Vac Excavation

March 21st, 2019

Discussion Topics

- Best Practices
- Test program
- Keys to success in HDD applications
- Dielectric misconceptions
- Disposal

Best Practices

- **GTI recommendations widely accepted/Ditch Witch.com- Dig Safe**
  - Maximum water pressure
  - Technique when excavating
  - Minimum distance between nozzle and utility
  - Heated water limitations

Test Program

- Explore consequences of different variables
  - Nozzle selection
  - Materials (type of utility)
  - Distance
  - Water pressure
  - Exposure
  - Water temperature
- **Intent was to define threshold of no damage**

Test Parameters

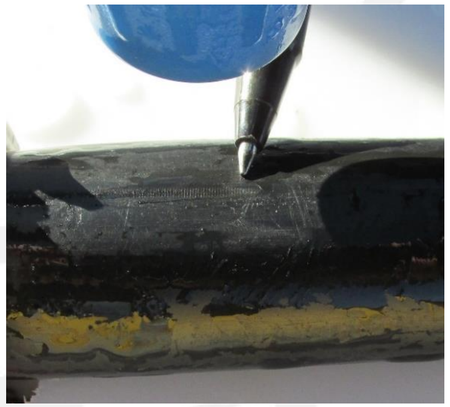
- 0.5” to 8” distance
- Exposure: 5 sec, 10 sec and constant movement
- Up to 3,000 psi
- Nozzles
    - Fan (15^{o} F angle)
    - Conical #1
    - Conical #2
    - Linear

Ambient and 180^{o} F

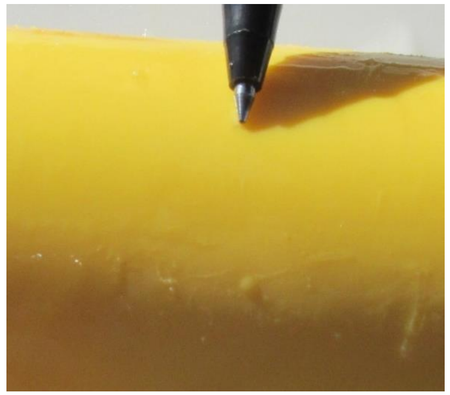
Various products

Results

Types of Utilities Tested



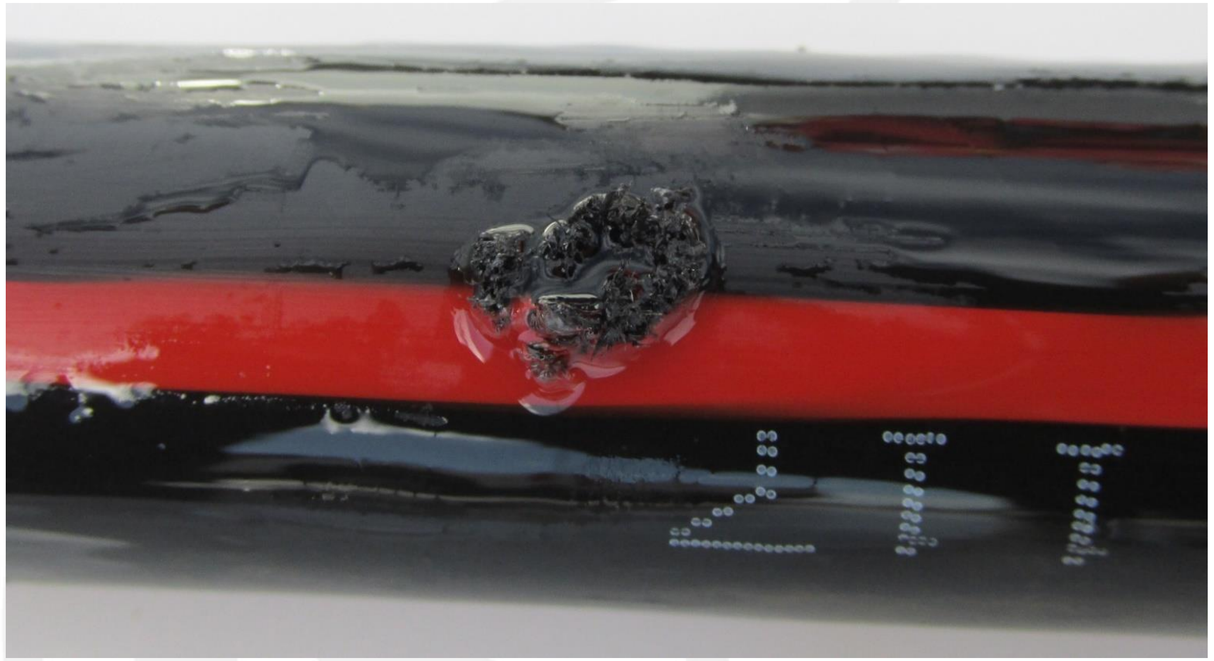
Fiber optic



Gas

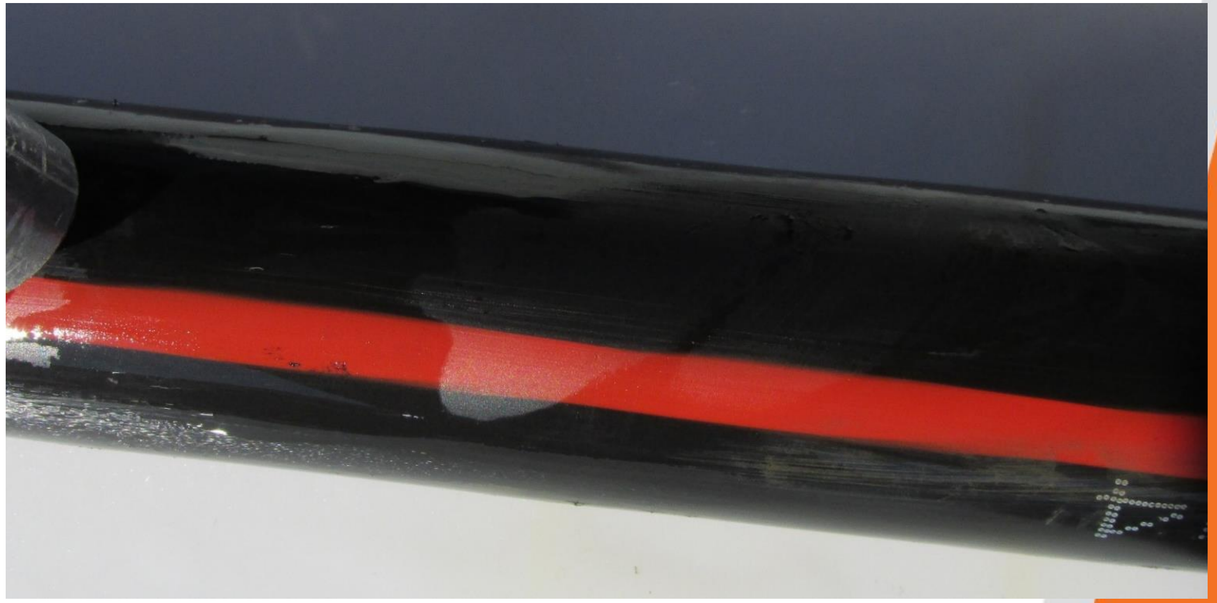
Old electric line

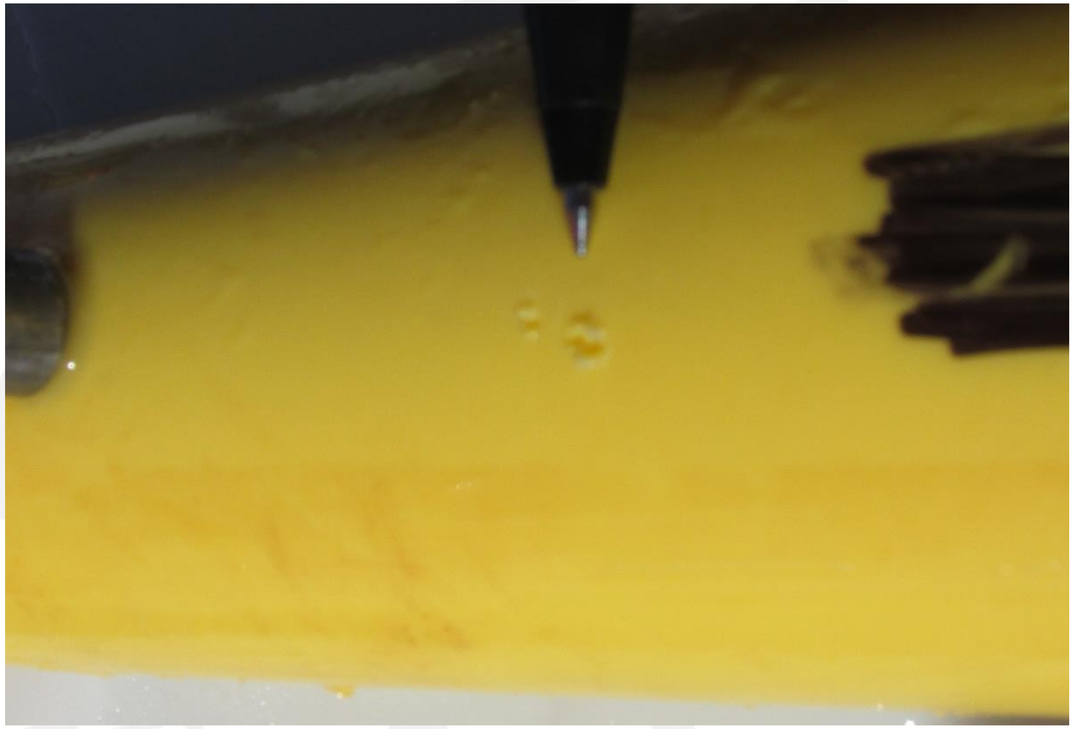
New electric



Fan
0.5” distance
1,500 psi
5 sec
Ambient temp

Conical #2
0.5” distance
3,000 psi
10 sec
Ambient temp



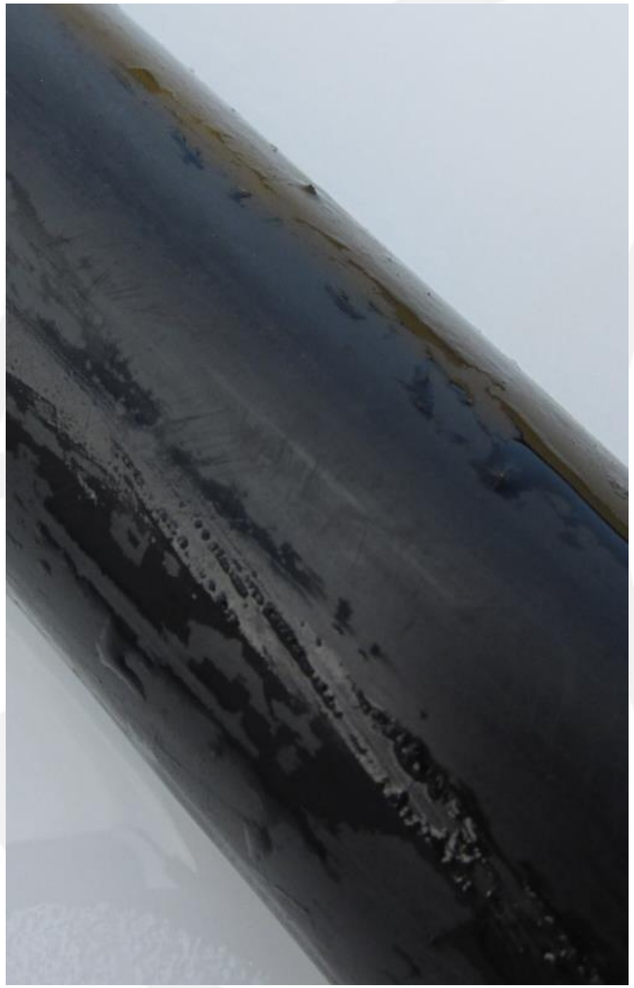


Fan
0.5” distance

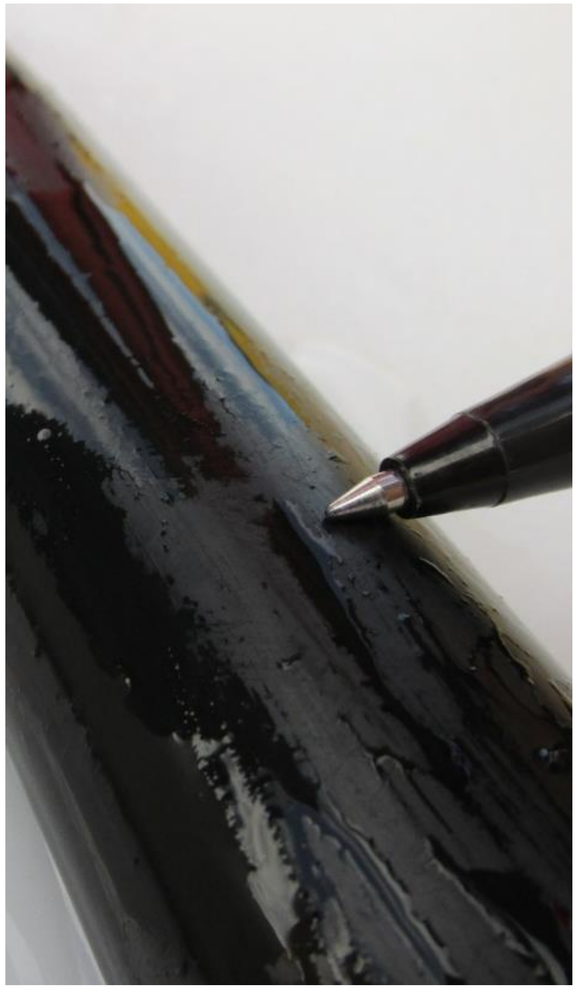
2,000 psi
5 sec
Ambient temp

Conical #1
0.5” distance

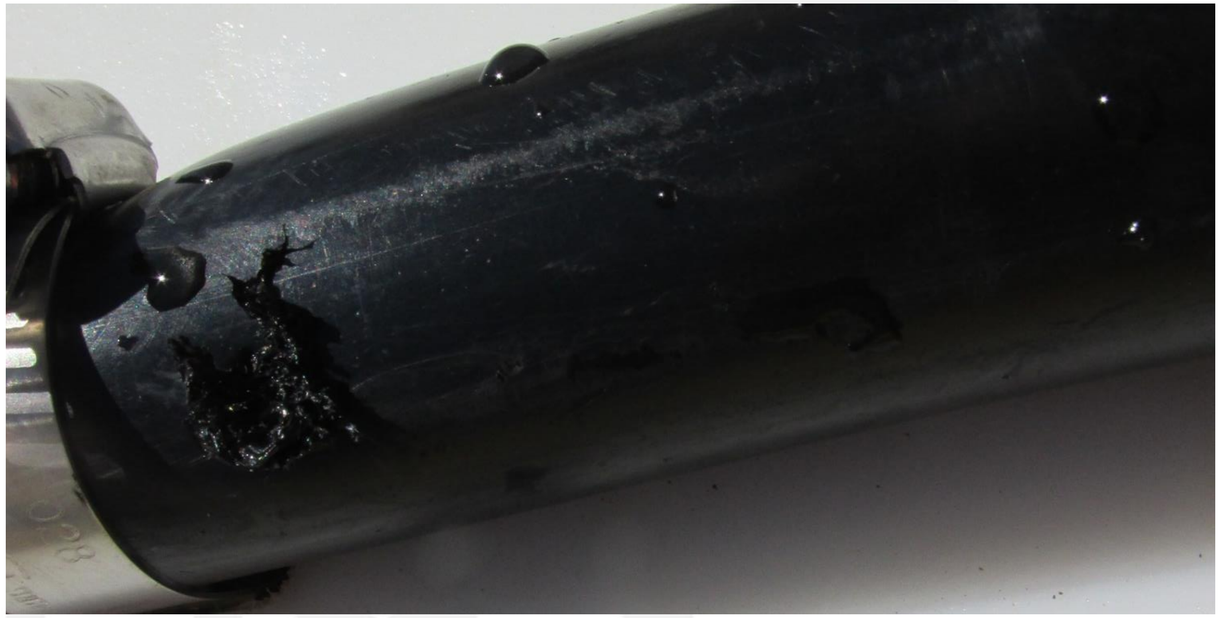
3,000 psi
10 sec
Ambient temp



Linear
0.5” distance
2,000 psi
10 sec
Ambient temp

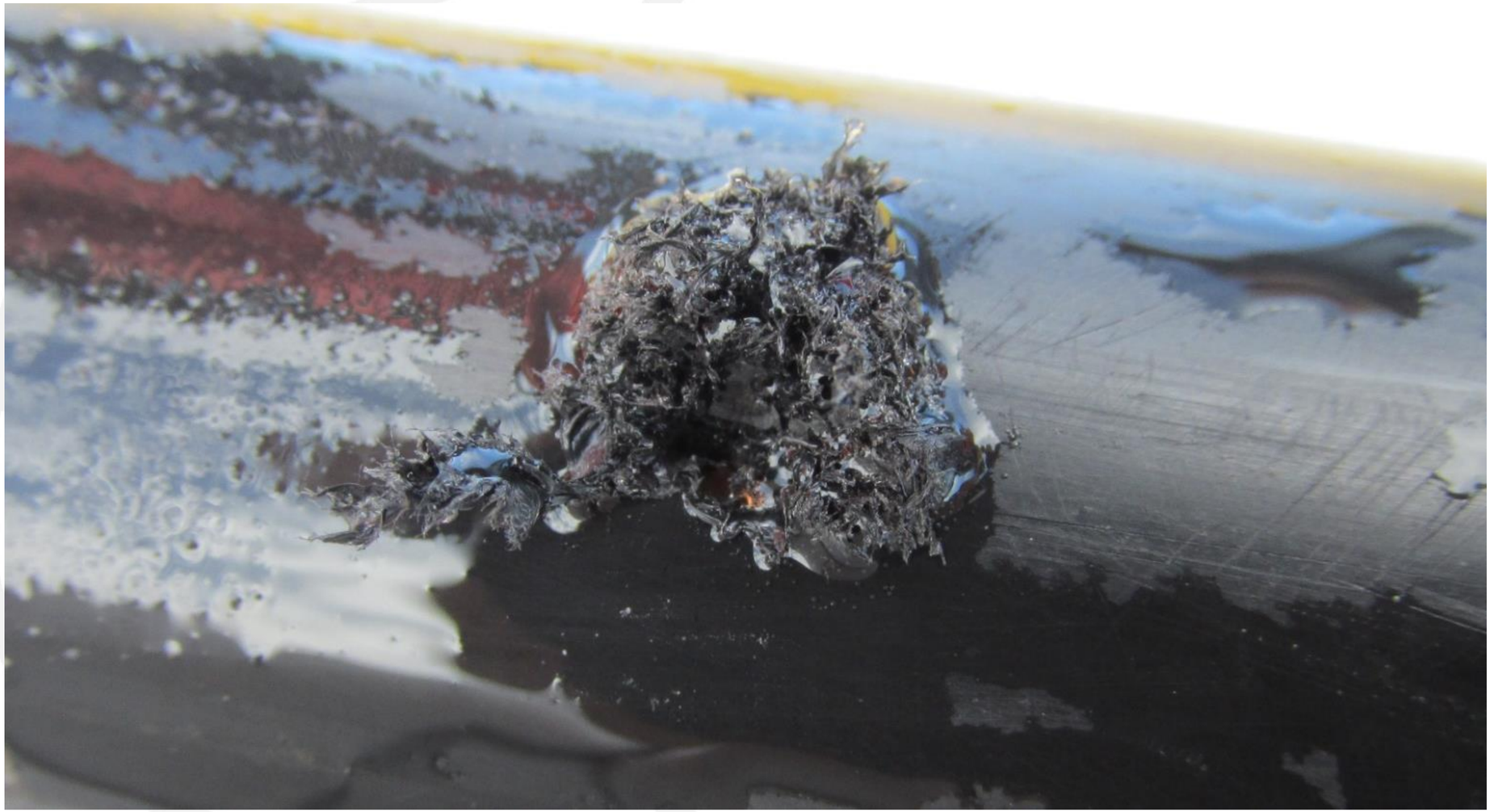


Linear
0.5” distance
2,000 psi
5 sec
Ambient temp



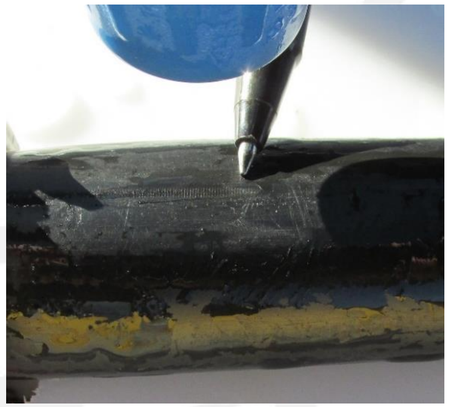
Linear
8” distance
2,000 psi
10 sec
Ambient temp

Linear
0.5” distance
2,000 psi
10 sec
Ambient temp

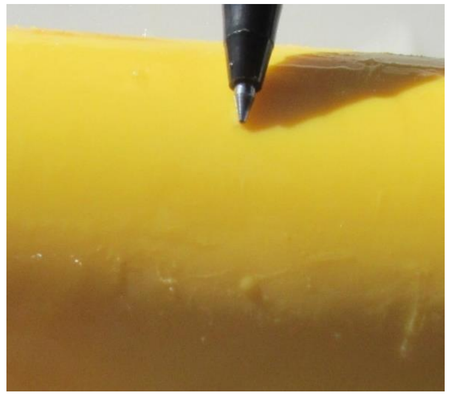


Linear
0.5” distance
2,500 psi
10 sec
Ambient temp

Conical #1



Fiber optic
0.5”
3,000 psi
5 sec
Ambient temp



Gas
0.5”
3,000 psi
10 sec
Ambient temp

Old electric line
0.5”
2,500 psi
5 sec
Ambient temp

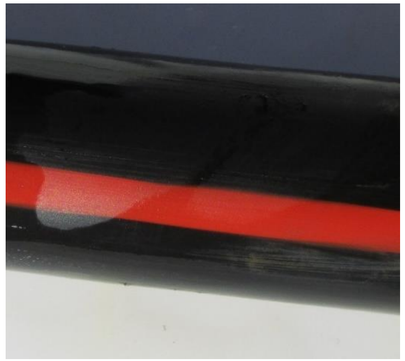
New electric line
0.5”
2,500 psi
10 sec
Ambient temp

Conical #2

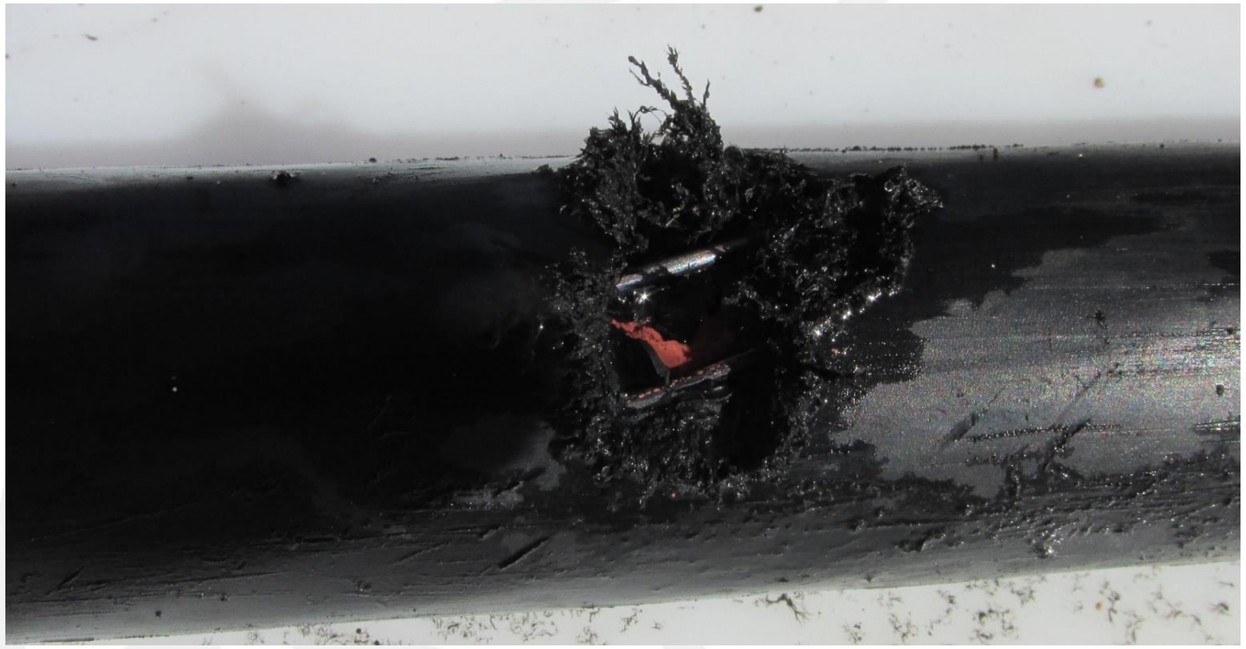
Fiber optic
0.5”
3,000 psi
10 sec
Ambient temp

Gas
0.5”
3,000 psi
10 sec
Ambient temp

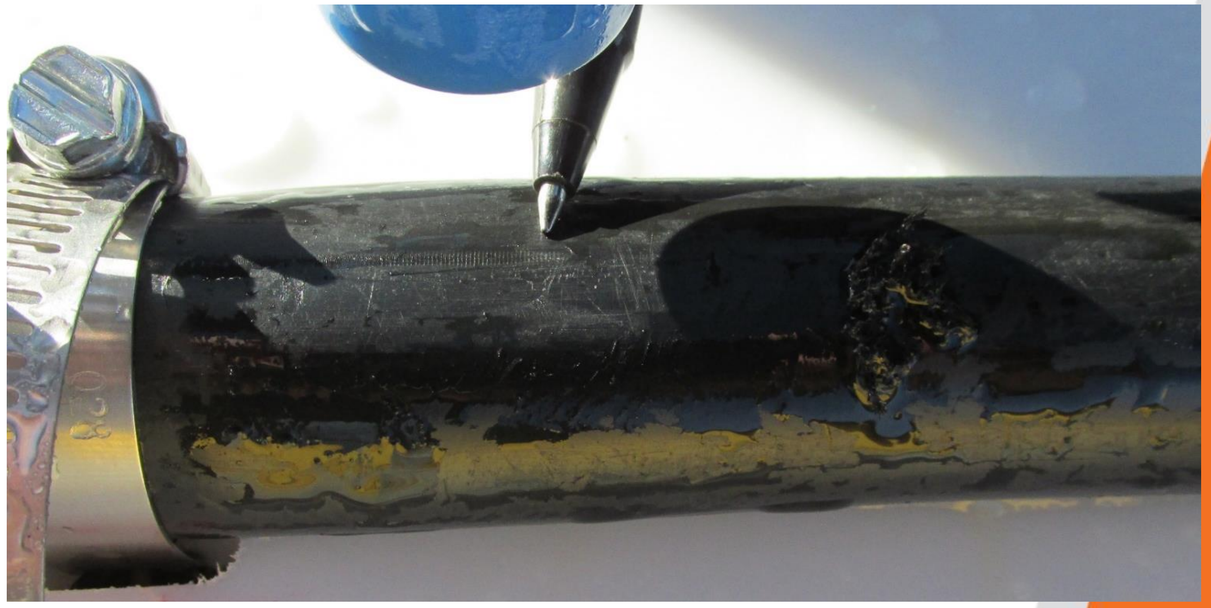
Old electric line
0.5”
3,000 psi
10 sec
Ambient temp



New electric line
0.5”
3,000 psi
10 sec
Ambient temp



Conical #1
0.5” distance
2,500 psi
10 sec
180◦ F



Conical #1
0.5” distance
2,500 psi
10 sec
Ambient Temp

Key Findings

- Nozzle selection is critical
- Exposure: Constant motion reduces damage
- Water temperature has noticeable impact

Nozzle Summary

- Four important considerations
  - Fan: Not recommended for exposing utilities
  - Linear: Not recommended for exposing utilities
  - Conical #1: Excellent performance at all distances
  - Conical #2: Excellent performance at all distances

Recommended Procedures

- Select proper nozzle
- Adjust pressure and/or temperature as needed
- Keep tip of nozzle in motion
- Don’t insert nozzle into soil
- Nozzle should never touch utility
- Keep loose spoils removed for visibility

HDD Applications

Success in HDD Application

- Many contractors are exposing utilities
- Increasing number leaving utility exposed while crossing and backreaming
- Alternative is measure depth and document with photos

Dielectric Misconceptions

Dielectric

- Increased discussion about dielectric tools
- All dielectric materials are insulators, not all insulators are dielectric
- Dielectric boot requirements are dictated by a standard (ASTM F1117)
  - “Dielectric boots,” therefore, has strict definition
- Vacuum tools are not dictated by a standard
  - Stating “dielectric” does not tell the entire story

METAFLO technologies™

A Solid Solution

MetaFLO Technologies Introduction

Ditch Witch®

www

www.MetaFLOtech.com

Applications

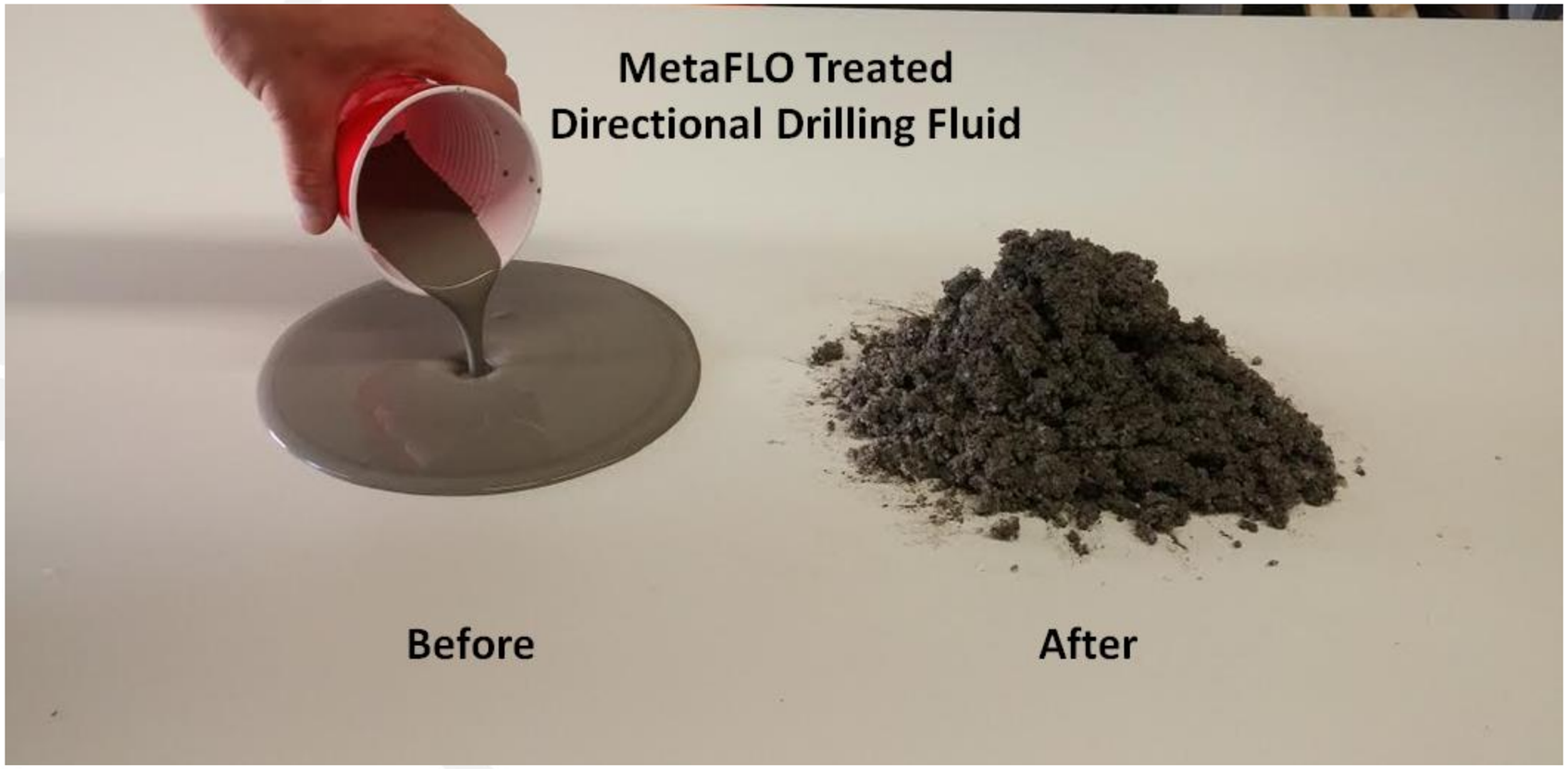
HDD

Hydrovac

Ditch Witch®

METAFLO technologies

Before and After



In field bulk mixing of hydrovac mud

Case study - Hydrovac

Before

After

Large bore HDD site set-up example

Solidified HDD Fluid with LMS and MF002

Bulk mixing – hydrovac offload

Questions?