

PRODUCT INFORMATION

LEWATIT® TP 208



Lewatit® TP 208 is a weakly acidic, macroporous cation exchange resin with chelating iminodiacetate groups for the selective removal of alkaline earth and heavy metal cations. Its standard bead size distribution and outstanding mechanical stability make it specially suitable for use in the following applications:

- » final polishing of brine feed to chloralkali membrane cells; traces of alkaline earth ions are removed after their normal precipitation by carbonates in the pH-range 7-11,
- » removal of heavy metal cations from neutralized mixed effluents in the absence of calcium at flow velocities up to 40 m/h and operating temperatures up to 80 °C.

The operating capacity of **Lewatit® TP 208** depends on the pH-value of the brine. At pH 11 it is approx. threefold that achieved at pH 7. At pH 9 and calcium contents 2-20 ppm, the operating capacity is 0.6 eq/l **Lewatit® TP 208** (volume of hydrogen-form). At a service flow rate of 20 BV/h, the residual calcium of treated electrolysis brine is less than 0.02 ppm. Greater security can be achieved by operating two units of equal size in series (see our Technical Information OC/I 20802).

Lewatit® TP 208 removes the heavy metal cations from neutralized effluents in the following order: Copper > Vanadium (VO) > Uranium (UO₂⁺⁺) > Lead > Nickel > Zinc > Cadmium > Iron (II) > Beryllium > Manganese > Calcium > Magnesium > Strontium > Barium > Sodium.

The selective extraction is achieved even in the presence of the following complexing agents :

- » nitrogen compounds, e.g. ammonia, aliphatic and aromatic amines,
- » multivalent carboxylic acids, e.g. citric acid, gluconic acid, glucuronic acid, oxalic acid, tartaric acid,
- » phosphates, e.g. tetrasodium diphosphate, sodium polyphosphate.

Lewatit® TP 208 does not remove heavy metals from solutions containing EDTA or NTA respectively. Only cadmium is removed from solutions containing cyanides. For the extraction of those heavy metals which follow the uranyl oxide ion in the selectivity sequence as shown above, **Lewatit® TP 208** has to be conditioned with caustic soda solution after every regeneration cycle/before every exhaustion cycle. After the conditioning it is partially in a salt-form, e.g. mono-sodium-form. For the final polishing of chloralkali brine feed, however, **Lewatit® TP 208** is used in its di-sodium-form. Before commissioning a **Lewatit® TP 208** unit, see our Technical Information OC/I 20343 e for laboratory tests.

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. Further advice in this matter can be obtained from Lanxess, Business Unit Ion Exchange Resins.

General Description

Ionic form as shipped	Na ⁺
Functional group	iminodiacetic acid
Matrix	crosslinked polystyrene
Structure	macroporous
Appearance	beige, opaque

Physical and Chemical Properties

		metric units	
Uniformity coefficient*		max.	1.8
Bead size*	> 90 %	mm	0.4 - 1.25
Effective size*		mm	0.55 (+/- 0.05)
Bulk density	(+/- 5 %)	g/l	740
Density		approx. g/ml	1.17
Water retention		wt. %	55 - 60
Total capacity*		min. eq/l	2.9
Volume change	Na ⁺ --> H ⁺	max. vol. %	-40
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 temperature		max. °C	80
Operating pH-range			2 - 12
Bed depth		min. mm	1000
Specific pressure loss	(15 °C)	approx. kPa*h/m ²	1.1
Pressure loss		max. kPa	250
Linear velocity	exhaustion	max. m/h	40
Linear velocity	backwash (20 °C)	approx. m/h	10
Bed expansion	(20 °C, per m/h)	approx. vol. %	5
Freeboard	backwash (extern / intern)	vol. %	80
Regenerant			HCl
Co current regeneration	level	approx. g/l	140
Co current regeneration	concentration	approx. wt. %	4 - 10
Linear velocity	regeneration	approx. m/h	5
Linear velocity	rinsing	approx. m/h	5
Conditioning			Mono NaOH Di-Na -Na
Conditioning	level	g/l	40 - 48 80 - 96
Conditioning	concentration	approx. wt. %	4
Linear velocity	conditioning	approx. m/h	5
Rinse water requirement	slow / fast	approx. BV	5

* 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 ion exchange units. These are to be found in our Technical Information Sheets.

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.

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by us. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.

LANXESS Deutschland GmbH
BU ION
D-51369 Leverkusen

www.lewatit.com
www.lanxess.com

Edition: 2005-10-19
Previous Edition: 2005-09-28