

Life-Cycle Cost (\$/ft²) 60-Year Life

Hot-Dip Galvanizing	\$1.60
Inorganic Zinc	\$5.16
Inorganic Zinc/Epoxy	\$8.07
Inorganic Zinc Primer/Epoxy Intermediate/ Polyurethane Topcoat	\$10.04
Acrylic WB Primer/ Acrylic WB Intermediate/ Acrylic WB Topcoat	\$14.82

Total Cost of 60-Year Project

Hot-Dip Galvanizing	\$48,000
Inorganic Zinc	\$154,800
Inorganic Zinc/Epoxy	\$242,100
Inorganic Zinc Primer/ Epoxy/ Polyurethane	\$301,200
Acrylic WB Primer/ Acrylic WB Intermediate/ Acrylic WB Topcoat	\$444,600

GalvanizeIt!

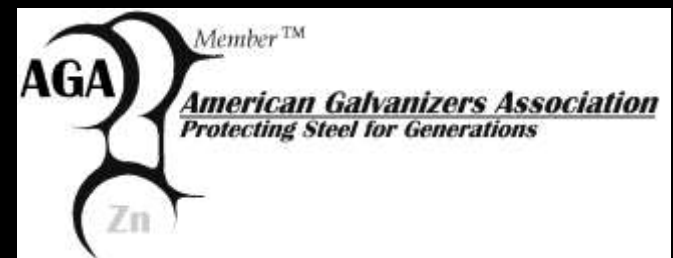
Thank You!

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Bayu Undan Gas Recycling Conoco Phillips 30,000 sq.mtr.



Cellar Deck/Flare Tower

SEIC 25,000 sq.mtr.





“All commonly practiced
welding and cutting
techniques can be used on
Galvanized Alloyed steel”

American Welding Society

D – 19.0

Welding Zinc Coated Steel

Preparation of Weld Area

“weld area should be free of Galvanizing, 1 to 4 inches back, both sides, top and bottom”



Preparation of Weld Area

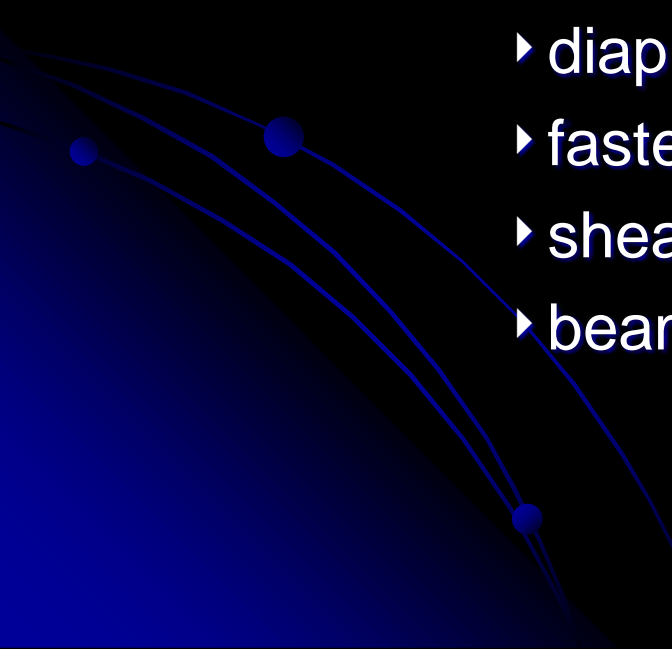
Removing the Galvanizing

- 1) Grind it off
- 2) Burn it off
- 3) Apply Galva Stop before Galvanizing

Cost Analysis of The Stearns Bayou Bridge



Stearns Bayou Bridge

- First fully galvanized bridge in the US
 - Built in Michigan 1965
 - All steel components were galvanized
 - ▶ handrail
 - ▶ diaphragms
 - ▶ fasteners
 - ▶ shear connectors
 - ▶ beams
- 

Stearns Bayou Bridge Options

Option 1: **\$5,500.00**
Paint the steel structure

Option 2: **\$8,700.00**
Galvanize the structure

**Preparation
costs
Were not
included**

Ohio County Bridge



Design for Galvanizing

A Ohio County Bridge Study

Cost Study of a truss 129 ft long x24 ft wide

5 gauge galvanized bridge floor

galvanized railing

Necessary hardware

Option 1:

Fully

Galvanized

A 572 Steel

\$180,237.00

Option 2:

Blasted and

painted

A 572 Steel

\$168,625.00



Maintenance Costs

\$16.00 per square foot

$$3096 \text{ ft}^2 \times \$16 = \text{\textcolor{red}{\$49,536}}$$

Option 1:

Fully

Galvanized

A 572 Steel

\$180,237.00

Option 2:

Blasted and

painted

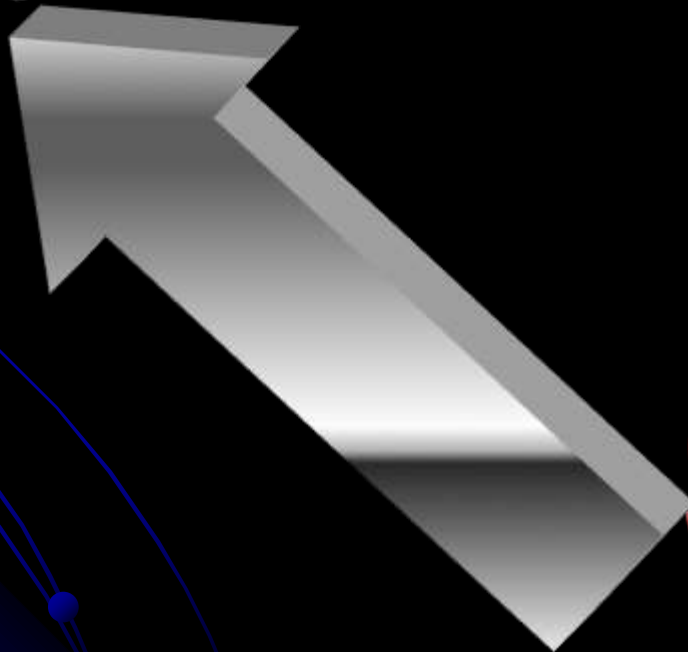
A 572 Steel

\$168,625.00

+ Maintenance

\$49,536.00

\$218,161.00



Safety Issues

The cost of repainting is small compared to the safety issues and the cost of maintaining safety throughout the project! These numbers are not figured in to the comparisons.

CASTLETON BRIDGE

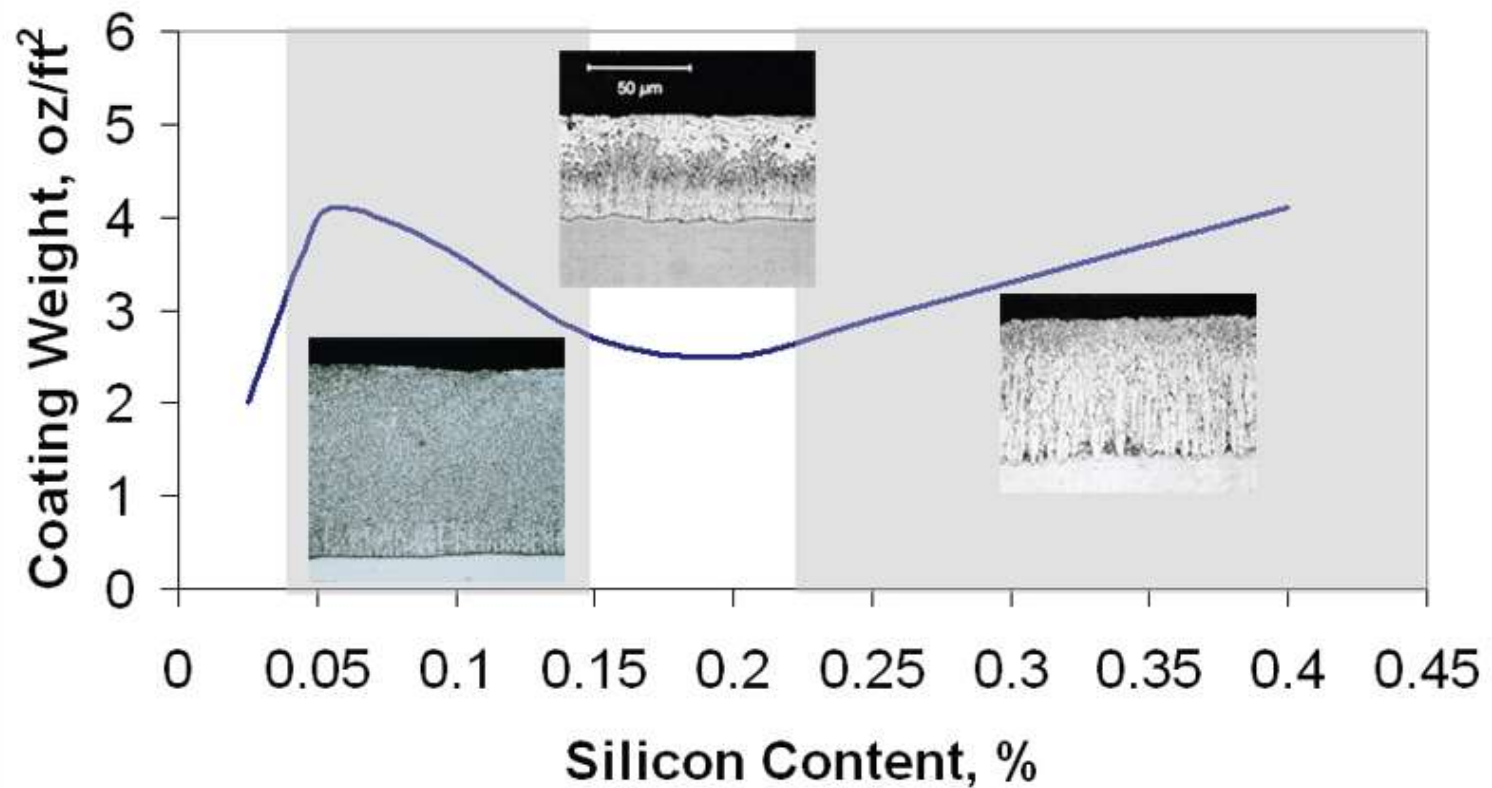
A GALVANIZED STEEL PERFORMANCE REPORT



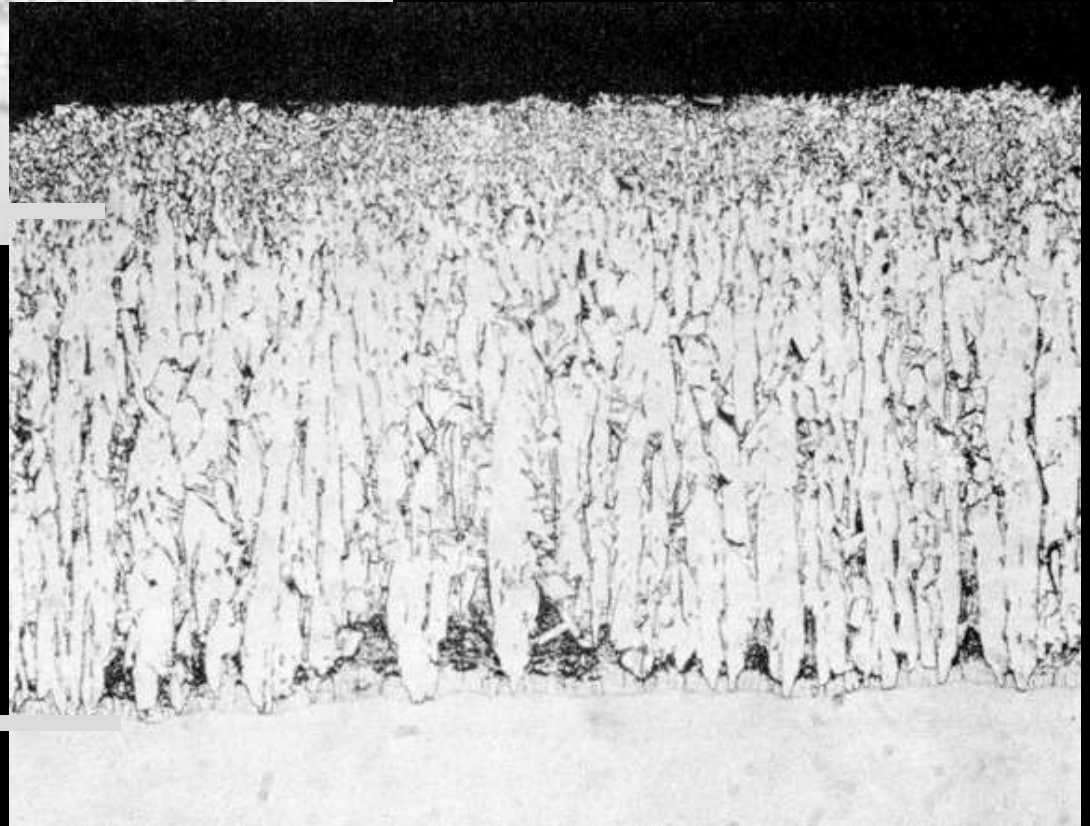
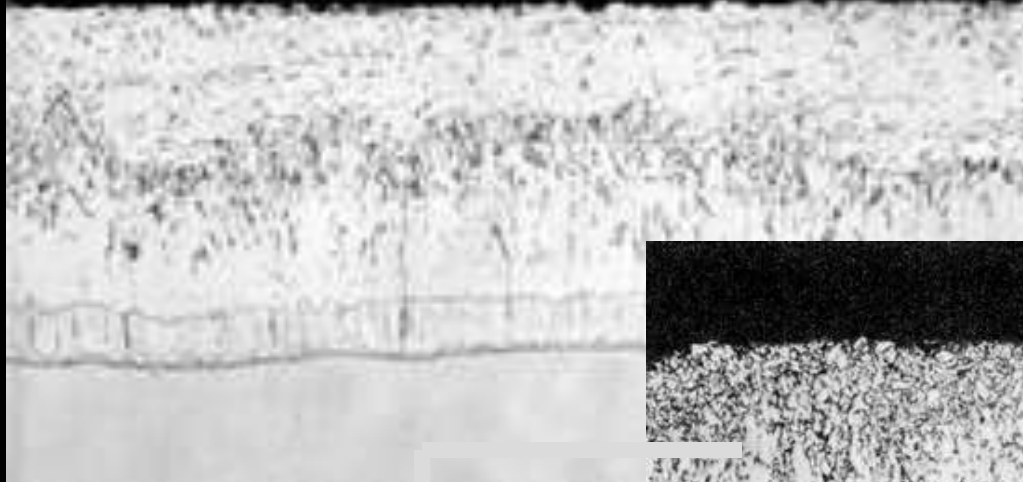
SUBJECT:

Steel Chemistry

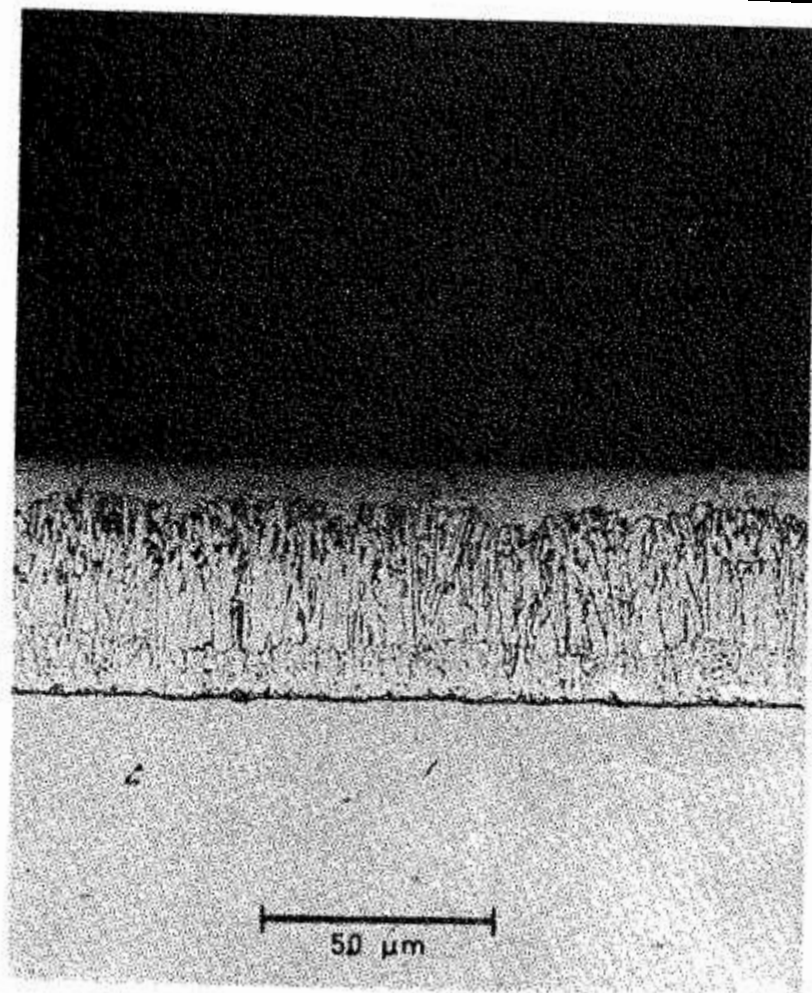
Sandelin Curve



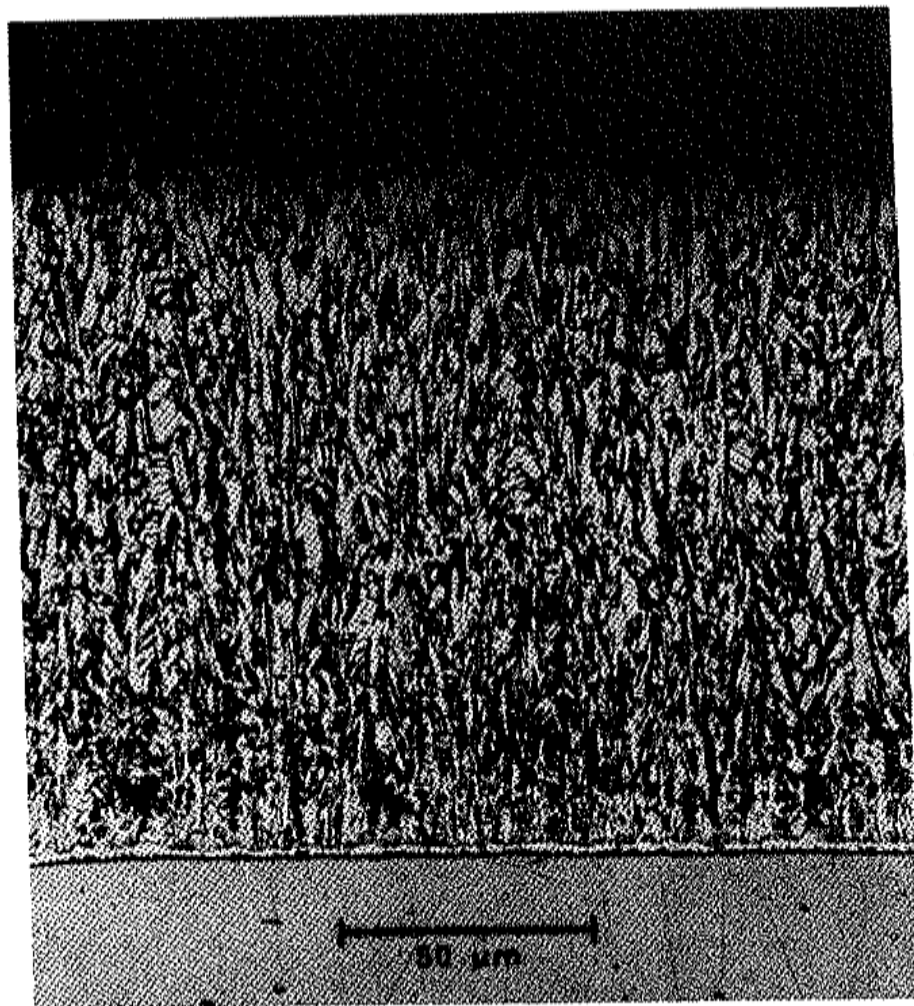
Typical Zinc-Iron Alloy Layers



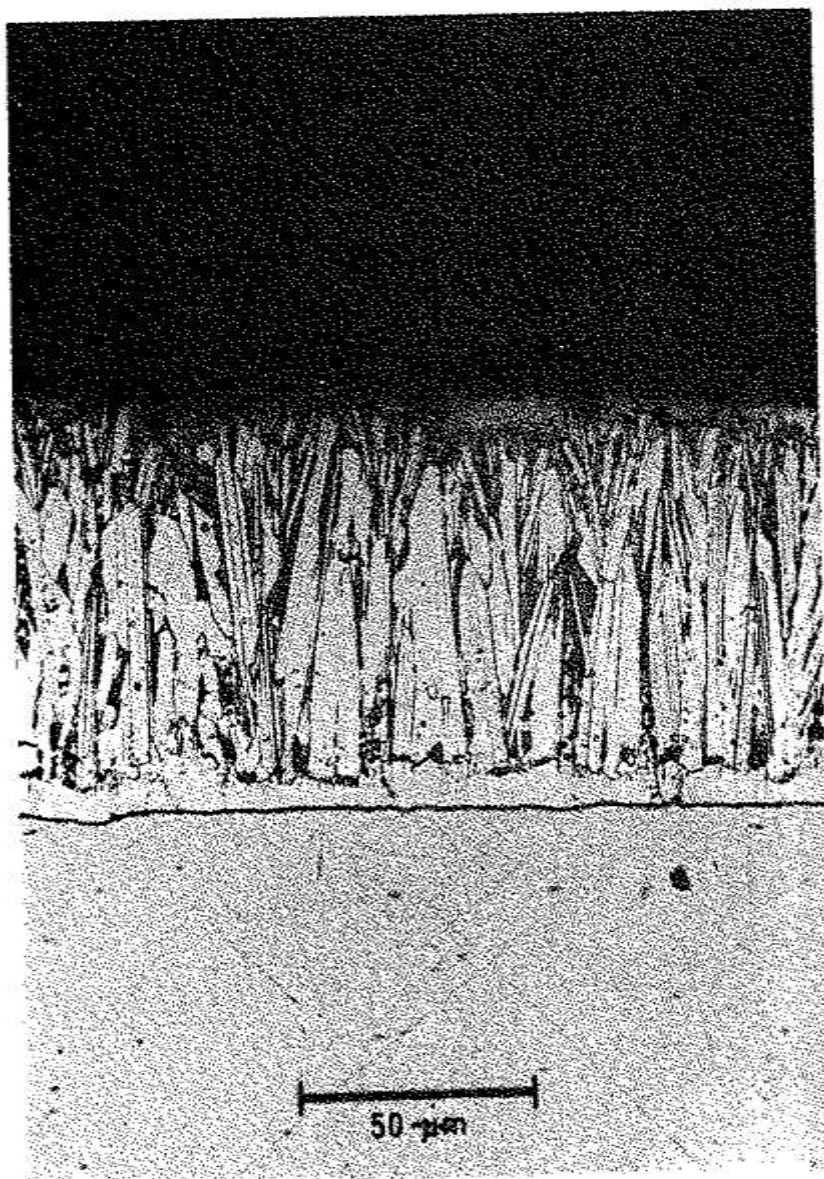
Irregular
Zinc-Iron
Alloy Layers



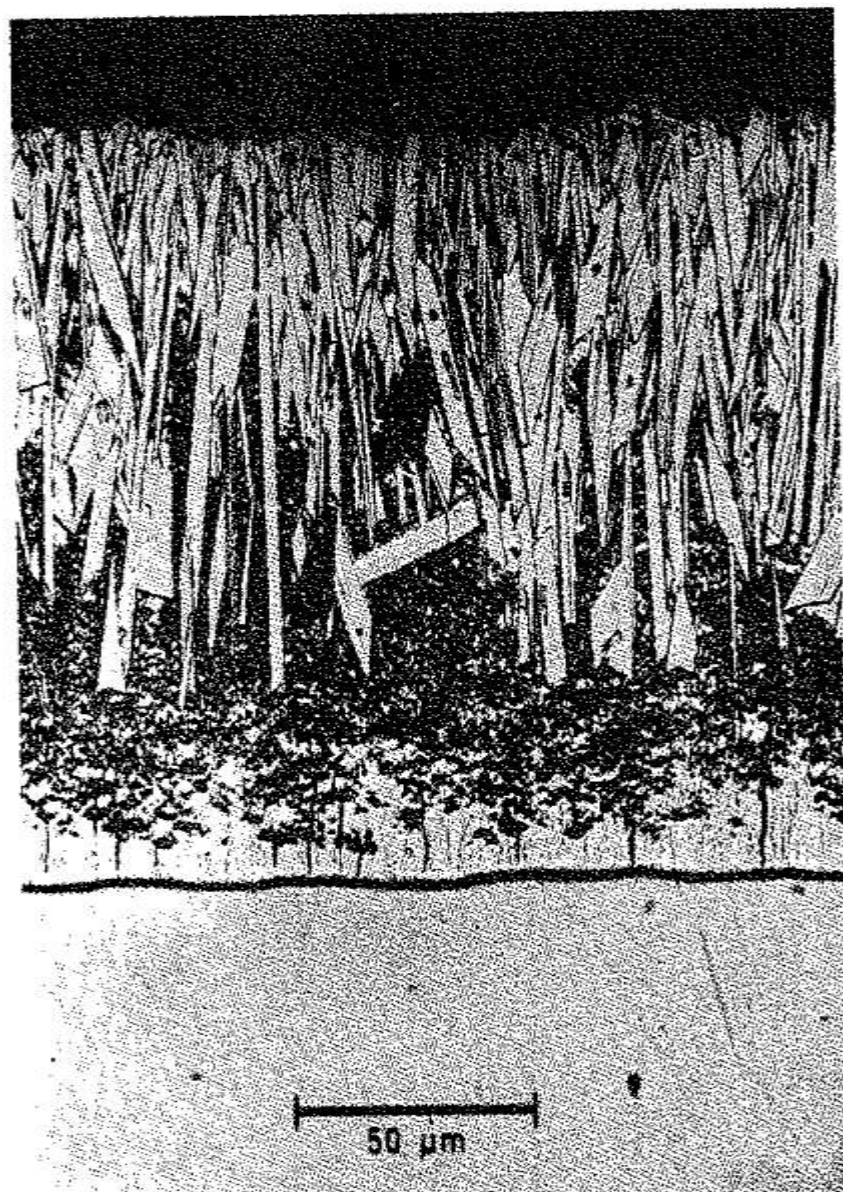
03% Si



10% Si



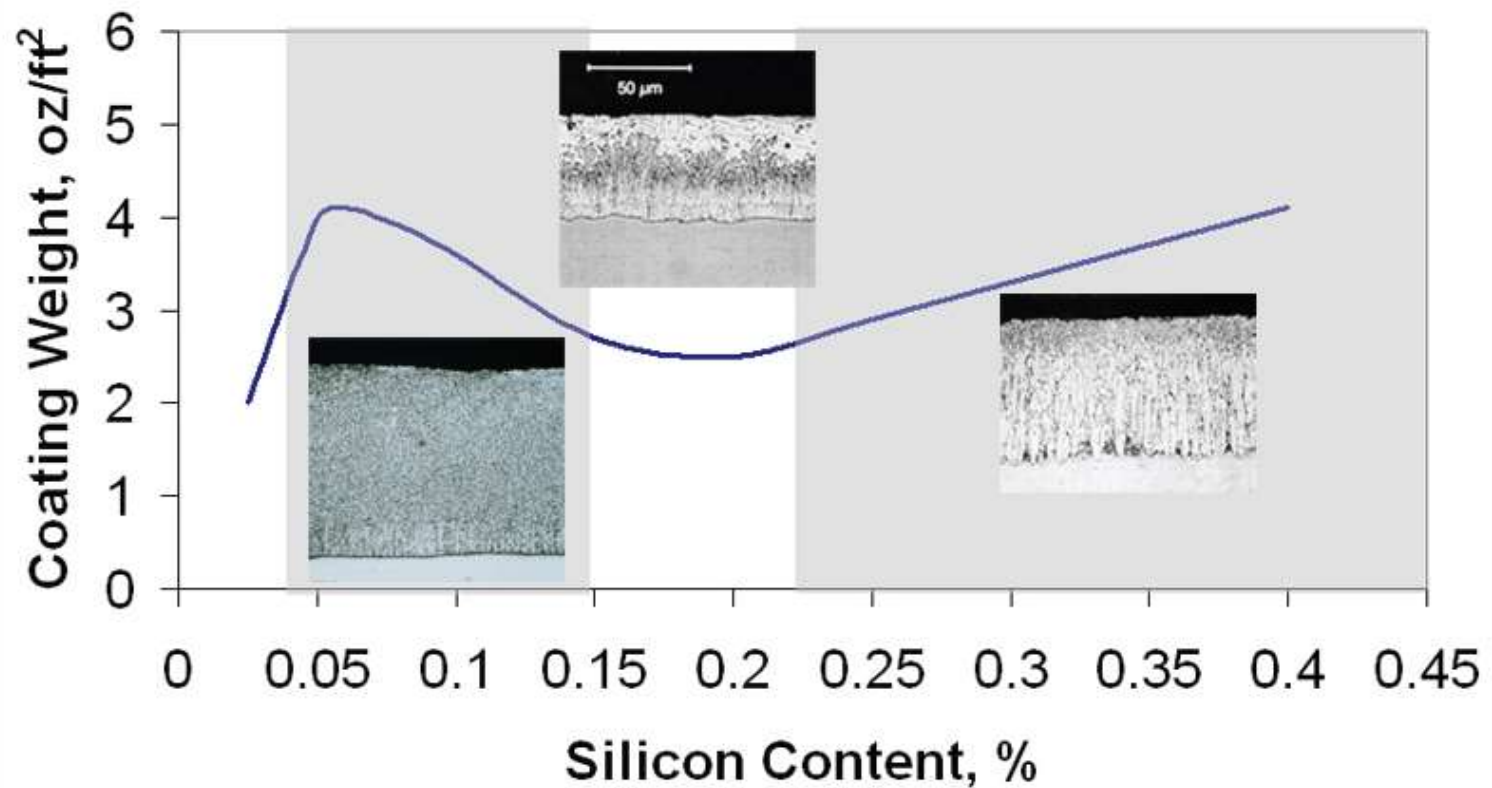
.24% Si



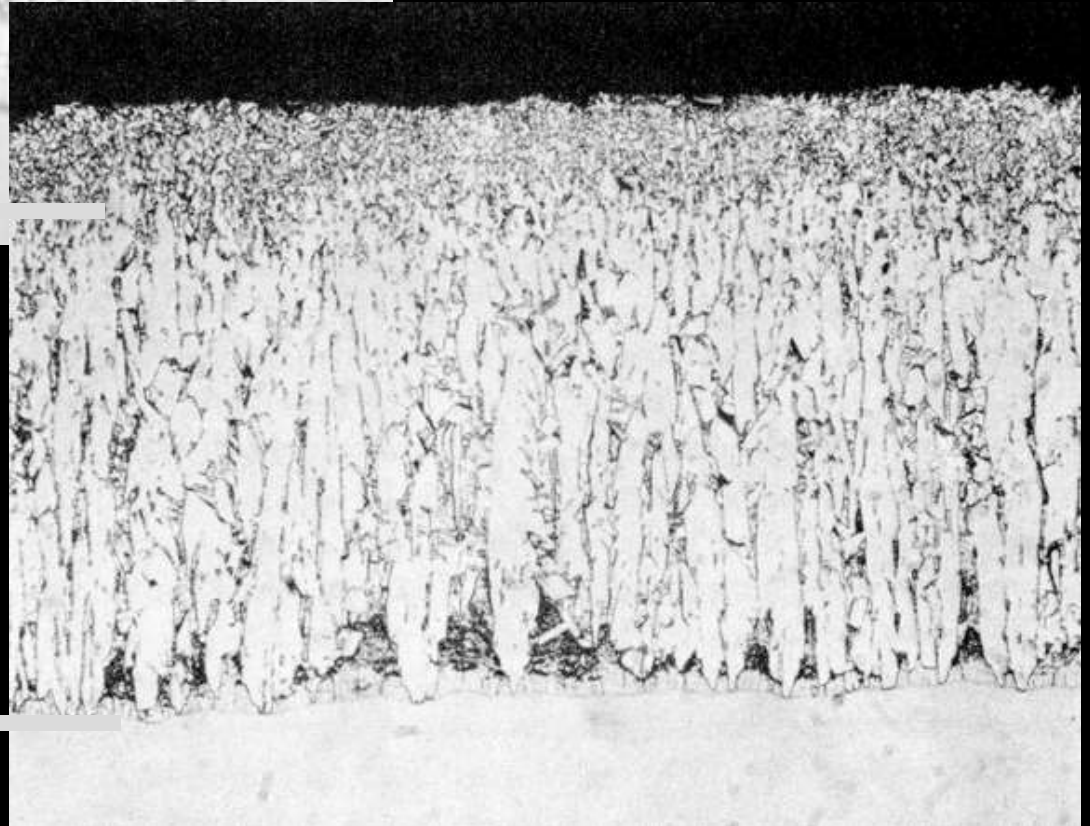
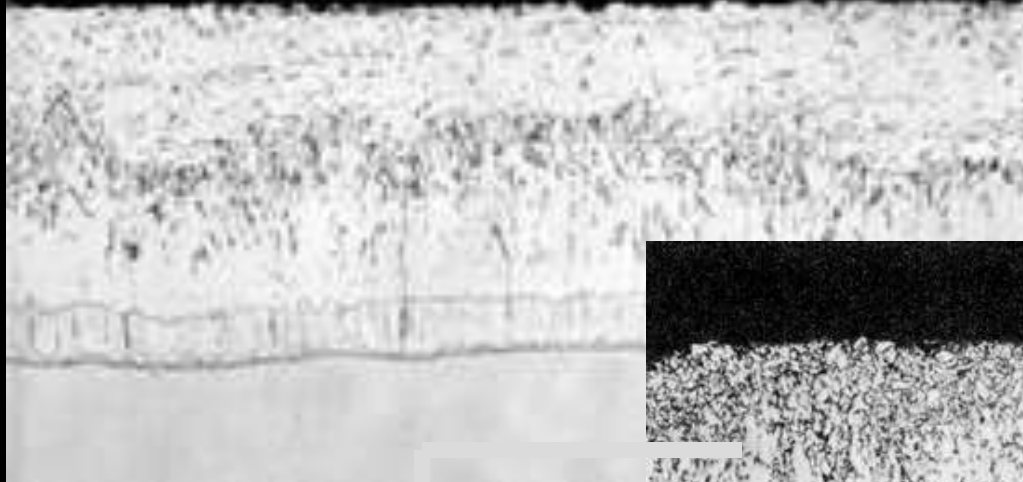
.44% Si

Steel Chemistry

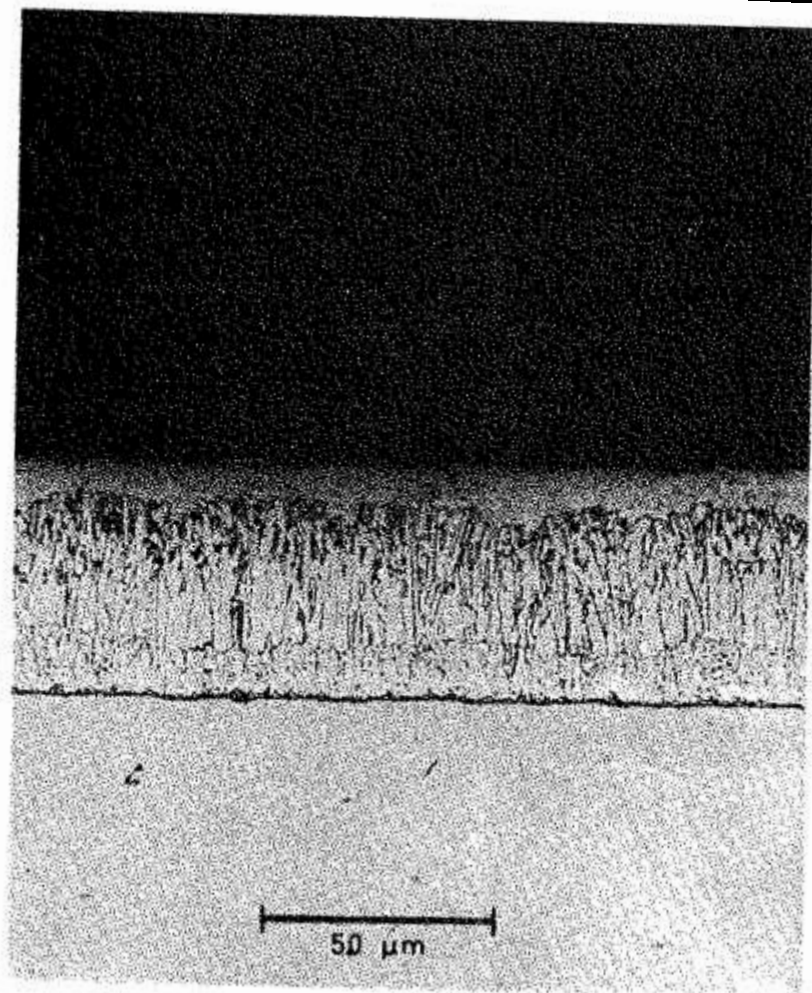
Sandelin Curve



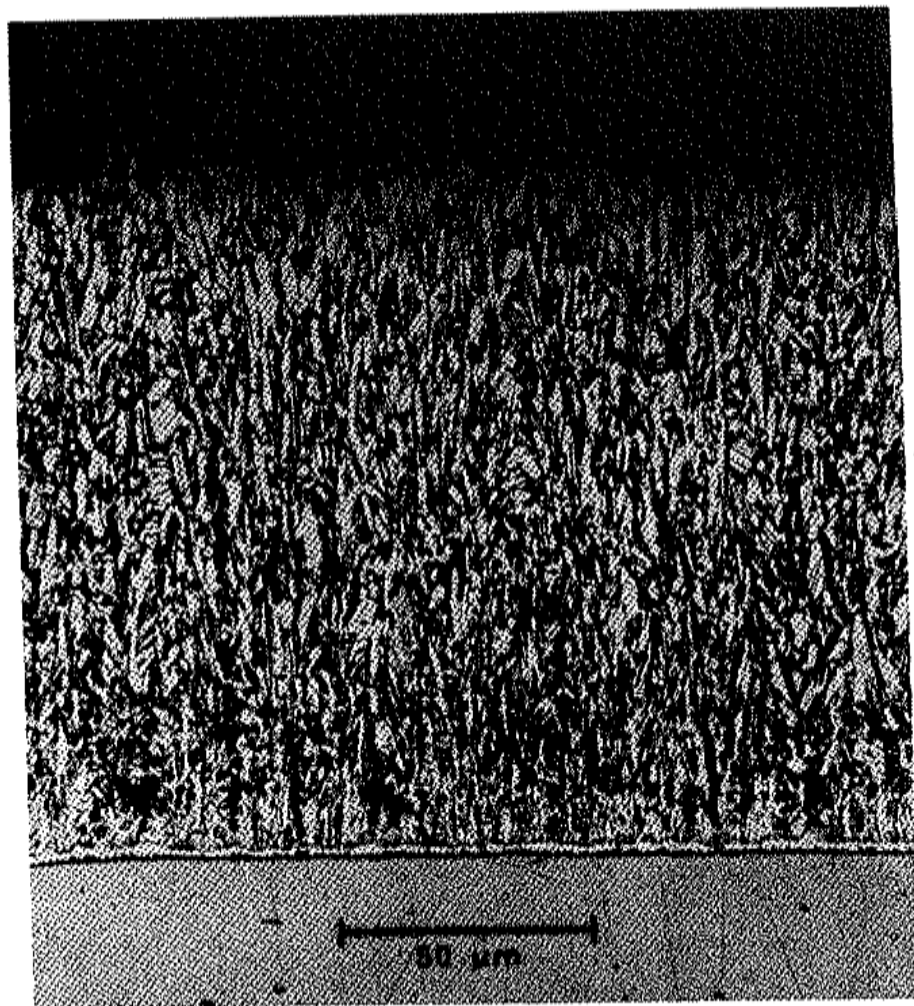
Typical Zinc-Iron Alloy Layers



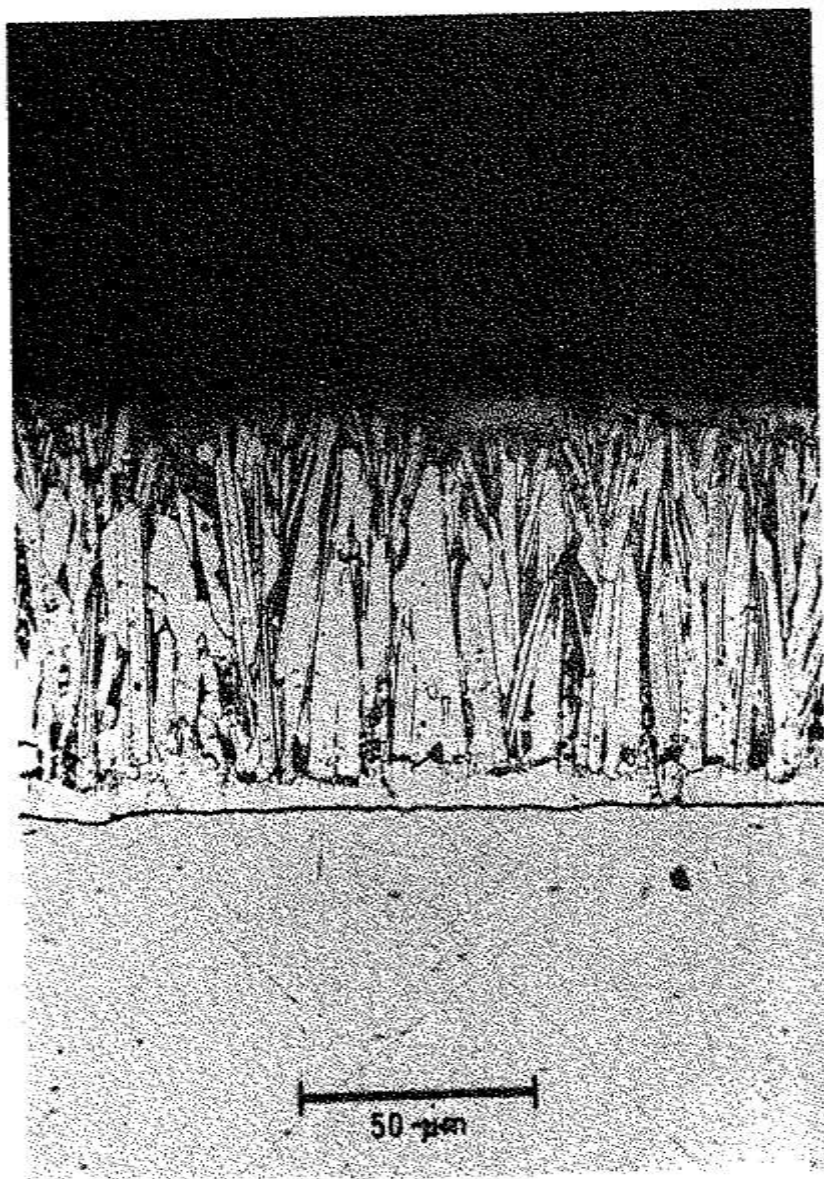
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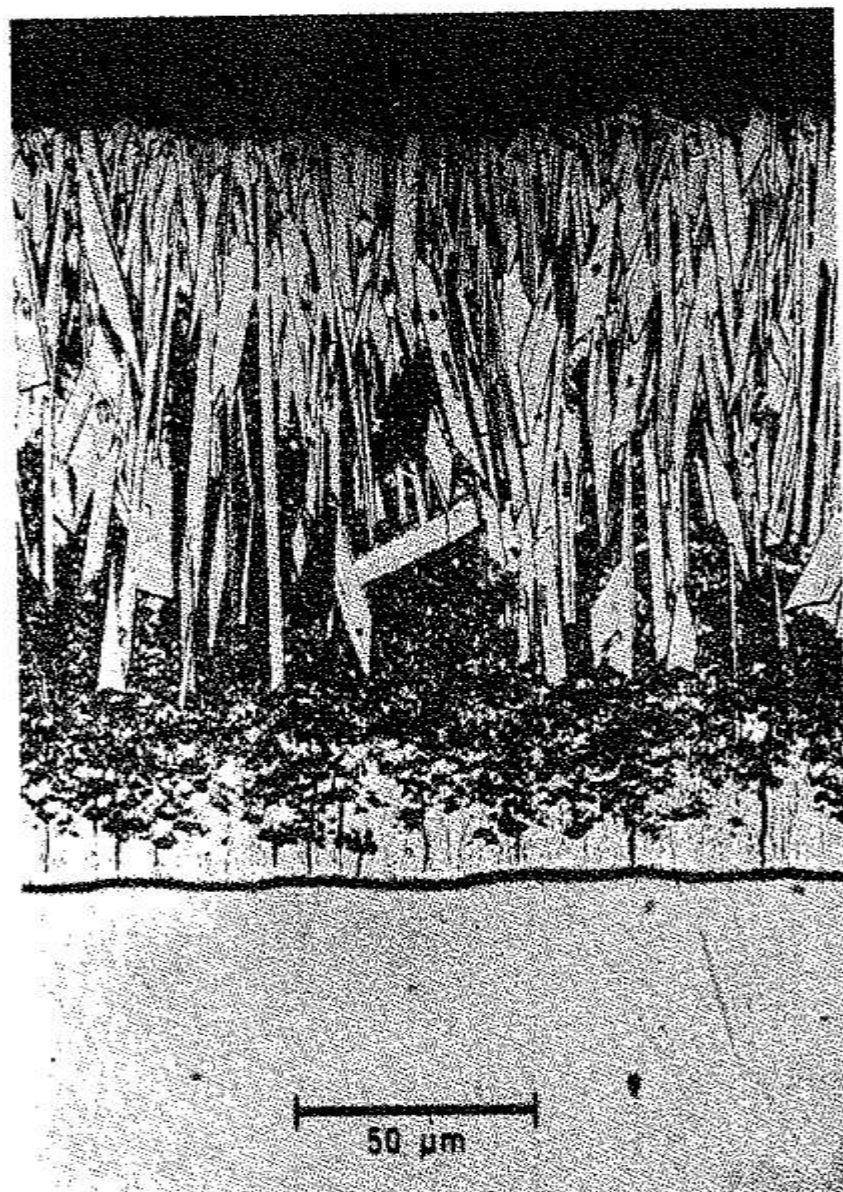
03% Si



10% Si



.24% Si



.44% Si

The Sterns Bayou Bridge





Stears Bayou Bridge

Stearns Bayou Bridge



Stearns Bayou Bridge



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- 

Sterns Bayou Bridge





Fischer

2.94

Thickness
mm 95

DEL

ON/OFF



Corrosion Protection

I69 over East 82nd Street,
Castleton, IN



I-69 Bridge





6.20 6.10 7.60
8.90 7.70

7.60 8.00 5.70
5.50 7.40

$\bar{X}=6.82$

7.60 7.70 6.70
5.80 5.60

6.20 6.10 7.60
8.90 7.70

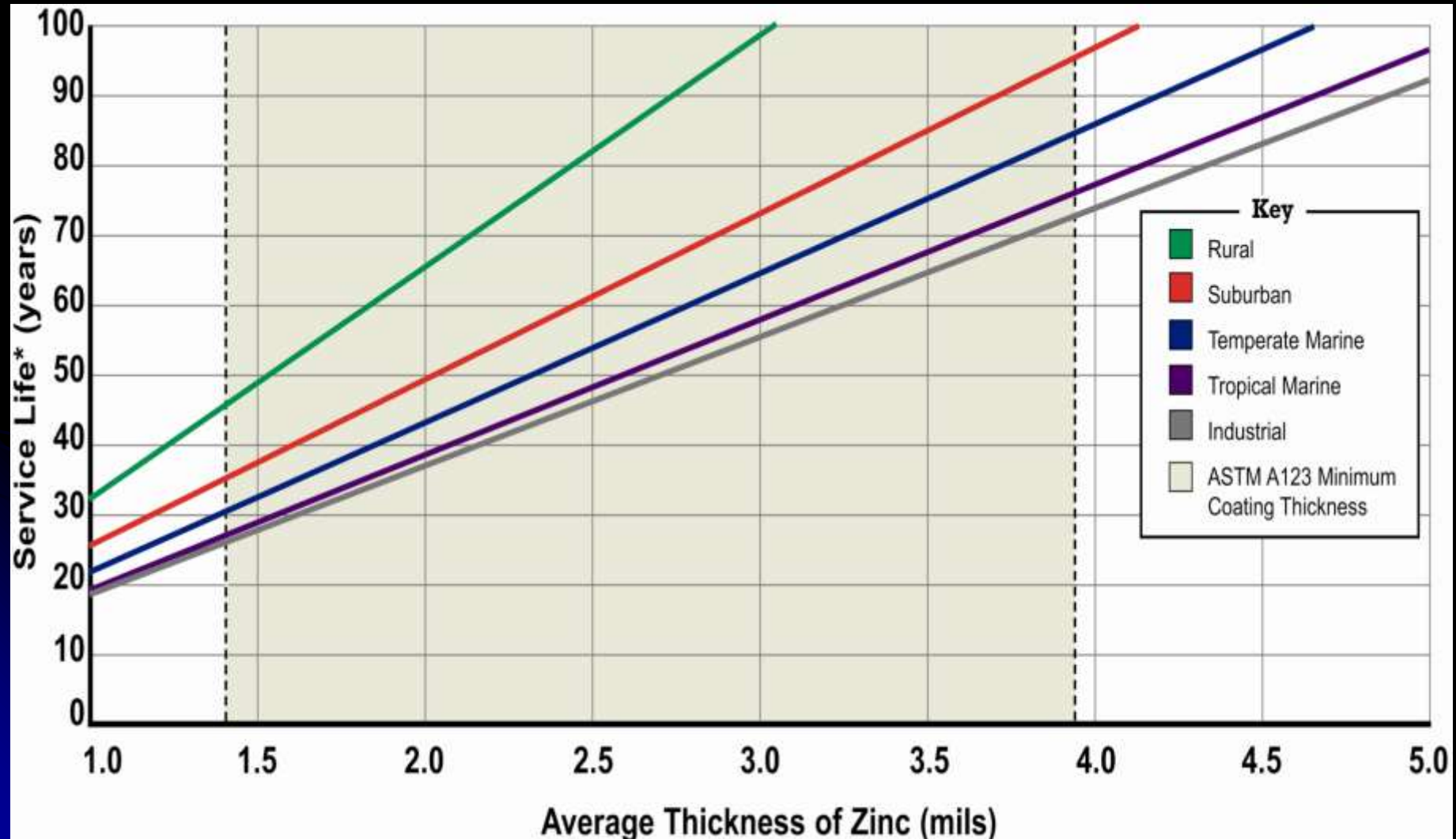
7.50 7.50 6.60
7.30 5.60

Beam 1

Zinc Coating Life Predictor

- Anticipates service life
- Program performs calculations
 - Statistical methods
 - Neural network
 - technology
 - Worldwide corrosion database
- Atmospheric categories
 - Rural
 - Suburban
 - Temperate marine
 - Tropical marine
 - Industrial

Estimated Service Life of HDG



*Service life is defined as the time to 5% rusting of the steel surface. 1 mil = 25.4 μ m = 0.56oz/ft²

The Corrosion Problem



Corrosion Tour

Questions & Comments



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Knox County, OH - Before



Knox County, OH - After