




Puraset references

WHAT WE ARE PROUD OF

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Water is our pure asset

WE ARE WORKING TO PROVIDE HEALTHY DRINKING WATER
WITH ADSORBENT AND RELATED TECHNOLOGIES

The Puraset Water & Metal Solutions Ltd. is a Central European water engineering company headquarters in Budapest, Hungary. Puraset was founded in 1998 by research and development experts dedicated to the water and metal industry. With the regenerable adsorbent materials manufactured by us we can remove arsenic, fluorine, boron, iodine, iron, manganese, ammonia from the water. Having long-term experience in arsenic removal development and production of simple complex water treatment systems we provide real answers, prompt solutions for water challenges of today.

The regenerable adsorbent-based drinking water treatment technology is a real green solution in the field of circular water use. Contaminants are extracted from the water used in the production line by a two-step distillation process. The purified water is recycled back into the production line. The process is similar regarding the regeneration of saturated adsorbents, where contaminants are removed from the back-wash water by magnetisation and the purified wash water can be reused in the next regeneration. Regenerable adsorbent-based drinking water purification – an environmentally friendly, sustainable and cost-effective solution for providing arsenic-free, healthy drinking water.



Regenerable adsorbent materials



With the production and distribution of regenerable adsorbent materials we remove arsenic, fluorine, boron, iodine, iron, manganese, ammonia from the water. As a bulk filter media this is an excellent solution for water utilities and water technology companies and for some industrial water management providers.

Our continuously manufactured products:

- AsMET – arsenic III and arsenic V adsorbent
- FluMET – fluoride adsorbent
- BoMET – boron binding adsorbent
- IoMET – iodine remover
- ZMET – iron, manganese, ammonia

Fields of application:

- for water utility companies and for water industry companies
- for communal and industrial wastewater treatment companies
- to treat the process water of power plants, mining and other factories
- for water bottling plants
- for vegetables, fruits, food processing industries

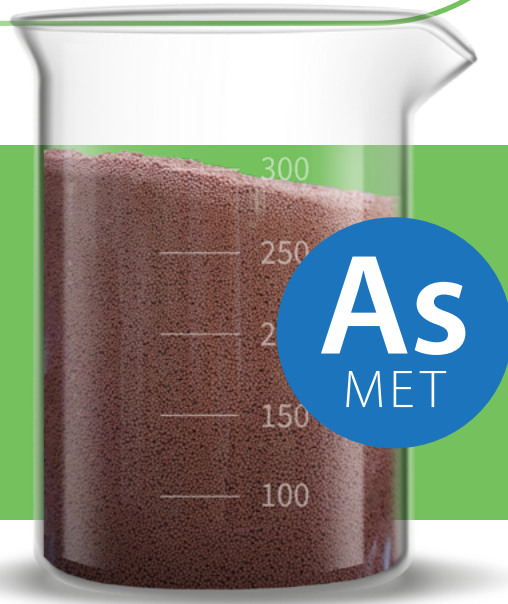


Benefits of the product:

- cerium based adsorber resin – flexible use for all user from domestic to waterworks and all water industry players
- can be attached to existing waterworks, or installed newly with suspended solid pre-filter
- lifetime 7–10 years
- regenerable, allowing for smaller filter and lower running cost and leaving smaller environmental footprint
- taste, smell, and mineral content of the water stays the same
- ensure the supply of stable water quality with cost saving long term operation

AsMET

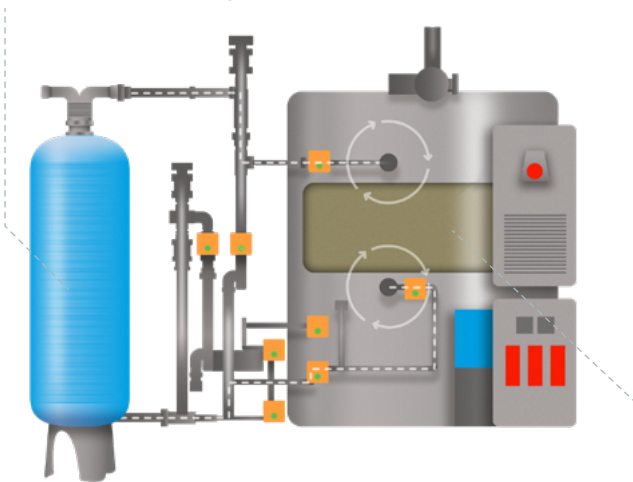
arsenic removal adsorbent technology



We offer a new, cost-effective, sustainable, and economic water treatment technology over conventional and chemical-intensive arsenic mitigation methods, it is called AsMET. AsMET is a cerium-based regenerable adsorber that can be used to remove arsenic contamination from drinking and industrial water. Regenerable means that as the adsorbent reaches its capacity limit, the media goes through a simple regeneration wash-off process and is ready to be used again for up to 10 years.

REGENERATION WASH-OFF PROCESS

AsMET adsorbent reuse after chemical washings



Arsenic accumulation in the washing liquid (NaOH)

THE ASMET ADSORBENT

- adsorbs the arsenic (III) and the arsenic (V) content of the raw water
- however high the arsenic content of raw water ensures that it is below the WHO limit
- expected life span is 7–10 years
- can be used up to 50 °C water temperature
- regeneration is performed with commercial chemicals, expected frequency of the regeneration is varied from the raw water As content
- the system operates without added chemicals
- the material always has to be kept under the water







ADVANTAGES OF THE PRODUCT

- cerium based adsorber resin – flexible use for all users from domestic use to waterworks and all the other water industry players
- can be attached to existing waterworks, or installed newly with suspended solid pre-filter
- lifetime 7–10 years
- regenerable, allowing for smaller filters and lower running costs and leaving a smaller environmental footprint
- taste, smell, and mineral content of the water stays the same
- ensure the supply of stable arsenic free water quality with cost-saving long-term operation

FIELDS OF APPLICATION

- for water utility companies and for water industry companies
- for agriculture, animal husbandry, vegetables, fruits, and food growing and processing industries, etc.

ARSENIC REMOVAL AT A WATER UTILITY COMPANY, HUNGARY

 Tiszagyenda, Hungary, 2022	 drinking water treatment
 Tiszamenti Regionális Vízművek Zrt.	 arsenic removal AsMET adsorbent
 water utility operator	 220 m ³ /day, Qmax 16m ³ /hour

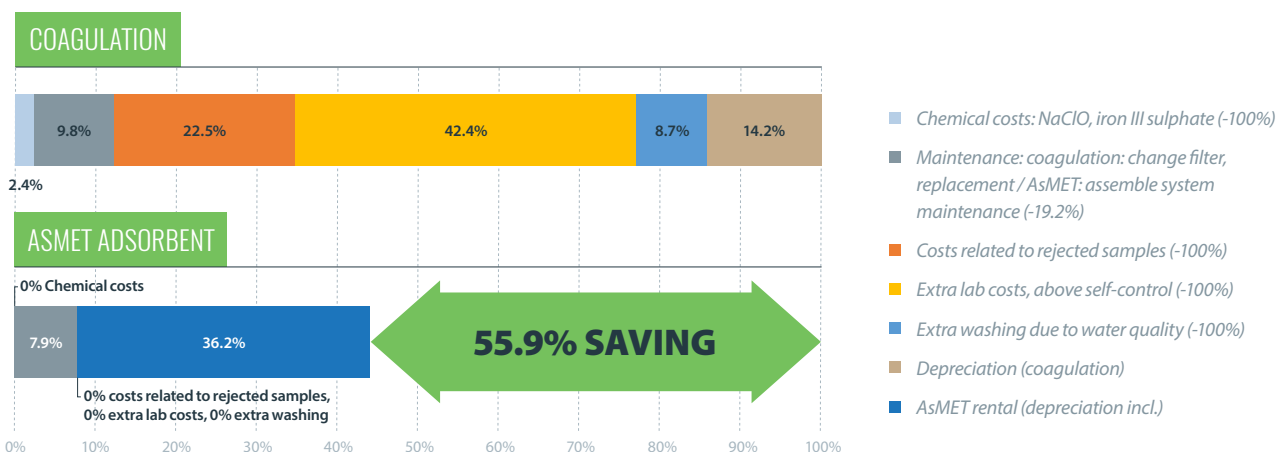
Arsenic-removal AsMET technology was installed at the drinking water plant of a settlement in Hungary, which was implemented in a long-term lease scheme that supports cost-effective development investment.

- scope of the project: treatment and stabilisation of hectic and high (average 80µg/l) arsenic levels in water production wells
- capacity: 220 m³/day Qmax 16m³/hour
- before the project: the arsenic was neutralised by adding large amounts of iron oxide, but this coloured the drinking water yellowish-brown and created large amounts of arsenic sludge
- achievements: more than 55% reduce on the operating cost of stable arsenic removal using AsMET technology and stable arsenic content under the regulated limit value
- financing: financing facility was provided to support investment
- realization: in a long-term lease structure that supports cost-effective and developmental investment



COMPARISON OF THE TWO TECHNOLOGY'S OPERATING COSTS

Operating costs of the regenerable adsorbent (AsMET) based arsenic removal technology as a percentage of arsenic removal coagulation technology costs (Tiszagyenda project, Qmax. 16 m³/h, avg. 80µg/l arsenic concentration)



PuraWELL

end point arsenic removal
in one step



We recommend our PuraWELL product for places where it is necessary to remove arsenic contamination from the water supplied. Our product removes not only arsenic but the mechanical contamination without changing other parameters of the water (taste, odour, chemical composition). The arsenic ions in the solution are bound to the surface of the filtration material by ion exchange and adsorption capacity. After the exhaustion of the filtration capacity, it can be repeatedly restored during the 7–10 years of service life. During operation, the backflushing is done by the automatic unit.



AREAS OF USE

- water utilities, water technology companies
- private individuals (residential communities, farms, etc.)
- businesses (guest houses, hunting lodges, etc.)
- public institutions (schools, kindergartens, hospitals)

CONDITIONS FOR PUTTING INTO OPERATION

- the filtering material is delivered in pressure-resistant containers
- the filtration capacity is preserved only with tanks filled with water

BENEFITS OF THE PRODUCT

- the lifetime of the adsorbent in the cartridges is 7–10 years
- can be regenerated
- cost-effective, low environmental footprint
- works with water flow
- preserves the taste, odour and mineral content of drinking water
- can be added at the end of an existing process line as an adapter
- ensures stable water quality under the permitted arsenic limit



ARSENIC-FREE IRRIGATION WATER PROVIDED BY PURAWELL



Makó, Hungary, 2020



drinking water treatment



Zöldségcentrum Kft.



arsenic removal PuraWELL



vegetable farm



6,000–7,000 litres per day arsenic free irrigation water



By using a 25-litre arsenic removal adsorbent connected to a mechanical pre-filtration system, the goal was to provide arsenic-free water to Zöldségcentrum Kft. (vegetable production centre). Following the positive results of the application, with the stable achievement of regulatory limits and

excellent operational experience, the technology was expanded in July 2020. The adsorbent-filled tower operates with flow-through and handling-free technology to remove arsenic. A 33-litre tower (25 litres of AsMET adsorbent inside) can produce 6,000–7,000 litres of arsenic-free water/per day.

PurAID®

the modular cost-effective water treatment solution for rural communities



- tailor-made water supplying system
- modular solution to serve more people
- complete way to remove arsenic from drinking water
- easy to install and operate
- small footprint
- wide capacity range: from households to small waterworks
- capacity: 6,000–10,000 litres/day – providing drinking water for 2,000–3,000 people/day (3 litres/day/person WHO reference)

Containerized, mobile and modular drinking water purifying system for rural areas to treat the existing but contaminated water in an easy and cost-effective way. PurAID® is a sustainable tailor-made water supply system for rural, isolated or less accessible areas and at institutions (hospitals, hotels, schools, etc.). PurAID® system provides a complete solution to remove iron, manganese, ammonia, arsenic, boron and iodine and infections from drinking water in five steps. Depending on the contamination of the water, PurAID® is possible to provide more tailor-made assistance.



provide clean potable water by removing arsenic contaminants



completely automatic system with as minimum operator intervention as possible and with remote supervision



transportable, compact, easy to install solutions



plug and play, easy to put into operation



modular solution to build up a network with 5-10 single units



removal of iron, manganese, ammonia, arsenic, boron and iodine and infections



small footprint



less construction work required



can be operated either from a solar panel



can be used even in the less accessible rural areas



chemical-free solution



regenerable adsorbents inside

UN listed PurAID® as SDG acceleration action.

DRINKING WATER FOR RURAL COMMUNITY IN GHANA



Akim Wenchi village, Ghana, 2021



Community Water and Sanitation Agency



water utility operator



drinking water treatment



iron, manganese, and bacteria removal



10m³/day serving 12,000 ppl







A modular, small size drinking water treatment unit, PurAID® has been installed in September 2021 in Akim Wenchi, Ghana. PurAID® is supplying 10m³/day drinking water for local people. The treatment unit was installed at a borehole next to the local Community Water Sanitation Agency (CWSA) office enabling the easy mastering of the operation. PurAID® supplying WHO compliant drinking water after removal of iron, manganese, and bacteria. The removal of contaminants is carried out by our own adsorbents and filter materials, this technology does not require the use of harmful chemicals, so the environmentally friendly backwash water is discharged into the rainwater ditch/sewer. Currently, the unit is plug and play technology with a daily energy consumption of 1-2 kWh. Green and sustainability guidelines are crucial for us therefore our engineering team is developing the solar based operation. The key element of the simple running is the developed monitoring system



which allows remote supervision of PurAID® unit. With a connected water supply of up to 30 installed PurAID® units, we can maximize the economical operation to cover a whole area from one service centre with one computer which is our aim to reach in Eastern Region.



PURAID® UNITS ARE PROVIDED TO THE CAMPSITE FOR ENGINEERS AND CONTRACTORS BUILDING A ROAD NETWORK

	Tema, Ghana, 2022		drinking water treatment
	INZAG Germany GmbH		iron, manganese, and bacteria removal
	constructor		3×10m ³ /day



The German construction company INZAG, headquarters in Wiesbaden, has been awarded to build the first section (Tema – Akosombo) of the Eastern Corridor Road from Tema to the Greater Accra Region (Kulungugu) over a length of 63.6 km. The development of the first 64 kilometres from the port town of Tema to Akosombo is highly complex. Through the city, the road will be widened from two to six lanes. This will be followed by a section with a four-lane expansion. Even further north, the road will have

two lanes. Included in the project are roundabouts, flyovers, and river crossings, as well as numerous pedestrian bridges. Due to the size and complexity of the investment, a complete village has been built for the project participants for the duration of the project. In the campsite, 3 pieces of PurAID® equipment have been installed to provide healthy drinking water for the workers. In December 2022 the mobile water treatment units have been successfully implemented, the system provides 30m³ clean water on a daily basis.



PURAIID® AS A TEMPORARY SOLUTION TO PROVIDE DRINKING WATER – TEMPORARY RENTAL CONTRACT



Hajdúbagos, Hungary, 2022



KEVIÉP Kft.



constructor



drinking water treatment



arsenic, iron, manganese, ammonium and bacteria removal



2×10m³/day

In the municipality of Hajdúbagos, the reconstruction of the waterworks was carried out as part of a programme to improve drinking water quality in Hungary. During the reconstruction the extracted raw water was discharged into the drinking water network, which did not fulfil the expected requirements on the quality for drinking water (due to the iron, manganese, ammonium, and arsenic content of the raw water). During the reconstruction of the waterworks, it was also necessary to provide 3l/day healthy drinking water to the citizens. This was achieved with two PurAIID® containerised water treatment systems provided by Puraset Ltd. in a leased construction.



The equipment was installed at two locations in the municipality, where, in addition to supplying the institutions' kitchen drinking water needs, the population could also get drinking water from taps on the side walls of the container. The solution is sustainable and economical temporary water supply type in comparison with other water distribution methods such as plastic bottled water or distribution with water tank cars.

FUTURE IMPROVEMENTS



PurAID® operating with alternative energy source such as solar, green energy or hybrid



Water purification equipment for container house



Capacity enlargement of the treatment units



PurAID® for schools program



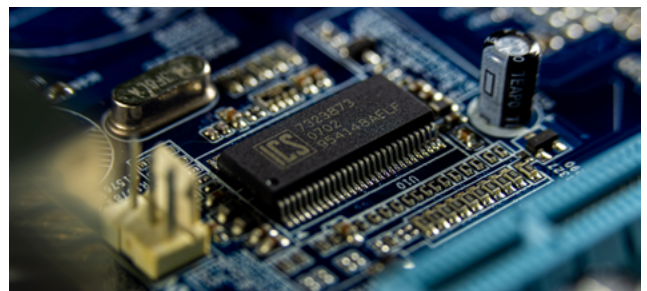
PurAID® UN SDG Acceleration Program



Partnering up with local vendors to treat water sources with PurAID® in community level



Arsenic removal for Agriculture and Animal Industry



Fluoride removal for semiconductor factories



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