



CARBONSEAL™
by **HJ3**

carbonsealrepair.com
GENERAL CONCRETE

CARBONSEAL FEATURES & BENEFITS

- ✓ Stronger Than Steel and Fiberglass
- ✓ No Downtime, No Heavy Equipment, No Hot Work Permits Needed
- ✓ Abrasion Resistant - only 10mg loss per 1000 cycles at 40mils
- ✓ Temperature Resistant - HDT up to 500F
- ✓ Corrosion-Resistant and Chemical-Resistant to Acids, Alkalis and Solvents
- ✓ 20 Years of Large-Scale Testing for the Strengthening of Concrete, Masonry, Steel and Wood Support Structures

CARBONSEAL: THE HIGHEST STRENGTH AND RESISTANCE TO HARSH ENVIRONMENTS

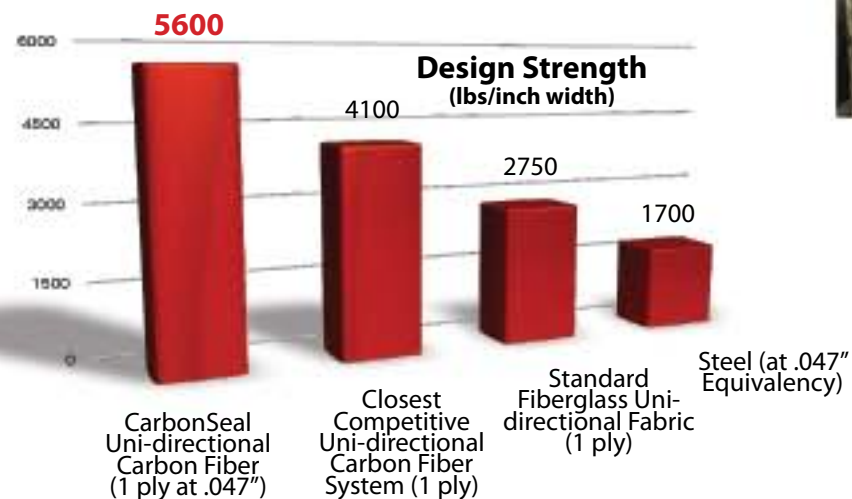
The CarbonSeal Concrete Repair System meets the tough demands of your concrete applications. Whether it's protecting structures exposed to aggressive environments or strengthening your damaged concrete, our systems save you significant money over traditional repairs or replacement.



The CarbonSeal Concrete Repair Systems are designed for multiple applications, including beams, columns, walls, slabs, pedestals, silos, and secondary containment

STRENGTH

Higher strength means less material and less labor



CHEMICAL RESISTANCE

Typical Chemical Resistance of CarbonSeal by Industry Type:*

Metals and Mining	Petrochemical	Pulp & Paper
Sulfuric Acid	Hydrocarbons	White Liquor (Sodium Sulfide)
Copper Sulfate	Gasoline	Green Liquor
Pine Oil	Diesel	Black Liquor
Ammonium Nitrate	JP-4 Jet Fuel	Sodium Hydroxide
Alcohol	Kerosene	Lime (Calcium Oxide)
Petroleum Distillate	Benzene	Bleach (Sodium Hypochlorite)
Sulfosuccinate Surfactant	Hydrochloric Acid	
Food and Agriculture	Power Generation	Wastewater
Citric Acid	Process Water	Hydrogen Sulfide
Anhydrous Ammonia	Flue Gas	Effluent Waste
Lard	Sodium Carbonate	Methanol
Soy Bean Oil	Bromine	Hydrogen Peroxide
Stearic Acid	Muriatic Acid	
Coconut Oil	Lime Slurry	



The CarbonSeal carbon fiber is lightweight, flexible and conforms to the substrate for easy installation

*Please call 520-322-0010 or Toll-Free (US) 877-303-0453 to speak to a Project Manager for additional technical support

// No one provides the detailed engineering package with their repairs like HJ3. We are thrilled with their product quality and support. //



Skip P, Industrial Mining Contractor, Southwest USA

CARBONSEAL CASE HISTORIES

● GENERAL CONCRETE

MANHOLES
STEEL PIPE
STEEL TANKS
UNDERGROUND PIPE
UNDERGROUND TANKS

100 YEAR-OLD COPPER PLANT REINFORCED WITH CARBON FIBER

ARIZONA

The constant vibrations, exposure to moisture and chemicals in a copper facility cause significant degradation to the facility's infrastructure over time. In this particular case, the copper plant, which was originally built in 1906, had degraded so badly that the building no longer met MSHA standards.

● PROBLEM

The concrete columns, beams and slabs in this case had been exposed to constant vibrations and moisture for over 100 years and had showed significant cracking.

The inside steel reinforcement had corroded and expanded or "bloomed", overcoming the tensile strength of the concrete around it.

● INSTALLATION

The substrates were cleaned by abrasive blasting the surface to remove loose concrete. All exposed steel rebar were cleaned to white metal and coated to prevent further corrosion. Cementitious quick set grout was used to resurface the concrete structures back to their original dimensions. CarbonSeal carbon fiber was saturated and placed onto the substrate. After applying the carbon fiber, CarbonSeal top coats were used to seal the FRP and protect it from further exposure to the environment.



● CONCLUSION

The CarbonSeal repair system strengthened over 150,000 square feet of concrete columns, beams and slabs, saving the client millions of dollars over the cost of replacement. This case history is an exceptional example of how carbon fiber can be used to repair concrete infrastructure even after 100 years of severe corrosion.



● WALLS



● PIPE RACKS



ADDITIONAL CONCRETE REPAIR APPLICATIONS

● SILOS



● CORNERS



● COLUMNS



● PEDESTALS



● BEAMS



● SLABS



HJ3 WORKING FOR YOU!

1 GATHER INFORMATION

Send us your "As-Built" drawings, completed CarbonSeal Worksheet and pictures of your application.

MARKETING
CUSTOMER SERVICE

2

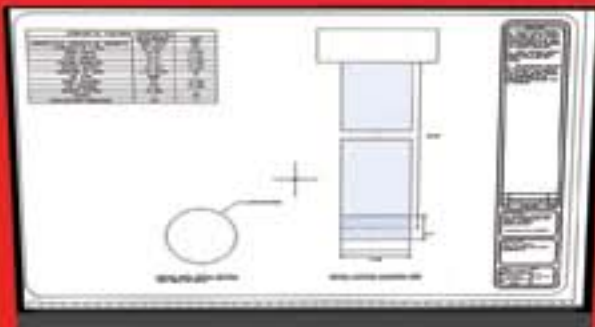
KICK-OFF MEETING

HJ3 Project Managers review the information provided and contact you to obtain additional information.

3

PRELIM DESIGN

HJ3 Engineers diagnose the problem and calculate a preliminary design to strengthen your application. Once completed, HJ3 sends you a final proposal that outlines the CarbonSeal repair system.



4

STAMPED DRAWINGS

After you approve HJ3's proposal, HJ3 completes final engineering calculations and submits full construction drawings stamped by a licensed P.E.

SHIPPING
PRODU

5

INSTALLATION

HJ3's Field Technician and Certified Contractor install the CarbonSeal Concrete Repair Kit per the final drawings. Services include QA, QC, and on-site testing per ASTM standards.

6

TOUCHDOWN MEETING!

HJ3 meets with you to obtain your feedback and answer any remaining questions. Upon request, HJ3 Project Managers submit a final project report documenting the installation.

CARBONSEAL GETTING STARTED

The CarbonSeal products are designed with you in mind. To help you determine which CarbonSeal Concrete Repair System is the best solution for your application, HJ3 provides the following tools:

- ✓ Electronic Worksheets
- ✓ Engineering Drawings
- ✓ On-site Assessment
- ✓ Testing Support
- ✓ Case Histories
- ✓ References

HOME WORKSHEETS

CARBONSEAL GENERAL CONCRETE PROJECT

NARRATIVE WORKSHEET DIMENSIONS & MATERIALS SKETCHES

SECTION 1: NARRATIVE

1 Requesting a Proposal (P), Quote (Q) or Rough Order of Magnitude (ROM)?

2 What date and time is the document desired?

3 Are "As-Built" plans available for review?

4 Description of Damage:

100-year-old copper plant showing severe cracking and corrosion to reinforced concrete columns

5 Are photos or videos available of the areas to be repaired?

6 The purpose of the repair / retrofit is to (select all that apply):

Bring structure back to original design values

Increase load capacity

Mitigate corrosion

Other (please specify):

7 Any temperature / moisture / chemical operating extremes?

8 Describe any visible damage to the substrate(s):

Corrosion?

Testing shows 25% steel loss on vertical bar

PHOTOS & DRAWINGS

TAP TO SELECT A PHOTO OR DRAWING, SLIDE RIGHT OR LEFT TO SCROLL THROUGH THE LIST

REFERENCES

CALL TODAY TOLL FREE 877 303 0453
carbonsealrepair.com
Tuesday, November 29, 2011

CONTACT

CONTACT HJ3

SUGGESTED SOLUTION

CARBONSEAL CONCRETE REPAIR KIT

BUY NOW!

KIT CONTENTS

- Carbon Fiber, pre-measured and cut to length
- Epoxy Resin Packs, pre-measured and batched
- Tools required to complete the installation

CONTACT US FOR HELP

DEPENDING ON YOUR PROJECT NEEDS

Turnkey concrete repair kits available:

- Beams
- Columns
- Slabs
- Pedestals
- Walls
- Silos

HJ3
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hj3.com

If you have a specific concrete application you would like reviewed, please contact an HJ3 Project Manager to schedule an on-site survey.

Or request and complete the General Concrete Repair Worksheet, and HJ3's engineering team will diagnose the problem and send you engineered systems in a matter of days.

Call us toll-free at
877-303-0453
or send our Project Managers an email at hj3pm@hj3.com
Visit us any time of the day at
carbonsealrepair.com

WHO IS HJ3?

the strongest name in carbon fiber

HJ3 Composite Technologies provides the most comprehensive line of strengthening products in the world for fortifying and protecting structures against earthquakes, blasts, and environmental damage, at a fraction of the cost of replacement.

Over the last 10 years, we have become the leading provider of carbon fiber repair systems to heavy industry, supporting Fortune 500 companies operating in pulp and paper, oil, gas, water and wastewater, mining, and power generation.

Not only are our products 40%-50% stronger than competitors per ply, they are designed to withstand high temperatures, abrasion, and aggressive chemical environments.

HJ3 has completed over 20 years of large-scale testing to support the use of our products for concrete, steel, wood and masonry applications.

We are proud to service clients around the globe and look forward to the opportunity to support your infrastructure applications.



WE ARE ON A MISSION

To set the worldwide standard for global infrastructure repair using high-strength composites, through continuous innovation and unwavering customer service, to prevent the loss of lives and resources.

WE ARE HERE FOR YOU

Our certified installer network has installed more than 3,000,000 square feet of HJ3 carbon repair systems worldwide.

Bahrain . Canada . Colombia . DR Congo . El Salvador . Haiti . Indonesia . Iraq . Jordan . Mexico . Qatar . Singapore . South Africa . Thailand . Turkey . UAE . USA



WE ARE COMMUNITY DRIVEN



Community Outreach

The HJ3 team takes a 'hands-on' approach when it comes to community service. Reaching out to those in need is as important to us as building relationships with our clients. Some of the organizations we have worked with include Habitat for Humanity, the Cystic Fibrosis Foundation, Goodwill, and the Salvation Army's "Adopt a Family" program.



Educational Support

HJ3 frequently supports education-based efforts to give back to the next generation, as we appreciate the knowledge and experiences we ourselves have gained over the years. Whether it is speaking at a college or university, volunteering for university events, or hiring and mentoring undergraduate, graduate and high school student interns who are interested in the composites industry, we are dedicated to supporting young, entrepreneurial minds.



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CARBONSEAL™

**GENERAL CONCRETE
REPAIR SYSTEMS**

by



hj3.com

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