

# LEWATIT<sup>®</sup> TP 260

## Product Information

**Lewatit TP 260** is a weakly acidic, macroporous cation exchange resin with chelating amino-methylphosphonic acid functional groups. It has a high operating capacity and very good mechanical and chemical stability in acid and alkaline media.

Primary areas of application are

- Secondary brine purification  
e.g. for the removal of alkaline earths from brine used in the alkali chloride membrane electrolysis process. **Lewatit TP 260** eliminates residual amounts of calcium and magnesium, particularly downstream the conventional purification processes (precipitation by hydroxides and carbonates) in the pH range of 8 - 11.  
**Lewatit TP 260** can be used to purify brine at pH 8 - 11 and 60 - 80 °C. The operating capacity depends greatly on the pH of the brine. At pH 10 it is about twice as high as at pH 8. At pH 10 and 1 - 5 ppm calcium, a capacity up to 14 g Ca/l **Lewatit TP 260** (calculated on the volume of the resin in the total sodium form) is obtained. The residual calcium values are well below 10 ppb, even at specific flow rates up to 40 bed volumes/hour. The use of two columns in series provides greater security.  
Chlorine (Cl<sub>2</sub>) levels in the feed brine should be kept below 0.1 ppm. Otherwise the life time expectation will be significantly decreased.
- Extraction / Recycling of heavy metal ions
  - from leaching solutions, e.g. uranium from crude phosphoric acid
  - from pickling and surface treatment baths e.g., iron, nickel and zinc from concentrated sodium gluconate solutions
  - from waste waters of the metals finishing industry e.g. tin and lead from rinse water of the printed circuit manufacturing.

The adsorption of heavy metal cations from aqueous solutions is in accordance with the following selectivity sequence:

$UO_2^{2+} > Pb^{2+} > Cu^{2+} > Ni^{2+} > Cd^{2+} > Co^{2+} > Ca^{2+} > Mg^{2+} > Sr^{2+} > Ba^{2+} > \text{alkalimetals}$

For the extraction of heavy metals from copper onwards in the selectivity sequence shown above, **Lewatit TP 260** has to be conditioned with caustic soda solution after every regeneration cycle / prior to every exhaustion cycle. For this purpose approx. 50 % of the resins total capacity needs to be converted into the sodium form.

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 Bayer AG, Business Group Specialty Products, Business Unit Ion Exchange Resins and Water Chemicals.

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## General Description

Ionic form as, as shipped	Di-Na
Functional group	Aminomethylphosphonic acid
Matrix	crosslinked polystyrene
Structure	macroporous
Appearance	beige, opaque

## Physical and Chemical Properties

Bead size*	> 90%	mm	0.4 - 1.25
Effective size*		mm	0.55 (+/- 0.05)
Uniformity coefficient*		max.	1.8
Bulk density	(+/- 5%)	g/l	770
Density		approx. g/l	1.2
Water retention		%	60
Total capacity*	H-form	min. eq/l	2.3
Volume change	Na+ -> H+	max. %	- 25
Stability	at pH-range		0 - 14
Storability	of the product	min. years	2
Storability	at temperature	°C	- 20 - 40

\* These data are specification values and are subject to continuous monitoring.

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## Recommended Operating Conditions\*

Operating temperature		max. °C	80	
Operating pH range			1 - 12	
Bed depth		min. mm	1000	
Specific pressure loss	(15°C)	approx. kPa*h/m <sup>2</sup>	1.1	
Max. pressure loss		kPa	250	
Linear velocity	exhaustion	max. m/h	40	
Linear velocity	backwash (20 °C)	approx. m/h	10 - 15	
Bed expansion	(20°C, per m/h)	approx. %	4	
Freeboard	as % of resin volume	%	80	
Regenerant			HCl	H <sub>2</sub> SO <sub>4</sub>
Cocurrent regeneration	level	approx. g/l	140	200
Cocurrent regeneration	concentration	%	4 - 10	5 - 15
Linear velocity	regeneration	approx. m/h	5	
Linear velocity	rinsing	approx. m/h	5	
Conditioning			Mono-Na (NaOH)	Di-Na
Conditioning	level	approx. g/l	40 - 45	80 - 90
Conditioning	concentration	%	4	
Linear velocity	conditioning	approx. m/h	5	
Linear velocity	rinsing	approx. m/h	5	
Rinse water requirement		approx. BV	3 - 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.

\*\* progressive Regeneration

\*\*\* 100m/h for polishing

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## Safety precautions

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

## Toxicity

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

## Disposal

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A proprietary technical recycling process for used ion exchanger is unknown to us. In the European Community the following possibilities for disposal can be utilized.

Resins used for water treatment and in the sugar industry can be disposed under code number 190 905. Our preference is to recommend disposal in an industrial incinerator.

Ion exchange resins which contain impurities after use in industrial processes, e.g. electroplating, chemicals treatment etc., can be disposed under code number 190 806. A certificate of disposal is required.

Bayer AG  
BG Specialty Products  
BU Ion Exchange Resins and Water Chemicals  
D-51368 Leverkusen

Internet: <http://www.lewatit.com>

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Internet: <http://www.bayer.com>

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