Pre-approved rust preventative coatings and VCI packaging per approved suppliers.

Rust Preventatives

Short Term—Indoor protection for 3 weeks. ASTM D1748 240 hours.

(CAT 1E4971 Spec)

- Zerust
  - **Axxatec 80C**----------Aqueous-Based Corrosion Preventative.
  - **Axxanol 33CD-HF**-------Solvent-Based Corrosion Preventative.
  - **Axxanol 34CD-HF**-------Solvent-Based Corrosion Preventative.

- Cortec
  - **Cortec VpCI 377**---------- Aqueous-Based Corrosion Preventative.
    - Recommended for bolted joints.
  - **Cortec VpCI 391**---------- Aqueous-Based Corrosion Preventative.
    - Recommended for bolted joints.
  - **Cortec VpCI 325**---------- Solvent-Based Corrosion Preventative.
    - Approved weldable RP.

- Daubert Cromwell
  - **Nox-Rust 7100**----------Solvent-Based, Water Displacing.
  - **Nox-Rust 7800**----------Solvent-Based Corrosion Preventative.
  - **Nox-Rust 9300**----------Solvent-Based Corrosion Preventative.
  - **Nox-Rust 9700**----------Aqueous-Based Corrosion Preventative.

Medium Term—Indoor protection up to 1 year. ASTM D1748 600 hrs. ASTM B117 24 hrs.

(CAT 1E4970 Spec)

- Zerust
  - **Axxanol 33**----------Oil-Based Corrosion Preventative.
  - **Axxanol 34N**----------Solvent-Based Rust Preventative.
  - **Axxanol 750**----------VCI Oil-Based Corrosion Preventative.
  - **Axxanol 750 NV**----------Solvent/Oil-Based Corrosion Preventative.

- Cortec
  - **Cortec VpCI 329D**----------VCI Oil-Based Corrosion Preventative.

- Daubert Cromwell
  - **Nox-Rust 7100**----------Solvent-Based, Water Displacing.
  - **Nox-Rust 7800**----------Solvent-Based Corrosion Preventative.
  - **Safecote CF**----------Aqueous-Based oil emulsion.
  - **Safecote CLV**---------- Aqueous-Based Corrosion Preventative.
  - **Nox-Rust 9300**----------Solvent-Based Corrosion Preventative.

Long Term—Indoor protection up to 5 years. ASTM D1748 1320 hrs. ASTM B117 240 hrs.

(CAT 1E4973 Spec)

- Zerust
  - **Axxanol Spray-G**----------Spray-able Grease-Base.
  - **AxxaCote 90**----------Self-Healing Solvent/Wax Based.
  - **Axxanol Z-Maxx**----------NLGI 2 or 0 Grease-Base.

- Cortec
  - **Cortec VpCI 369**----------Oil-Based Corrosion Preventative**.**

- Daubert Cromwell
  - **Nox-Rust 5400**----------Petroleum-Based Corrosion Preventative.
    - Approved weldable RP.

VCI Packaging

VCI Poly

- **Zerust**
  - Zerust ICT510-C VCI Film----------4mil
  - Zerust ICT510-OPS VCI Shrink Film----------8mil
  - Zerust ICT510-SM VCI Stretch Film----------1 & 1.25mil

- **Cortec**
  - Cortec VpCI-126 Blue----------2mil to 10mil

- **Daubert Cromwell**
  - Premium Metal-Guard----------2mil to 8mil

- **Armor**
  - Armor Poly VCI Film----------1mil to 12mil
  - Armor Defender VCI Film----------3 layer protection
  - Armor Crusader VCI Film----------3 layer protection—Export specific
  - Armor Sea Film----------Heavy duty for Extreme/Outdoor storage
  - Armor Poly VCI Stretch Film----------various thicknesses. Bundle capabilities.

VCI Paper

- **Zerust**
  - Zerust ICT420----35#, 40#, &60#. pH neutral, acid free, complete VCI saturation.
    - Up to 1 year indoor protection---Multimetal
  - Zerust ICT420-35P-----35# & 40#. Polyethylene layer containing VCI.
    - Up to 3 year indoor protection----Ferrous metals
  - Zerust ICT430-35PCR------35# w/ ¾ Poly-coated reinforced side equaling 50#.
    - Up to 1 year protection---Multimetal
  - Zerust ICT427----------35#. Robust corrosion protection.
    - Up to 1 year protection---Multimetal

- **Cortec**
  - Cortec VpCI-144------35#. Aqueous-Based VCI coated paper. (one sided)
    - Up to 2 years protection-----Multimetal
  - Cortec VpCI-146------35#. Cortec Vapor phase VCI coating. (both sides)
    - Up to 2 years protection-----Multimetal

- **Daubert Cromwell**
  - Ferro-Galv PW40FG---40# & 60#. Maximum strength corrosion inhibitor.
    - Up to 2 years. Galvanized and Ferrous metals. (Export and long term)
  - Protek Wrap PW30H---30#. Fully saturated VCI paper.(both sides)
    - Up to 2 years protection----Ferrous metals, cast iron, and steel.
  - Protek Wrap PW32H---35#. Fully saturated VCI paper.(both sides)
    - Up to 3 years protection----Ferrous metals, cast iron, and steel.
  - Nox-Rust Vapor Wrapper PC55D---40#&60#. Nitrate free, polyethylene coated
    - Up to 2 years protection---Ferrous metals. (moisture barrier)
  - Nox-Rust VW100DH---40#. Polyethylene saturated one side/VCI on other.
    - Up to 2 years protection---Ferrous metals.
  - Nox-Rust VW30DH---30#. Nitrate-free, fully saturated VCI paper.(both sides)
    - Up to 3 years protection----Ferrous metals, cast iron, and steel.

- **Armor**
  - Armor Wrap---35#. Fully saturated VCI paper. (both sides)
    - Up to 2 years---Multimetal

The choice of coating should include the following considerations:

- The time frame that the packaged part will be stored.
- Short term coatings should only be considered for parts that are remaining local and will be used within the 3 week expected time frame.
- Metal working fluid (MWF) residues left on parts after manufacture and final wash operations, are not adequate as RP coatings for final parts packaging.
- Parts must be clean, dry and fingerprint free before applying the RP coating.
- If the RP coating is applied by solvent evaporation, the coating shall be allowed to dry per the suppliers recommended practice, before applying other packaging materials such as VCI paper or poly.
- Water based coatings are not permitted unless under certain circumstances and with prior approval and pilot study.
- A rust preventative oil remains oily on the part.
- A solvent applied that leaves a firm to nearly firm film coating will not be oily. In some cases, it may be almost indiscernible.
- The coating type may be required to support the cleanliness requirements of the parts. In those cases, a non-oily RP should be considered.
- Over time in storage, an oil based RP coating may settle due to gravity.
    - If a VCI oil, it should continue to protect through the VCI technology in the enclosed packaged environment.
- An RP coating product should be identified as either a VCI or not.
    - Non VCI oils still serve a purpose as contact corrosion inhibitors. They would be appropriate where the full function of a VCI might not be realized. Such as parts not tightly enclosed in the packaging by the use of a VCI poly bag or wrap.
    - Where not possible to pack a larger component in a VCI environment, a non-VCI RP coating with good contact corrosion inhibiting properties would be the better choice.

        - If the part is packed in a crate, lining the crate with a MIL spec PRF paper with vapor barrier properties is highly recommended.

    - VCI coatings and associated VCI packaging products are the most effective when they completely enclose the part they are protecting.
        - If opened for inspection or a bulk pack with access to remove parts, the VCI has to be securely reclosed.

****Technical data sheets should be requested from Packaging Engineer @ wmcgaugh@ProgressRail.com to confirm considerations.**

****If the VCI products above are not available, the supplier will need to provide test data (ASTM performance) of comparable products.**