

QUALITY PURIFIES.



QUALITY WORKS.

LANXESS
Energizing Chemistry

New end polisher quality for semiconductor applications with **Lewatit® UltraPure 1296 MD PLUS**

In the production of semiconductors and displays, a complex water treatment is necessary to achieve the specified water quality. The fast development of the new generation of wafers requires the ion exchanger systems to be of increasingly high quality. Moreover, new analytic systems are able to analyze ions in the lower ppt range and for some kinds of ions in the ppq range. Many treatment steps, such as demineralization with primary ion exchange, working mixed bed, reverse osmosis, degassing, ultrafiltration, H₂O₂ removal, and end polishing are necessary to achieve sufficient ultrapure water (UPW) quality.

Quality criteria for UPW applications

Lewatit® ion exchange resins are used for the final polishing of ultrapure water in semiconductor applications as well as in cartridge applications for ultrapure water. The main quality points for water that is directly used for etching and cleaning processes are:

- Low amount of total organic carbon (TOC)
- Electrical conductivity close to theoretical value of pure water
- Extremely small number of fine particles
- Extremely low residual content of ion components
- Sufficient kinetic and operating capacity for weak ions
- Chemically and degradation-stable cation and anion exchanger components

Next generation of polishing mixed bed resin

Based on the existing standard grade product **Lewatit® UltraPure 1296 MD**, LANXESS has developed the next generation of polishing mixed bed resin. The new premium grade **Lewatit® UltraPure 1296 MD PLUS** stands for very high purity. Even the standard grade **Lewatit® UltraPure 1296 MD** shows good Inductively Coupled Plasma – Mass Spectrometry (ICP MS) results with less than 0.1 ppt of metal leakage. The new **Lewatit® UltraPure 1296 MD PLUS** has achieved further improvements, which include:

- Significant metal reduction
- Reduced particle release
- Low TOC release

X Lewatit®

Figure 1: SEMI C93-0620 (HCl leach test) – Determining the quality of ion exchange resin used in polish applications of ultrapure water system – ICP MS analysis of average metal content of Lewatit® UP 1296 MD PLUS vs. competitor product

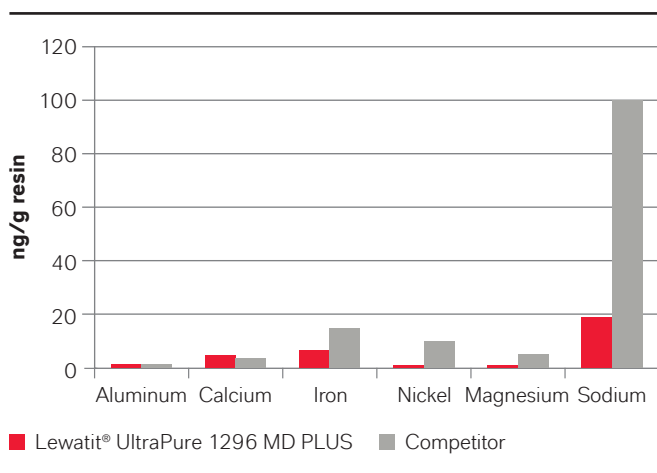


Figure 2: SEMI C93-0620 (≥ 3 nm particle test) – Determining the quality of ion exchange resin used in the polishing step of UPW systems – Online measured particle release of Lewatit® UP 1296 MD PLUS vs. competitor product

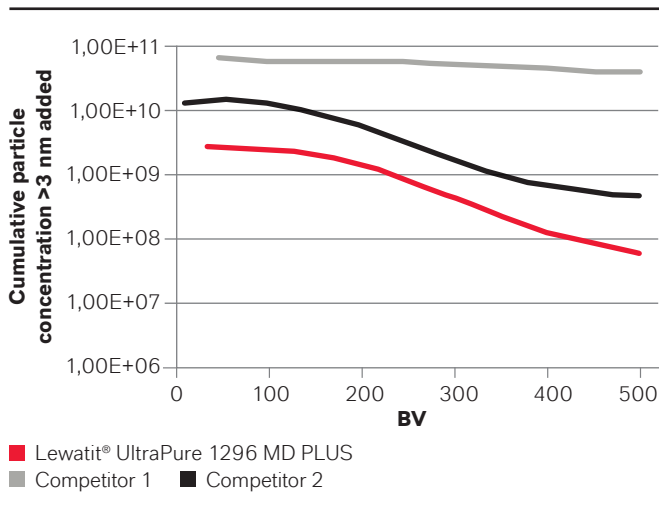
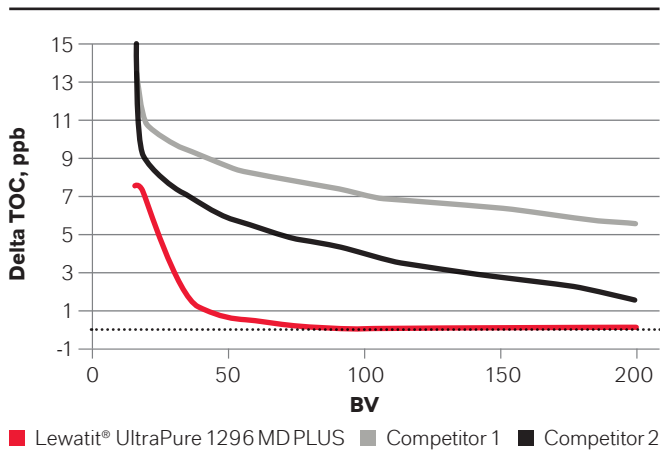


Figure 3: SEMI C93-0620 (TOC rinse test) – Determining the quality of ion exchange resin used in polish applications of ultrapure water system – Online measured TOC release of Lewatit® UP 1296 MD PLUS vs. competitor product



Further advantages include:

- The high total capacity and conversion rate of our anion and cation exchanger components results in a high operating capacity for boron and silica as well as metals.
- The bead size distribution of the monodisperse components is designed to avoid an automatic separation of cation and anion exchanger.
- Because of the perfect distribution of cation and anion resin beads in our ready-to-use mix bed, potential impurities will be removed and do not enter your UPW stream.
- The particle and organic release is therefore within an extremely low range.

Benefits of Lewatit® UltraPure 1296 MD PLUS

- Resin components intensively cleaned
- Low rinsing water demand
- Extremely low TOC release
- High operating capacity for low selective ions
- Excellent chemical resin stability
- Low particle release
- Less separable mixture



LANXESS Deutschland GmbH
 Liquid Purification Technologies
 Kennedyplatz 1
 50569 Cologne, Germany
 Tel.: +49-221-8885-0
 E-mail: lewatit@lanxess.com

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