



## CL-Technology GmbH

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## CL BRIGHT NICKEL MR

### PROPERTIES

CL Bright Nickel MR is a nickel electrolyte which deposits bright and constant ductile nickel coatings. It is distinguished by its economical operating parameters and excellent throwing power.

CL Bright Nickel MR can be used for barrel- as well as for rack applications.

### EQUIPMENT

Tank:	the working tank should have a special rubber lining
Heating:	various heating systems are possible for example: immersion Bath heaters, heat exchangers, heating coils etc.
Heating material:	porcelain, titanium or Teflon
Anodes:	pure nickel anodes. The use of anode bags is a must to ensure that the anode sludge does not reach the cathode area of the nickel electrolyte. Anode bags have to be treated with 2 – 3% hydrochloric acid before application.
Filtration:	continuous. The capacity of the filter must allow at least four rotations of the electrolyte volume per hour.
Exhaust device:	necessary
Rectifier:	Usually 15 Volt devices, for higher capacity 18 Volt devices. The residual ripple over the total currency must be < 5%
Deposition rate:	approx. 0,1 – 0,2 µm/min.

Bankverbindung : Stadt – Sparkasse Solingen, BLZ 342 500 00, Konto nr. 5353248  
HRB 5025 Amtsgericht Solingen. Ust-ID-Nr. DE 813 359 241  
Geschäftsführer : Uwe Lüdtke

## MAKE-UP FOR 100 LTR. ELECTROLYTE

17,0 kg Nickel Sulfat x 6 H<sub>2</sub>O  
8.0 kg Nickel Chlorid x 6 H<sub>2</sub>O  
4.0 kg Boric Acid  
1,5 l. Carrier K  
0,4 l. Carrier M  
0,05 kg Wetting Agent M  
0,1 l. CL Brightener MR

## MAKE-UP PROCEDURE

The working tank, fittings, filter device must be thoroughly cleaned, if necessary with diluted hydrochloric acid (ratio 1 : 9), add Wetting Agent and brush off and clean thoroughly with water.

The nickel salts and boric acid are dissolved separately in suitable tanks. Subsequently add the solved salts to the working tank which is filled up with water half of the required volume.

After this add 2 g/l active carbon and stir for 2 hours.

Leave the solution idle for 4 hours (or if possible overnight). The active carbon and other particles will precipitate and carefully filtered out. Top-up the electrolyte with water until the nominal volume is reached and adjust the pH value with pure sulphuric acid conc. to 2,0 – 2,5.

With the use of a modest number of anodes, work through the electrolyte at the working temperature and with 0,5 - 1 A/dm<sup>2</sup>. After this the CL brightener, carrier and wetter may be added.

The pH value is now adjusted to 4,0 – 4,2 with the use of pure sulphuric acid or by means of filtration over a nickel carbonate filter. After this the electrolyte is ready for use.

## WORKING CONDITIONS

Density (20°C):	1,15 g/cm <sup>3</sup> (19 °Be)
pH Value:	3,9 – 4,6 (optimum 4,0 – 4,2)
Temperature:	40 – 60°C (optimum 50 – 52°C)
Current density:	average value 0,5 – 1 A/dm <sup>2</sup>
Anode current density:	1 – 3 A/dm <sup>2</sup>

## MAINTENANCE AND REPLENISHING

The following chemicals should be on stock:

CL Brightener MR  
CL Carrier M  
CL Carrier K  
Wetting Agent M

Drag out reduces the total concentration of the electrolyte. It is of great importance to check the density and pH value during operation.

The following nominal values should be adhered:

Nickel:	55 g/l (50 – 65 g/l)
Chloride:	25 g/l (20 – 30 g/l)
Boric acid:	40 g/l (37 – 45 g/l)
Carrier K	15 ml/l (10-20 ml/l)
Carrier M	4 ml/l (2- 6 ml/l)

The consumption is depending on the barrel equipment drag out and type of parts. According to our experience the following values are consumed per 10.000 Ah:

CL Brightener MR	3 – 5 l.
Carrier K	1 – 2 l.
Carrier M	0.8-1.2l.
Wetting Agent M	0.05-0.1 kg

## CORRECTIONS

Replenishing should take place according to analyses.  
Density and temperature and pH value must be checked daily.  
Test deposition in the hull cell should take place 1 times per week.

## WARRANTY

Seller makes no warranty, whether of merchantability, fitness or otherwise, expressed or implied, concerning the product other than it shall be of the specifications stated herein. Any recommendations made by Seller concerning the use of the product are believed to be reliable, but seller makes no warranty of the results obtained. Buyer agrees to inspect the product supplied hereunder immediately after delivery. Failure to give notice in writing as aforesaid within the specified time constitutes an unqualified acceptance of the product and a waiver of all claims with respect thereto.

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