Corrosion Control & Advanced Coatings

Preserving Mission Readiness through Advanced Surface Protection and Material Integrity

U.S. Air Force Photo

Concurrent Technologies Corporation (CTC) provides end-to-end corrosion prevention and control (CPC) and coatings solutions to extend the life of critical assets. Our certified experts and materials scientists apply decades of experience to combat the multi-billion-dollar impact of corrosion on infrastructure, ground vehicles, ships, aircraft, and equipment.

Effective corrosion control enhances system reliability, ensures safety, and drastically reduces lifecycle maintenance costs. Our approach combines laboratory-proven science with rugged, field-deployable application methods to protect assets in the harshest environments. Using this methodology allows us to provide non-traditional corrosion solutions to advanced engineered technologies as well as more common systems.

Why partner with a nonprofit for Coatings & Corrosion solutions?

CTC is an independent, nonprofit organization that offers distinct benefits:

- Mission-Focused Readiness
- Association for Materials Protection and Performance (AMPP)-Certified Expertise
- Specialized Chemical Agent Resistant Coating (CARC) Proficiency
- Integrated Laboratory & Field Services
- Regulatory & Environmental Compliance
- Extended Asset Lifecycle
- Tailored Mitigation Strategies

CTC *Concurrent Technologies Corporation*

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Why partner with a nonprofit for Coatings & Corrosion solutions?

- Mission-Focused Readiness: We prioritize asset availability by implementing corrosion prevention strategies that minimize downtime and prevent structural failures before they occur in the field.
- AMPP-Certified Expertise: Our AMPP-certified materials engineers and other subject matter experts bring a wealth of knowledge in coating chemistry, cathodic protection, and metallurgical analysis.
- Specialized CARC Proficiency: As specialists in CARC, we ensure military assets meet stringent survivability standards while providing superior resistance to harsh decontaminants and environmental exposure.
- Integrated Laboratory & Field Services: CTC seamlessly bridges the gap between research and development (R&D) and application. We use state-of-the-art ISO/IEC 17025 accredited laboratory testing (accelerated aging, salt spray) to optimize our real-world field applications.

CTC's technical team applies in-depth expertise to identify and test coating solutions.

- Regulatory & Environmental Compliance: We help clients navigate complex environmental regulations, specializing in identifying the right low-VOC coating and chrome-free pretreatment alternatives that reduce environmental impact without sacrificing performance.
- Extended Asset Lifecycle: By identifying corrosion at its earliest stages and applying advanced barrier protections, we significantly extend the service life of high-value equipment and infrastructure.
- Tailored Mitigation Strategies: We understand that every environment and client is different. CTC offers flexible solutions ranging from specialized shop-based coating applications to mobile, on-site corrosion training teams.

How does CTC apply coatings & corrosion solutions?

Our comprehensive approach integrates assessment, application, and validation to protect complex systems across their entire lifecycle.

Assessment & Specification Definition

Activities:
Conducting facility and equipment audits, identifying environmental corrosion stressors, performing material compatibility studies, and defining technical coating specifications.

Client Outcome:
Data-driven mitigation plan and precise material specifications that ensure the right protection is applied to the right asset, reducing the risk of premature failure.

Surface Preparation & Advanced Application

Activities:
Executing precision surface cleaning and profiling, applying multi-layer coating systems (including primers, mid-coats, and CARC topcoats) in controlled environments or in the field.

Client Outcome:
High-performance protection applied to exacting standards, resulting in superior adhesion, durability, and a professional finish that meets all military and industrial requirements.

Verification, Validation & Quality Control

Activities:
Performing non-destructive dry film thickness (DFT) testing and environmental monitoring during the curing process to ensure compliance with quality standards.

Client Outcome:
Confidence that the coating system was applied correctly and will perform as intended, backed by comprehensive quality assurance documentation and inspection reports.

Sustainment & Long-Term Monitoring

Activities:
Developing long-term corrosion management plans, providing on-site training for maintenance personnel, and utilizing sensors or Digital Twins to monitor coating health and predict future maintenance needs.

Client Outcome:
Optimized lifecycle support, shifting from reactive repairs to proactive maintenance, which ensures long-term operational readiness and minimizes total cost of ownership.

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What technologies & tools does CTC offer?

At CTC, we leverage best-in-class technologies and rigorous testing protocols to ensure our coating solutions withstand the most demanding operational conditions.

Advanced Surface Preparation
We evaluate and utilize specialized media blasting and chemical stripping to ensure optimal substrate profile and cleanliness, which are foundational for any successful coating system.

Materials Analysis & Microscopy
Our coatings experts use in-house scanning electron microscopy (SEM) and energy-dispersive X-ray spectroscopy (EDS) equipment in our metallography lab to diagnose the root cause of coating failures and material degradation.

Analytical & Environmental Testing
To validate coating performance, we use ASTM-standard testing, including salt fog corrosion testing and cyclic corrosion testing. CTC also develops and conducts specialized coatings performance test plans.

Field-Deployable Kits
We develop, demonstrate, and deploy customized mobile equipment designed for on-site corrosion repair, allowing for rapid maintenance of fielded systems without the need for transport to a depot.

CARC & Functional Coatings
For 25 years, CTC has supported the Department of War by developing, demonstrating, and transitioning organic and inorganic coating systems, improved coatings removal methods, and optimized approaches for cleaning surfaces prior to coating application. We have extensive knowledge in CARC, anti-fouling layers, and functionalized primers designed to resist chemical, biological, and radiological contaminants.

What are examples of CTC's coating & corrosion control success stories?

Corrosion Monitoring of Water Piping

Challenge:
Water pipes at U.S. military installations, especially in mechanical rooms, are highly susceptible to hidden internal corrosion. When corrosion becomes severe, pipes can burst, leading to costly repairs, disrupted maintenance schedules, and temporary loss of water service on post.

Solution:
CTC led a team to develop, demonstrate, and install a non-intrusive, fiber-optic-based acoustic sensor system for detecting corrosion within water pipes.

Result:
The system can detect pipe wall thickness loss, an indicator of internal corrosion, and continuously analyze signals using either a generated tone in quiet settings or background noise in louder areas like mechanical rooms.

Capabilities Used:
- Laboratory corrosion testing
- Prototype design and development
- Team and stakeholder coordination

U.S. Navy Photo

Reverse Sensitization Unit (RSU)

Challenge:
Maritime aluminum alloys (5xxx-series) sensitize over time, leading to stress corrosion cracking and structural failure. Repairs typically require costly, time-consuming replacement of large metal sections.

Solution:
CTC's portable Reverse Sensitization Unit (RSU) uses in-situ thermal treatment to restore corrosion resistance, eliminating the need to cut or replace the original metal.

Result:
The RSU extends asset life, reduces maintenance costs by millions, and allows for in-place repair without structural replacement.

Capabilities Used:
- Materials science and deep understanding of alloy behavior
- Prototype design and development
- Test plan development and execution
- Technology transitioning and implementation

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Concurrent Technologies Corporation

Concurrent Technologies Corporation (CTC) is an independent, nonprofit, applied scientific research and development professional services organization. CTC collaborates with its technology transition affiliate, Enterprise Ventures Corporation, to leverage research, development, test and evaluation work to provide transformative, full life-cycle solutions. To best serve our clients' needs, we offer the complete ability to fully design, develop, test, prototype, and build. We deliver robust, technical, and innovative solutions that safeguard our national security, retain U.S. technological advantage, and ensure the primacy of American manufacturing.

CTC's quality management systems are certified to the ISO 9001:2015 (Quality) and ISO14001:2015 (Environmental) standards, and to AS9100D:2016 (Quality-Aerospace-Related Products). In addition, CTC is accredited by Perry Johnson Laboratory Accreditation, Inc. for ISO/IEC 17025:2017, which covers mechanical testing of various metals.

www.ctc.com

For more information, contact:
Rob Mason, CEF
Principal Materials and Process Scientist
814-269-2662
corrosion@ctc.com
coatings@ctc.com

100 CTC Drive • Johnstown, PA 15904
Phone: 1-800-282-4392

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