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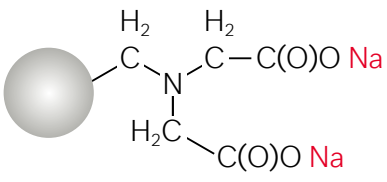
Lewatit® MonoPlus TP 209 XL – a Tailor-made Resin for Recovery from Pulps (RIP Processes)

New approach

Lewatit® MonoPlus TP 209 XL is a monodisperse iminodiacetic acid (IDA) chelating resin and the latest member of the TP specialties family. Compared with other IDA resins such as Lewatit® MonoPlus TP 207 it has a bigger particle size (approx. 0.84 mm) and a higher total capacity (> 2.4 eq./l). Its special macroporous styrene/DVB copolymer structure results in high mechanical stability. Thus, Lewatit® MonoPlus TP 209 XL is especially suited for the recovery of metals such as copper, cobalt, and nickel from pulps.

Lewatit® MonoPlus TP 209 XL



Schematic representation of the IDA functional group.

Key features

- Strong and elastic properties to endure mechanical stress in RIP operations
  - Less resin loss during operation due to breakage
  - Longer lifetime
  - Reduced top-up volumes
- Bigger bead size to ease resin separation from pulps through sieving
- Higher operating capacities for base metals
- Fast kinetics during adsorption and elution
- Good osmotic stability
- Lower pressure drop in fixed-bed operations

The improved polymer backbone, with a higher degree of cross-linkage, leads to enhanced mechanical durability towards abrasion and attrition, as these can occur while resins are pumped, sieved, or stirred with pulps during hydrometallurgical operations.

Lewatit®

The mechanical resistance is demonstrated by three different test methods, i.e., the attrition test, roll test, and ball mill test. All three tests simulate the forces that ion exchange resins are exposed to during the RIP process. Lewatit® MonoPlus TP 209 XL shows superior mechanical stability for all test methods.

Figure 1: Attrition test showing the percentage decrease in diameter (d50) upon grinding ion exchange beads with a quartz pulp.

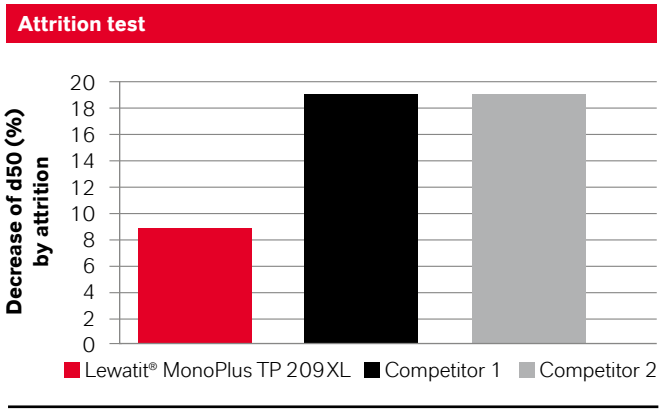


Figure 2: Roll test depicting the remaining whole perfect beads after rolling a 5 kg cylinder over a monolayer of beads 20 times.

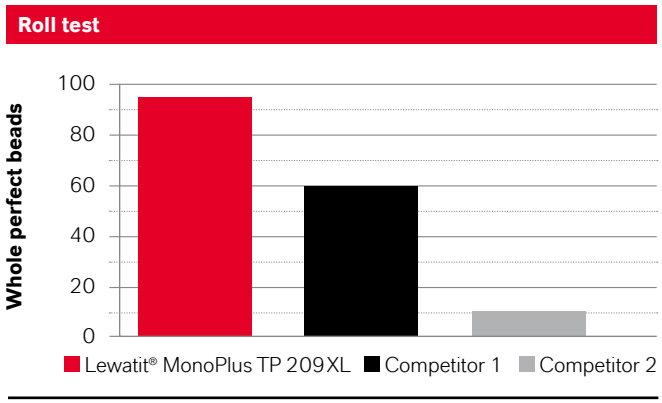
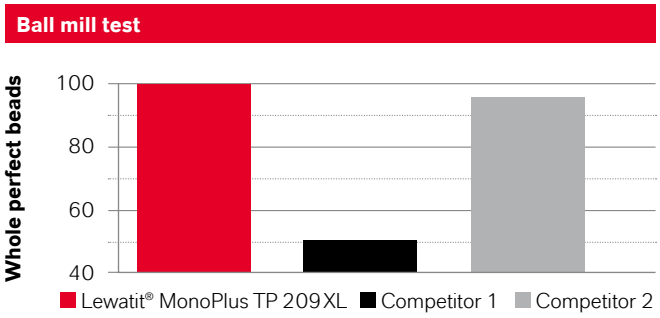


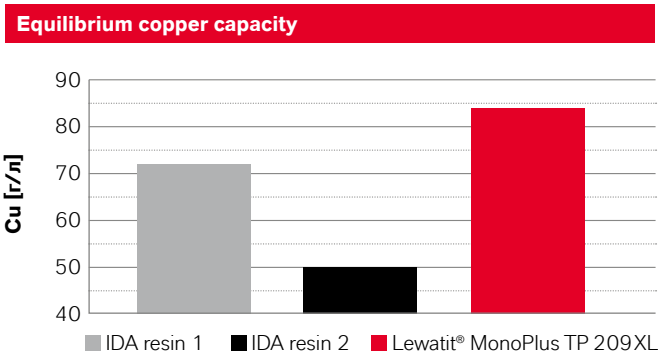
Figure 3: Ball mill test depicting the remaining whole perfect beads after milling 60 min with ceramic spheres at 600 rpm.



At the same time, Lewatit® MonoPlus TP 209 XL has a significantly higher capacity for heavy metals than conventional IDA resins.

Figure 4 illustrates the benchmark results for the copper adsorption in batch tests. Under the described test conditions, copper operating capacities of more than 80 g/l were found.

Figure 4: The equilibrium copper capacity in comparison
Test conditions: [Cu] = 3 g/l
Resin: solution ratio = 1:50, pH = 3, contact time = 24 h



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