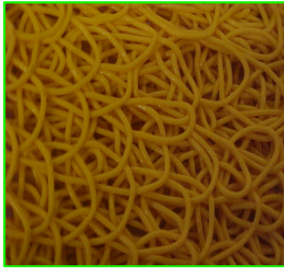




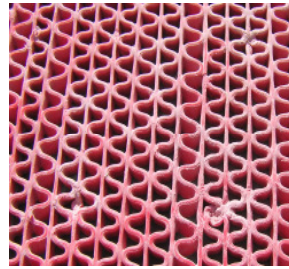
Coating, Chemical & Design Solutions Protecting Assets & Infrastructure

Primary North America Rockshield Manufacturers

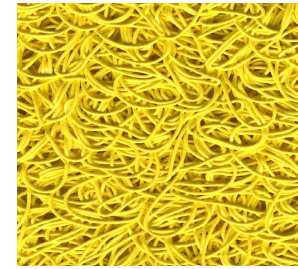
Flexible PVC Rockshields



Tuff-N-Nuff (Sika)

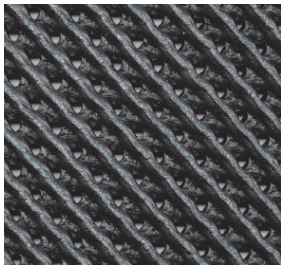


RedOne (Keymay)

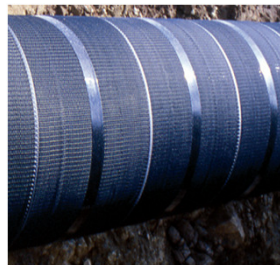


IVI Rockshield

Polyethylene Rockshields



Foamed 3/8" Polyethylene
(Boddington's)



Wrapid Shield PE
3/8" Polyethylene
(CANUSA)

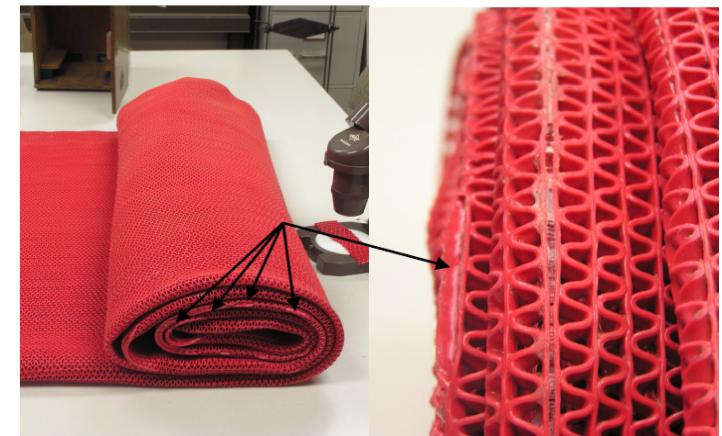
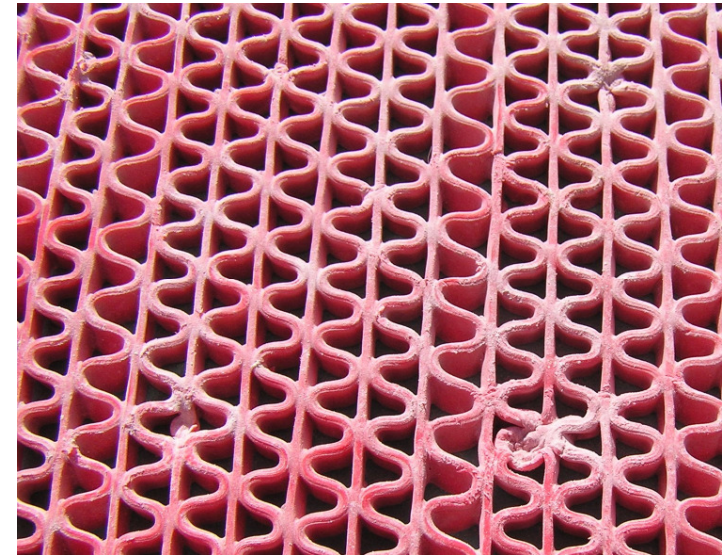


.16" Thick Polyethylene Mesh

Flexible PVC Rockshields

RedOne by Keymay

- Red-One is of mesh construction, which transfers more impact load directly to the pipe coating (cannot absorb the blow like a strand product)
- Initially used as a floor matting in China/India, not created as a rockshield
- Has gained some acceptance among some owners and engineering firms
- Strong presence in Canada, now a presence in the USA as well
- Only available in ¼" thickness, so it really shouldn't even be considered an equal to 3/8" TUFF-N-NUFF
- Made in China – availability problems have been seen on big jobs, especially in USA
- It has been seen that roll widths greater than 34" have glued seams, known to separate



DETERMINING PIPELINE COATING PERFORMANCE

Actual ASTM G-13 Test Procedure

- 35 lbs of 3/4" diameter stones
- Drop from height of 6 feet
- Through a funneling "chute"
- 10 repetitions or until a holiday is discovered
- Designed to test the durability of pipeline coatings



DETERMINING ROCKSHIELD PERFORMANCE

Modified ASTM G-13 Test

- 55 lbs of stones
- 1 ½" diameter stones
- Drop from a height of 6 ft
- Through a funneling “chute”
- 10 reps or until a holiday is discovered
- Increase stone size, and repeat



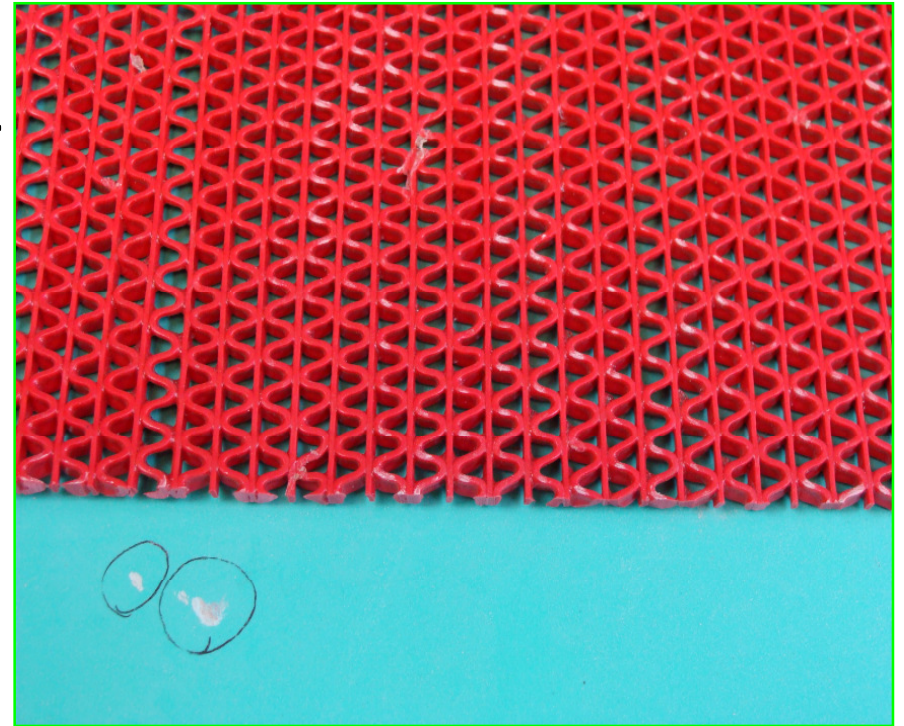
TESTING MEDIUM



- 1/4" x 12" x 12" steel plate
- Coated with 16 mil of Fusion Bonded Epoxy from Bayou Pipe Coating Company

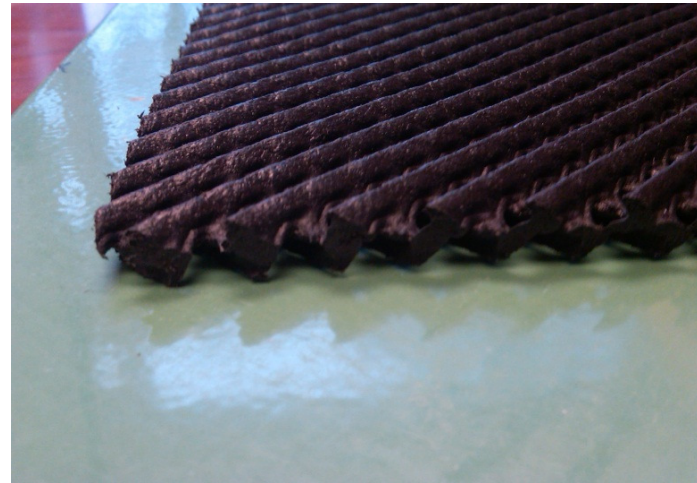
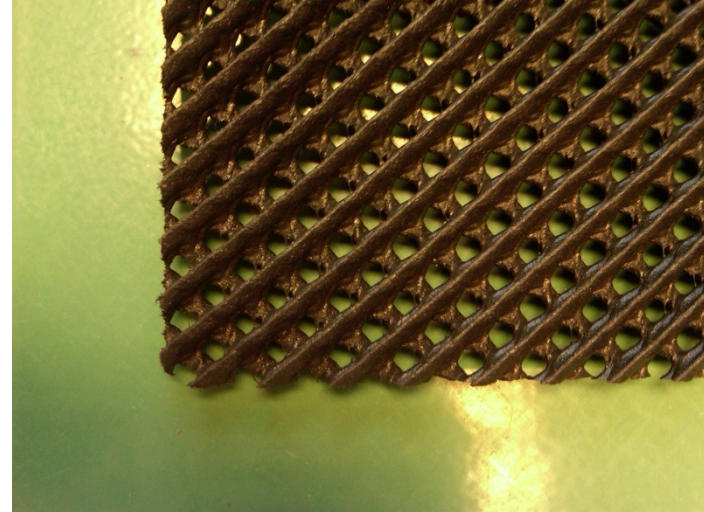
FLEXIBLE PVC MESH – REDONE

- Holidays were detected after the 4th drop of 3"stones



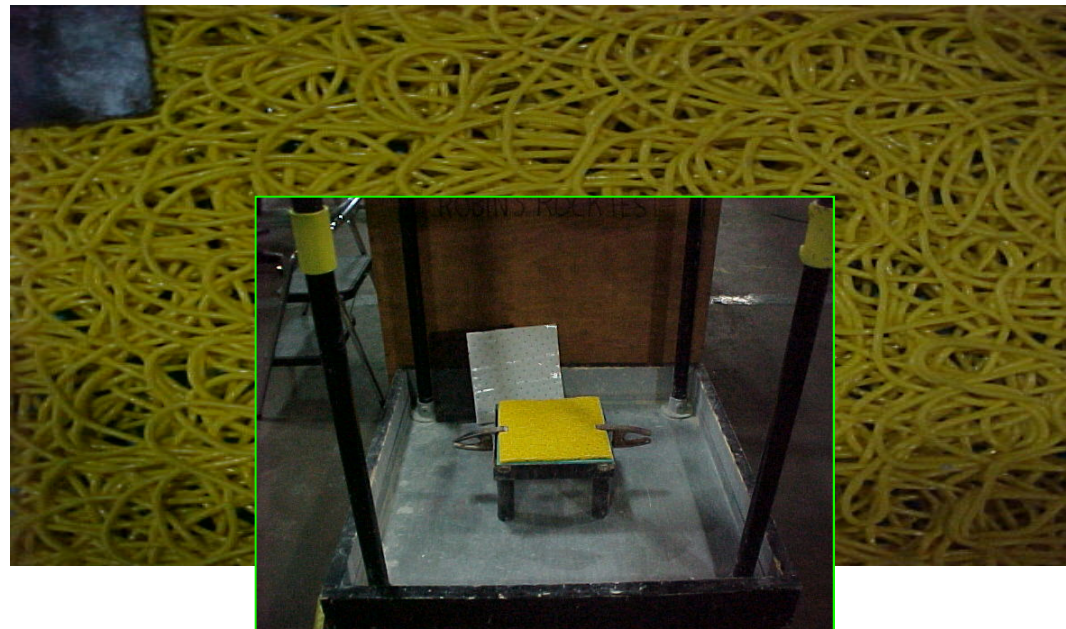
FOAMED PE MESH – ROCKGUARD HD

- Endured 10 drops of 3” stones
- Holidays were detected after the 5th drop of 4” stones



#1 IN IMPACT RESISTANCE: TUFF-N-NUFF

- 10 drops @ 55 lbs of 1 ½" diameter stones
- 10 drops @ 55 lbs of 3" diameter stones
- 10 drops @ 55 lbs of 4" diameter stones
- 3 drops @ 55 lbs of 6" diameter stones



RESULTS OF GREENSTREAK'S ASTM G13 MODIFIED TEST RESULTS

