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Problem: Corrosion

Solution: ASTM A 1055 Dual Coated Rebar



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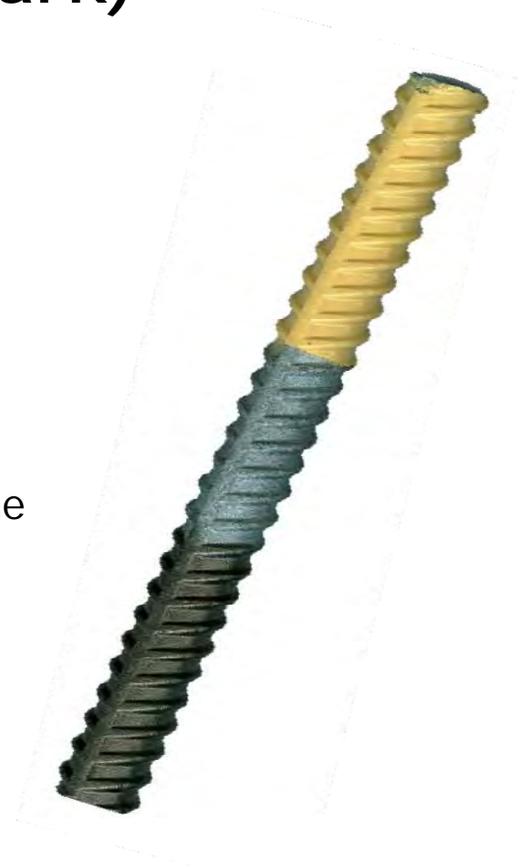


## ZBAR (Gerdau Trade Mark)

- ASTM A 615/A 706 Dual Coated Reinforcing Steel
- Produced to ASTM A 1055-10

“Engineered Corrosion Prevention System that utilizes innovative anode technology to cathodically protect the underlying steel preferentially”

“Specify ASTM A 1055”





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## GERDAU

- **Subsidiary of Gerdau SA (GGB) Sao Palo, Brazil**
  - 110 Years Steel Making History
  
- **Global Reach**
  - 10<sup>th</sup> largest steel producer operating in 13 countries
  - 25 million tons annual production
  
- **Gerdau Long Steel North America (GLN) Tampa, Florida**
  - 10 million tons annual production
  
  - 2<sup>nd</sup> largest recycler in North America
  
  - 11,000 employees in US and Canada

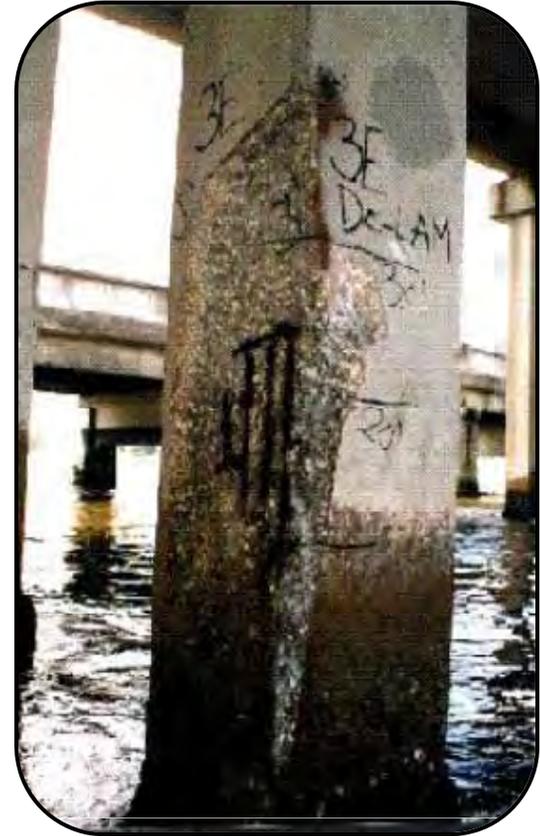




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## The Problem



"Specify ASTM A 1055"

## Industry Trends

- Cost of corrosion in United States = \$276 billion/year and increasing
- Industry demand for Sustainability and High Performance Materials (CRR)
- 75 - 100 year new design criteria



Corrosion Resistant  
Rebar (CRR)



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## The Dual Coated Solution

- Corrosion Prevention System for concrete reinforcing steel (ASTM A 1055)
- Durable and flexible exterior polymer coating developed by 3M
- Arc sprayed (not galvanized) zinc inner protection
- Innovative and dynamic system for corrosion protection



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## Functionality

- Zinc Anode
  - Provides galvanic cathodic protection if needed
- Polymer Membrane
  - Maintains anode to steel continuity during fabrication, shipment, installation and concrete curing



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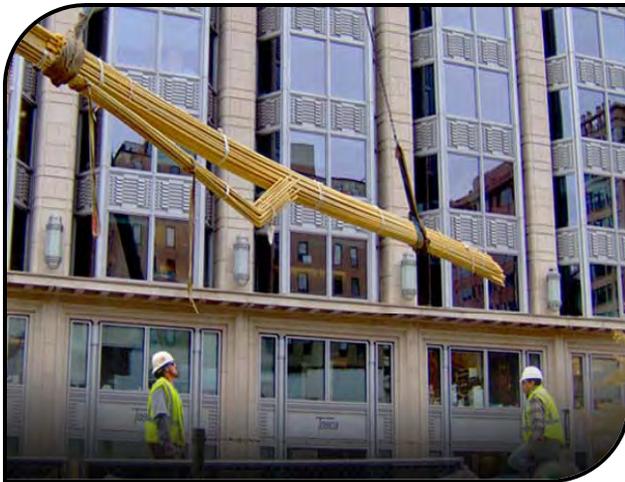


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## Versatility

- Can be used in any concrete reinforced steel structure
- Uses current design and installation methods
- Dynamic smart system (requires no maintenance or monitoring)
- Fabrication after coating



Parking Structure

1199F Washington, DC



Airport

Louisville, KY

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## Research

- University of South Florida (USF)
  - Author - A. Sagues & K. Lau
  - Purpose - Mechanistic properties of Dual Coated Rebar
  - Reasons - FDOT Approval of Dual Coated Rebar
  - Start/End Date - October 2007/October 2009
  - Status - Completed
  - Results - Superior corrosion resistance compared to ECR
  - Availability - Upon request [www.specifyzbar.com](http://www.specifyzbar.com)
  
- University of South Florida (USF)
  - Author - A. Sagues & K. Lau
  - Purpose - Insitu properties of Dual Coated Rebar
  - Reasons - Predict Dual Coated Rebar life cycle
  - Start/End Date - October 2009/April 2010
  - Status - Completed
  - Results - Dual Coated Rebar 4-5 times more corrosion resistant than ECR
  - Availability - Upon request [www.specifyzbar.com](http://www.specifyzbar.com)



## Research...continued

- University of South Florida (USF)
  - Author - Adrienne Accardi
  - Purpose - Determine Dual Coated Rebar zinc crevice passivation rate
  - Reasons - Better understanding of the Dual Coated Rebar properties
  - Start/End Date - January 2009/March 2009
  - Status - Completed
  - Results - Zinc oxide formation prevents corrosion of the underlying steel
  - Availability - Upon request [www.specifyzbar.com](http://www.specifyzbar.com)
  
- Virginia Transportation Research Council (VTRC)
  - Author - G. Clemena
  - Purpose - Southern exposure test
  - Reasons - Determine corrosion resistance of Dual Coated Rebar
  - Start/End Date - December 2000/December 2002
  - Status - Completed
  - Results - Dual Coated Rebar performance comparable to stainless steel
  - Availability - Upon request [www.specifyzbar.com](http://www.specifyzbar.com)



## Research...continued

### ➤ Kansas University (KU)

- Author - D. Darwin
- Purpose - Dual Coated Rebar bond strength
- Reasons - Mechanical properties of Dual Coated Rebar in concrete for design purposes
- Start/End Date - May 2006/ June 2006
- Status - Completed
- Results - Dual Coated Rebar bond strength = 95.9% of black bar (A 944 minimum requirement 85%)
- Availability - Upon request [www.specifyzbar.com](http://www.specifyzbar.com)

### ➤ Federal Highway Administration (FHWA)

- Author - S.K. Lee
- Purpose - Research to extend life expectancy of bridges
- Reasons - Dual Coated Rebar included in the study of 10 other materials
- Start/End Date - January 2009/March 2011
- Status - Awaiting publication(Interim report presented at NACE 2010)
- Results - Dual Coated Rebar performing as good or better than the 10 other materials
- Availability - Formal request to S.K. Lee at FHWA





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## Dual Coated Rebar Advantages

- Prevents the onset of corrosion
- Is more corrosion resistant than Stainless Steel
- Lasts > 100 years in concrete with chlorides
- Eliminates maintenance costs
- Holidays do not diminish performance
- Backed by proven science
- Lowest Life Cycle Cost
- Meet Commercial Building Code ACI 318
- Strong Specification - ASTM A 1055M -10<sup>e1</sup>
- Readily available from Trusted Sources



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## Project Galleries



### Others

Disney Wide World of Sports,  
Disney World, FL



### Building

Signature Place, St. Petersburg, FL

### Parking Garage

Washington, DC



### Sea Walls

Galveston, TX



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## Project Galleries on Bridges



Pound, Virginia



Kentucky State



Tennessee State



Hampton, NH

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GO GERDAU

# QUESTIONS

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