

Lewatit® MonoPlus TP 214 is a monospherical, macroporous chelating resin with thiourea groups having a high affinity for mercury. Next to this special mercury selectivity, **Lewatit® MonoPlus TP 214** has a high selectivity for PGM metals such as platinum, gold and silver. For these reasons it is special used for:

- » removal of mercury in flue gas scrubbing processes
- » removal of mercury from brines in front of chloralkali membrane processes and effluents from chloralkali electrolysis plants using mercury process
- » removal of mercury from ground water
- » metal separation and recovery in hydrometallurgy
- » recovery of PFM-metals from rinse water and exhausted process solutions
- » recovery of palladium catalysis from organic process streams

Cations are removed from solutions in the following order: $\text{Hg}^{2+} > \text{Ag}^+ > \text{Au}^{1+/3+} > \text{Pt}^{2+/4+} > \text{Cu}^{2+} > \text{Pb}^{2+/4+} > \text{Bi}^{2+} > \text{Sn}^{2+} > \text{Zn}^{2+} > \text{Cd}^{2+} > \text{Ni}^{2+}$. Based on more than 25 years of experience with the old replaced heterodispersed **Lewatit® TP 214**, this new resin, produced by a new patented process, offers clear advantages:

- » higher mechanical and osmotic stability
- » better kinetics
- » 10-20% higher capacity, depending on process conditions
- » remarkable low leakage according to the process conditions

Due to the broad variety of the solutions to be treated, the determination of a suitable process design according to our Technical Information OC/I 20343 is recommended. The regeneration of **Lewatit® MonoPlus TP 214** exhausted with mercury is not possible with normal regenerant solutions. Therefore, exhausted resins can only be disposed in accordance with the local regulations governing their disposal. The regeneration of **Lewatit® MonoPlus TP 214** exhausted with precious metals in general is not possible. Recovery of these metals is usually practised by incineration in special designed furnaces. The regeneration of **Lewatit® MonoPlus TP 214** loaded with Zn^{2+} , Cd^{2+} , Ni^{2+} , Pb^{2+} , Cu^{2+} is partially possible but connected with intellectual properties of third parties.

The special properties of this product can only be fully utilized if the technology and process used correspond to the current state-of-the-art and the operating conditions are adapted to the individual requirements. Further advice in this matter can be obtained from Lanxess, Business Unit Ion Exchange Resins.

General Description

Functional group	thiourea
Matrix	crosslinked polystyrene
Structure	macroporous
Appearance	beige, opaque

Physical and Chemical Properties

	metric units	
Uniformity Coefficient*	max.	1.1
Mean bead size*	mm	0.55 (+/- 0.05)
Bulk density (+/- 5 %)	g/l	680
Density	approx. g/ml	1.1
Water retention	wt. %	43 - 48
Functional groups*	min. eq/l	1.0
Stability at pH-range		0 - 14
Storability of the product	max. years	2
Storability temperature range	°C	- 20 - 40

* Specification values subjected to continuous monitoring.

Recommended Operating Conditions*

	metric units	
Operating capacity		**
Operating temperature	max. °C	100
Operating pH-range		-1 - 10
Bed depth	min. mm	1000
Specific pressure drop (15 °C)	approx. kPa*h/m²	1.1
Pressure drop	max. kPa	250
Linear velocity operation	max. m/h	20
Bed expansion (20 °C, per m/h)	approx. vol. %	8
Freeboard backwash (extern / intern)	vol. %	80

*

The recommended operating conditions refer to the use of the product under normal operating conditions. It is based on tests in pilot plants and data obtained from industrial applications. However, additional data are needed to calculate the resin volumes required for industrial scale ion exchange units. These can be found in our technical data sheets, have to be requested from Lanxess-application-specialists or have to be elaborated in laboratory- and pilot-tests.

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Operating Capacity, Leakage Level and Cycle Time:

Operating capacity, leakage levels as well as operating time achieved is depending on the given, defined or adjusted operating conditions as there is

- 1) regularized or technical restrictions in the maximum load of ion exchangers
- 2) specific volumetric flow rate
- 3) water or process stream composition, especially concentration of competing ions
- 4) oxidative state of the target compound
- 5) pH
- 6) definition of the breakthrough point
- 7) complexing agents
- 8) number of columns switched in series
- 9) suspended solids in the feed
- 10) bed depth
- 11) level of regeneration and level of conditioning as well as type of conditioning
- 12) age of resin and others

Under normal operating conditions an operating capacities of more than 50% of the total capacity is possible. Thereby the total capacity is defined as the capacity at complete saturation of the functional groups. Removal rates of up to 99% and higher can be achieved under optimum operating conditions.

Additional Information & Regulations

Safety precautions

Strong oxidants, e.g. nitric acid, can cause violent reactions if they come into contact with ion exchange resins.

Toxicity

The safety data sheet must be observed. It contains additional data on product description, transport, storage, handling, safety and ecology.

Disposal

In the European Community ion exchange resins have to be disposed, according to the European waste nomenclature which can be accessed on the internet-site of the European Union.

Storage

It is recommended to store ion exchange resins at temperatures above the freezing point of water under roof in dry conditions without exposure to direct sunlight. If resin should become frozen, it should not be mechanically handled and left to thaw out gradually at ambient temperature. It must be completely thawed before handling or use. No attempt should be made to accelerate the thawing process.

This information and our technical advice – whether verbal, in writing or by way of trials – are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to check its validity and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.



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