

# **Casing Centralization for SET Using Spray Metal Technology**

**ETF, Houston – Nov 2<sup>nd</sup> & 3<sup>rd</sup> 2011**

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**WearSox LP**

# Stabilizers built entirely of Spray Metal



For  
Casing-  
or Liner-  
Drilling

Replacing  
machined  
IBS's

# Centralizers using Spray Metal stops

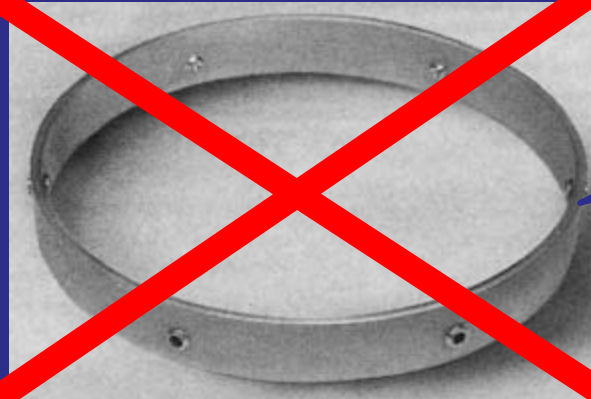
13-5/8" Bowsprings to pass thru' 14.5"



Spray Metal  
Stop Rings

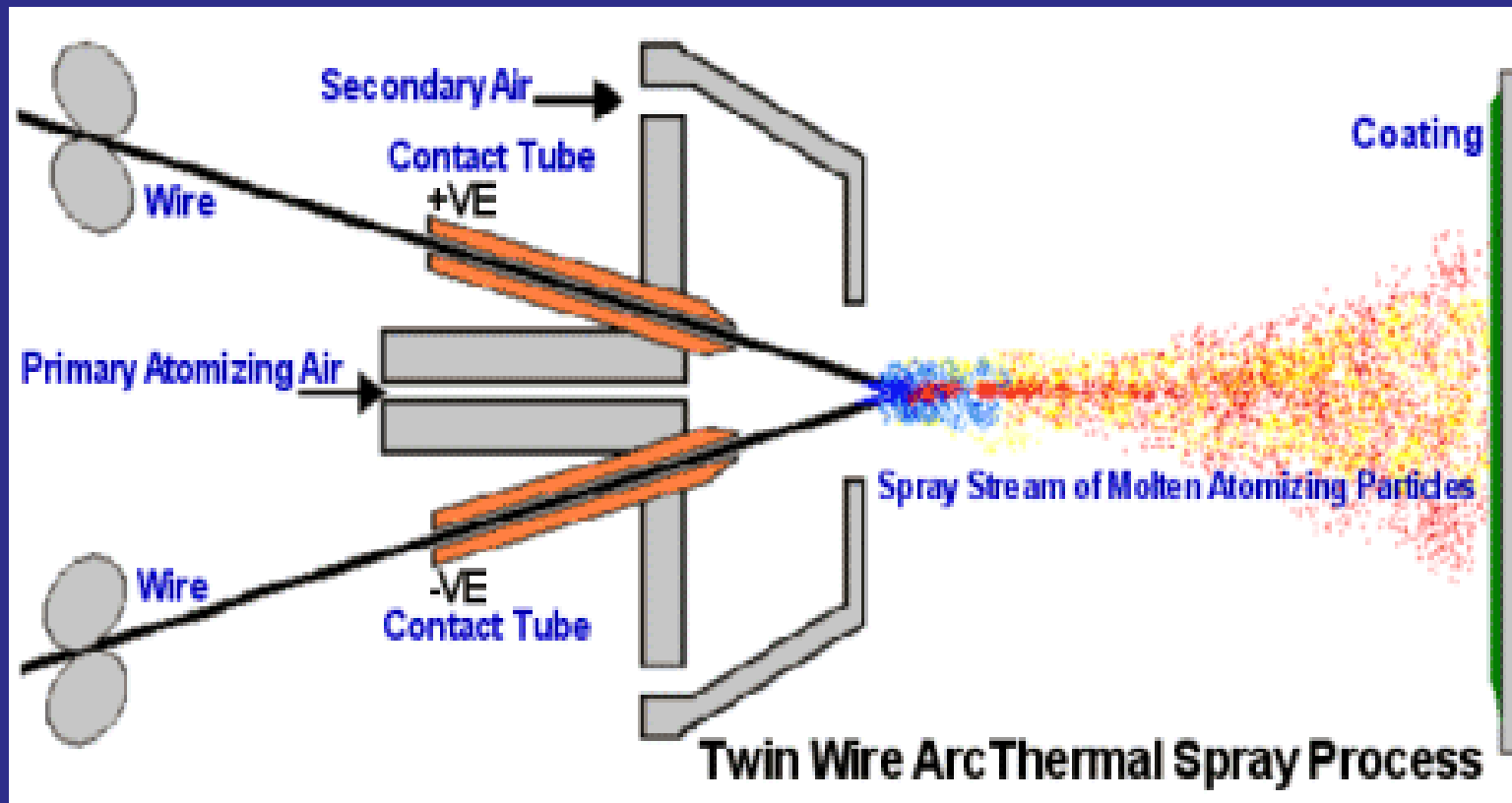
# Casing Centralization 101

- On upset or flush connections centralizers can no longer rely on the casing collar for location
- SET must not be marked or scored



**Set Screw  
Stop Collar**

# The Spray Metal Process



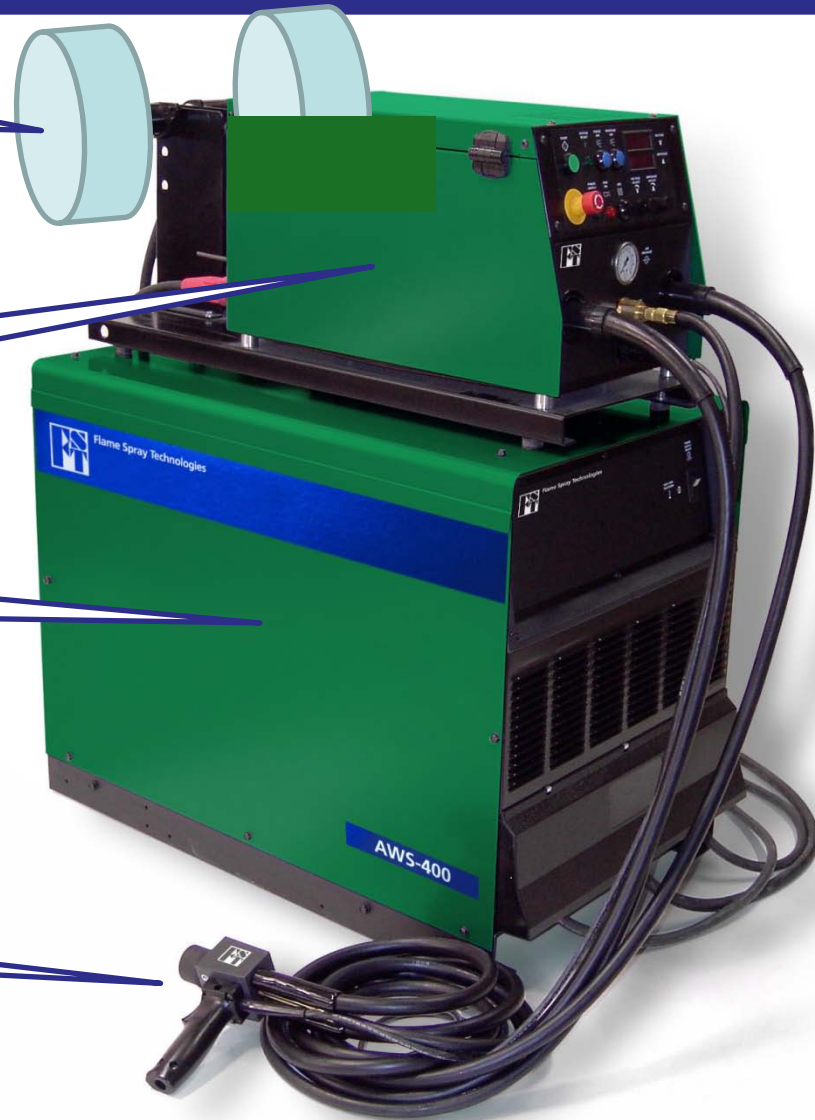
# The Spray Metal Process

Two Wire Spools

Controls & Wire Drive

Power Supply

Spray Gun



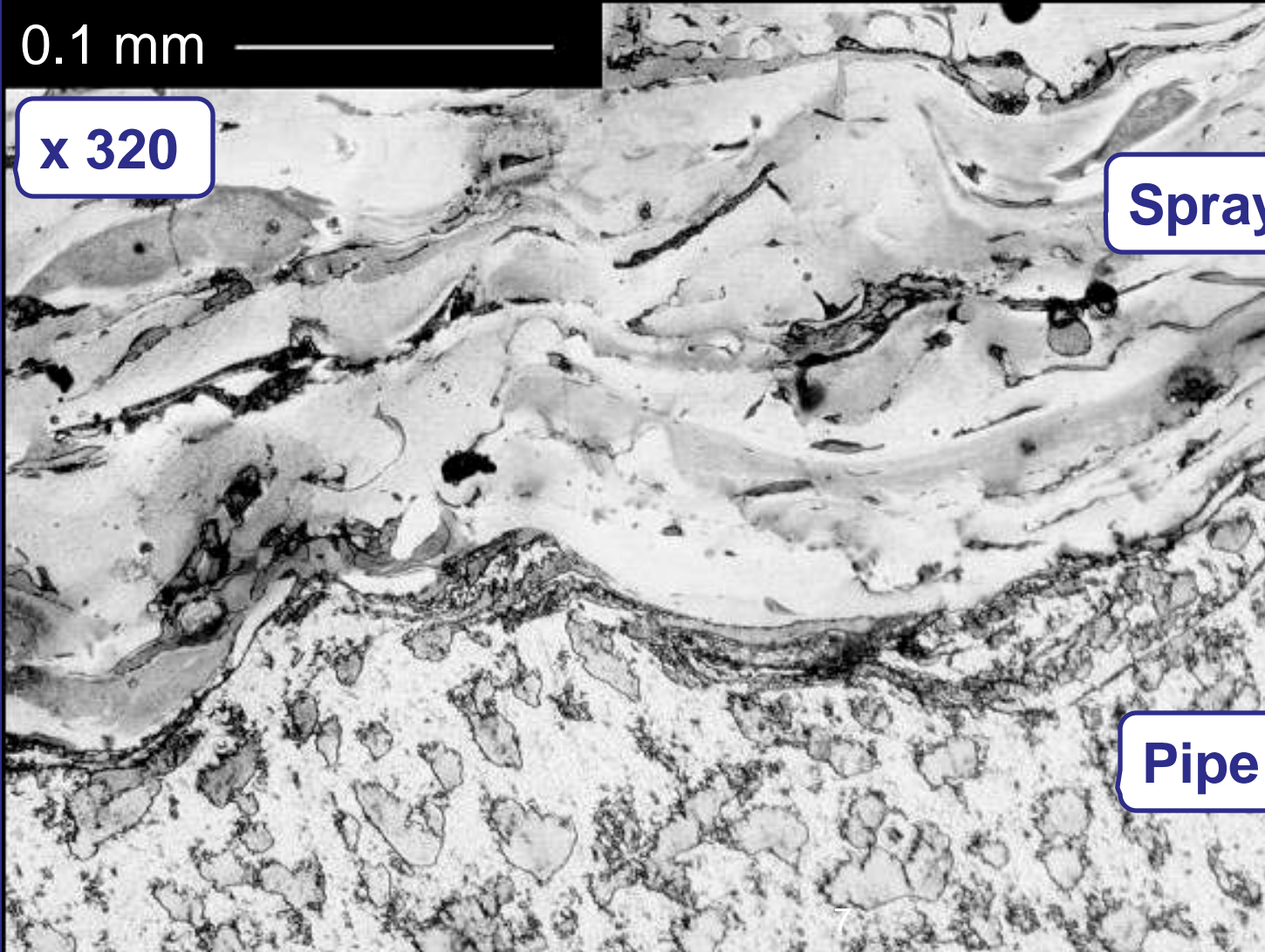
# The Spray Metal Process

0.1 mm

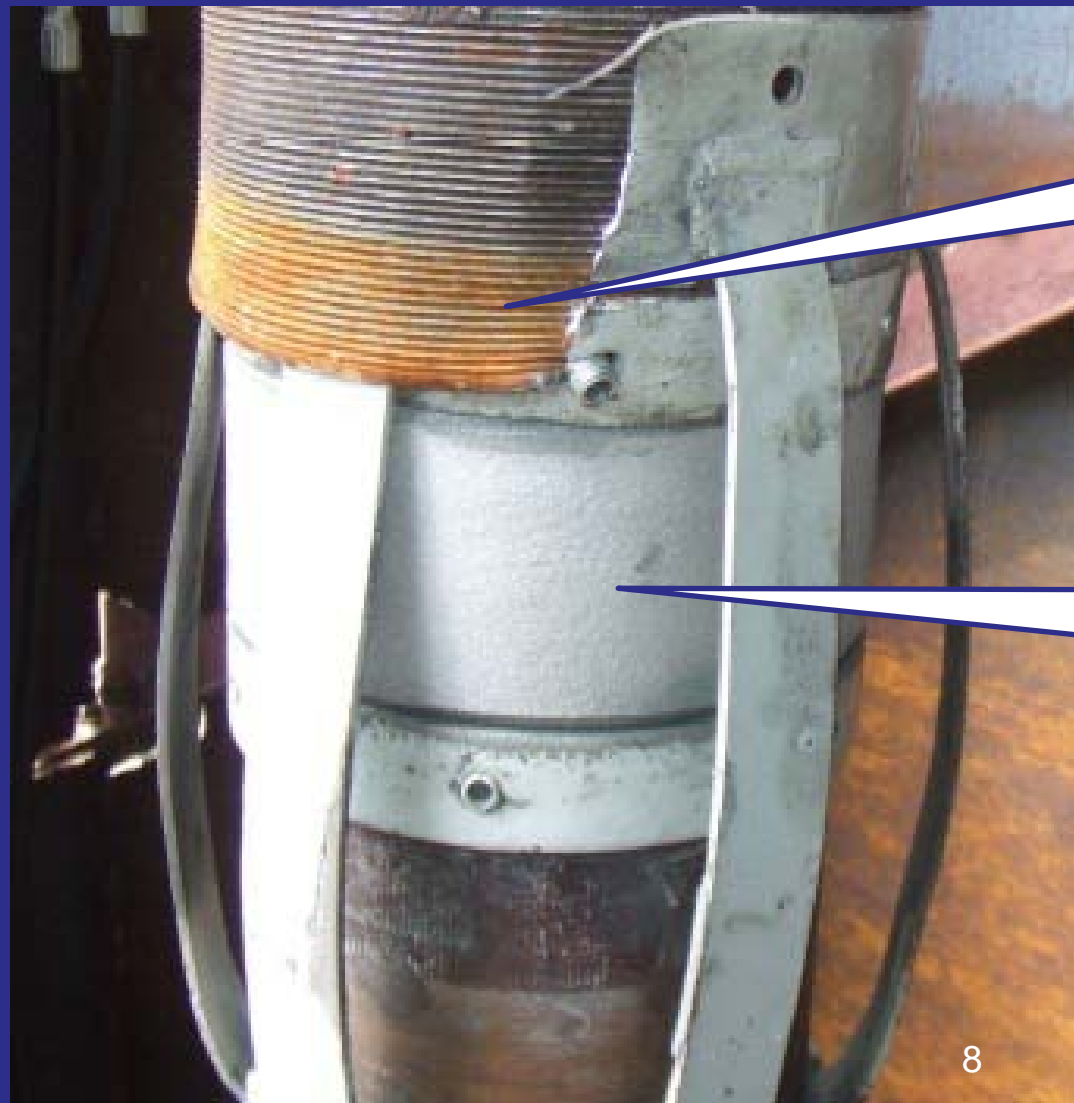
x 320

Spray Metal

Pipe Steel



# Testing the Result



**Push Pipe  
@ 155 klbs**

**Spray Metal  
Stop Ring  
4" x 1/4"**

# Centralizers using Spray Metal stops

11-7/8" Unibody to pass thru' 12.25"



Flow channels  
through 12.20"  
stop rings to  
reduce  
circulating  
pressure

# Centralizers using Spray Metal stops



**Bowsprings  
with internal  
spray metal  
stops.**

**Allows rotation**

# Centralizers using Spray Metal stops



**Use Solid  
Bodies  
where  
clearances  
allow**

# Centralizers built entirely of Spray Metal

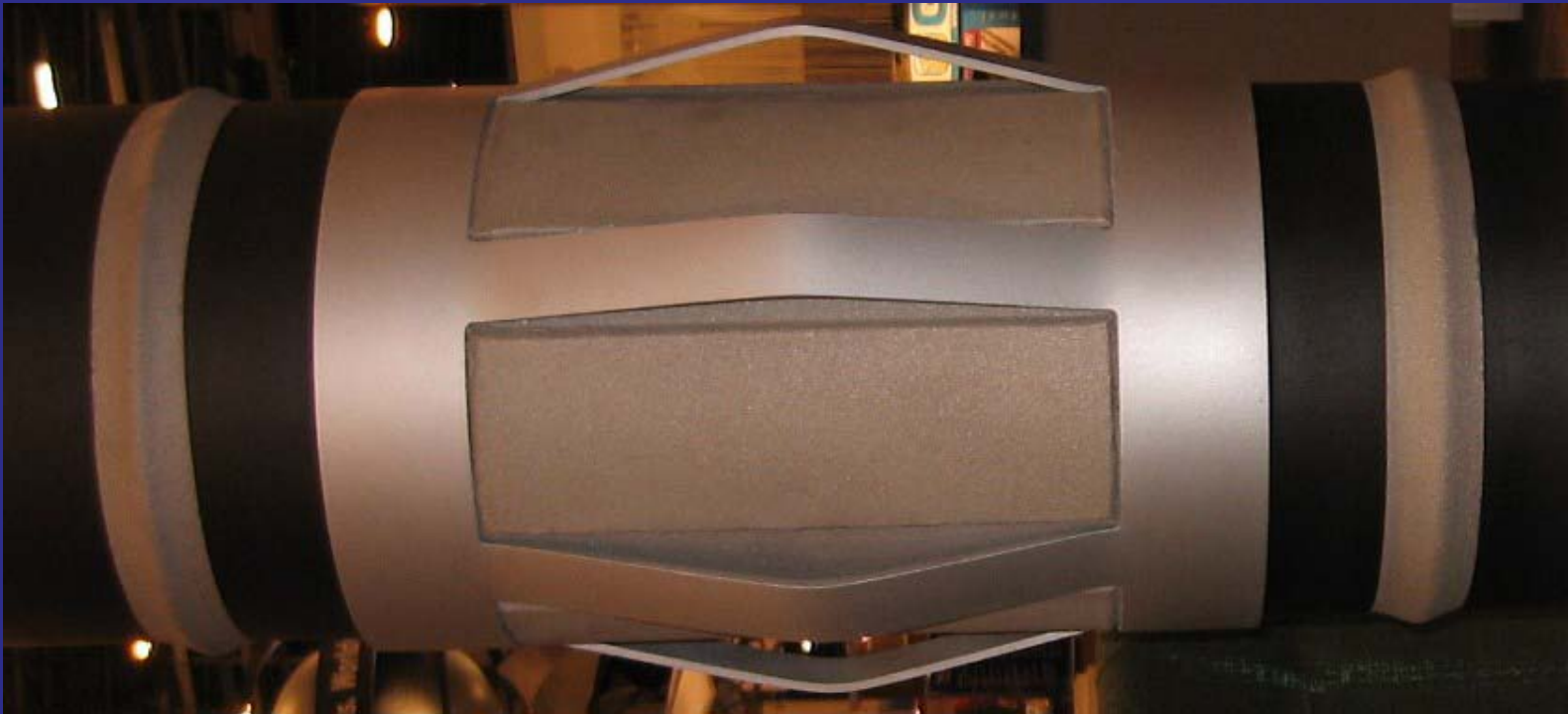


The simplest designed centralizer has three straight blades.

Helical blades provide better stand-off.

# Centralizers using Spray Metal stops

9-7/8" Unibody with Internal Anchors



# The Aftermath



7-5/8" 29.7 lb/ft SET expanded 15.7%

# Shapes We Have Tested



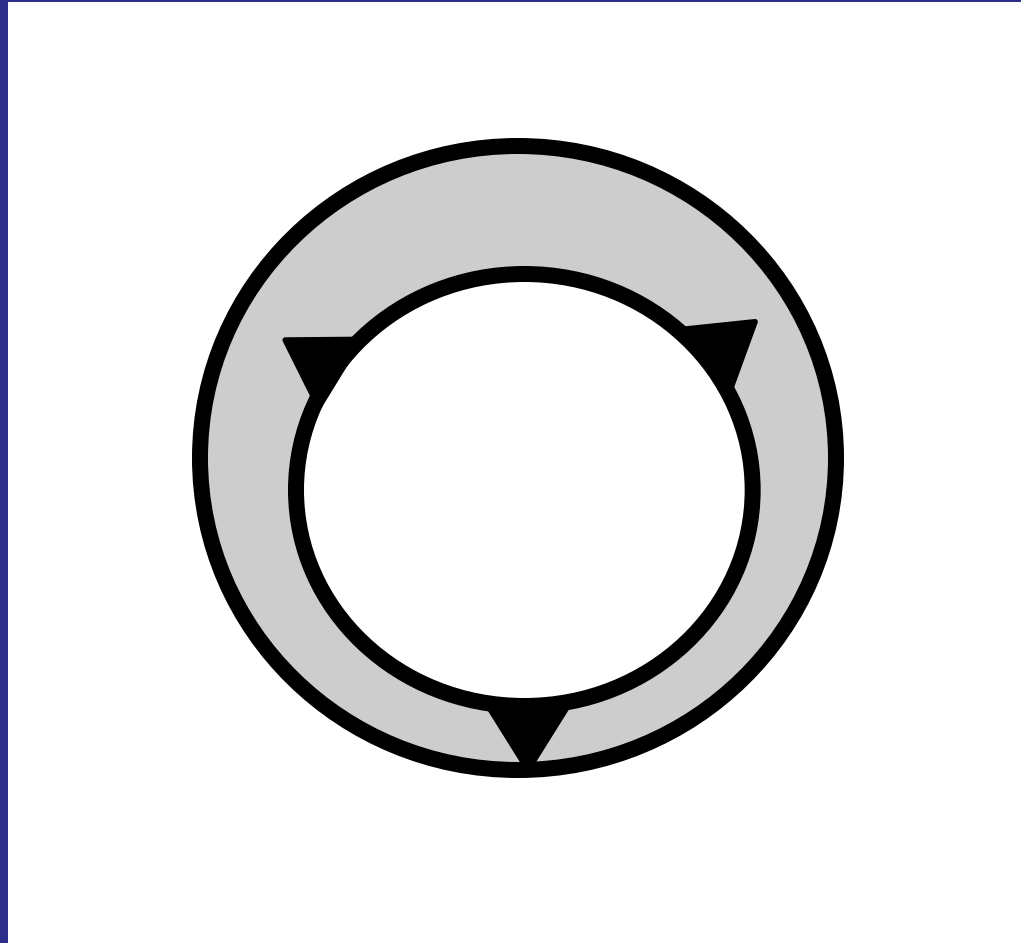
# All Shapes are Possible



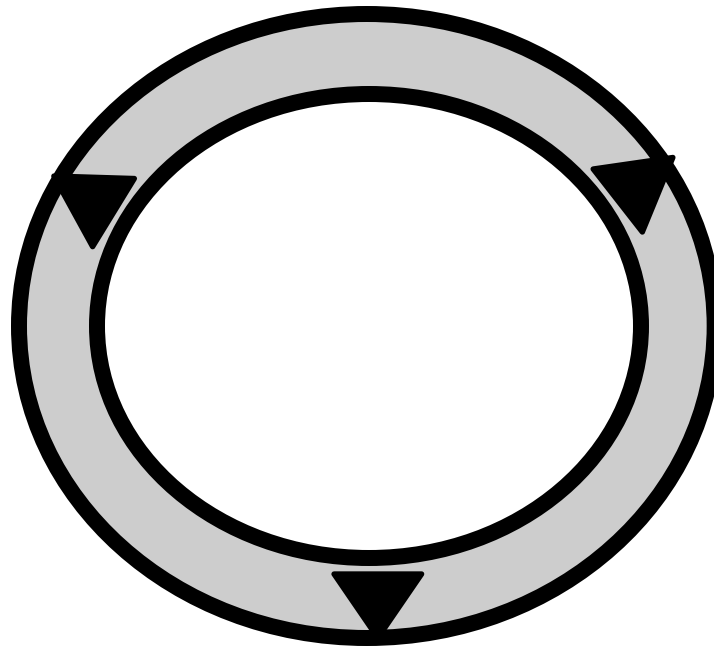
# Critical Factors

- **Centralization will help prevent differential sticking while RIH with casing**
- **Once on depth, centralization will facilitate longitudinal shrinkage, also by reducing the chance of differential sticking**
- **During expansion the spalled pieces will stay in place in the wet cement and still centralize the expanded pipe**

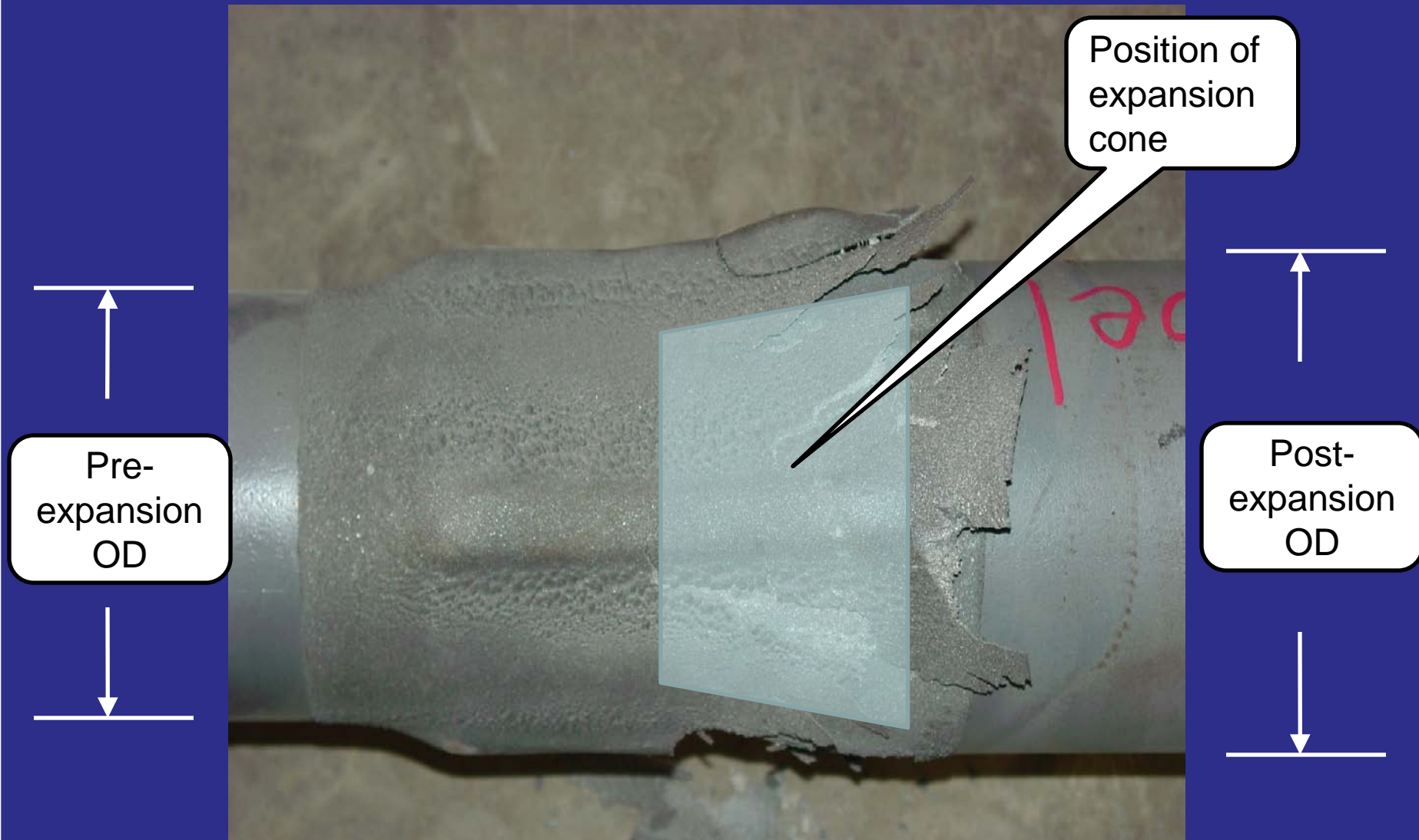
# Centralized, Unexpanded



# Expanded, Centralized



# Expansion in Process

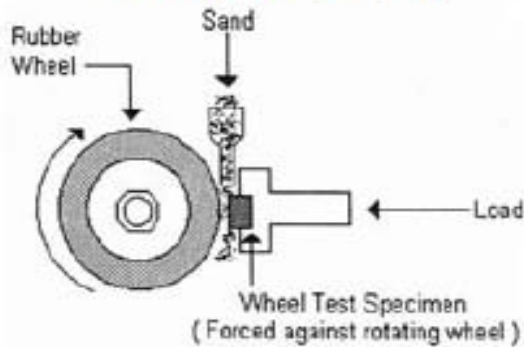


# Testing @ Rijswijk

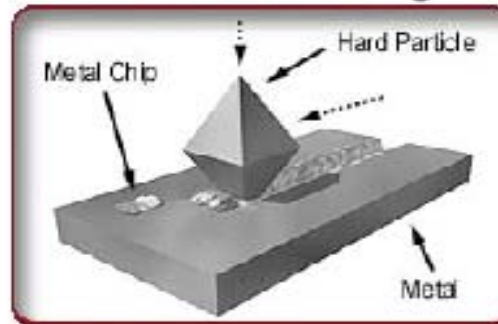
## *Worn Surface Analysis*

**Sample # 50, BASE, Alloy type VM 50**

### **Abrasive testing**



### **Scratch testing**



### **Sample view after testing**



### **Worn area after abrasive testing**

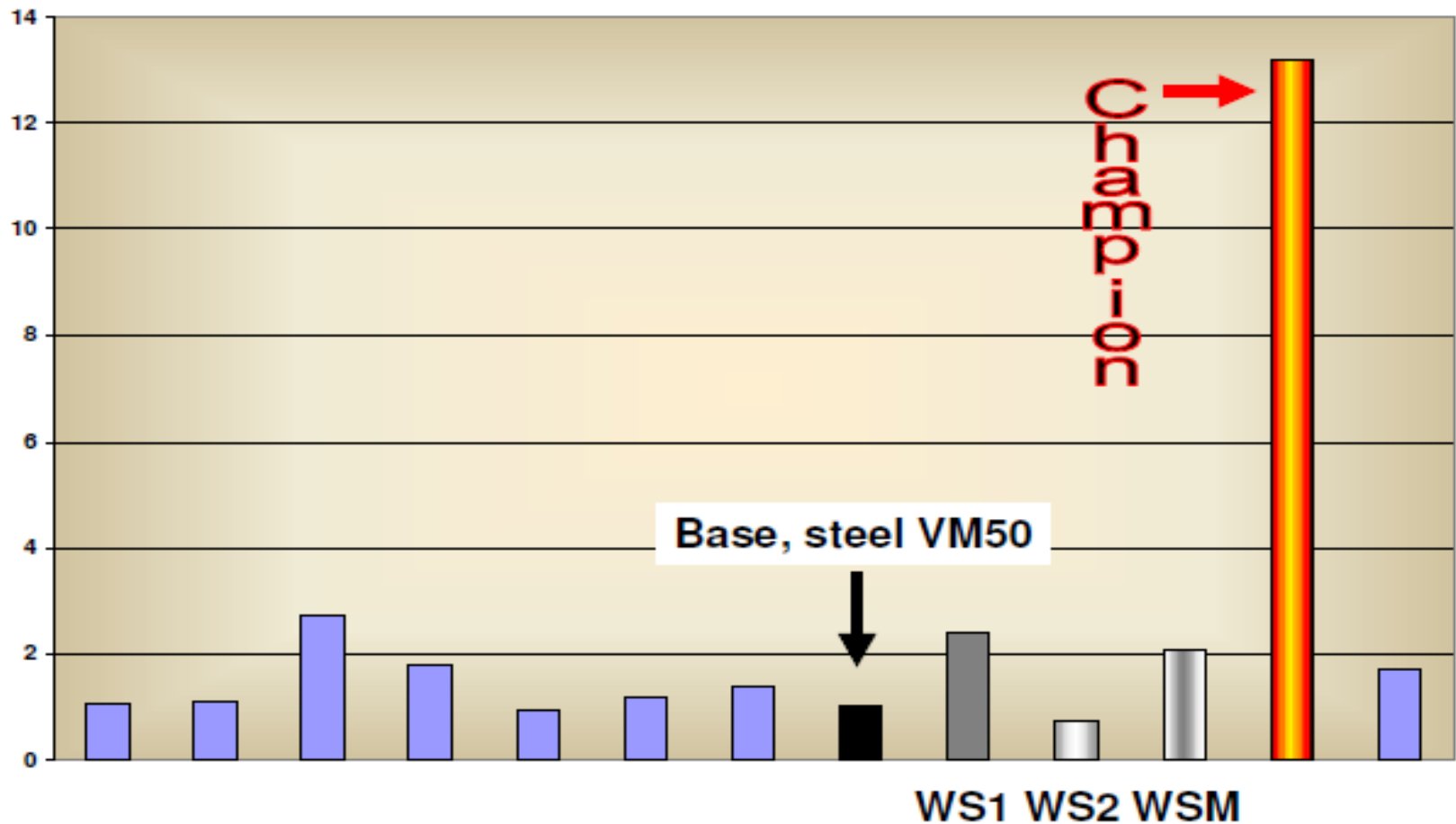


### **Top view after scratch testing**



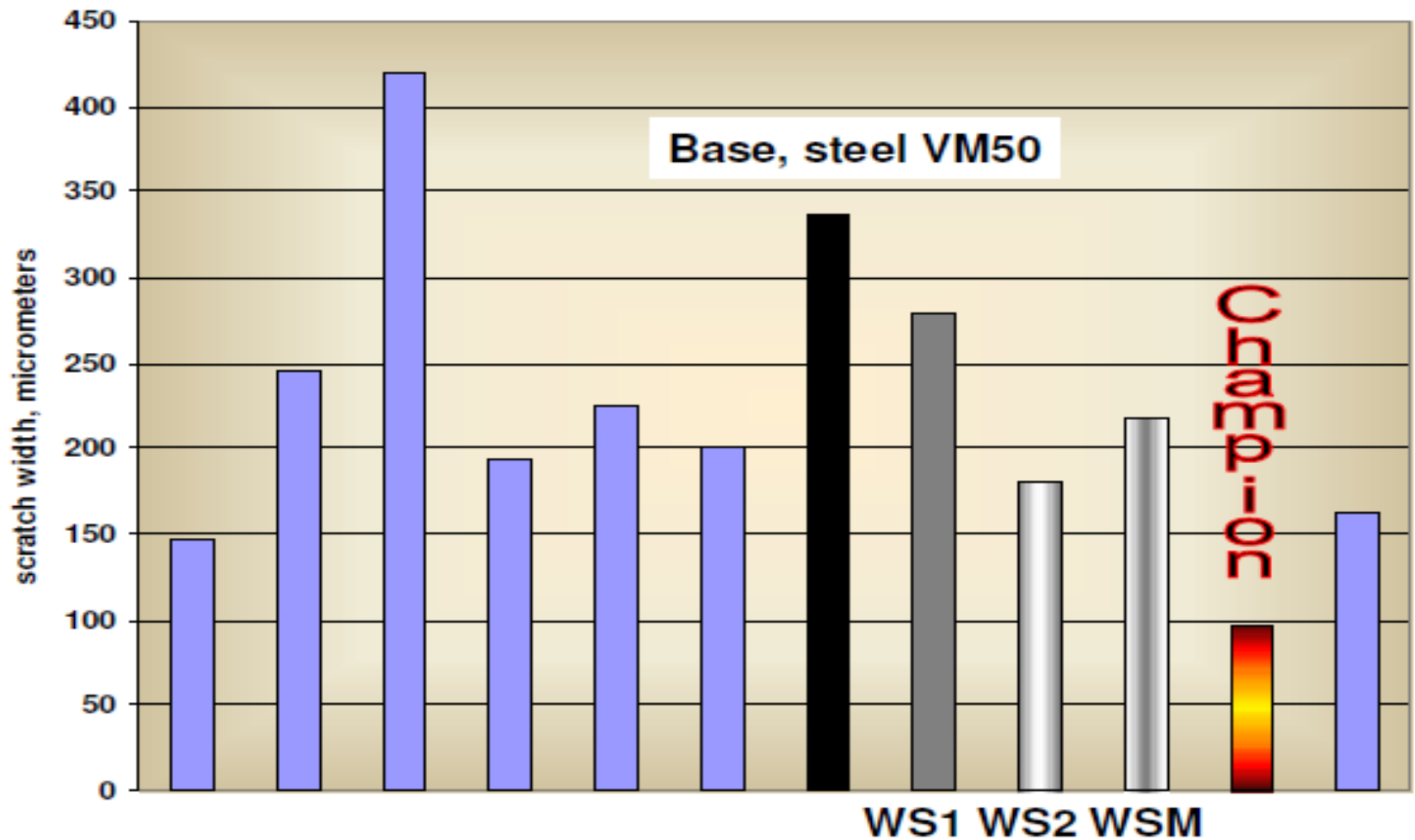
# Rijswijk Results 1/2

*Abrasive Wear Resistance Improvement (times)*

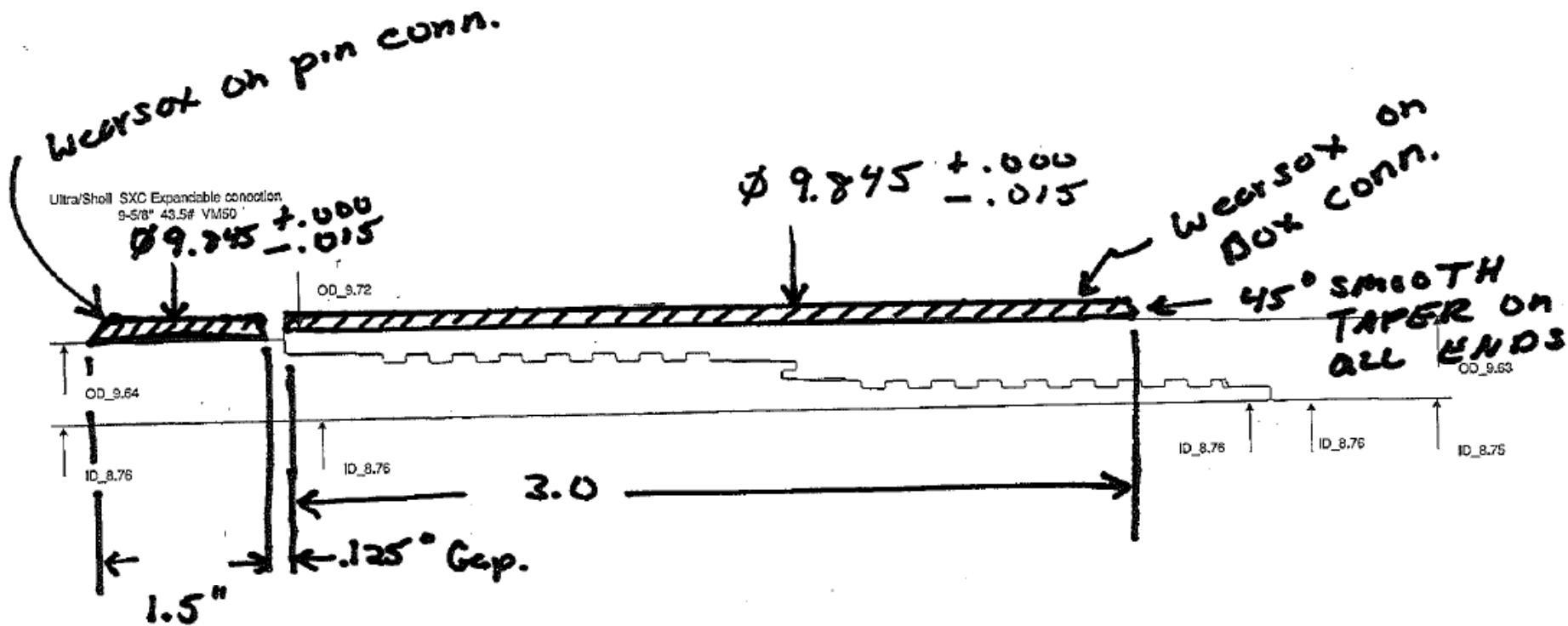


# Rijswijk Results 2/2

## Scratch Testing Results



# Spray Metal Wear Sleeves



# Case Histories

- No news is good news!
- When a job leaves our facility we seldom hear anything further
- Comments from the audience?
- 
- 
-

# Conclusions

- **Spray Metal is proving to be an enabling technology in many downhole applications**
- **It is now a “mainstream” product in DW GOM and other areas**
- **Its strength and durability make it suitable for centralizing SET**
- **It fails passively and its presence on the pipe does not appear to affect the expansion process**

# Casing Centralization for SET Using Spray Metal Technology



**Thank You**