



REASONS

WHY METAL PARTS RUST
DURING SHIPPING/STORAGE
AND HOW TO AVOID THEM



OUR PURPOSE

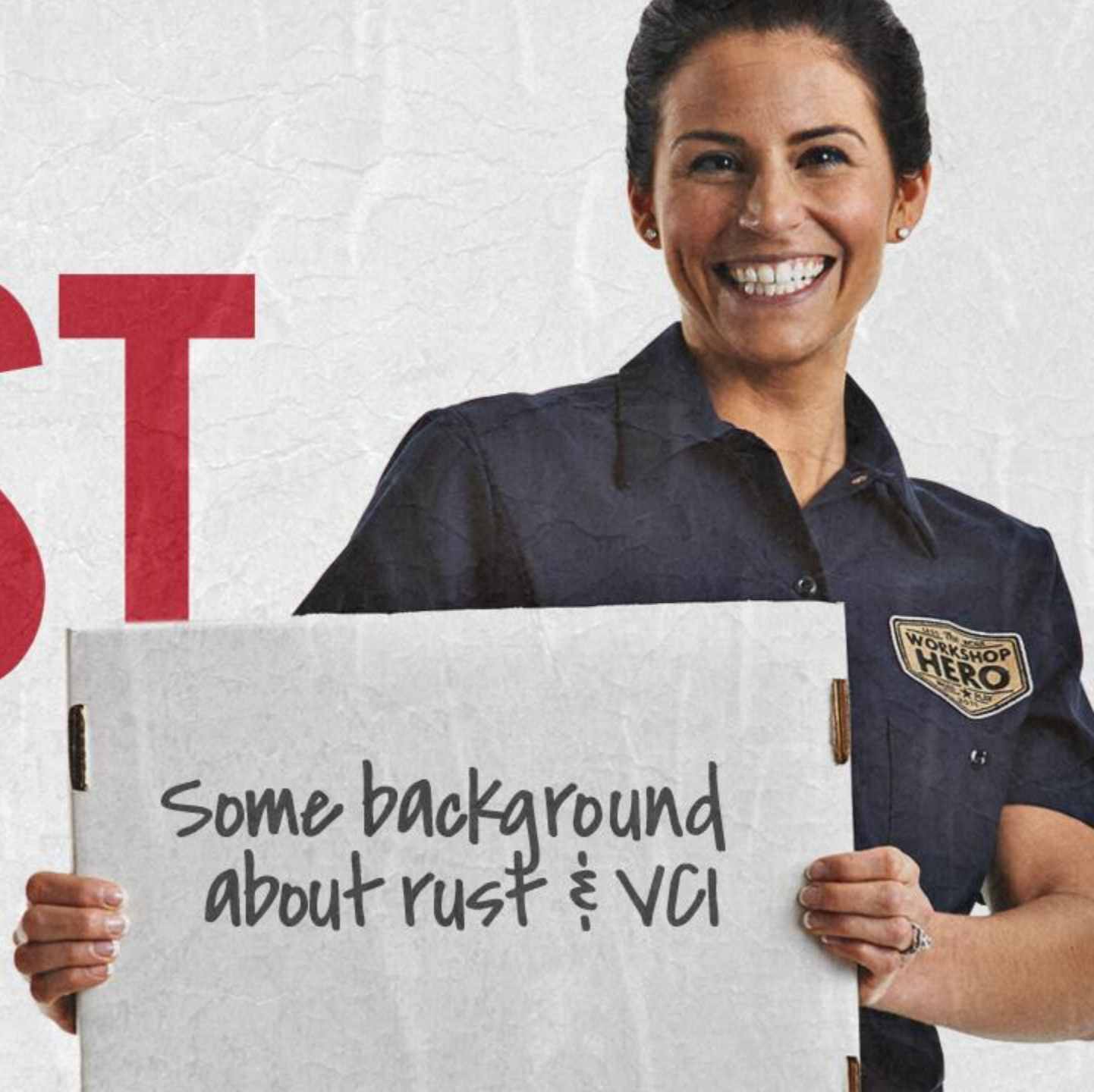
PROTECT YOUR BRAND,
PARTS & REPUTATION

OUR THING

CLEAN, SAFE & EASY
RUST PREVENTION
& REMOVAL



FIRST



Some background
about rust & VCI

WHY CARE ABOUT CORROSION?



RUST ICEBERG

INSPECTIONS
EXTRA SHIPPING

SCRAPPING
DERUSTING

SORTING
REWORK

VISIBLE COSTS

8D MEETINGS
EXPEDITING COST
STORAGE COSTS
LOST CUSTOMER LOYALTY
8D REPORTS

COMMUNICATION
LOST SALES
EXCESS INVENTORY
OPPORTUNITY

HIDDEN COSTS



SEEKING STABLE



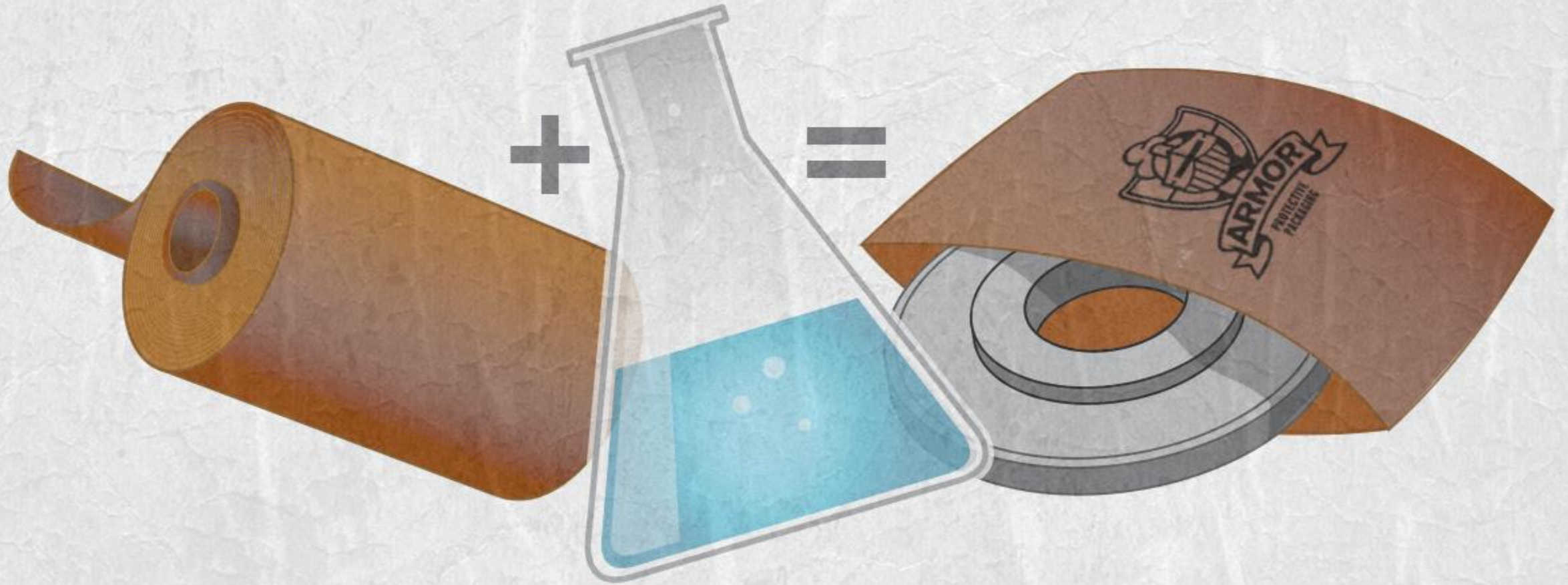
RUST PREVENTION METHODS

**PAINT • COATINGS • OIL
GREASE • RP LIQUIDS**

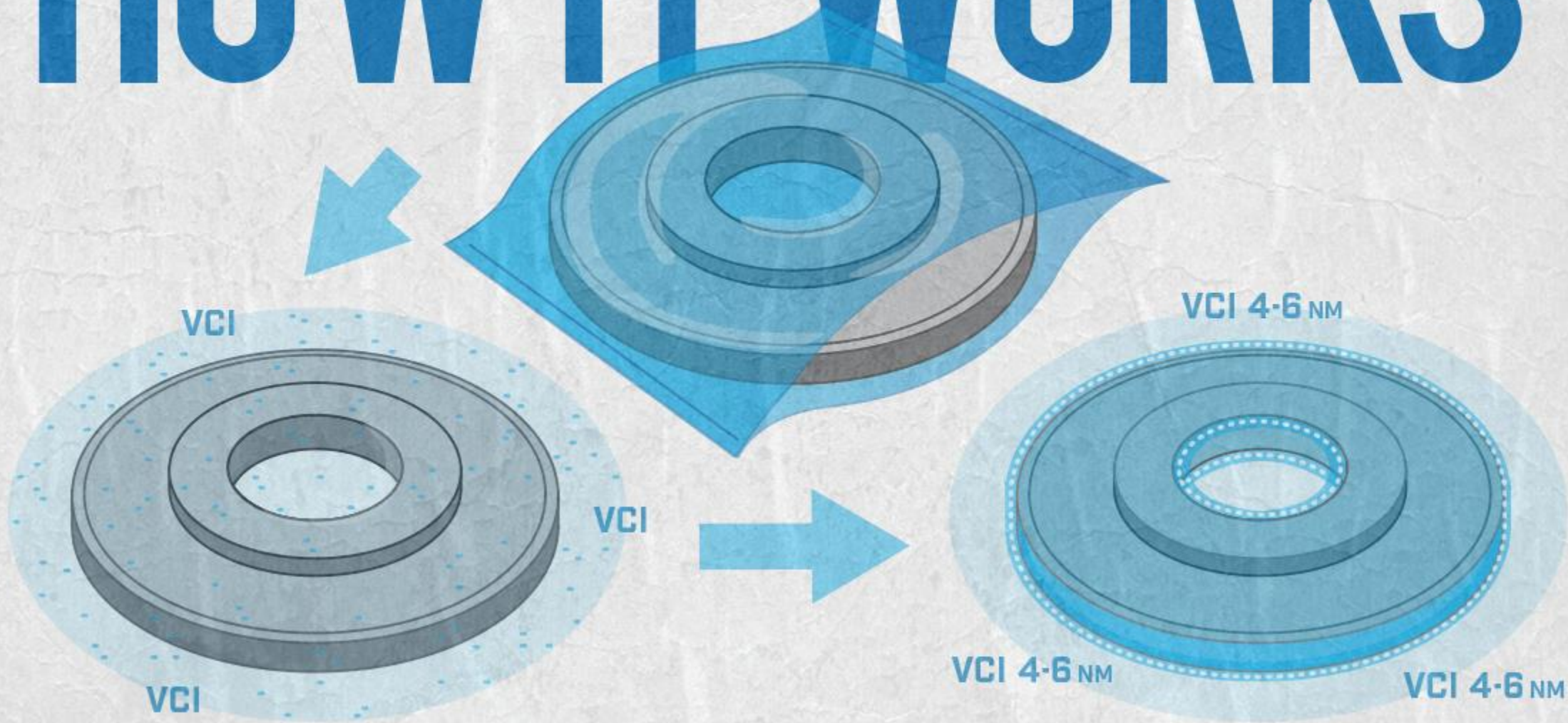
VCI Packaging



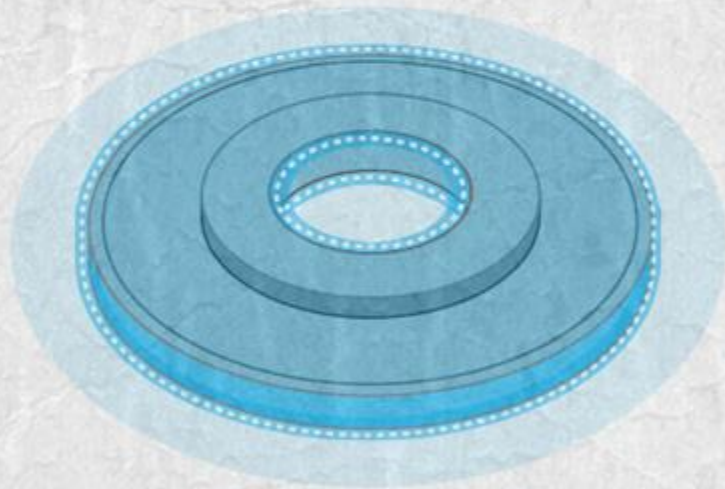
WHAT IS IT?



HOW IT WORKS



VCI THICKNESS



ARMOR VCI
4-6 NM



DRY COAT
500 NM



PRIMER COATING
20,000 NM



SHEET PAPER
100,000 NM



REASONS

WHY METAL PARTS RUST
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AND HOW TO AVOID THEM



PROTECTION RADIUS

**IMPROPER POSITIONING OF VCI
PRODUCTS WITHIN PACKAGING**



4 WATER VARIABILITY

**CHLORIDE AND CHLORINE LEVELS
IN WATER SOURCE CAN DIFFER**



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TRAINING

**IMPROPER OR LACK OF VCI
TRAINING AND EDUCATION**



RUSTIMONIAL

TAKING THE WORK OUT OF YOUR WORKDAY*

ARMOR SOLUTIONS SAVE CUMMINS \$130,000 PER YEAR

Armor Protective Packaging® worked with the CDP Cummins Engine Plant to develop a better rust prevention solution for its engine blocks/engine heads. The result saved Cummins \$130,000/year.

BEFORE



AFTER



THE FACTS

Competitor Rust Prevention Process:

- 2 Medium-Sized VCI Bags
- 4 VCI Foam Pads
- 4-5 Sprays of messy RP for each pallet
- Labor-intensive application process.

THE RESULTS

ARMOR Rust Prevention Solution:

- 1 ARMOR POLY VCI Bag
- ARMOR WRAP VCI Paper
- 12% Savings in materials
- 30% Reduction in labor

ANNUAL COST SAVINGS: \$130,000

Armor Protective Packaging® provides clean, safe, easy and effective rust prevention and rust removal products that are designed to protect metal while in-process, during transport or in storage. For more than 25 years, ARMOR has worked with customers from around the globe to provide rust prevention and rust removal solutions to "Take the Work Out of Your Workday!"

ARMOR VCI USAGE GUIDE

REMEMBER: Use ARMOR VCI to prevent rust & Metal Rescue™ to remove it.

Use gloves when handling parts to eliminate rust caused by fingerprints.

Package parts as soon as possible for optimum effectiveness.

Avoid using VCI packaging that is soiled or damaged.

Seal bags and/or wrap product completely for best protection.

ARMOR WRAP™ VCI papers are impregnated with VCI on both sides.

Place ARMOR VCI products between metals and acidic packaging materials.

DID YOU KNOW? ARMOR VCI PRODUCTS ARE VAPOR & CONTACT INHIBITORS.

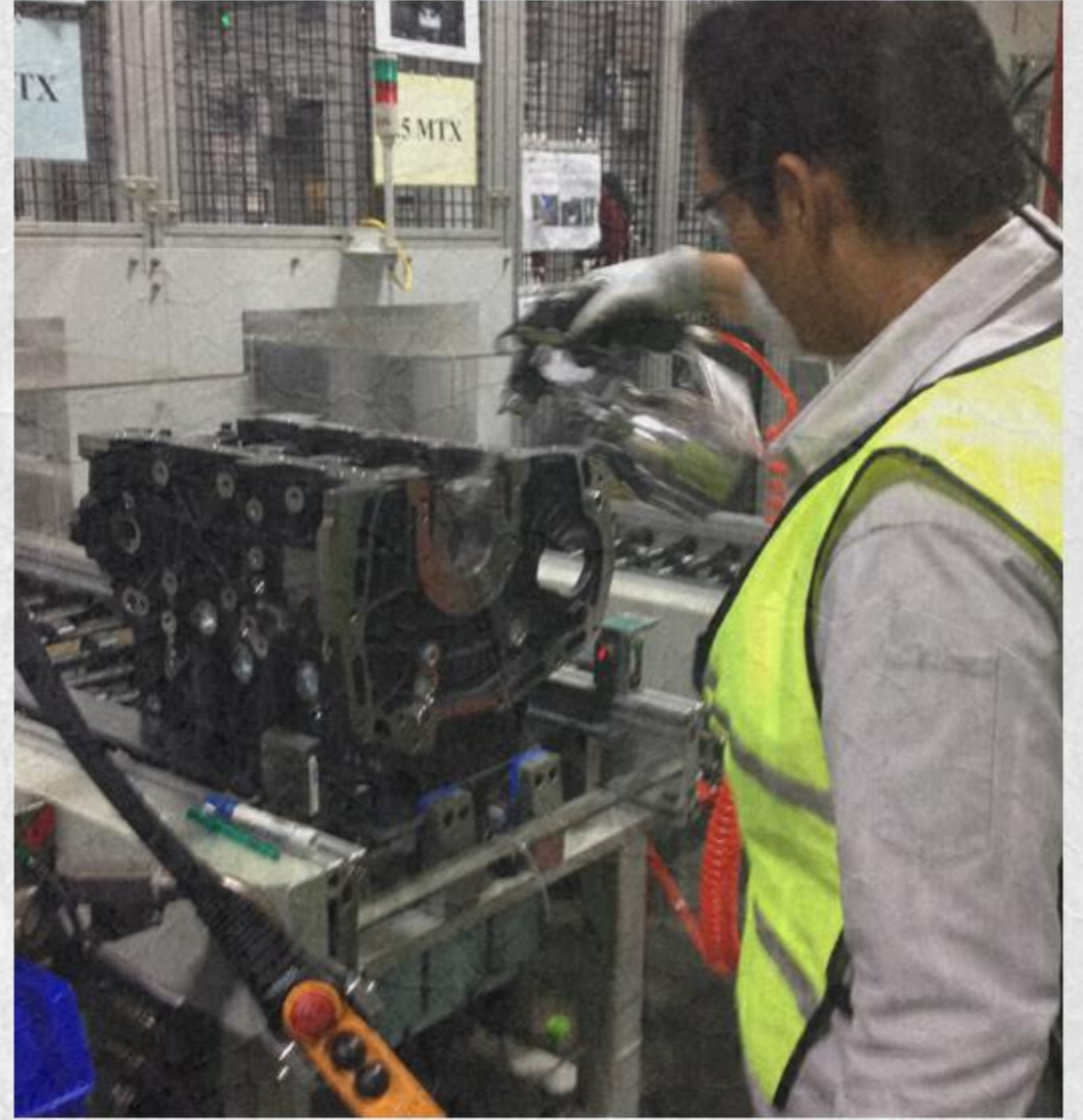


CORROSION MANAGEMENT SOLUTIONS



OIL TREATMENT

**OIL IS NOT THE BEST SOLUTION
FOR PREVENTING RUST**



ACIDIC PACKAGING

**METAL CONTACT WITH WOOD,
PAPER OR CORRUGATED**

NO



YES



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IMPROPER AMOUNT

**NOT USING ENOUGH VCI
PACKAGING OR PRODUCTS**



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POOR QUALITY

USE OF INEFFECTIVE OR LESS
QUALITY VCI PRODUCTS



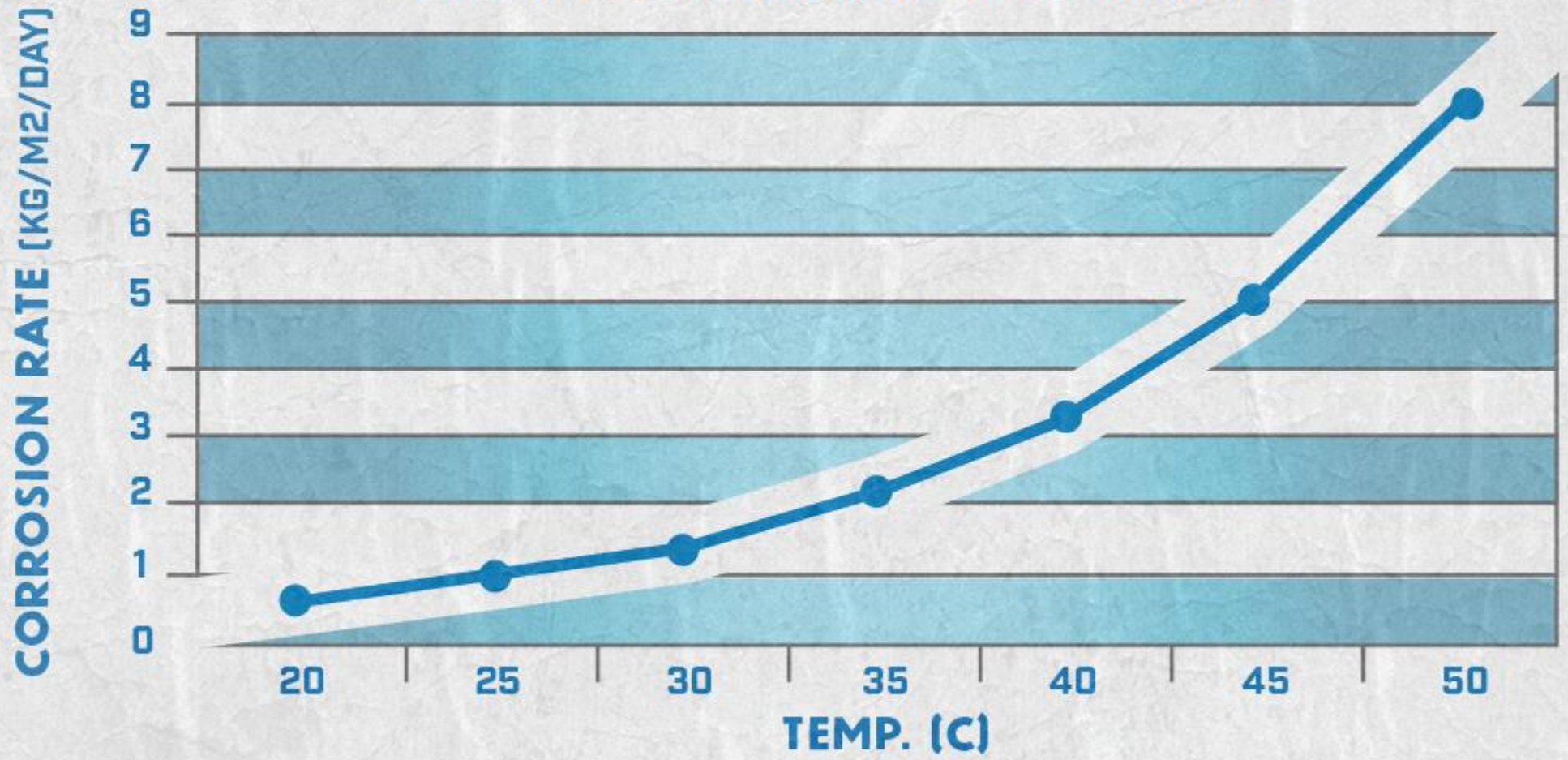
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TEMPERATURE

**FAILURE TO MAINTAIN PROPER
TEMPERATURE FOR METAL PARTS**

EFFECTS OF TEMP ON CORROSION RATE

FOR LOW ALLOY STEEL UNDER ACIDIC CONDITIONS





CONTAMINATION

**LEAVING METAL PARTS
UNCOVERED OR UNPROTECTED**

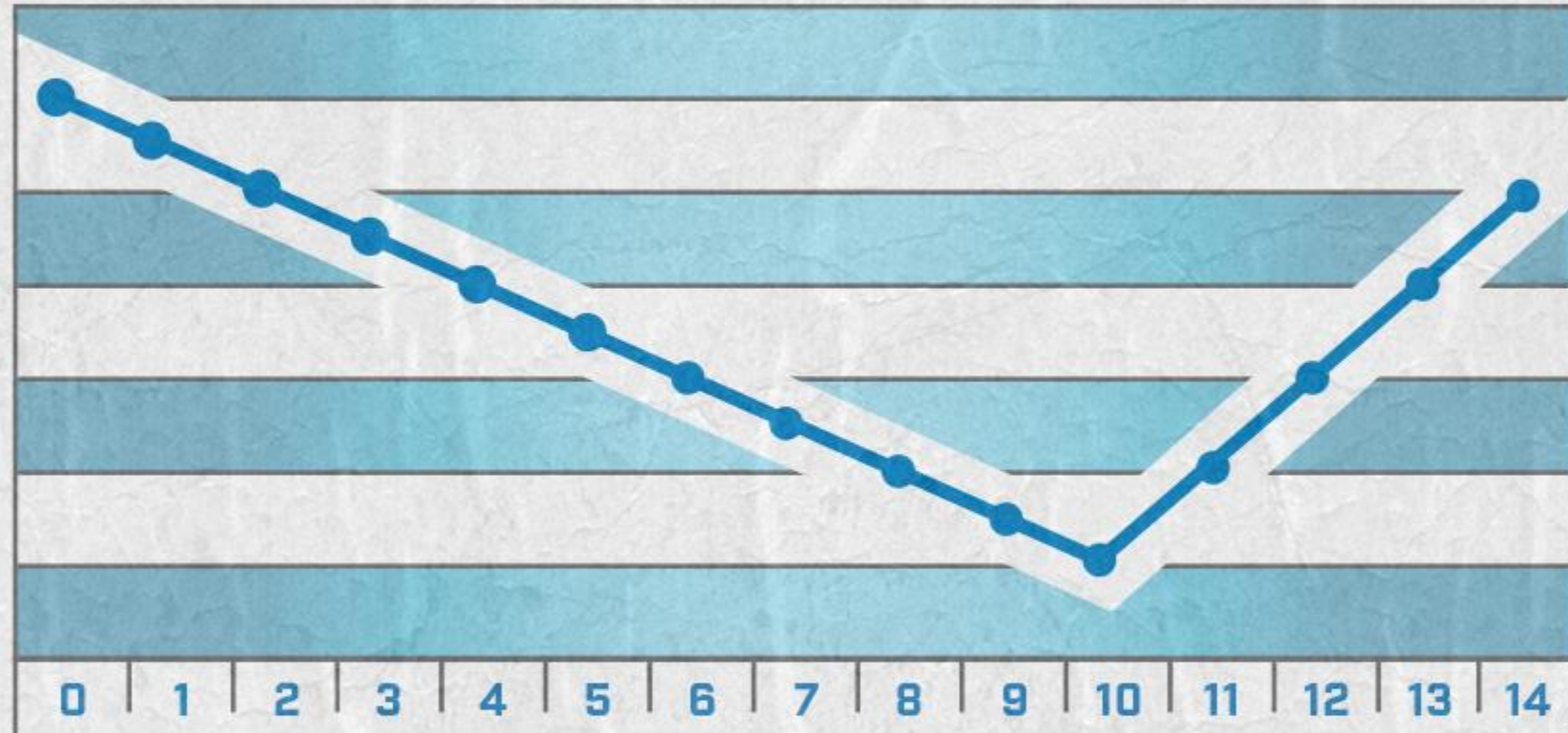


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pH LEVELS

IMPROPER TITRATIONS OF BATHS
AND pH LEVELS

CORROSION RATE



pH LEVEL

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IMPROPER USAGE

**INCORRECT APPLICATION OF
VCI PACKAGING OR PRODUCTS**

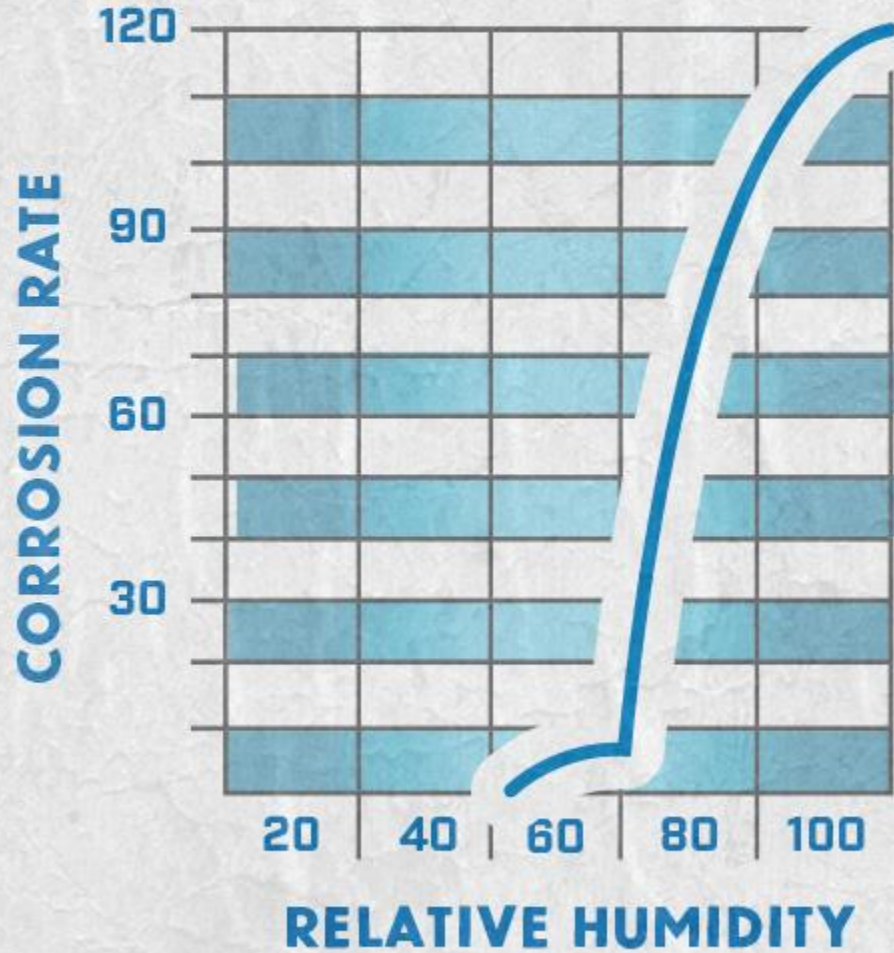


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CONDENSATION

**MOISTURE COLLECTION ON METAL
PARTS INSIDE PACKAGING**

IRON CORROSION RATE AT DIFFERENT RELATIVE HUMIDITIES (%RH)



WATER SOURCES

1. AIR INSIDE PACKAGING
2. MATERIALS INSIDE PACKAGING
3. WALLS OF PACKAGING
4. WATER PERMEATION THRU PACKAGING

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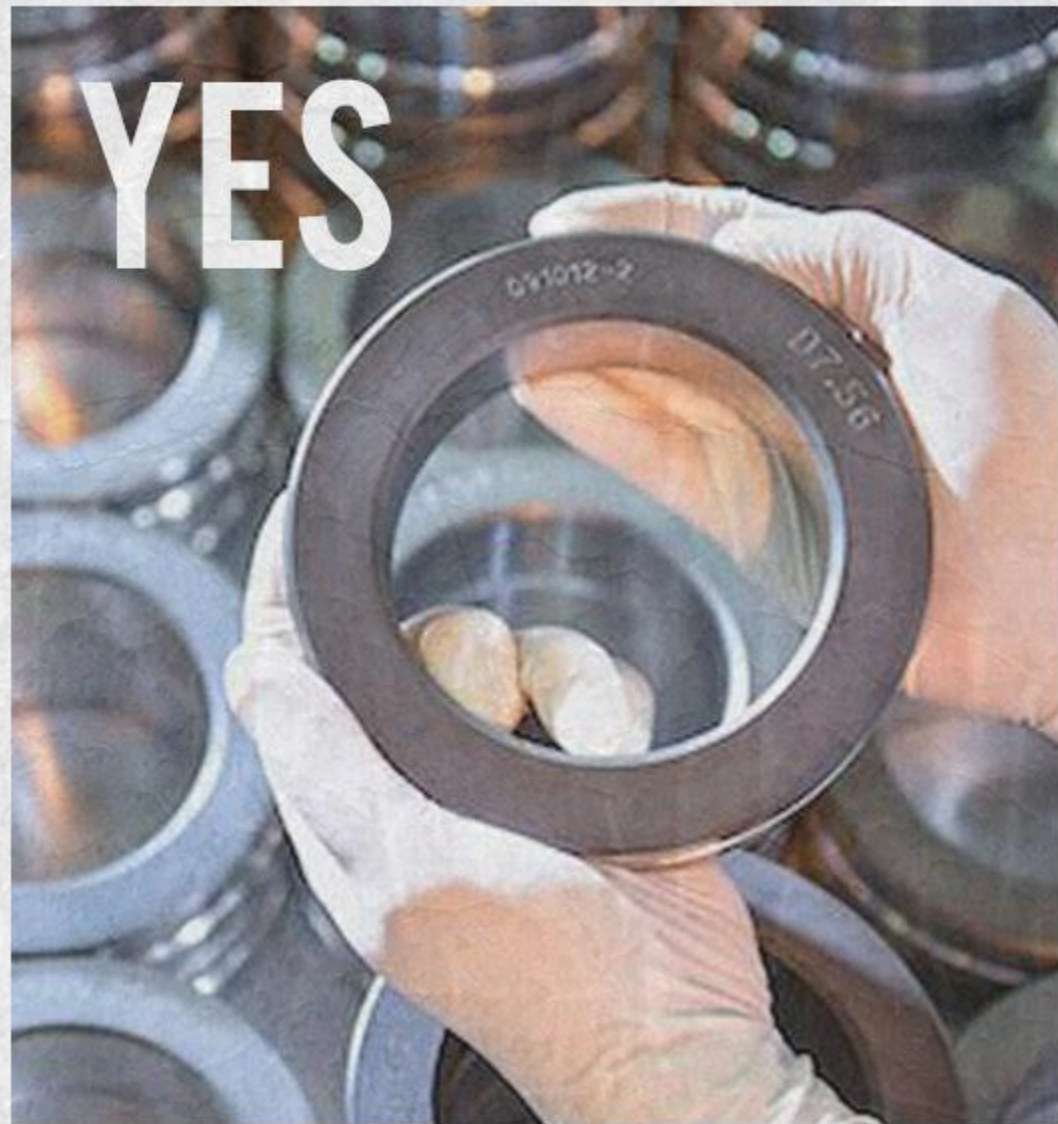
HANDLING

**TOUCHING METAL PARTS
WITH BARE HANDS**

NO



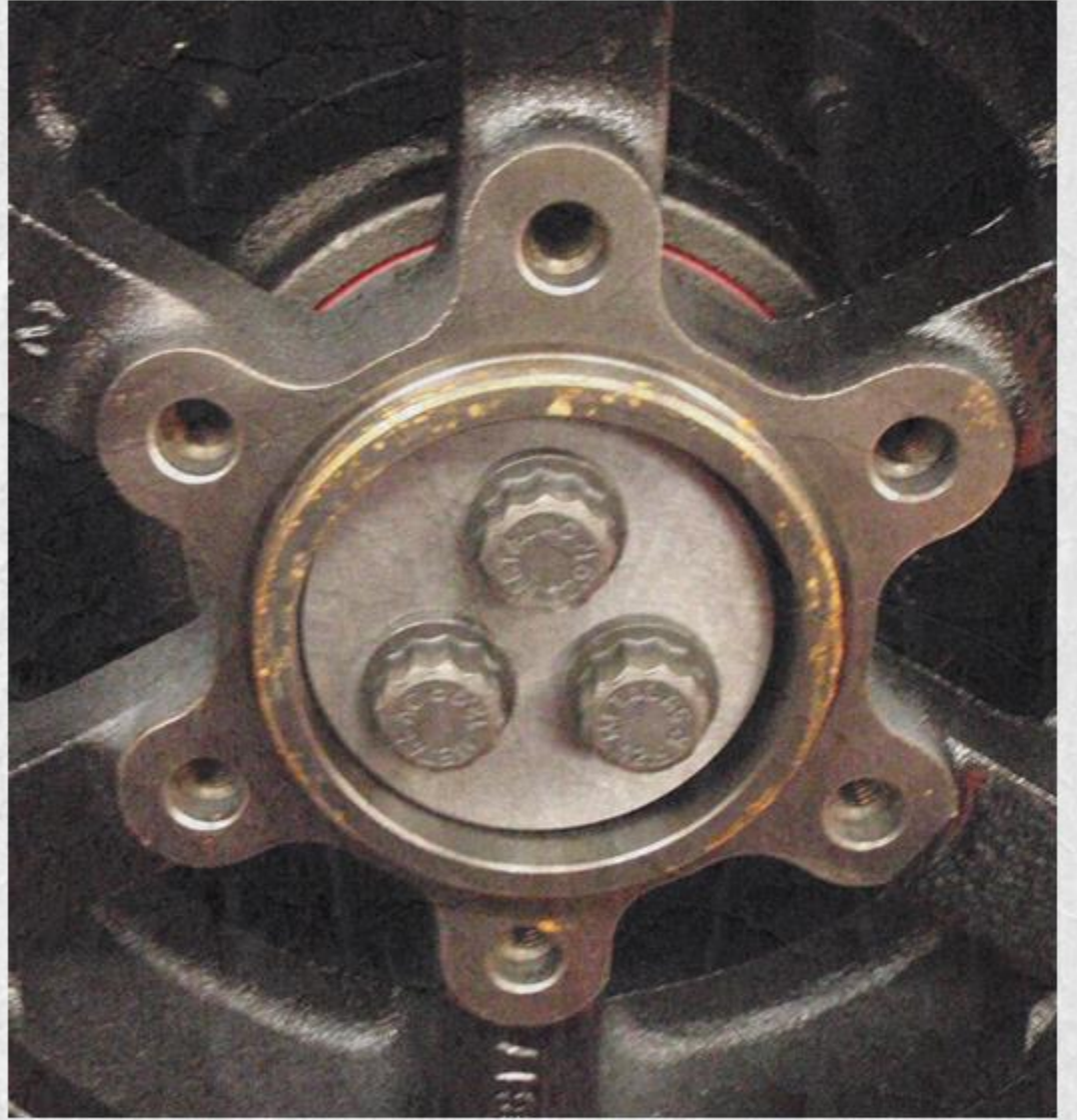
YES



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RINSE & DRY

**PACKAGING METAL PARTS
WHILE DAMP OR WET**





DIRTY CONDITIONS

**UNCLEAN WORK SPACE, SWARF
OR CLEANING SOLUTIONS**



THANK YOU

TAKING THE WORK OUT OF YOUR WORKDAY

