

PALM

a **umicore** company

Liquid Nickel Sulfamate 20

Palm International's Liquid Nickel Sulfamate 20 is specially produced for use in the surface finishing industry and is the purest form available commercially. Palm's LNSF 20 is used for electroforming and other nickel solutions requiring exceptional purity. LNSF 20 is manufactured to demanding specifications from carefully selected raw materials. LNSF 20 is subjected to stringent quality control standards and testing.

Store and handle as an acid solution in a cool ventilated area away from foodstuffs. Keep container tightly closed.



Concentration

10.2 percent nickel or 20 ounces of nickel metal per gallon or 85 ounces of $\text{Ni}(\text{NH}_2\text{SO}_3)_2$ salt per gallon.

Appearance

Green Clear Liquid

Contaminants

Measured in ppm

Analysis:

| Parameter | Specification | Typical |
|------------------|---------------|-----------|
| Nickel | 148-160 g/l | 154 g/l |
| pH | 3.0 - 5.0 | 4.5 |
| Cadmium | < 1 ppm | < 0.1 ppm |
| Calcium | < 5 ppm | 0.6 ppm |
| Cobalt | < 1 ppm | < 0.1 ppm |
| Chromium | < 1 ppm | 0.1 ppm |
| Copper | < 1 ppm | < 0.1 ppm |
| Iron | < 4 ppm | 1.0 ppm |
| Lead | < 1 ppm | < 0.1 ppm |
| Magnesium | < 2 ppm | 0.1 ppm |
| Manganese | < 1 ppm | < 0.1 ppm |
| Sodium | < 10 ppm | 1.5 ppm |
| Zinc | < 1 ppm | < 0.1 ppm |
| Ammonia | < 100 ppm | 75 ppm |
| Sulfate | < 700 ppm | 275 ppm |
| Chloride | < 10 ppm | 5.0 ppm |
| Specific Gravity | 1.45-1.49 SG | 1.47 SG |

Shelf Life

If stored at a temperature above 40°F and a maximum of 105°F in its original container, LNSF 20 has a shelf life of 5 years.

Packaging

5 gallon pails or 55 gallon drums.

Storage/Safety

Store and handle as an acidic solution.