

## PRODUCT DATA SHEET

# Tuff-N-Nuff®

### Rockshield for Pipe / Coating Protection

#### PRODUCT DESCRIPTION

Tuff-N-Nuff® is a rockshield comprised of small diameter (approximately 0.050") strands of flexible PVC which form a porous, non-woven mat. These strands are bonded to each other in a controlled random pattern during production. Tuff-N-Nuff® protects pipeline coatings from direct impact during backfill operations. It also provides long-term protection by keeping hard objects in the backfill from coming into contact with the pipeline coating. Tuff-N-Nuff® also protects the pipeline coating from these abrasive objects as lateral and longitudinal movements occur once the pipeline is placed into service.

Tuff-N-Nuff® with Rapid-Edge self fastening hook and loop system available for faster, easier installation. In addition, Tuff-N-Nuff® does not shield cathodic protection being supplied to pipelines when installed using Rapid-Edge, monofilament tape or nonmetallic strapping as described in the Application Instructions.

#### USES

Steel and plastic pipelines

#### CHARACTERISTICS / ADVANTAGES

- Laboratory and field tested to protect FBE coated steel from rocky or harsh backfill material.
- Outstanding impact resistance results in the modified ASTM G-13 rock drop testing.
- Porous and random strand matrix design does not shield cathodic protection.
- PVC product construction reduces the impact load transfer onto the pipe during backfilling.
- Durable product which exhibits excellent physical and performance properties.
- Flexible, lightweight material allows for a quick and inexpensive installation process, even in extreme arctic temperatures.
- Custom sizes are available for every pipeline diameter size (zero waste).
- Product was designed and has been sold specifically as a rockshield for nearly 30 years.
- Manufacturing capacity to support large scale pipeline projects.
- Specified for use as a rockshield by some of largest pipeline owners in the world.
- Safety yellow color helps to identify the pipeline during dig ups.
- Quicker installation with less manpower when utilizing Rapid-Edge hook-and-loop closure system.
- No Tape or strapping material required when Rapid-Edge option is used.

#### PRODUCT INFORMATION

##### Packaging

Tuff-N-Nuff® is available with or without Rapid-Edge hook and loop fastening system.

##### Packaging without Rapid-Edge option

Tuff-N-Nuff is available two standard product thicknesses - 1/4" and 3/8" (6.35 mm and 9.52 mm). Rolls are provided for pipeline diameters up to and

including 20", with a width matching the pipeline circumference plus a nominal 4-inch overlap. Standard rolls are 30 feet long, but can be produced in any practical length that can be easily lifted on the jobsite, typically not exceeding 60 feet in length. Pads are provided for pipelines greater than 20" in diameter, with a width matching the pipeline circumference plus a nominal 4-inch overlap. Standard pad lengths are 72" (36" width available upon request).

Packaging with Rapid-Edge option

Tuff-N-Nuff® with Rapid-Edge is available in 3/8" (9.52mm) thickness. Rolls are provided for pipeline diameters up to and including 20", with a width matching the pipeline circumference plus a nominal 4-inch overlap. Standard rolls are 30 feet long.

Rapid-Edge hook width = 1"

Rapid-Edge loop width = 2"

<b>Shelf Life</b>	N/A	
<b>Storage Conditions</b>	Material must be protected from long term UV exposure	
<b>Mass per Unit Area</b>	0.860 (Minimum)	(ASTM D-792)

**TECHNICAL INFORMATION**

<b>Impact Strength</b>	No failure @ 6" rock <sup>1</sup>	(ASTM G-13) (Modified)
	<sup>1</sup> Test modified to include rocks which progress in size from 1 ½", 3", 4" and 6", 10 drops each. Each drop consisted of released 50+ lbs of stone from a height of 6' onto a fusion bonded epoxy coated steel plate protected by Tuff-N-Nuff. The FBE coated steel plate is visually inspected for holidays after each drop.	
<b>Resistance to Static Puncture</b>	Impact Resistance No failure @ 6" rock	ASTM G13 (Modified)* * Test modified to include rocks which progress in size from 1 ½", 3", 4" and 6", 10 drops each. Each drop consisted of released 50+ lbs of stone from a height of 6' onto a fusion bonded epoxy coated steel plate protected by Tuff-N-Nuff. The FBE coated steel plate is visually inspected for holidays after each drop.
<b>Resistance to pyramid puncture</b>	Puncture Strength 150 lbs	(ASTM D-6241 (Modified))
<b>Compression resistance</b>	Compressive Strength 2.20 lbs/in <sup>2</sup> @ 10% deflection	(ASTM D-1621)
<b>Tensile Strength</b>	Tear Strength 150 lbs/in	(ASTM D-4533)
	Grab Strength 99 lbs	(ASTM D-4632)
	Low Temp Brittleness >-65°F (exceeded chamber capability)	(ASTM D-746)
<b>Elongation</b>	100%	(ASTM D-4632)



<b>Ambient Maximum Temperature of Liquids</b>	320°F	(Custom)
<b>Water permeability</b>	Cathodic Protection No inhibiting effect Abrasion Resistance 75 psi	custom   (ASTM D-4886)
<b>Microbiological Resistance</b>	No Growth	(ASTM G-22)
<b>Durability</b>	No failure @ 6" rock <sup>1</sup>	(ASTM G-13 (Modified))

## BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

## ENVIRONMENTAL, HEALTH AND SAFETY

## APPLICATION INSTRUCTIONS

### APPLICATION METHOD / TOOLS

Tuff-N-Nuff® is installed in one of four ways, depending on if Rapid-Edge is used as well as pipeline diameter, available equipment, and contractor's preference. For pipelines measuring 20" in diameter or less, it is recommended that the Tuff-N-Nuff® be ordered with the factory applied Rapid-Edge self fastening hook and loop system. Unroll Tuff-N-Nuff® with Rapid Edge rolls along the top of the pipe allowing the free edges to hang down. The width of the Tuff-N-Nuff® roll is matched to the circumference of the pipe and includes a nominal overlap of 4". Secure the free edges in place by pressing the hook and the corresponding loop strips together overlapping the ends at the 6 o'clock position of the pipe for maximum protection.

When Rapid-Edge is not used for pipelines measuring 20" in diameter or less, the "cigarette wrap" method can be utilized. Unroll Tuff-N-Nuff® rolls along the top of the pipe allowing the free edges to hang down. The width of the Tuff-N-Nuff® roll is matched to the circumference of the pipe and includes a nominal overlap of 4". Secure the free edges in place with monofilament tape or nonmetallic strapping overlapping the ends at the 6 o'clock position of the pipe for maximum protection. For pipelines measuring 22" in diameter or more, 72" long Tuff-N-Nuff® pads are available from the factory cut to a width matching the circumference of the pipe. Pads are wrapped around the circumference of the pipe, with ends overlapped approximately 2" to 4" at the 6 o'clock position. Pads are secured in place with monofilament tape or nonmetallic strapping. Pads are placed in this manner along the length of the pipe with an edge overlap of 1" to 2".

The fourth method of installing Tuff-N-Nuff® is spiral wrapping. Tuff-N-Nuff® can be purchased in roll form and spiral wrapped around the pipe by hand or with a spiral wrap tape machine.

## OTHER RESTRICTIONS

See Legal Disclaimer.

## LEGAL DISCLAIMER

- KEEP CONTAINER TIGHTLY CLOSED
- KEEP OUT OF REACH OF CHILDREN
- NOT FOR INTERNAL CONSUMPTION
- FOR INDUSTRIAL USE ONLY
- FOR PROFESSIONAL USE ONLY

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