WATCH WATER®

CATALYTIC CARBON MG®


Concept illustration

MAGNESIUM. IRON. CARBON.

A STRONG SCIENTIFIC FOUNDATION FOR PFAS ADSORPTION

05 CATALYTIC CARBON MG®

WATCH WATER® — OUR COMMERCIAL PRODUCT

ACTIVATED CARBON + ZERO-VALENT IRON + MAGNESIUM MODIFICATION

Watch Water's magnesium-modified, ZVI-coated activated carbon combines complementary surface functions in one treatment medium.



CARBON —
Accessible pores and hydrophobic interactions contribute to PFAS uptake.



MAGNESIUM-BEARING SITES —
Surface charge and cation bridging can strengthen uptake under suitable water conditions.



IRON / ZVI —
Iron surfaces provide additional PFAS-binding interactions. Surface chemistry and ageing matter.

01–04: PUBLISHED RESEARCH ON RELATED MATERIALS

Results below concern the materials tested in each study, not measured ratings for Catalytic Carbon MG®.

01 MAGNESIUM-MODIFIED ACTIVATED CARBON

1.97× TREATED BED VOLUMES

Calgon Carbon patent, 2024

MgO-containing carbon reached **25,282** bed volumes versus **12,851** for F400 at a combined PFOA + PFOS endpoint of **70 ng/L.** This was the historical test endpoint.

Meaning: magnesium modification can improve carbon column performance.

Applicant-reported patent data; a different material from MG.
Source: US11911743B2, Example 3, Table 1.

02 MAGNESIUM + IRON + BIOCHAR

OVER 80% REMOVAL THROUGH FIVE CYCLES

Niaz et al., 2024

Magnesium-ferrite biochar outperformed pristine and magnesium-modified comparison biochars. Reported adsorption capacities: PFOA **2.876 mg/g;** PFOS **7.291 mg/g.**

Meaning: combined iron–magnesium modification can improve PFAS adsorption and reuse.

Synthetic-water batch tests. Magnesium ferrite is not ZVI.
DOI: 10.1016/j.jece.2024.114894

03 COMBINED Fe/Mg CARBON SURFACES

OVER 90% OF INITIAL EFFICIENCY RETAINED

Xin et al., 2026

Fe/Mg-modified porous biochar was investigated for PFOA, PFOS, PFBA and PFBS. More than **90%** of initial adsorption efficiency remained after five regeneration cycles.

Meaning: combined metal sites and accessible pores support a promising reusable adsorbent design.

Different carbon preparation and iron phases from MG.
DOI: 10.1016/j.cej.2026.177573

04 ZERO-VALENT IRON AND PFAS BINDING

EQUILIBRIUM WITHIN ONE HOUR

Fang et al., 2024

Nanoscale ZVI adsorbed both PFOA and PFOS. Maximum reported capacities were **17.63 mg/g** for PFOA and **256.24 mg/g** for PFOS.

Meaning: iron surfaces can contribute substantial, PFAS-specific adsorption.

Unsupported nanoparticles; no magnesium-coated carbon bed was tested.
DOI: 10.1039/D3EN00987D

THE COMPLETE SURFACE DESIGN MATTERS

Magnesium oxide, magnesium metal, magnesium ferrite and ZVI are different chemical forms. Carbon pores, pH, natural organic matter and PFAS chain length influence performance. Capacities from different experiments cannot be used as a direct product ranking.

FROM SCIENTIFIC SUPPORT TO PROVEN PERFORMANCE

Measure real-water breakthrough, individual short- and long-chain PFAS, and retained capacity after regeneration. PFAS destruction requires separate PFAS and fluorine accounting.

Related-material research supporch the approach. Product superiority requires independent comparative testing of the finished medium.

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