1,000	ASTM D 412
Rheological, (sag in vertical displacement), at 120° F (49° C)	No sag	ASTM C 639
Extrudability, sec	2 – 3	ASTM C 1183
Hardness, Shore A, at standard conditions	17	ASTM C 661
Weight loss, after heat aging, %	< 10	ASTM C 1246
Tack-free time, min (maximum 72 hours)	90	ASTM C 1246
Stain and color change	Passes (no visible stain)	ASTM C 510
Bond durability,* pli on aluminum and concrete, +/– 50% movement	Passes	ASTM C 719
Adhesion* in peel, pli (kg/cm), (minimum 5 pli [0.89 kg/cm])		ASTM C 794
Aluminum	35 (6.2)	
Concrete	36 (6.4)	
Artificial weathering, Xenon arc, 2,000 hrs	No Cracking	ASTM G 155

*Concrete primed with MasterSeal P 179 for water immersion as indicated in ASTM C 920.
Test results are averages obtained under laboratory conditions. Reasonable variations can be expected.

TABLE 1
Joint Width and Sealant Depth

JOINT WIDTH, IN (MM)	SEALANT DEPTH AT MIDPOINT, IN (MM)
½–¾ (13–19)	¼–⅜ (6–10)
¾–1 (19–25)	⅜–½ (10–13)
1–1½ (25–38)	½ (13)

Yield
LINEAR FEET PER GALLON*

JOINT DEPTH, (INCHES)	⅜	½	JOINT WIDTH (INCHES) ⅝
¼	205	154	122
⅜	–	–	82
½	–	–	–

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3. In deep joints, the sealant depth must be controlled by closed cell backer rod or soft backer rod. Where the joint depth does not permit the use of backer rod, a bond breaker (polyethylene strip) must be used to prevent three-point bonding.
4. To maintain the recommended sealant depth, install backer rod by compressing and rolling it into the joint channel without stretching it lengthwise. Closed cell backer rod should be about ⅛" (3 mm) larger in diameter than the width of the joint to allow for compression. Soft backer rod should be approximately 25% larger in diameter than the joint width. The sealant does not adhere to it, and no separate bond breaker is required. Do not prime or puncture the backer rod.

SURFACE PREPARATION

Substrates must be structurally sound, fully cured, dry and clean. Substrates should always be free of the following: dirt, loose particles, oil, grease, asphalt, tar, paint, wax, rust, waterproofing or curing and parting compounds, membrane materials and sealant residue.

EIFS

1. MasterSeal NP 150 should be applied to the system base coat for best adhesion and to avoid delamination of EIFS finish applied in the joint.
2. Base coat must be sound, well bonded, properly cured and of sufficient depth to comply with manufacturer's specifications.
3. Certain EIFS systems require the use of a primer. Refer to the EIFS manufacturer for recommendations.

CONCRETE, STONE, AND OTHER MASONRY

Clean by grinding, sandblasting or wire brushing to expose a sound surface free of contamination and laitance.

WOOD

New and weathered wood must be clean, dry and sound. Scrape away loose paint to bare wood. Any coatings on wood must be tested to verify adhesion of sealant or to determine an appropriate primer.

METAL

Remove scale, rust and loose coatings from metal to expose a bright white surface. Any coatings on metal must be tested to verify adhesion of sealant or to determine an appropriate primer.

PRIMING

1. MasterSeal NP 150 is generally a non-priming sealant, but special circumstances or substrates may require a primer.
   - Porous materials subject to intermittent water immersion require priming. Use MasterSeal P 179.
   - Certain architectural metal finishes may require priming with MasterSeal P 173.
   - It is the user's responsibility to check the adhesion of the cured sealant on typical test joints at the project site before and during application. Refer to the technical data guides for MasterSeal P 179 and MasterSeal P 173.
2. Apply primer full strength with a brush or clean cloth. A light, uniform coating is sufficient for most surfaces. Very porous surfaces may require a second coat of MasterSeal P 179; however, do not over apply.
3. Allow primer to dry before applying MasterSeal NP 150. Depending on temperature and humidity, primer will be tack-free in 15–30 minutes. Priming and sealing must be done on the same day.

APPLICATION

1. MasterSeal NP 150 comes ready to use. Apply using professional grade caulking gun. Do not open cartridges, ProPaks or pails until preparatory work has been completed.
2. Fill joints from the deepest point to the surface by holding an appropriately sized nozzle against the back of the joint.
3. Dry tooling is recommended. Proper tooling results in the correct bead shape, neat joints, and optimal adhesion.

CLEAN UP

1. Immediately after use, clean equipment with MasterSeal 990 or xylene. Use proper precautions when handling solvents.
2. Remove cured sealant by cutting with a sharp-edged tool.
3. Remove thin films by abrading.

FOR BEST PERFORMANCE

- In cold weather, store container at room temperature for at least 24 hours before using.
- Not for use in glazing applications. Do not apply on glass and plastic glazing panels.
- For proper sealing of joint edges, all window covers must be removed prior to application of sealant.
- Do not allow uncured MasterSeal NP 150 to come into contact with alcohol-based materials or solvents.
- MasterSeal NP 150 should not be applied adjacent to other uncured sealants and certain petroleum based products.
- MasterSeal NP 150 can adhere to other residual sealants in restoration applications. For best results, always clean the joint as advised in the Surface Preparation section of this data guide. A product field adhesion test for MasterSeal NP 150 within the specific application is always recommended to confirm adhesion and suitability of the application.
- MasterSeal NP 150 should not be used for continuous immersion in water. Contact Technical Service for recommendations.
- Do not apply over freshly treated wood. Allow six months for weathering.
- Do not use MasterSeal P 179 on nonporous surfaces such as aluminum, steel, vinyl or Kynar 500 based paints. Use MasterSeal P 173 on coated metals when testing dictates.
- Lower temperatures and humidity will extend curing times.
- MasterSeal NP 150 can be painted over after a thin film or skin forms on the surface.
- Pursuant to accepted industry standards and practices, using rigid paints and/or coatings over flexible sealants can result in a loss of adhesion of the applied paint and/or coating, due to the potential movement of the sealant. However, should painting and/or coating be desired it is required that the applicator of the paint and/or coating conduct on-site testing to determine compatibility and adhesion.
- Proper application is the responsibility of the user. Field visits by BASF personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

Technical Data Guide
MasterSeal® NP 150

HEALTH, SAFETY AND ENVIRONMENTAL

Read, understand and follow all Safety Data Sheets and product label information for this product prior to use. The SDS can be obtained by visiting www.master-builders-solutions.basf.us, e-mailing your request to basfbscst@basf.com or calling 1(800)433-9517. Use only as directed.
For medical emergencies only, call ChemTrec® 1(800) 424-9300.

LIMITED WARRANTY NOTICE

BASF warrants this product to be free from manufacturing defects and to meet the technical properties on the current Technical Data Guide, if used as directed within shelf life. Satisfactory results depend not only on quality products but also upon many factors beyond our control. BASF MAKES NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PRODUCTS. The sole and exclusive remedy of Purchaser for any claim concerning this product, including but not limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is the replacement of product or refund of the purchase price, at the sole option of BASF. Any claims concerning this product must be received in writing within one (1) year from the date of shipment and any claims not presented within that period are waived by Purchaser. BASF WILL NOT BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFITS) OR PUNITIVE DAMAGES OF ANY KIND.

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BASF Corporation
Construction Systems

889 Valley Park Drive, Shakopee, MN 55379
www.master-builders-solutions.basf.us

Customer Service 1(800)433.9517
Technical Service 1(800)243.6739

DuPont™ Tyvek® HomeWrap®

PHYSICAL PROPERTIES DATA SHEET

PROPERTIES	METHOD	DUPONT™ TYVEK® HOMEWRAP®
Air Penetration Resistance	ASTM E2178 (cfm/ft²@1.57 psf)	< .004
	Gurley Hill (TAPPI T-460) (sec/100cc)	1200
	ASTM E1677	Type 1
Water Vapor Transmission	ASTM E96-05 Method A (g/m²-24 hrs)	400
	(perms)	56
	Method B (glm²-24 hrs)	370
	(perms)	54
Water Penetration Resistance	ATTCC 127 (cm)	250
Basis Weight	TAPPI T-410 (oz/yd²)	1.8
Breaking Strength	ASTM D882 (lbs/in)	30/30
Tear Resistance (Trapezoid)	ASTM D1117 (lbs)	8/6
Surface Burning Characteristics	ASTM E84 Flame Spread Index	15 Class A
	Smoke Developed Index	15 Class A
Ultra Violet Light Exposure (UV)		120 days (4 months)

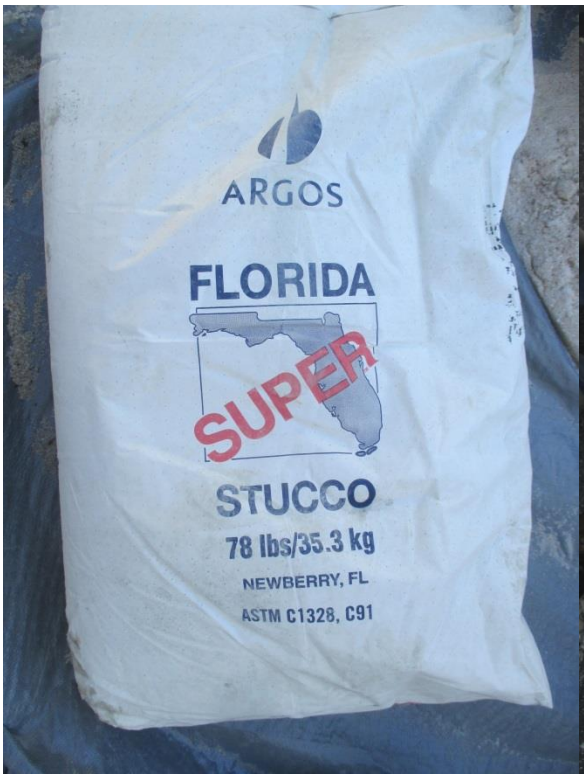
Test results shown represent roll averages. Individual results may vary either above or below averages due to normal manufacturing variations, while continuing to meet product specifications.

For more information about DuPont™ Tyvek® Weatherization Systems, please call 1-800-44-Tyvek or visit us at www.Construction.Tyvek.com

WARNING: DuPont™ Tyvek® is combustible and should be protected from an open flame and other high heat sources. If the temperature of DuPont™ Tyvek® reaches 750 °F (400 °C), it will burn and the fire may spread and fall away from the point of ignition.

DuPont The miracles of science™

DuPont™ Tyvek® HomeWrap®



PRI Construction Materials Technologies LLC
6412 Badger Drive
Tampa, FL 33610
813.621.5777
https://www.pri-group.com/

Laboratory Test Report

Table T-5

ASTM E 330 WIND RESISTANCE EVALUATION OF SEALED CLADDING SYSTEM OVER DENSGLASS® SHEATHING

(PROJECT NO. 1809T0003)

For

KONING CONSTRUCTION CONSULTANTS
8301 JOLIET STREET
HUDSON, FL 34667

DECEMBER 5, 2019

Purpose: Evaluate the exterior finish assembly described herein for wind resistance in accordance with **ASTM E 330:** ***Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference***.

Test Methods: Testing was conducted in accordance with ASTM E 330-02(2010): *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*. Specimens were tested in accordance with Procedure A. The selected test load was ±120 psf, which equates to a ±180 psf proof load when the typical 1.5 factor of safety is applied to the test result. The following sequence was used to evaluate the specimen:

1. +60 psf was applied for 10 seconds
2. Specimen was recovered for 1-5 minutes
3. +120 psf was applied for 10 seconds
4. Specimen was recovered for 1-5 minutes
5. -60 psf was applied for 10 seconds
6. Specimen was recovered for 1-5 minutes
7. -120 psf was applied for 10 seconds
8. Specimen was recovered for 1-5 minutes
9. +180 psf was applied for 10 seconds
10. Specimen was recovered for 1-5 minutes
11. -180 psf was applied for 10 seconds
12. Specimen was recovered for 1-5 minutes

Sampling: All products applied to the assembly were provided by Koning Construction Consultants. Below is an itemized list of products that are used in the Sealed Cladding System.

Product Identification	Manufacturer
TYPAR® BuildingWrap	Fiberweb, Inc.
TYPAR® Construction Tape	Fiberweb, Inc.
StructaLath No. 17 SFRC Twin Trac 2.5	Structa Wire Corp.
DRYLOK® Extreme Masonry Waterproofer	United Gilsonite Laboratories
Vinyl Corp E-Flange Casing Beads	ClarkDietrich
MasterSeal NP150	BASF
Florida Super Stucco	Argos Cement LLC

Specimen: A 4-ft x 8-ft mock-up was constructed from 18 ga. galvanized steel, 2x6 c-stud with studs located 16-inch o.c. and sheathed with 5/8" thick DensGlass® Sheathing attached 6" o.c. with #8 x 1.25" wafer head screws. C-stud straps were placed 24" o.c. between each stud and the DensGlass® Sheathing was attached 6" o.c. into each strap. TYPAR® BuildingWrap was installed with a T-Joint, having a minimum 6" overlap. All joints were taped with 1-7/8" wide TYPAR® Construction Tape. The building wrap was tacked in place with 3/8" crown x 1/4" leg staple placed randomly to hold in place. Vinyl Corp 3/4" E-Flange Casing Beads was attached along the perimeter of the wall with #8 x 1" lath screws spaced 24" o.c. The casing was sealed on the exterior to the wall with MasterSeal NP150. StructaLath No. 17 SFRC Twin Trac 2.5 was installed with #8 x 1" truss-head K-lath screws spaced a maximum 16" o.c. into each stud along the twin track. The attachment rows were spaced vertically into the stud at each twin track

(approximately 6" o.c.). In addition, the lath was attached at each c-stud strap 4" o.c. and along the twin track. The stucco finish was prepared by mixing Florida Super Stucco and sand at a 1:4 ratio and applied in two (2) 3/8" coats for a total thickness of 3/4". The final coat was densified with a green wet float. The walls were coated with DRYLOK® Extreme Masonry Waterproofer at a rate of 100 ft^2/gal applied in two coats (13-21 wet mils per coat).

Results: The specimen was tested December 5, 2019. Results of testing are shown below.

Table 1. Results from ASTM E 330, Procedure A for ±120 psf Test Load

Pressure (psf)	Duration (s)	Result (Pass/Fail)
+60	10	Pass
0	60	Pass
+120	10	Pass
0	60	Pass
-60	10	Pass
0	60	Pass
-120	10	Pass
0	60	Pass
+180	10	Pass
0	60	Pass
-180	10	Pass
0	60	Pass

Note(s): Deflection measurements were not evaluated.

Statement of Attestation:

The performance evaluation of the Sealed Cladding System was conducted in accordance with ASTM E 330-02(2010): *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference* as described herein. The laboratory test results presented in this report are representative of the material supplied.

Signed: _____

Zachary Priest, P.E.
Director

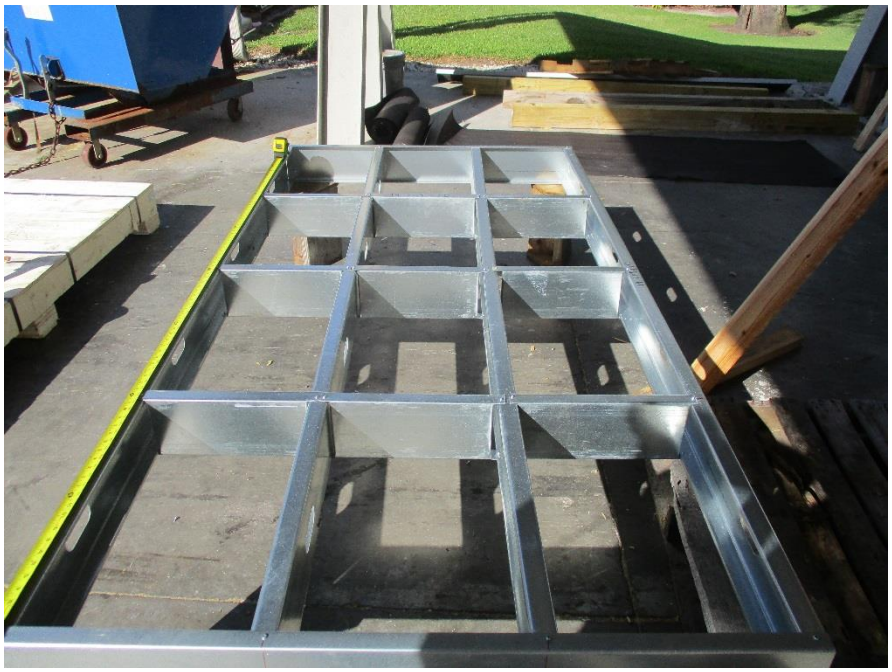
Report Issue History:

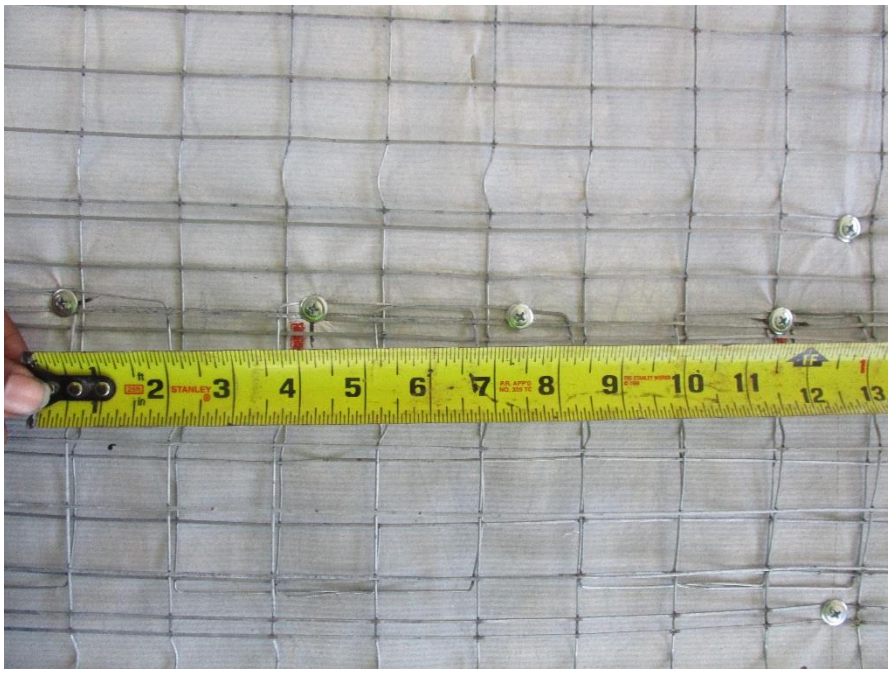
Issue #	Date	Pages	Revision Description (if applicable)
Original	12/05/2019	8	NA

PPENDIX FOLLOWS

PRI Construction Materials Technologies LLC 6412 Badger Drive Tampa, FL 33610 Tel: 813-621-5777 Fax: 813-621-5840 e-mail: materialstesting@pricmt.com WebSite: http://www.pricmt.com

Specimen #1 Construction Photos



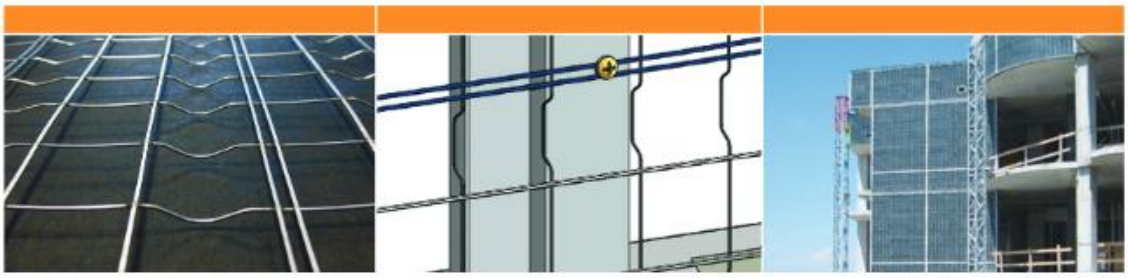


STRUCTA WIRE CORP

STRUCTALATH **TWIN TRAC**

SPECIFICATION SHEET

IAPMO UES 2017 US Patent # 6,305,424, B1 7,287,356, B2



Structalath Twin is a self furring welded wire lath for use as an alternative to the 2.5 lb/yd² diamond mesh metal lath as specified in ASTM C 847 and for use as an alternative to the 1.14 lb/yd² welded wire lath specified in ASTM C 933. Structalath Twin Trac is similar to Structalath No. 17 ga. with an addition of eight secondary cold–rolled longitudinal wires. Excellent for commercial construction, Twin Trac has been designed to simplify the attachment of wire lath to wood and steel studs.

FEATURES

- Designed to simplify attachment for both steel and wood stud construction
- 17 ga. galvanized steel wire is precision welded to form 1 ½" x 1 ½" openings
- Eight additional secondary cold rolled longitudinal wires form a twin trac that simplifies attachment
- The 3/16" Twin Trac spacing allows the easy penetration of screws, nails, and a wide base for automatic staples
- Rolls are 38 3/8" wide by 150 ft. long (50 square yards)
- Weight of roll is 1.14 lb/yd2
- Design promotes uniform plaster thickness
- Provides superior reinforcement and crack resistance
- Each and every cross wire is securely furred
- Hat channel furr provides for superior stucco embedment
- Longitudinal wires are cold rolled (flattened) to eliminate curvature memory
- Cold rolled (CR) process increases tensile and breaking load of wire
- Rolls out flat and stays flat
- Easy to fold around corners with clean bending lines

DETAILS

A. Width of furring leg 3/8"
B. Furring height 1/4" to the underside of the cross wire
C. Furring rows every 3" on centre
D. Every cross wire is furred
E. Tabs are aligned with edge wire and extend 1/4" beyond edge wires
F. Overall width is 38 3/8". Designed for full coverage of 9' - 3" wall heights including code required overlaps
G. Twin Trac for ease of attachment

PACKAGING

- 32 rolls per pallet
- Each rolls is banded with poly strapping indicating manufacturer and IAPMO UES 2017
- English/Spanish installation instructions available

GREEN ATTRIBUTES

- Made from 80% recycled steel – recycling conserves natural and energy resources
- Conservation of steel without reducing strength
- Less metal with no loss of performance
- Compact packaging means further reduction in total carbon footprint

ALSO AVAILABLE:

- Twin Trac - Stainless Steel T- 304/ANSI *Special Order Only*

Fully conforms to the requirements for stucco reinforcing as defined in UBC, IBC and IRC building codes

STRUCTA WIRE CORP. 1395 NORTH GRANDVIEW HWY, VANCOUVER, BC V5N 1N2 T 604-254-9868 E INFO@STRUCTAWIRE.COM