# KT-20

## High Performance Iron Removal Media KT™


KT-20™ is an efficient and high performance media for the reduction of dissolved iron and manganese compounds from raw water supplies. It may be used in either gravity feed or pressurized water treatment systems. KT-20™ filter media acts as an insoluble catalyst to enhance the reaction between dissolved oxygen (D.O.) and the iron compounds. In ground waters the dissolved iron is usually in the ferrous bicarbonate state due to the excess of free carbon dioxide and is not filterable. KT-20™, acting as a catalyst between the oxygen and the soluble iron compounds, enhances the oxidation reaction of Fe++ to Fe+++ and produces ferric hydroxide which precipitates and may be easily filtered.

## PHYSICAL PROPERTIES:

| | |
|---|---|
| ·Color | Black |
| ·Bulk Density | 1390 Kg / $M^3$ |
| ·Particle Size | 0.8 - 1.2 mm |
| ·Specific Gravity | 2.0 gm/cc |
| ·Effective Size | 0.9 mm |
| ·Uniformity Coefficient | 1.7 |

## CONDITIONS FOR OPERATION:

| | |
|---|---|
| water temp | 100°F/38°C |
| Water pH | 6.8-9.0 |
| Dissolved Oxygen | 15% of iron & 29% of manganese content. |
| Bed depth | 30 - 40 Inches. |
| Freeboard | 40% |
| Backwash rate | 10-12 gpm/sq. ft. |
| Service flow rate | 3.5-5 gpm/sq. ft |

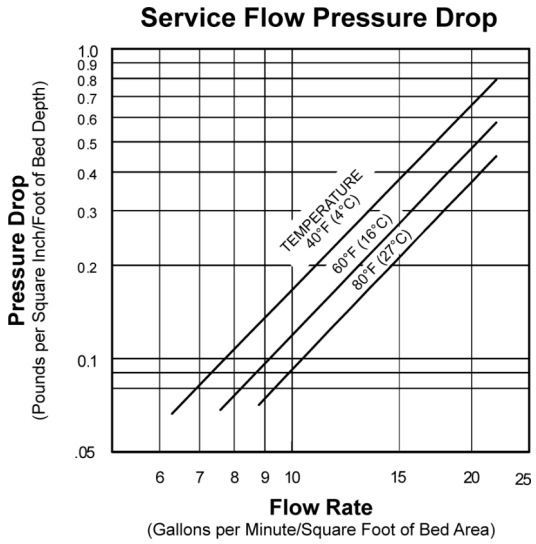
## INFLUENT AND BACKWASH LIMITATIONS

- Free chlorine concentration less than 0.5 ppm
- Hydrogen Sulfide should be removed prior to contact with KT-20™ media
- Oil: None Present
- Polyphosphates: None present

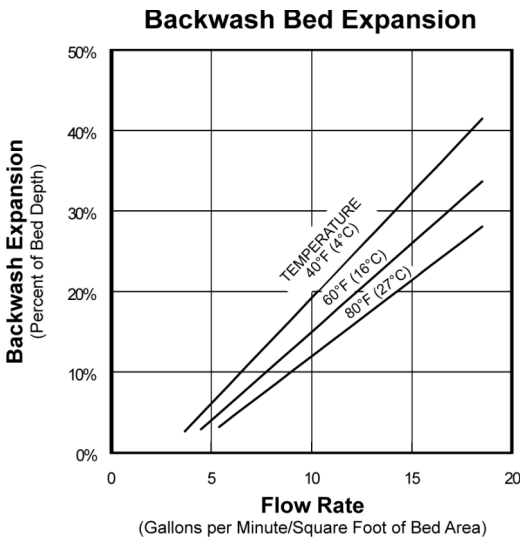
## APPLICATIONS

- Under the proper conditions, no chemicals to purchase for maintenance.
- Regeneration not required.
- Iron removal efficiency is extremely high.
- Negligible labor cost: only periodic backwashing required.
- Durable material with a long life and wide temperature range.

KT-20™ Pressure Drop Graph




KT-20™ Backwash Expansion Graph




## ADVANTAGES

- It can take maximum iron concentrations up to 20 ppm.
- It can reduce iron, Manganese and Hydrogen Sulfide up to < 0.1 ppm
- It complements mixed filters very well, particularly KT-20™ filter media
- High resistance to a variety of chemicals
- Greater physical strength for use in industrial water purification.
- Prevents filtration blockage and more.
- Prevention of mad ball forming at the surface of the sand layer.

**WARNING :**

For safety and handling purposes, we recommend appropriate protective measures when entering a wet vessel containing granular anthracite, because wet anthracite depletes oxygen from air and therefore, dangerously low levels of oxygen may be encountered. In such a case, the oxygen level inside the vessel shall be determined before entering and appropriate protective equipment should be worn when entering, or leave the vessel open until the oxygen level in the vessel is normal.

This information has been gathered from standard materials and or test data that is believed to be accurate and reliable. Nothing herein shall be determined to be a warranty or representation expressed or implied with respect to the use of such information or the use of the goods described for any particular purpose alone or in combination with other goods or processes, or that their use does not conflict with existing patent rights. No license is granted to practice any patented invention. It is solely for your consideration, investigation and verification.

**KYNREM TECHNOLOGY PVT LTD**
**O :** 4/1, Dum Dum Road, Nager Bazar, Kolkata 700 074.
**F :** 108, Nilganj Road, Mirhati, Amdanga, Kolkata 700125 +91 9051825548 sales@kynrem.com www.kt-20.com

सीएसआईआर - खनिज एवं पदार्थ प्रौद्योगिकी संस्थान
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)
भुवनेश्वर-751013, ओडिशा, भारत
CSIR - INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY
Council of Scientific & Industrial Research
Bhubaneswar - 751013, Odisha, INDIA
Diamond Jubilee 1964-2023
सीएसआईआर
CSIR
भारत का नवाचार इंजन
The Innovation Engine of India
आज़ादी का अमृत महोत्सव

**Date:** 07/11/2024

## To Whomsoever It May Concern

This is to certify that CSIR-IMMT Bhubaneswar has conducted pilot runs and tested the Iron removal media (KT-20) of M/s KYNREM Technology Pvt Ltd. No. 4/1, First Floor, Dum Dum Road, Nagar Bazar, Kolkata-700074, West Bengal, India.

The Iron removal plant filled with KT-20 media supplied by M/s KYNREM Technology Pvt Ltd was tested for feed Iron concentration upto 20 mg/L. The filter system was able to reduce iron in treated water within the Indian standard drinking water specification permissible limit i.e 0.3 mg/L (BIS 10500-2012).

The experimental results are the outcome of the pilot cycle trials and treated water quality testing & evaluation undertaken for the above mentioned filter unit during September-October 2024 operated under specified set-up and operating conditions in terms of cycle run, capacity, media properties and water characteristics & flow rate during filtration.

In order to achieve the full efficiency back wash/regeneration of plant is required whenever necessary. Further to note that, KT-20 media treated water shows increase in water pH, which need pH correction before use.

**This Certificate supersedes any earlier certificate (if issued earlier) and effective from signing date.**

N:B-This is only applicable to M/s KYNREM Technology Pvt Ltd. No. 4/1, First Floor, Dum Dum Road, Nagar Bazar, Kolkata-700074, West Bengal, India.

R. Boopathy

Dr. Boopathy Ramasamy
Senior Scientist, Project Leader
CSIR-IMMT, Bhubaneswar

डॉ. आर. बूपथी / Dr. R. BOOPATHY
वैज्ञानिक/Scientist
सीएसआईआर-खनिज एवं पदार्थ प्रौद्योगिकी संस्थान
CSIR-Institute of Minerals & Materials Technology
भुवनेश्वर/Bhubaneswar-751013



Tel.: +91 (0674) 2379401 (Dir), Tel.: 2379408/9501 (Admn) / 2379510/9341 (F&AO) / 2379258/9513 (Pur), +91 (0674) 2379212, 2379430 (Security)
Web site: www.immt.res.in

**Table-1.1: Removal of iron by KT-20 media in synthetic water**

| Date of Test | Iron content of water before media unit, mg/l | Iron content of water after media, mg/l | BIS 10500:2012 Limit, mg/l | Flow Rate/Hour | Run Time, Hour |
|---|---|---|---|---|---|
| 06.09.2024 | 4.9 | 0.16 | 0.3 | 100 litre | 5 |
| 07.09.2024 | 9.1 | 0.18 | 0.3 | 100 litre | 5 |
| 09.09.2024 | 8.93 | 0.21 | 0.3 | 100 litre | 5 |
| 10.09.2024 | 10.8 | 0.16 | 0.3 | 100 litre | 5 |
| 11.09.2024 | 9.6 | 0.15 | 0.3 | 100 litre | 5 |
| 12.09.2024 | 8.95 | 0.18 | 0.3 | 100 litre | 5 |
| 13.09.2024 | 10.5 | 0.19 | 0.3 | 100 litre | 5 |
| 16.09.2024 | 14.8 | 0.2 | 0.3 | 100 litre | 5 |
| 17.09.2024 | 14.6 | 0.17 | 0.3 | 100 litre | 5 |
| 18.09.2024 | 14.9 | 0.18 | 0.3 | 100 litre | 5 |
| 19.09.2024 | 14.6 | 0.19 | 0.3 | 100 litre | 5 |
| 20.09.2024 | 14.5 | 0.18 | 0.3 | 100 litre | 5 |
| 23.09.2024 | 18.8 | 0.19 | 0.3 | 100 litre | 5 |
| 25.09.2024 | 19.5 | 0.23 | 0.3 | 100 litre | 5 |
| 26.09.2024 | 20.4 | 0.22 | 0.3 | 100 litre | 5 |
| 27.09.2024 | 21 | 0.24 | 0.3 | 100 litre | 5 |
| 01.10.2024 | 20.4 | 0.23 | 0.3 | 100 litre | 5 |
| 03.10.2024 | 20.4 | 0.24 | 0.3 | 100 litre | 5 |

*About up 21 mg/L of iron contaminated water is prepared using tap water
**Source of tap water**: CSIR-IMMT campus

***Total cycle hours for single charge of products =75 hrs**

**Table-1.2: Key parameters of synthetic iron contaminated water (Feed and treated water by unit) as per IS: 10500:2012**

| **Parameters** | **06.09.24 Before** | **06.09.24 After** | **09.09.24 Before** | **09.09.24 After** | **13.09.24 Before** | **13.09.24 After** | **19.09.24 Before** | **19.09.24 After** |
|---|---|---|---|---|---|---|---|---|
| PH | 5.44 | **10.65** | 5.53 | **10.49** | 5.03 | **10.50** | 5.33 | **10.56** |
| Conductivity, µS/cm | 902.1 | 401.4 | 420.4 | 449.1 | 231.9 | 279.5 | 231.8 | 245.5 |
| TDS, mg/l | 784.0 | 353.0 | 370.0 | 394.0 | 203.0 | 242.0 | 204.0 | 214.0 |
| Turbidity, NTU | 44.10 | 2.31 | 26.00 | 1.05 | 82.40 | 0.62 | 68.00 | 0.47 |
| Alkalinity, mg/l | 0.0 | 70.0 | 10.0 | 80.0 | 0.0 | 80.0 | 0.0 | 20.0 |
| Total Hardness, mg/l | 30.0 | 120.0 | 30.0 | 126.0 | 60.0 | 340.0 | 60.0 | 290.0 |
| Calcium, mg/l | 6.4 | 44.9 | 8.0 | 45.7 | 20.0 | 120.2 | 18.0 | 104.2 |
| Magnesium, mg/l | 3.4 | 1.9 | 2.4 | 2.9 | 2.4 | 9.7 | 3.6 | 7.3 |
| Sulphate, mg/l | 42.2 | 39.2 | 44.7 | 40.7 | 64.2 | 55.5 | 69.7 | 60.5 |
| Fluoride, mg/l | 0.03 | 0.07 | 0.01 | 0.00 | 0.00 | 0.04 | 0.00 | 0.03 |
| Chloride, mg/l | 25.0 | 26.0 | 16.0 | 27.0 | 38.0 | 39.0 | 36.0 | 38.0 |
| Sodium, mg/l | 15.39 | 17.43 | 17.05 | 19.43 | 23.38 | 13.31 | 23.5 | 14.61 |
| Potassium, mg/l | 1.12 | 9.66 | 1.06 | 11.81 | 0.85 | 12.64 | 1.06 | 9.37 |
| Nitrate, mg/l | 6.12 | 3.78 | 6.85 | 4.34 | 8.96 | 4.42 | 2.32 | 1.15 |

| Parameters | 26.09.24 Before | 26.09.24 After | 27.09.24 Before | 27.09.24 After | 01.10.24 Before | 01.10.24 after | 03.10.24 Before | 03.10.24 After |
|---|---|---|---|---|---|---|---|---|
| PH | 4.50 | **10.25** | 4.69 | **10.30** | 7.13 | **10.07** | 7.20 | **10.10** |
| Conductivity, µS/cm | 304 | 427.8 | 310.1 | 459.5 | 404.3 | 422 | 397.2 | 360.7 |
| TDS, mg/l | 265.0 | 375.0 | 274.0 | 406.0 | 355.0 | 372.0 | 349.0 | 318.0 |
| Turbidity, NTU | 9.28 | 0.75 | 320.00 | 1.45 | 305.00 | 3.53 | 440.00 | 4.71 |
| Alkalinity, mg/l | 0.0 | 26.0 | 10.0 | 40.0 | 46.0 | 32.0 | 48.0 | 30.0 |
| Total Hardness, mg/l | 65.0 | 325.0 | 160.0 | 390.0 | 150.0 | 225.0 | 155.0 | 210.0 |
| Calcium, mg/l | 20.0 | 110.2 | 60.1 | 152.3 | 36.1 | 80.2 | 30.1 | 60.1 |
| Magnesium, mg/l | 3.6 | 12.2 | 2.4 | 2.4 | 14.6 | 6.1 | 19.4 | 14.6 |
| Sulphate, mg/l | 86.2 | 80.5 | 104.7 | 98.0 | 11.7 | 10.6 | 7.1 | 5.8 |
| Fluoride, mg/l | 0.00 | 0.03 | 0.04 | 0.03 | 0.09 | 0.13 | 0.09 | 0.13 |
| Chloride, mg/l | 24.0 | 27.0 | 27.0 | 28.0 | 28.0 | 28.0 | 26.0 | 24.0 |
| Sodium, mg/l | 16.32 | 14.84 | 16.43 | 15.06 | 15.63 | 15.52 | 16.49 | 16.09 |
| Potassium, mg/l | 1.28 | 10.24 | 1.37 | 11.28 | 2.33 | 7.37 | 2.06 | 7.15 |
| Nitrate, mg/l | 16.15 | 14.52 | 36.26 | 34.36 | 3.52 | 65.89 | 3.45 | 46.32 |

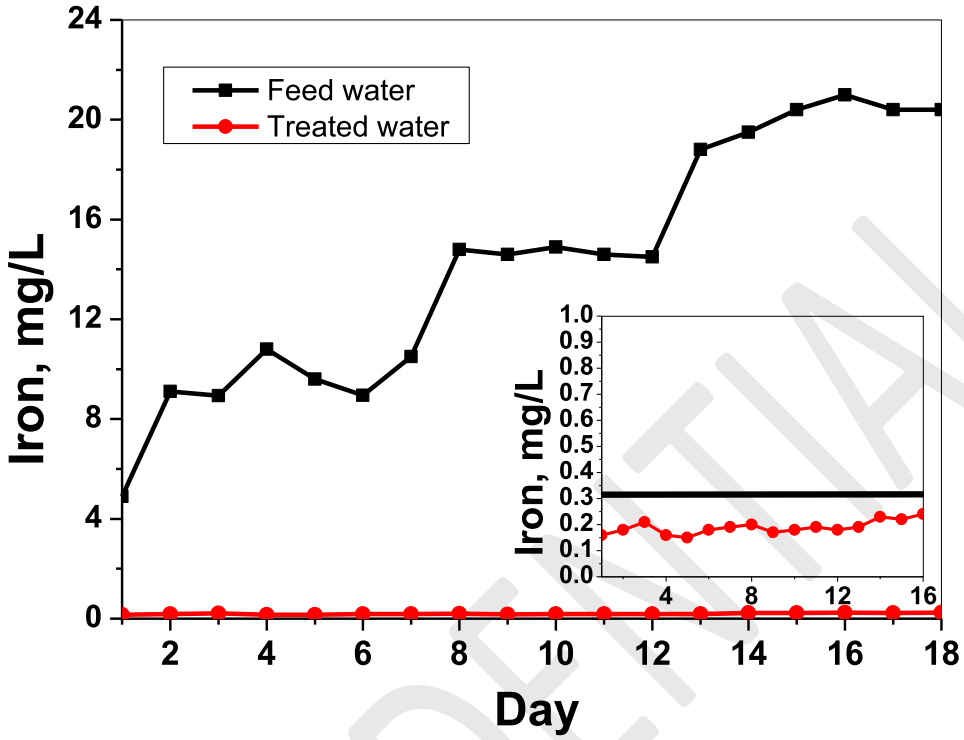



**Figure-1.1:** Removal of Iron by KT-20 media (**Conditions:** Flow rate, 100 L/h; run time per day, 5 h; inner graph shows the treated water with permissible concentration level of iron (0.3 mg/L) with horizontal bar line.