Layup of Manufacturing Facilities

When evaluating the layup of a manufacturing facility, the task can be broken down by classification of equipment and systems into categories as follows:

- Structures
- Equipment
- Work in progress
- Finished goods
- Air systems
- Water systems

Each category will be broken into subsets with specific recommendations for products and applications.

STRUCTURES

- **Concrete foundations, walls, ceilings, etc.**
  - Wash all surfaces to remove all contaminants (10% solution of VpCI®-414)
  - Visually inspect for damage
  - Repair damaged areas using MCI® repair mortar (https://www.cortecmci.com/)
  - Coat all concrete surfaces with MCI®-2020 or MCI®-2022

- **Structural steel**
  - Inspect for areas of rust and/or peeling paint
  - Power wash or use high pressure air to remove all loose rust and contaminants
  - Determine if cross-section in rusted areas meets acceptable design parameters
  - Options to address rust
    - Option 1: Convert hematite to magnetite using CorrVerter® Rust Converter Primer; then topcoat with EcoShield® 386 clear or color match
    - Option 2: Remove rust with VpCI®-423; remove VpCI®-423 with 10% solution of VpCI®-414; and topcoat with EcoShield® 386 clear or color match

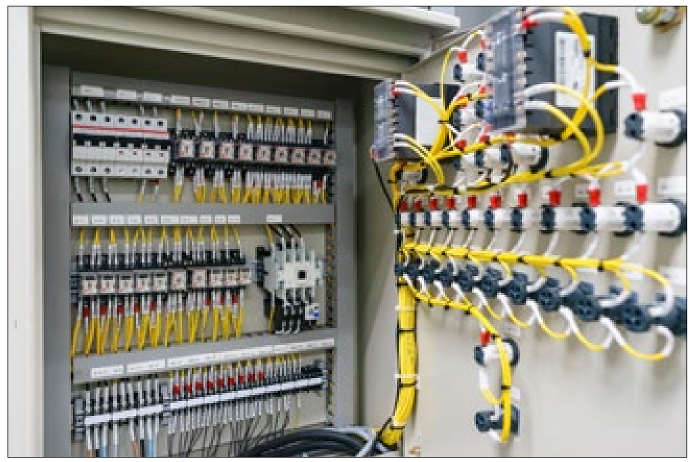
- **Loading bay doors**
  - Clean with 10% solution of VpCI®-414
  - Spray all hinges, rollers, and roller trac/guides with CorShield® 369 Wet Film Corrosion Inhibitor and Lubricant

- **Fasteners, locks, hinges, etc.**
  - Spray with CorShield® VpCI®-369 Wet Film Corrosion Inhibitor and Lubricant

FIRE PROTECTION SYSTEMS

- **Wet Systems**
  - Drain the system
  - Recharge the system adding VpCI®-649 at 1% by weight to the water
- **Dry systems**
  - Set up system to force air being fed into system through a bed of VpCI®-308 Powder

ELECTRICALS



- **Control panels, power panels, and MCC**
  - Deenergize the system
  - Spray all contacts and exposed metal with ElectriCorr® VpCI®-239
  - Insert appropriately sized emitter
    - VpCI®-105 – 5 ft^3 (0.14 m^3)
    - VpCI®-111 – 11 ft^3 (0.31 m^3)
    - VpCI®-308 Pouch – 35 ft^3 (1 m^3)
  - If vented, shrink wrap with either MilCorr® VpCI® Shrink Film or VpCI®-126 HPUV
- **Motors**
  - Deenergize system
  - Closed frame motor
    - Remove any rust with VpCI®-423
    - Remove VpCI®-423 residual with 10% solution of VpCI®-414
    - Coat exposed machined surfaces with VpCI®-391
    - Insert VpCI®-101 Device into junction box

  - Open frame motor
    - Remove any rust with VpCI®-423
    - Remove VpCI®-423 residual with 10% solution of VpCI®-414
    - Coat exposed machined surfaces with VpCI®-391
    - Insert VpCI®-101 Device into junction box
    - Fog ElectriCorr® VpCI®-239 into motor core
    - As a minimum, shrink wrap fan end with either MilCorr® VpCI® Shrink Film or VpCI®-126 HP UV
- **Air systems**
  - Piping
    - Purge and fill air lines, gauges, reservoirs with air pumped through VpCI®-308 Powder
  - Compressors
    - Air side – Fog with VpCI®-337 at 0.5 oz./ft^3 (0.5 mL/L)
    - Lubrication side – depending on type of lubricant, apply one of the below products by fogging at 0.5 oz./ft^3 (0.5 mL/L), or add to oil at 5% by volume
      - M-528 – PAG
      - M-529 – PAO
      - M-530 – Mineral
      - M-531 – PAO
- Manufacturing equipment – lathes, drills, grinders, etc.
  - Deenergize equipment
  - Remove any rust with VpCI®-423

- Remove VpCI®-423 residual with 10% solution of VpCI®-414
- Lubrication side – depending on type of lubricant apply one of the below products by fogging at 0.5 oz./ft^3 (0.5 mL/L) or add to oil at 5% by volume
    - M-528 – PAG
    - M-529 – PAO
    - M-530 – Mineral
    - M-531 – PAO
    - Coolants - https://www.cortecvci.com/Publications/Brochures/Metalworking%20Broch.pdf
    - Lathes, drills, grinders, tumblers, etc. – Add VpCI®-345 to coolant at 10% by volume; circulate and drain
- Guides, screws, etc. (surfaces subjected to relative motion) – Coat with VpCI®-369 D
- Cross slides, headstock assembly, tailstock (components with lubrication oil)
    - Depending on type of lubricant, apply one of the below products by fogging at 0.5 oz./ft3 (0.5 mL/L) or add to oil at 5% by volume
        - M-528 – PAG
        - M-529 – PAO
        - M-530 – Mineral
        - M-531 – PAO

- **Work in process and finished goods**
    - Clean with a 10% solution of VpCI®-414
    - Spray with either ElectriCorr® VpCI®-239 or CorShield® VpCI®-369 Wet Film Corrosion Inhibitor and Lubricant
    - Wrap with appropriate VpCI® film or VpCI® paper: https://www.cortecpackaging.com/wp-content/uploads/2018/09/Packaging_Brochure_09-18.pdf

- **Boilers**
    - Drain
    - Add Boiler Lizard® pouches (one per 1000 gallons [3.8 m^3]) to water side or fog with Boiler Dragon™ at 1 oz./ft^3 (1 L/m^3)
    - Fog fire side with Boiler Dragon™ at 1 oz./ft^3 (1 L/m^3)
    - Fog all piping with Boiler Dragon™ at 1 oz./ft^3 (1 L/m^3)
    - Spray all valve stems, bushings, packing body, and bonnet nuts with CorShield® VpCI®-369 Wet Film Corrosion Inhibitor and Lubricant

- **HVAC systems**
    - Spray evaporator and condenser coils with 10% solution of VpCI®-414 to clean
    - Spray evaporator and condenser coils with VpCI®-337
    - Place VpCI®-308 Pouch (35 ft^3 [1 m^3]/pouch) inside HVAC enclosure
    - Shrink wrap with either MilCorr® VpCI® Shrink Film or VpCI®-126 HP UV
    - HVAC ducting
        - Close air register
        - Fog with VpCI®-337 at 1 oz./ft^3 (1 L/m^3)

- **Toilets**
    - Secure water, flush, and add either of the below products to the tank and bowl
        - ECO-SEPT™
        - PORTA-TREAT™

Product	NSN (National Stock Number)	Qualified MIL Spec	Standard Test Methods
Boiler Lizard® (powder contents)		MIL-I-22110C commercial equivalent	NACE Standard TM0208-2008 NACE RP0487-2000 OECD 306, BOD-28 EPA/600/4-90/027F
CorrVerter® Rust Converter Primer			ASTM B-117 ASTM D-1748 ASTM D-3359 ASTM D-522 ASTM D-532 ASTM D-3960 ASTM D-3363 ASTM D-3363 NACE RP0487-2000 NACE (Minimum Surface Preparation Guideline) SSPC (Minimum Surface Preparation Guideline)
CorShield® VpCI®-369 Wet Film Corrosion Inhibitor and Lubricant		MIL-PRF-16173E, Grade 2 commercial equivalent	ASTM D-1735 ASTM D-1748 ASTM B-117 ASTM D3690 ASTM D522 NACE (Minimum Surface Preparation Guideline) NACE RP0487-2000 SSPC (Minimum Surface Preparation Guideline)
ECO-SEPT™			EUCAST – Antimicrobial susceptibility testing – disk diffusion method, Version 6.0, January 2017 (components) OECD Method 301D (for active ingredients)
EcoShield® 386			ASTM B-117 ASTM D-1748 ASTM D-3359 ASTM D-522 ASTM D-532 ASTM D-3960 ASTM D-3363 ASTM D-3363 NACE RP0487-2000 NACE (Minimum Surface Preparation Guideline) SSPC (Minimum Surface Preparation Guideline)
ElectriCorr® VpCI®-239	6850-01-600-4422		ASTM D-1748 ASTM B-117 NACE RP0487-2000
M-528			OECD Method 301D ASTM D-4172 ASTM D-130 ASTM D-665 ASTM D-974 ASTM D-1748 ASTM D-2196

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M-529	8030-01-630-5244	MIL-PRF-46002 commercial equivalent MIL-PRF-85062 commercial equivalent	ASTM D-4172 ASTM D-130 ASTM D-665 ASTM D-974 ASTM D-1401 ASTM D-1748 ASTM D-2196
M-530/M-531		MIL-PRF-46002 commercial equivalent MIL-PRF-85062 commercial equivalent	ASTM D-4172 ASTM D-130 ASTM D-665 ASTM D-974 ASTM D-1401 ASTM D-1748 ASTM D-2196
MCI®-2020			ASTM G-109 NSF Standard 61
MCI®-2022			SS-W-110C NCHRP 244 Series II EIS – Corrosion Protection to Rebar
MilCorr® VpCI® Shrink Film	8340-01-629-6601	MIL-PRF-121 commercial equivalent MIL-PRF-22019 E (Performance Requirements) commercial equivalent	ASTM D-882 ASTM D-882A ASTM D1709, Method A ASTM D-1922A ASTM D-3420 ASTM D6988-07 ASTM D1748 ASTM D2732-30 ASTM F3429 ASTM D3985 NACE TM0208-2008 NACE RP0487-2000
PORTA-TREAT™			EUCAST – Antimicrobial susceptibility testing – disk diffusion method, Version 6.0, January 2017 (components) OECD Method 301D (for active ingredients)
VpCI®-101 Device	6850-01-338-1392	MIL-I-22110C commercial equivalent	NACE TM0208-2008 NACE RP0487-2000
VpCI®-105	6850-01-406-2060	MIL-I-22110C commercial equivalent	NACE TM0208-2008 NACE RP0487-2000
VpCI®-111	6850-01-408-9025	MIL-I-22110C commercial equivalent	NACE TM0208-2008 NACE RP0487-2000
VpCI®-126 HP UV		MIL-PRF-22019E (Performance Requirements) commercial equivalent MIL-PRF-22020E commercial equivalent	ASTM D-882 ASTM D-882A ASTM D-1922 ASTM D-3420 ASTM D6988-07 ASTM D1748 ASTM D1735 ASTM D2732-30 NACE TM0208-2008 NACE RP0487-2000

VpCI®-308 Pouch/Powder		MIL-I-22110C commercial equivalent	NACE TM0208-2008 NACE RP0487-2000
VpCI®-337	6850-01-629-9146		
VpCI®-345			ASTM D-1748 ASTM D-4627 ASTM G-31 NACE RP0487-2000
VpCI®-369 D		MIL-PRF-16173E, Grade 2 commercial equivalent	ASTM D-1735 ASTM D-1748 ASTM B-117 ASTM D3690 ASTM D522 NACE (Minimum Surface Preparation Guideline) NACE RP0487-2000 – Selection of Rust Preventives SSPC (Minimum Surface Preparation Guideline)
VpCI®-369 M (1 qt. [0.9 L])	8030-00-244-1295	MIL PRF-16173E, Grade 2	ASTM D-1735 ASTM D-1748 ASTM B-117 ASTM D3690 ASTM D522 NACE (Minimum Surface Preparation Guideline) SSPC (Minimum Surface Preparation Guideline) ASTM D-1735 ASTM D-1748 ASTM B-117 ASTM D3690 ASTM D522 NACE (Minimum Surface Preparation Guideline) SSPC (Minimum Surface Preparation Guideline)
VpCI®-369 M (1 gal. [3.8 L])	8030-00-244-1297		
VpCI®-369 M (5 gal. [18.9 L])	8030-00-244-1298		
VpCI®-369 M (55 gal. [208 L])	8030-01-149-1731		
VpCI®-386	8030-01-481-8897		ASTM B-117 ASTM D-1748 ASTM D-3359 ASTM D-522 ASTM D-532 ASTM D-3960 ASTM D-3363 ASTM D-3363 NACE RP0487-2000 NACE (Minimum Surface Preparation Guideline) SSPC (Minimum Surface Preparation Guideline)
VpCI®-391			ASTM D-1748 ASTM B-117 ASTM D3690 ASTM D522 NACE RP0487-2000 NACE (Minimum Surface Preparation Guideline) SSPC (Minimum Surface Preparation Guideline)
VpCI®-414			ASTM G-31 ASTM D4627 OECD Method 301D

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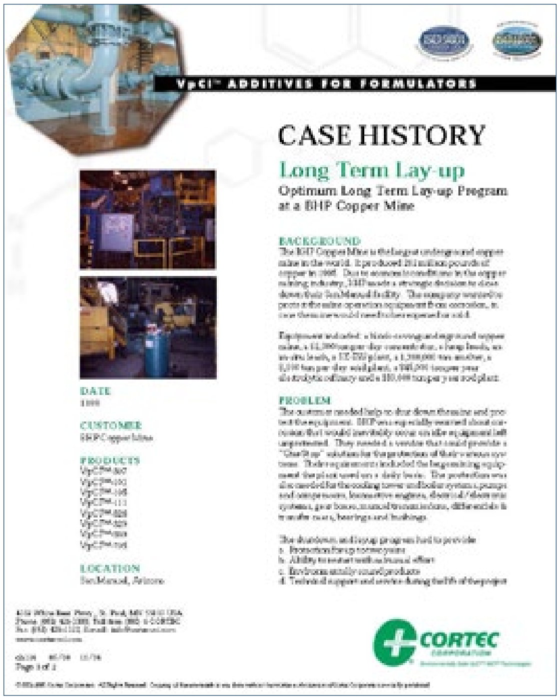
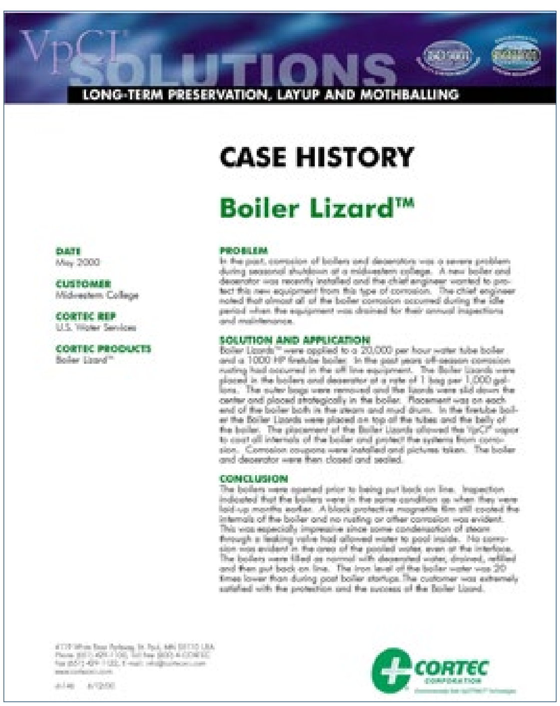
VpCI®-423	6850-01-482-4536		ASTM F-519 ASTM D-6866-11 OECD Method 301D
VpCI®-649	6850-01-535-2531		NOEC/LOEC – Toxicology Testing ASTM D4627 ASTM G-31

CASE HISTORIES



Copper Mine Layup
https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch124.pdf

Layup of Offshore Rig
https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch662.pdf



Boiler Lizard® Protecting College Boiler
https://www.corteccasehistories.com/?s2member_file_download=access-s2member-level1/ch146.pdf

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