Technology Day

Washdown Considerations for Squirrel Cage Induction Motors

October 17th, 2013

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Outline

- **General Concerns for Washdown Applications**
- **Examples of Motor Applications**
- **Measures to Protect from Mechanical Failure**
  - Finding the right product for demanding applications

Top Concerns for Washdown Applications

- **Water / Caustics / Contamination**
  - High pressure sanitation fills motor housing with water causing premature failure.
  - Caustics or chemicals degrade finishes and seals.
- **Corrosion / Paint Chipping / Deterioration**
  - Rust will cause motor shaft to seize
  - Deterioration will contaminate product
- **Compromised Seals**
  - O-rings, seals and gaskets serve as a protective barrier against water and other contaminates

Washdown Motors - Objectives

- **Protect motor from contaminants**
- **Eliminate potential for rust**
- **Longer motor life**

Standard Motors Perform Poorly in Washdown Applications

- Special consideration must be given to motors in harsh environments
- Toughest processing applications include poultry, meat, dairy, snack foods and pharmaceuticals
- Specific product lines have been tailored to these industries to give the motor sufficient protection and maintain a long service life

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75% of all mechanical failures in electric motors are due to bearing failures

- Bearings are small compared to other motor components, making them vulnerable to wear and damage.
- Water sprays can cause grease to flow from bearing or completely wash away grease
- Recognizing specific operating conditions are vital to preventing premature motor failure

Washdown Motor Features

- **Improved Surface Preparation**
  - **White epoxy**
  - **5 times more resistant to corrosion and chipping**
  - **ASTM B117 salt spray test for over 500 hours**
- **300 series stainless steel shaft**
- **Condensate drain holes in endplates**
  - **Provides for thorough drainage regardless of motor's mounting position**
- **Slinger and lip seals**
  - **Extra measure of protection to keep contaminants out**

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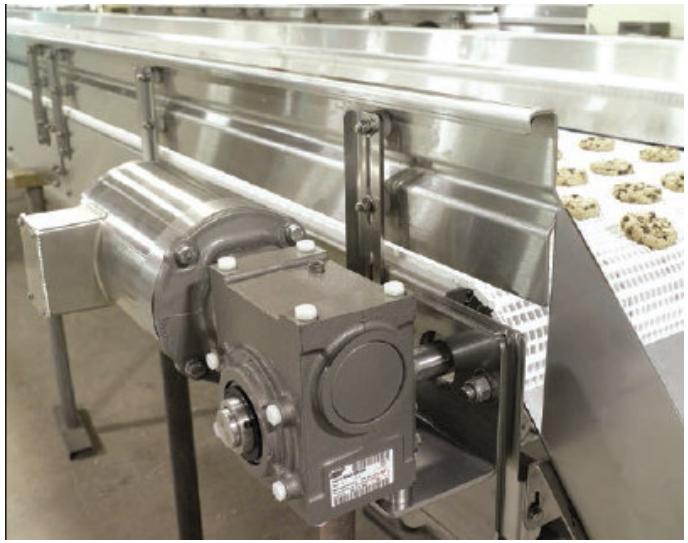
Stainless Steel Washdown Motors

- Additional protection from corrosive agents
- 300 series stainless steel on all external surfaces
- Labyrinth seal on both ends of shaft extension to protect bearings



Stainless Steel Encapsulated Motor

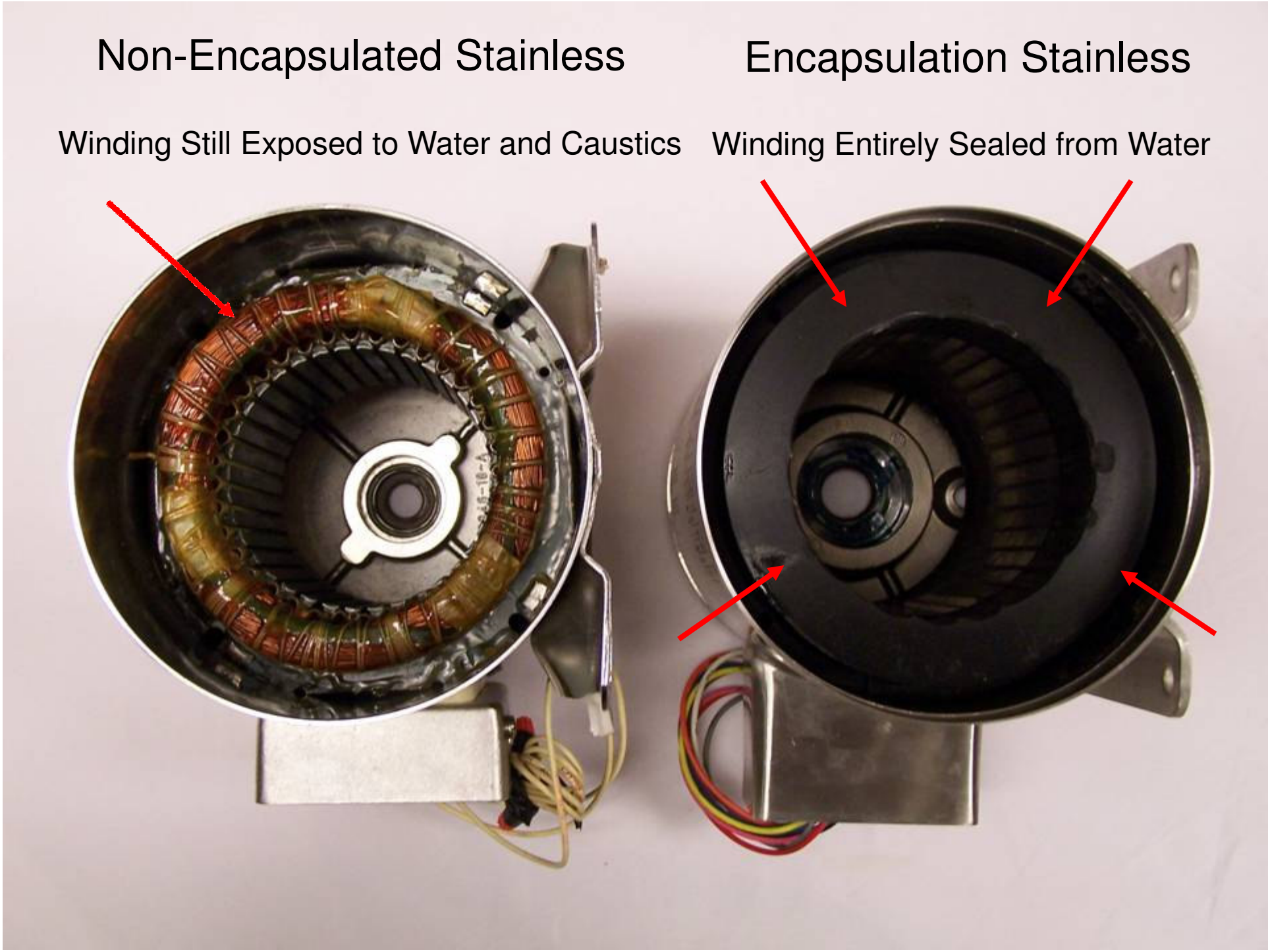
- **Conduit box and mounting feet welded to frame- eliminates potential for contamination buildup**
- **Nameplate laser etched on motor frame- eliminates contamination beneath bolt-on nameplates, improves runoff**
- **Epoxy encapsulation provides another internal level of protection from contaminants and moisture**

Non-Encapsulated Stainless

Winding Still Exposed to Water and Caustics

Encapsulation Stainless

Winding Entirely Sealed from Water

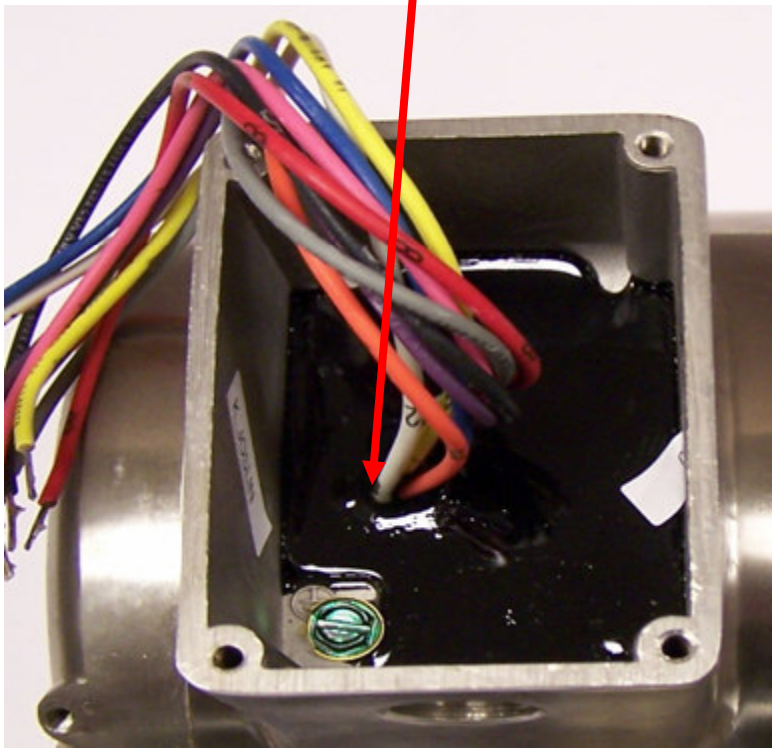


Non-Encapsulated Motor

Hole directly into motor windings

Encapsulated Conduit Box

Encapsulated at Conduit Box



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Washdown Motors - Summary

- **Protect the motor from contaminants**
  - Multiple levels of protection based on demand of application
- **Eliminate potential for rust**
  - Consideration of stainless steel products
- **Produce longer motor life**
  - Proactive measures to prevent failure proves for increased reliability and service