SECTION 33 05 97

UNDERGROUND UTILITY WARNING TAPE

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\*\* NOTE TO SPECIFIER \*\* TerraTape, Div. of Reef Industries, Inc.; Underground marking tape.
This section is based on the products of TerraTape, Div. of Reef Industries, Inc., which is located at:
9209 Almeda-Genoa Rd.
Houston, TX 77075
Toll Free Tel: 800-231-6074
Tel: 713-507-4200
Fax: 713-507-4295
Email: [request info (ri@reefindustries.com)](https://arcat.com/rfi?action=email&company=TerraTape%252C%252BDiv.%252Bof%252BReef%252BIndustries%252C%252BInc.&message=RE%253A%2520Spec%2520Question%2520(02511trt)%253A%2520&coid=39672&spec=02511trt&rep=&fax=713-507-4295)
Web: <http://www.terratape.com>
 [ [Click Here](https://arcat.com/company/terratape-div-of-reef-industries-inc-39672) ] for additional information.
Terra Tape's Underground Marking tape is the industry standard for protecting, identifying and locating all types of buried utilities. High performance grades in both detectable and non-detectable constructions offer the best in underground marking and protection.
All Terra Tape® underground marking tapes are extrusion laminated and the tape color is 100 percent pigmented plastic not an ink coating as with many manufacturers. Reef Industries provide underground marking tape grades available in standard APWA color codes. Please consult the APWA table below for the available colors and applications.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Underground Utility Warning Tape.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. 02510 (33 10 00) - Water utilities.
		2. 02530 (33 30 00) - Sanitary sewers.
		3. 02550 (33 50 00) - Fuel distribution.
		4. 02580 (33 71 19) - Underground ducts and manholes.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM International (ASTM):
			1. ASTM D882 - Standard Test Method For Tensile Properties Of Thin Plastic Sheeting.
			2. ASTM D1709 - Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
			3. ASTM D1938 - Standard Test Method for Tear-Propagation Resistance (Trouser Tear) of Plastic Film and Thin Sheeting by a Single-Tear Method.
			4. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.
			5. ASTM D2578 - Standard Test Method for Wetting Tension of Polyethylene and Polypropylene Films.
			6. ASTM D2582 - Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting.
			7. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
		2. American National Standards Institute (ANSI):
			1. ANSI Z535.1 - Safety Colors.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data:
			1. Manufacturer's data sheets on each product to be used.
			2. Preparation instructions and recommendations.
			3. Storage and handling requirements and recommendations.
			4. Typical installation methods.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern and color.
		2. Shop Drawings: Include details of materials, construction and finish. Include relationship with adjacent construction.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
		2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
		3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up on might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
			1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
			2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
			3. Retain mock-up during construction as a standard for comparison with completed work.
			4. Do not alter or remove mock-up until work is completed or removal is authorized.
	1. PRE-INSTALLATION CONFERENCE
		1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
	2. DELIVERY, STORAGE, AND HANDLING
		1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
		2. Protect from damage due to weather, excessive temperature, and construction operations.
	3. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	4. WARRANTY
		1. Manufacturer's standard limited warranty unless indicated otherwise.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: TerraTape, Div. of Reef Industries, Inc., which is located at:
		9209 Almeda-Genoa Rd.
		Houston, TX 77075
		Toll Free Tel: 800-231-6074
		Tel: 713-507-4200
		Fax: 713-507-4295
		Email: [request info (ri@reefindustries.com)](https://arcat.com/rfi?action=email&company=TerraTape%252C%252BDiv.%252Bof%252BReef%252BIndustries%252C%252BInc.&message=RE%253A%2520Spec%2520Question%2520(02511trt)%253A%2520&coid=39672&spec=02511trt&rep=&fax=713-507-4295);Web: <http://www.terratape.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	1. PERFORMANCE AND DESIGN REQUIREMENTS
		1. Uniform Colors per APWA: Per ANSI Z535.1.
			1. Red: Electric Power Lines, Cables, Conduit, and Lighting Cables.
			2. Yellow: Gas, Oil, Steam, Petroleum, or Gaseous materials.
			3. Orange: Fiber Optic Lines, Telecommunication, Alarm, Signal lines, Cables, and Conduit.
			4. Blue: Water Lines, and Potable Water,
			5. Green: Sewers, and Drain Lines.
		2. Non-Detectable Tapes: 100 percent virgin polyethylene film with a printed message.
		3. Ink Printing: Permanent and cannot be removed by normal handling or upon burial.
		4. Chemical Composition of Tape and Ink: Inert and will not degrade when exposed to acids, alkalis and other destructive substances commonly found in soil.
		5. Useful Life: Lasts longer than utility lines.
		6. Can be installed by plows at same time as utility line;depending on product.
	2. PRODUCT TYPES

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: Economy 3.0 Non-Detectable as manufactured by Terra Tape.
			1. Material: 100 percent virgin pigmented polyolefin film with a printed message on one side.

\*\* NOTE TO SPECIFIER \*\* Delete color and printing options not required. Red and Yellow are standard. Other colors from manufacturer's standard range are available upon request.

* + - 1. Color: Red. Printing: CAUTION ELECTRIC LINE BURIED BELOW.
			2. Color: Yellow. Printing: CAUTION GAS BURIED BELOW.
			3. Color: \_\_\_\_\_. Printing: \_\_\_\_\_\_\_\_.
			4. Thickness Overall per ASTM D2103: 3.0 mil (0.08 mm).
			5. Weight per ASTM D2103: 14.5 lbs per 1000 sq ft (7.1 kg per 100 sq m).

\*\* NOTE TO SPECIFIER \*\* Delete tape width option not required.

* + - 1. Tape Width: 3 inch (76 mm).
				1. Load at Yield per ASTM D882:

Machine Direction: 16.0 lbf (71 N).

Transverse Direction: 13.5 lbf (60 N).

* + - * 1. Load at Break per ASTM D882:

Machine Direction: 26 lbf (116 N).

Machine Direction: 2850 Psi (19.7 Mpa).

* + - 1. Tape Width: 6 inch (152 mm).
				1. Load at Yield (Calculated Value) per ASTM D882:

Machine Direction: 32 lbf (142 N).

Transverse Direction: 27 lbf (120 N).

* + - 1. Elongation per ASTM D882: Machine Direction: 725 percent.
			2. Tongue Tear per ASTM D1938: 2.5 lbf (11 N).
			3. Trapezoidal Tear per ASTM D4533: 7.0 lbf (31 N).
			4. PPT Resistance per ASTM D2582: 12.3 lbf (55 N).
			5. Dart Impact per ASTM D1709 (B): 1.4 lbs (0.64 Kg).
			6. Printability per ASTM D2578: Greater than or equal to 40 Dynes.
		1. Basis of Design: Extra Stretch as manufactured by Terra Tape. 100 percent virgin pigmented polyolefin film with a printed message on one side.
			1. Material: 100 percent virgin pigmented polyolefin film. Constructed by mechanical (non-adhesive) lamination of two plies of three ply blown film to produce the bi-axially oriented six ply structure.

\*\* NOTE TO SPECIFIER \*\* Delete color and printing options not required. Red and Yellow are standard. Other colors from manufacturer's standard range are available upon request.

* + - 1. Color: Orange.
				1. Printing: CAUTION FIBER OPTIC CABLE BURIED BELOW.
				2. Printing: CAUTION TELEPHONE CABLE BURIED BELOW.
			2. Color: Red. Printing: CAUTION ELECTRIC LINE BURIED BELOW.
			3. Color: Yellow. Printing: CAUTION GAS LINE BURIED BELOW.
			4. Color: \_\_\_\_\_. Printing: \_\_\_\_\_\_\_\_.
			5. Thickness Overall per ASTM D2103: 9.0 mil (0.23 mm).
			6. Weight per ASTM D2103: 30 lbs per 1000 sq ft (14.6 kg per 100 sq m).
			7. Tape Width: 3 inch (76 mm).
				1. Load at Yield per ASTM D882:

Machine Direction: 35.0 lbf (156 N).

Transverse Direction: 36 lbf (160 N).

* + - * 1. Load at Break per ASTM D882:

Machine Direction: 82 lbf (365 N).

Machine Direction: 3025 Psi (20.9 Mpa).

* + - 1. Tape Width: 6 inch (152 mm).
				1. Load at Yield (Calculated Value) per ASTM D882:

Machine Direction: 70 lbf (311 N).

Transverse Direction: 72 lbf (320 N).

* + - 1. Elongation per ASTM D882: Machine Direction: 825 percent.
			2. Tongue Tear per ASTM D1938: 13 lbf (57.8 N).
			3. Trapezoidal Tear per ASTM D4533: 15 lbf (66.7 N).
			4. PPT Resistance per ASTM D2582: 24 lbf (106.8 N).
			5. Dart Impact per ASTM D1709 (B): 1.7 lbs (0.8 Kg).
			6. Printability per ASTM D2578: Greater than or equal to 40 Dynes.
		1. Basis of Design: Extra Stretch II as manufactured by Terra Tape.
			1. Material: 100 percent virgin pigmented polyolefin film with a printed message on one side.

\*\* NOTE TO SPECIFIER \*\* Delete color and printing options not required. Red and Yellow are standard. Other colors from manufacturer's standard range are available upon request.

* + - 1. Color: Orange.
				1. Printing: CAUTION FIBER OPTIC CABLE BURIED BELOW.
				2. Printing: CAUTION TELEPHONE CABLE BURIED BELOW.
				3. Printing: CAUTION COMMUNICATION CABLE BURIED BELOW.
			2. Color: \_\_\_\_\_. Printing: \_\_\_\_\_\_\_\_.
			3. Thickness Overall per ASTM D2103: 6.0 mil (0.15 mm).
			4. Weight per ASTM D2103: 29 lbs per 1000 sq ft (14.2 kg per 100 sq m).
			5. Tape Width: 3 inch (76 mm).
				1. Load at Yield per ASTM D882:

Machine Direction: 30.0 lbf (133 N).

Transverse Direction: 27 lbf (120 N).

* + - * 1. Load at Break per ASTM D882:

Machine Direction: 78 lbf (347 N).

Machine Direction: 4480 Psi (30.9 Mpa).

* + - 1. Tape Width: 6 inch (152 mm).
				1. Load at Yield (Calculated Value) per ASTM D882:

Machine Direction: 60 lbf (267 N).

Transverse Direction: 54 lbf (240 N).

* + - 1. Elongation per ASTM D882: Machine Direction: 875 percent.
			2. Tongue Tear per ASTM D1938: 6 lbf (27 N).
			3. Trapezoidal Tear per ASTM D4533: 13 lbf (58 N).
			4. PPT Resistance per ASTM D2582: 18.5 lbf (82 N).
			5. Dart Impact per ASTM D1709 (B): 1.6 lbs (0.73 Kg).
			6. Printability per ASTM D2578: Greater than or equal to 40 Dynes.
		1. Basis of Design: Premium as manufactured by Terra Tape.
			1. Material: 100 percent virgin pigmented polyolefin film with a printed message on one side.

\*\* NOTE TO SPECIFIER \*\* Delete color and printing options not required. Red and Yellow are standard. Other colors from manufacturer's standard range are available upon request.

* + - 1. Color: Yellow.
				1. Printing: CAUTION ELECTRIC LINE BURIED BELOW.
				2. Printing: CAUTION GAS LINE BURIED BELOW.
				3. Printing: CAUTION PIPE LINE BURIED BELOW.
			2. Color: \_\_\_\_\_. Printing: \_\_\_\_\_\_\_\_.
			3. Thickness Overall per ASTM D2103: 6.0 mil (0.15 mm).
			4. Weight per ASTM D2103: 28.5 lbs per 1000 sq ft (13.9 kg per 100 sq m).
			5. Tape Width: 3 inch (76 mm).
				1. Load at Yield per ASTM D882:

Machine Direction: 27.0 lbf (120 N).

Transverse Direction: 25 lbf (111 N).

* + - * 1. Load at Break per ASTM D882:

Machine Direction: 65 lbf (289 N).

Machine Direction: 3700 Psi (25.5 Mpa).

* + - 1. Tape Width: 6 inch (152 mm).
				1. Load at Yield (Calculated Value) per ASTM D882:

Machine Direction: 24 lbf (240 N).

Transverse Direction: 50 lbf (222 N).

* + - 1. Elongation per ASTM D882: Machine Direction: 800 percent.
			2. Tongue Tear per ASTM D1938: 6 lbf (26.7 N).
			3. Trapezoidal Tear per ASTM D4533: 11 lbf (48.9 N).
			4. PPT Resistance per ASTM D2582: 17 lbf (75.6 N).
			5. Dart Impact per ASTM D1709 (B): 1.4 lbs (0.64 Kg).
			6. Printability per ASTM D2578: Greater than or equal to 40 Dynes.
		1. Basis of Design: Security Shield as manufactured by Terra Tape.
			1. Material: 100 percent virgin pigmented polyolefin film with a printed message on one side. Constructed by mechanical (non-adhesive) lamination of two plies of three ply blown film to produce the bi-axially oriented six ply structure.

\*\* NOTE TO SPECIFIER \*\* Delete color and printing options not required. Red and Yellow are standard. Other colors from manufacturer's standard range are available upon request.

* + - 1. Color: Orange.
				1. Printing: CAUTION FIBER OPTIC CABLE BURIED BELOW.
				2. Printing: CAUTION TELEPHONE CABLE BURIED BELOW.
			2. Color: Red. Printing: CAUTION ELECTRIC LINE BURIED BELOW.
			3. Color: Yellow.
				1. Printing: CAUTION GAS LINE BURIED BELOW.
				2. Printing: CAUTION ELECTRIC LINE BURIED BELOW.
			4. Color: \_\_\_\_\_. Printing: \_\_\_\_\_\_\_\_.
			5. Thickness Overall per ASTM D2103: 17.0 mil (0.43 mm).
			6. Weight per ASTM D2103: 66 lbs per 1000 sq ft (30 kg per 100 sq m).
			7. Tape Width: 3 inch (76 mm).
				1. Load at Yield per ASTM D882:

Machine Direction: 72.0 lbf (320 N).

Machine Direction: 1400 Psi (9.6 Mpa).

* + - * 1. Load at Break per ASTM D882:

Machine Direction: 175 lbf (778 N).

Machine Direction: 3400 Psi (23.4 Mpa).

* + - 1. Tape Width: 6 inch (152 mm).
				1. Load at Yield (Calculated Value) per ASTM D882:

Machine Direction: 144 lbf (640 N).

Machine Direction: 1400 Psi (9.6 Mpa).

* + - 1. Elongation per ASTM D882: Machine Direction: 900 percent.
			2. Trapezoidal Tear per ASTM D4533: 36 lbf (160 N).
			3. Printability per ASTM D2578: Greater than or equal to 40 Dynes.
		1. Basis of Design: Sentry Line Detectable as manufactured by Terra Tape.
			1. Material: A tri-layer laminate consisting of a 100 percent virgin polyolefin pigmented film, a solid aluminum foil core and a clear protective encapsulating film.
				1. Clear Protective Encapsulating Film: Allows full view of foil to ensuring continuity.
				2. Solid Aluminum Foil Core: Provides detectability utilizing either inductive or conductive modes using a pipe and cable locator.

\*\* NOTE TO SPECIFIER \*\* Delete color and printing options not required. Red and Yellow are standard. Other colors from manufacturer's standard range are available upon request.

* + - 1. Color: Blue. Printing: CAUTION WATER LINE BURIED BELOW.
			2. Color: Green. Printing: CAUTION SEWER LINE BURIED BELOW.
			3. Color: Orange.
				1. Printing: CAUTION COMMUNICATION CABLE BURIED BELOW.
				2. Printing: CAUTION FIBER OPTIC CABLE BURIED BELOW.
			4. Color: Red.
				1. Printing: CAUTION ELECTRIC LINE BURIED BELOW.
				2. Printing: CAUTION HIGH VOLTAGE CABLE BURIED BELOW.
			5. Color: Yellow.
				1. Printing: CAUTION ELECTRIC LINE BURIED BELOW.
				2. Printing: CAUTION GAS LINE BURIED BELOW.
			6. Color: \_\_\_\_\_. Printing: \_\_\_\_\_\_\_\_.
			7. Thickness Overall per ASTM D2103: 6.0 mil (0.15 mm).
			8. Weight per ASTM D2103: 32 lbs per 1000 sq ft (15.6 kg per 100 sq m).
			9. Tape Width: 3 inch (76 mm).
				1. Load at Yield per ASTM D882:

Machine Direction: 70 lbf (311 N).

Transverse Direction: 65 lbf (289 N).

* + - * 1. Load at Break per ASTM D882:

Machine Direction: 45 lbf (200 N).

Machine Direction: 2459 Psi (25 Mpa).

* + - 1. Tape Width: 6 inch (152 mm).
				1. Load at Yield (Calculated Value) per ASTM D882:

Machine Direction: 140 lbf (622 N).

Transverse Direction: 130 lbf (578 N).

* + - 1. Elongation per ASTM D882: Machine Direction: 80 percent.
			2. Tongue Tear per ASTM D1938: 6.5 lbf (29 N).
			3. Trapezoidal Tear per ASTM D4533: 11.5 lbf (51 N).
			4. PPT Resistance per ASTM D2582: 9.5 lbf (42 N).
			5. Dart Impact per ASTM D1709 (B): 1.6 lbs (0.73 Kg).
			6. Printability per ASTM D2578: Greater than or equal to 40 Dynes.

\*\* NOTE TO SPECIFIER \*\* terra clips are optional. Delete if not required.

* + - 1. Terra Clips: For connecting two lengths of detectable tape. The connection connects the tape lengths mechanically and electrically.
		1. Basis of Design: Sentry Line Reinforced Detectable as manufactured by Terra Tape.
			1. Material: A tri-layer laminate consisting of a 100 percent virgin polyolefin pigmented film, polyester laid scrim, a solid aluminum foil core and a clear protective encapsulating film.
				1. Clear Protective Encapsulating Film: Allows full view of foil to ensuring continuity.
				2. Solid Aluminum Foil Core; Provides detectability utilizing either inductive or conductive modes using a pipe and cable locator.

\*\* NOTE TO SPECIFIER \*\* Delete color and printing options not required. Red and Yellow are standard. Other colors from manufacturer's standard range are available upon request.

* + - 1. Color: Orange. Printing: CAUTION FIBER OPTIC CABLE BURIED BELOW.
			2. Color: Red. Printing: CAUTION ELECTRIC LINE BURIED BELOW.
			3. Color: \_\_\_\_\_. Printing: \_\_\_\_\_\_\_\_.
			4. Thickness Overall per ASTM D2103: 8.0 mil (0.20 mm).
			5. Weight per ASTM D2103: 43 lbs per 1000 sq ft (21 kg per 100 sq m).
			6. Tape Width: 3 inch (76 mm).
				1. Load at Yield per ASTM D882:

Machine Direction: 125 lbf (556 N).

Transverse Direction: 140 lbf (623 N).

* + - * 1. Load at Break per ASTM D882:

Machine Direction: 70 lbf (311 N).

Machine Direction: 2917 Psi (20.1 Mpa).

* + - 1. Tape Width: 6 inch (152 mm).
				1. Load at Yield (Calculated Value) per ASTM D882:

Machine Direction: 250 lbf (1112 N).

Transverse Direction: 280 lbf (1246 N).

* + - 1. Elongation per ASTM D882: Machine Direction: 275 percent.
			2. Tongue Tear per ASTM D1938: 12 lbf (53 N).
			3. Trapezoidal Tear per ASTM D4533: 24 lbf (107 N).
			4. PPT Resistance per ASTM D2582: 25 lbf (110 N).
			5. Dart Impact per ASTM D1709 (B): 1.6 lbs (0.73 Kg).
			6. Printability per ASTM D2578: Greater than or equal to 40 Dynes.

\*\* NOTE TO SPECIFIER \*\* terra clips are optional. Delete if not required.

* + - 1. Terra Clips: For connecting two lengths of detectable tape. The connection connects the tape lengths mechanically and electrically.
		1. Basis of Design: Standard as manufactured by Terra Tape.
			1. Material: 100 percent virgin pigmented polyolefin film with a printed message on one side.

\*\* NOTE TO SPECIFIER \*\* Delete color and printing options not required. Red and Yellow are standard. Other colors from manufacturer's standard range are available upon request.

* + - 1. Color: Blue. Printing: CAUTION WATER LINE BURIED BELOW.
			2. Color: Green. Printing: CAUTION SEWER LINE BURIED BELOW.
			3. Color: Orange.
				1. Printing: CAUTION CATV CABLE BURIED BELOW.
				2. Printing: CAUTION COMMUNICATION CABLE BURIED BELOW.
				3. Printing: CAUTION FIBER OPTIC CABLE BURIED BELOW.
				4. Printing: CAUTION TELEPHONE CABLE BURIED BELOW.
			4. Color: Red. Printing: CAUTION ELECTRIC LINE BURIED BELOW.
			5. Color: Yellow. Printing: CAUTION ELECTRIC LINE BURIED BELOW.
			6. Color: Yellow. Printing: CAUTION GAS LINE BURIED BELOW.
			7. Color: Yellow. Printing: CAUTION PIPELINE BURIED BELOW.
			8. Color: Yellow. Printing: CAUTION CATHODIC PROTECTION LINE BURIED BELOW.
			9. Color: \_\_\_\_\_. Printing: \_\_\_\_\_\_\_\_.
			10. Thickness Overall per ASTM D2103: 4.0 mil (0.1 mm).
			11. Weight per ASTM D2103: 19.6 lbs per 1000 sq ft (8.8 kg per 100 sq m).
			12. Tape Width: 3 inch (76 mm).
				1. Load at Yield per ASTM D882:

Machine Direction: 20 lbf (89 N).

Transverse Direction: 19 lbf (85 N).

* + - * 1. Load at Break per ASTM D882:

Machine Direction: 40 lbf (178 N).

Machine Direction: 3400 Psi (23.4 Mpa).

* + - 1. Tape Width: 6 inch (152 mm).
				1. Load at Yield (Calculated Value) per ASTM D882:

Machine Direction: 40 lbf (178 N).

Transverse Direction: 38 lbf (170 N).

* + - 1. Elongation per ASTM D882: Machine Direction: 820 percent.
			2. Tongue Tear per ASTM D1938: 3.8 lbf (17 N).
			3. Trapezoidal Tear per ASTM D4533: 8.5 lbf (38 N).
			4. PPT Resistance per ASTM D2582: 14.5 lbf (65 N).
			5. Dart Impact per ASTM D1709 (B): 2 lbs (0.9 Kg).
			6. Printability per ASTM D2578: Greater than or equal to 40 Dynes.
		1. Options:

\*\* NOTE TO SPECIFIER \*\* Delete options not required. Not all options may be available on all materials and minimum order may apply.

* + - 1. Custom Printing: Permanent black ink on colored tape. Can be custom printed with company names, logos, phone numbers and/or messages in up to four different colors.
			2. Plastic cores.
			3. Individual or custom boxing.
			4. Large diameter sideboards and core plugs for long lengths.
			5. Export packaging / paperwork.

\*\* NOTE TO SPECIFIER \*\* Delete stock sizes not required.

* + - 1. Stock Sizes: 3 inch (76 mm) x 1000 ft (304.8 m) rolls.
			2. Stock Sizes: 3 inch (76 mm) x 6000 ft (1828.8 m) rolls.
			3. Stock Sizes: 6 inch (152 mm) x 1000 ft (304.8 m) rolls on plastic cores.
			4. Stock Sizes: 6 inch (152 mm) x 6000 ft (1828.8 m) rolls on plastic cores.

\*\* NOTE TO SPECIFIER \*\* Delete accessories not required.

* + 1. Accessories:
			1. Dispenser Reels and Handles: Allow rapid installation in a trench. Simply hold the roll over the trench while walking along side.
			2. Dispenser Boxes: For more efficient use when traveling from job site to job site.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly constructed and prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions approved submittals and in proper relationship with adjacent construction.
	4. FIELD QUALITY CONTROL
		1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
	1. CLEANING AND PROTECTION
		1. Clean products in accordance with the manufacturers recommendations.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION