

# METAFIX® REAGENT Treatability Test

Laboratory Services



METAFIX® REAGENTS are custom formulated blends of reducing agents, reactive minerals, adsorbents, mineral activators, catalysts and pH modifiers for the treatment of heavy metals. Site-specific bench scale testing allows the optimization of the reagent formulation and dosage rates needed to achieve remedial goals. This customized approach allows for a cost-efficient solution to meet or exceed the remedial objectives.

The standard treatability test will include the evaluation of three METAFIX® REAGENTS formulations at two dosage rates, as well as an untreated control. The testing method will be done by TCLP, SPLP or a groundwater leachate test, at the discretion of the client.

## Standard test

A standard METAFIX® treatability test costs \$3,500 for one soil sample, no replicate analyses, and up to three metals included. Table 1 provides a standard list of analytes and detection limits. A report will be issued following the completion of the study.

## Customized test

Customized METAFIX® treatability tests can be designed and performed to address other metals, such as mercury or metalloids, evaluate lower detection limits or the EPA's Leaching Environmental Assessment Framework (LEAF) Methods. In addition, column studies can be performed to help evaluate ground water treatment efficacy.

Please contact your Technical Representative to request a proposal.

## Materials needed for sample collection and shipping

- Sample containers (0.5 or 1.0 L plastic wide mouth jars with lids)
- Sealable plastic bags
- Bubble wrap or bags
- Large plastic bag with cable tie
- Shipping cooler
- A plastic tag with transparent document sleeves attached to the cooler handle for holding the shipping documents

## Sample collection

2.0 kg of soil and 5.0 L of groundwater (if evaluating a saturated zone application) are required for each METAFIX® treatability test. Samples should be placed in plastic containers with a quality seal. Prior to sealing, clean the outside of each container, including the threads, and make sure to tightly seal the lid onto each.

**NOTE: DO NOT PRESERVE SAMPLES BY ACIDIFICATION OR ANY OTHER METHOD.**

## Sample label requirements

Samples must be placed in the 0.5 or 1.0 L plastic containers. Each individual sample must be clearly labeled with:

1. Project name
2. Date and time of collection sample
3. A descriptive sample number and name
4. The name of the person who collected the soil
5. Every container must also be marked "Contents – Soil Sample" or "Contents – Groundwater Sample"

## Preparation for shipping

1. Place each container inside a sealable plastic bag as secondary containment to prevent spillage during transport
2. Wrap each container in bubble plastic to protect from damage during shipping
3. Secure all the samples in the large plastic bag with a cable tie as tertiary containment
4. Place the large bag with samples in the shipping cooler
5. Complete the Chain of Custody form and place it inside the cooler
6. Surround the large bag with packing material (e.g. newspapers, packing peanuts, bubble plastic or other appropriate material) to prevent the samples from shifting during shipping
7. **DO NOT INCLUDE ICE OF ANY KIND IN THIS SHIPMENT**
8. Securely close and seal the cooler with packaging tape
9. Make sure the cooler's water drain, if present, is taped closed or otherwise sealed
10. Place the shipping documents in one of the re-sealable transparent sleeves on the handle tag

## Shipping information

Please contact your Evonik Technical Representative prior to shipping samples and provide the completed Chain of Custody Form and shipment tracking information.

Samples shipping from outside the United States require specific labeling and shipping information; please request further information prior to shipping. Billing will be done by invoice once the final report is issued.

## Samples should be shipped to:

Resolution Partners  
Attention: METAFIX  
967 Jonathon Drive, Madison, WI  
53713, USA  
+1 608 669 1248

**Chain of custody**

_____	_____		
Contact name	Address		
_____	_____		
Company	City	State/Province	Postal Code
_____	_____		
Telephone number	Country		
_____	_____		
Email	Evonik Technical Sales Representative providing support		

_____	_____	_____
Project name	Number of soil samples	Number of groundwater samples

What metals are being evaluated for treatment with METAFIX®? \_\_\_\_\_

Is the treatment of chlorinated solvents being evaluated for use with METAFIX®?      Yes      No

Please provide the remedial goals and detection limits. \_\_\_\_\_

Are replicate analyses required?      Yes      No

If more than one sample, do you want      each soil sample tested separately or      homogenized into one sample?

Please specify the requested testing protocol:      TCLP      SPLP      Groundwater      Other

The TCLP test is used for soil disposal as non-hazardous material. The SPLP test is applied to validate in situ stabilization of vadose zone soils, as the test is designed to simulate exposure to rainfall over an extended period of time. Groundwater analysis is applied to validate in situ treatment of the saturated zone to evaluate changes in dissolved concentrations.

Standard filtration of samples is 0.7 µm for TCLP and SPLP, and 0.45 µm for groundwater leaching tests.

Please specify desired filtration (if different from standard): \_\_\_\_\_ µm

Standard soil : liquid ratio for METAFIX® trials is 1 : 20.

Please indicate the desired soil : liquid ratio (if different from standard): \_\_\_\_\_      Note: alternate ratios may affect sample volume requirements.

Standard reaction time is 1 week. A quote for a customized test outline can be provided upon request.

# METAFIX® REAGENT Treatability Test

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## Chain of custody (continued)

Sample #	Sample name	Sample note (special instructions, comments, etc)

Special instructions:	Tracking No:
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Method of shipment:
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Relinquished by / date:	Received by / date:	Relinquished by / date:	Received by / date:
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Table 1 Standard list of analytes and detection limits

Metal	MDL, MG/L
Arsenic	0.030
Cadmium	0.003
Chromium	0.005
Copper	0.005
Lead	0.030
Molybdenum	0.010
Nickel	0.010
Antimony	0.030
Selenium	0.030
Vanadium	0.001
Zinc	0.001

Laboratory comments (internal use only):
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PO #

**Evonik Corporation**  
**Soil & Groundwater Remediation**  
**METAFIX® Treatability Test Order Form**

Submit form: RemediationCustomerService@evonik.com



Date: \_\_\_\_\_ Account # (if known): \_\_\_\_\_

Is a PO required for order placement?\*    Yes                  No

\*If a PO is required, the test will not be performed until a PO is received or accompanies this order form. If no, the order will be placed based on the information provided on this form.

The Invoice will be generated upon completion of the final report provided by the Evonik Technical Sales Representative.

**Customer Contact Information:** (if different than the Chain of Custody contact)

_____	_____
Contact Name	Company
_____	_____
Email address	Phone
_____	_____
Project Name/Job # (if applicable)	Evonik Account Manager
_____	_____
Quote Number (if applicable)	PO #/Contract #

**Sold-To (billing location):**

_____	_____
Company Name	Address – Street
_____	_____
City	State/Province
_____	_____
Zip Code	Country
_____	_____
Send Invoice to	Customer Accounts Payable Contact

All orders for product ("Product") are subject to written acceptance by the Evonik entity that is to sell the Product ("Seller"), and to ongoing credit approval. The complete and exclusive agreement between Seller and buyer ("Buyer") is contained in these Terms and in other document(s), if any, agreed to in writing by Seller and Buyer (collectively, "Contract"), and cancels and supersedes any prior understandings or agreements. BUYER'S SUBMISSION OF ANY PURCHASE ORDER OR LIKE DOCUMENT ("ORDER") NOT SPECIFICALLY AGREED TO BY SELLER IN WRITING IN ADVANCE IS HEREBY REJECTED, AND AUTOMATICALLY CONSTITUTES BUYER'S IRREVOCABLE ACCEPTANCE OF THESE TERMS. ANY PERFORMANCE OR OTHER ACTION UNDERTAKEN BY SELLER FOLLOWING ITS RECEIPT OF SUCH ORDER, INCLUDING ACKNOWLEDGEMENT OF ORDER RECEIPT, OR SELLER'S RECEIPT OF ANY PAYMENT, AS WELL AS THE RIGHTS AND OBLIGATIONS OF SELLER AND BUYER, SHALL BE EXCLUSIVELY GOVERNED BY THESE TERMS (AND, IF APPLICABLE, THE REMAINDER OF THE CONTRACT).

**1. ACCEPTANCE/PRICE/PAYMENT:** Except as stated therein, quotations are held open for thirty (30) days from the date on the quotation. Prices quoted will be firm for orders scheduled by Seller to be delivered within sixty (60) days after the quotation date; otherwise, Seller reserves the right to apply prices in effect, including any applicable tariffs, at the time of delivery, including any surcharges applicable to the cost of production, distribution or storage of Product. Prices do not include sales, use, excise, or other similar taxes or governmental charges, and all such present and future taxes and charges will be paid by Buyer. If any government action, order or request prevents Seller from adjusting or continuing in effect the price stated in the Contract, Seller shall have the right to cancel the Contract with respect to all or a portion of Product deliverable thereunder, without any liability whatsoever. Each delivery of Product is a separate and independent transaction, and payment for each delivery shall be made accordingly. Payment is due thirty (30) days after invoice date. All payments are to be made in United States currency and in full, and are not subject to set-off, recoupment, abatement, counter-claim or any other adjustment. No Product order shall be cancelled except with the written consent of Seller.

**2. DELIVERY:** Delivery to Buyer of Product, and corresponding transfer of title and of all risk of loss exclusively to Buyer, shall occur upon Seller's loading of Product onto the carrier at Seller's shipping point or as otherwise agreed to in the Contract (the "Delivery Point"). Delivery dates, where stated, are approximate and shall not be strictly construed or enforced. Seller reserves the right to pack the Product otherwise than as specified by Buyer but otherwise in a commercially reasonable manner. Seller's weights shall govern, absent manifest error.

**3. EXCUSED NON-PERFORMANCE:** (a) Seller shall not be liable for breach of any obligation directly or indirectly attributable to events or circumstances beyond Seller's reasonable control, and whether affecting Seller or any person or entity whose performance Seller is relying upon, in whole or in part, to satisfy its obligations under the Contract (individually and collectively, "Force Majeure"). Such events include, but are not limited to, acts of God, acts of Buyer, war, riots, accidents, fires, explosions, floods, sabotage, terrorism, governmental laws, rules, regulations, orders or action (whether valid or not valid), acts or failure to act by Seller's suppliers or third parties, natural disaster, weather conditions, or shortages of or inability to obtain (upon Seller's usual terms and from its usual sources of supply) suitable or sufficient energy, labor, machinery, facilities, raw materials, transportation, supplies or other resources or services. Labor difficulties, strike, lockout or other act of workers shall be conclusively presumed to be beyond Seller's reasonable control, and accordingly within the meaning and intent of this Paragraph 3. All or some of the quantities of Product deliverable under, or other performance by Seller under, the Contract that is affected by a Force Majeure event may, in Seller's sole and absolute discretion, be eliminated and/or suspended from the operation of the Contract (with the elimination and/or suspension of Buyer's corresponding obligations), but such Contract shall remain otherwise unaffected.

(b) In no event shall Seller be required to acquire alternative product and/or services from a third party in the event of a Force Majeure. If Seller is unable to supply the quantity of Product stated in the Contract, it may in its sole discretion, without any liability, allocate its available supply among any or all purchasers, as well as itself and its affiliates, in a manner that it determines in good faith to be fair and reasonable.

(c) If, in Seller's sole and exclusive good faith judgment, (i) its compliance with any governmental law, regulation, rule, order or action (including but not limited to those relating to environment, energy, occupational safety and health, toxic substances, product safety, packaging, consumer protection or transportation) renders the production, marketing or transportation of the Product economically, technically or commercially unfeasible, or (ii) the manufacture, export, import, sale and/or use of the Product, or of any related component or process, by it or any of its affiliates, or by Buyer or any of Buyer's customers, may breach, violate or infringe any patent or intellectual property right, Seller has the right without liability to discontinue or limit its production or sale of Product hereunder.

**4. PRODUCT SAFETY: BUYER COVENANTS AND AGREES TO TRANSPORT, STORE, HANDLE, USE, DISPOSE OF AND OTHERWISE DEAL WITH PRODUCT SAFELY AND IN STRICT COMPLIANCE WITH ALL LAWS AND REGULATIONS AND ALL APPLICABLE STANDARDS OF CARE, INCLUDING IN A MANNER NO LESS STRINGENT THAN AS SET FORTH IN SELLER'S LABELS, MATERIAL SAFETY DATA SHEETS AND OTHER SAFETY AND HEALTH INFORMATION.** Seller does not warrant the safety of the Product or its use, whether alone or in combination with any other substance or in any process or equipment. Buyer assumes all responsibility for warning its employees, customers, and contractors of any hazards associated with the Product, including those arising from incorporation of the Product into other substances or use in process(es). Seller assumes no liability for Buyer's failure to comply with Buyer's obligations under the E.U. REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulations.

**5. WARRANTY: SELLER MAKES NO WARRANTY OF, AND SHALL HAVE NO LIABILITY FOR, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (EVEN IF SELLER IS AWARE OF SUCH PURPOSE) OR OTHERWISE, WHETHER EXPRESS OR IMPLIED, AT LAW OR IN EQUITY OR OTHERWISE, OTHER THAN THAT (A) THE PRODUCT, UPON DELIVERY AT THE DELIVERY POINT AND NOT ALTERED OR MODIFIED BY BUYER OR ANY THIRD PARTY, SHALL MEET THE SPECIFICATIONS STATED IN THE CONTRACT, AND (B) SELLER SHALL TRANSFER TO BUYER GOOD TITLE TO PRODUCT. IF NO SPECIFICATIONS ARE SO STATED, THEN AT THE DELIVERY POINT PRODUCT SHALL MEET SELLER'S SPECIFICATIONS FOR THE PRODUCT AT THE TIME OF ITS MANUFACTURE. NO OTHER WARRANTY OR LIABILITY WHATSOEVER, EXPRESS OR IMPLIED, AND WHETHER ARISING BY OPERATION OF LAW, STATUTE OR CUSTOM, SHALL APPLY.** Product meeting specifications must be accepted and paid for by Buyer. Buyer agrees to inspect the Product and its packaging immediately upon such delivery and to give notice in writing to Seller of any claim within thirty calendar (30) days after such delivery. Failure to give such notice constitutes an unqualified acceptance of the Product and a waiver of all claims with respect thereto.

**6. LIABILITY:** Seller's total liability shall be limited to the purchase price of the Product supplied (or to have been supplied) hereunder in respect of which Damages are claimed. All technical or other advice, recommendation or assistance by Seller, whether or not at Buyer's request, with respect to the Product, its processing, further manufacture, or otherwise, is given gratis by Seller and Seller shall not be liable for, and Buyer assumes all risk of, same and the consequences thereof. OTHER THAN AS SET FORTH IN THIS

PARAGRAPH 6, SELLER SHALL IN NO EVENT BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, INCIDENTAL OR OTHER DAMAGES, AND REGARDLESS (i) WHETHER THE CLAIM IS BASED ON WARRANTY, CONTRACT, TORT, STRICT LIABILITY, NEGLIGENCE OR OTHERWISE, AND (ii) WHETHER SELLER WAS OR SHOULD HAVE BEEN AWARE OF SAME. Upon satisfactory proof of claim by Buyer of Product not meeting specifications as provided in this Contract, and as Buyer's exclusive remedy, Seller will within a reasonable time supply Buyer at the Delivery Point with replacement Product meeting specifications, free of charge, freight prepaid or, at Seller's option, refund the purchase price for the Product upon return of such non-conforming Product. Buyer claims for replacements and returns for credit will not be allowed unless authorized by Seller in writing. The Buyer shall indemnify, defend and hold harmless Seller and its affiliates from and against all claims, proceedings, damages, costs, fees, expenses (including reasonable attorneys' fees and expenses), liabilities, losses, obligations, judgments, and penalties ("Damages") arising out of, or in connection with, any actual or alleged breach by Buyer of its obligations under the Contract, and also from Buyer's transportation, use, storage, handling, disposal, resale of or other dealing with Product.

**7. LIMITATIONS OF ACTIONS:** Subject to Paragraph 5, Buyer's right to commence a legal action arising out of or in connection with the Contract or the Product expires one (1) year after the cause of action has accrued. Buyer hereby waives any otherwise applicable statute of limitations. Failure by Buyer to commence a legal action within one year forever bars Buyer from commencing any legal action with respect thereto.

**8. MANUFACTURING DEVICES AND CONFIDENTIAL INFORMATION:** All manufacturing devices, designs, formulas, data, or other technical information of Seller or any of its affiliates relating to the Contract will remain Seller's or its affiliates' confidential property, and Buyer shall not have any rights thereto, nor any right to disclose such items or information to any third party. Nothing in the Contract shall be construed (by implication, estoppel or otherwise) as granting, or as an undertaking by Seller to subsequently grant, to Buyer any license, right, title or interest in or to any present or future patent, patent application, know-how, copyright, trademark, trade secret or other proprietary right.

**9. BUYER'S CREDIT/COLLECTION:** Notwithstanding any prior credit approval, if Buyer fails to pay in full for any one invoice when payment is due, or if at any time Seller in its sole and exclusive good faith judgment determines Buyer's credit or payment history to be unacceptable, or believes that Buyer's future credit will be unacceptable, Seller reserves the right, among other remedies and without any liability, (a) to cancel any order or to terminate the Contract, (b) to suspend or terminate any shipments of Product, or (c) to require payment in advance or other security for future deliveries. Buyer shall be responsible for the payment of reasonable attorneys' fees and related costs and expenses incurred by Seller in (i) any claim or action by Seller to enforce the Contract, and (ii) successfully defending any claim or action by Buyer.

**10. COMPLIANCE:** Seller's policies concerning social, safety and environmental matters can be found at [www.evonik.com/responsibility](http://www.evonik.com/responsibility). Seller expects that all parties in its supply chain and anyone using Seller's products for other than an end-use similarly meet such standards. Buyer shall comply with all applicable legal requirements in its import, use, transport, storage, distribution, and export or re-export of Product (especially if not an end-use), including compliance with the U.S. Foreign Corrupt Practices Act. Seller's export of Product and any related technical information may be subject to laws and regulations controlling the export and re-export of products and data. Seller shall not be obligated to export, transfer or deliver any Products and related data to Buyer if prohibited by applicable law or until all necessary government registrations or authorizations have been obtained. Seller shall not be liable for any expenses or damages resulting from failure to obtain or delays in obtaining any such required government authorizations and may, at its option, rescind a sale if the necessary registrations or authorizations cannot be obtained or are delayed.

**11. BINDING EFFECT/ASSIGNMENT:** The Contract shall be binding on the successors and assigns of Buyer and Seller; *provided, however*, that Buyer shall not, directly or indirectly, and whether by operation of law or otherwise, assign any of its rights or delegate any of its obligations under the Contract, or suffer the same to occur without the prior written consent of Seller, signed by Seller. Other than Seller's affiliates, there are no third-party beneficiaries to the Contract.

**12. WAIVER/SEVERABILITY:** (a) Seller's failure in any instance to insist upon strict performance of any provision of the Contract will not constitute a continuing waiver of such provision, or a waiver of any other provision. No waiver by Seller shall be deemed to arise from any course of dealing or trade custom, and will only be effective if set forth in a separate writing specifically identifying the matter waived, and signed by Seller. (b) If any provision of the Contract is held to be wholly or partly invalid, the validity of the remaining provisions shall not be affected.

**13. GOVERNING LAW/CONSTRUCTION/WAIVER OF JURY TRIAL:** The Contract shall be interpreted and enforced in accordance with the laws of the State of New Jersey, U.S.A., without regard to the United Nations Convention on the International Sale of Goods or other international treaty, rule or accord, and without regard to conflicts of law principles. These Terms shall supersede any inconsistent provision of any other part of the Contract, unless and to the extent such provision expressly states that it will supersede these Terms. Paragraph headings are exclusively for reference purposes, only. Seller and Buyer hereby irrevocably submit to the exclusive jurisdiction of the federal and state courts located in the State of New Jersey for the resolution of any suit, action or proceeding, whether by way of claim or counterclaim, under the Contract, and Buyer agrees not to assert any defense to any suit, action or proceeding initiated by Seller based upon improper venue or inconvenient forum. BUYER AGREES THAT ANY SUIT, ACTION OR PROCEEDING, WHETHER BY WAY OF CLAIM OR COUNTERCLAIM, BROUGHT BY IT RELATED TO THE CONTRACT SHALL BE TRIED ONLY BY A COURT AND NOT BY A JURY. BUYER HEREBY KNOWINGLY, VOLUNTARILY, INTENTIONALLY AND INTELLIGENTLY WAIVES ANY RIGHT TO A TRIAL BY JURY IN ANY SUCH SUIT, ACTION OR PROCEEDING.