

# NB SEMIPLATE IN 100

In electroplating process

## INTRODUCTION

The NB SEMIPLATE IN 100 process is an alkaline, non-cyanide indium plating formulation. Deposits obtained from the NB SEMIPLATE IN 100 bath are matte and fine-grained. Throwing power is excellent. The alkaline nature of the bath eliminates the impurity build-up of nickel, iron and copper. NB SEMIPLATE IN 100 deposits have main applications in semiconductor or MEMS processing for bonding purposes.

“NB SEMIPLATE IN 100” is shipped **ready-for-use**, while the “IN 100 xxx” are compounds and used for mixture and maintenance.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT.

## PHYSICAL PROPERTIES OF THE DEPOSIT

Purity (%):	99
Specific gravity (g/cm <sup>3</sup> ):	7.0
For 1 micron deposit (mg/dm <sup>2</sup> ):	70

## MATERIALS REQUIRED

Product Name	Article No.	Comment
<b>NB SEMIPLATE IN 100</b>	207100-00	<ul style="list-style-type: none"> <li>ready-for-use solution</li> </ul>
IN 100 REPLENISHER	207100-10	<ul style="list-style-type: none"> <li>for maintenance of the bath</li> </ul>
IN 100 INDIUM COMPLEX	207100-20	<ul style="list-style-type: none"> <li>for maintenance of the indium metal of the bath</li> </ul>
Sodium hydroxide (NaOH, reagent grade, 20% by volume)	-	<ul style="list-style-type: none"> <li>is required to raise the pH</li> </ul>
Sulfuric acid (H <sub>2</sub> SO <sub>4</sub> , reagent grade, 5% by volume solution)	-	<ul style="list-style-type: none"> <li>is required to lower the pH</li> </ul>

## EQUIPMENT REQUIRED

Tanks	Polypropylene, CPVC, unfilled PVC, and plexiglass are recommended. Viton is a recommended gasket material. If any questions arise as to material compatibility, consult NB Technologies.
Leaching	Leach all tanks and peripheral equipment thoroughly prior to installation of this process.
Heating	Titanium, stainless steel (type 316)
Filtration	Continuous filtration is required. Fiberglass or cellulose can be used to obtain a clear filtrate after carbon treatment. Use properly leached Dynel, or polypropylene filter cartridges.
Rectifiers	Sufficient to develop more than the greatest direct current required with less than 5% ripple at the amperage used.
Anodes	High purity indium anodes should be used. Anode bags are not required.
Ventilation	Exhaust according to local regulations

## **BATH PARAMETERS**

The following table shows the bath parameters, which should be maintained and checked with regular sample analysis.

	NBT analysis	Units	Max. upper limit	Upper action limit	Optimum	Lower action limit	Lowest limit
In	X	g/l	40	35	30	25	20
pH	(X)	pH	10.4	10.3	10.2	10.1	10.0

## **GENERAL PLATING CONDITIONS**

Parameter		Optimum	Range
Cathode current density	[mA/cm <sup>2</sup> ]	30	25 – 35
Flow depending on tool	[l/h]	-	1200 –
Anode to cathode spacing (depends on tool and wafer size)	[cm]		5 - 15
Temperature	[°C]	60	50 to 70

Efficiency: 19.0 bis 23.8 mg/Amin

## **MAKE-UP PROCEDURE**

NB SEMIPLATE IN 100 solution is supplied ready for use at 30 g/l Indium metal concentration.

## **SPECIFIC REQUIREMENTS**

- Fixtures and anode should be operated in symmetric conditions to the wafer centre (distance of wafer edge to fixture edge, distance of fixture to tank wall, electrical contacting)
- Anode material soluble indium of high purity
- Fixture and others features of PP, PFTE, POM or compatible-proven materials (degreased, leached)

## **MAINTENANCE OF THE SOLUTION**

Regular analysis for indium metal content and pH determination are essential for the control of the bath.

### **INDIUM COMPLEX**

Since soluble indium anodes are used the indium concentration should remain within the operating limits. If necessary high purity IN 100 Indium Complex (100 g/l In) may be used to maintain the recommended concentration.

### **IN 100 REPLENISHER**

IN 100 REPLENISHER is supplied as a liquid in 1000 ml units. Each unit contains all the necessary agents to be added for the electrodeposition of 500 g Indium metal. For each gram of Indium metal deposited add 2 ml of IN 100 REPLENISHER.

### **pH ADJUSTMENTS**

To increase the pH, add sodium hydroxide.

To decrease the pH, add sulphuric acid.

### **INDIUM CONSUMPTION**

Under optimum conditions the NB SEMIPLATE IN 100 process will deposit 100 g Indium metal for every 4,200 Amin. Since drag out losses cannot be accounted accurately, analytical checks should be performed regularly to confirm Ampere-Minute-Meter readings.

**IMPURITIES**

Introduction of metallic impurities into the solution should be prevented by proper rinsing of the parts to be plated. The NB SEMIPLATE IN 100 process is relative tolerant to low levels of heavy metal contaminants, as it will co-deposit these metals without serious effect upon either the appearance or physical properties of the deposit. Organic impurities may be dragged into the plating solution from a variety of sources and will usually result in a significant decrease in plating efficiency which will eventually lead to bath decomposition.

**SPECIFIC PROCEDURES**

- Oxygen plasma before plating
- chemical pre-treatment not recommended/normally not needed
- Cleaning of all items with DI before insertion in electrolyte
- Wetting of wafer surface with DI water before insertion into bath (check for wetting)

**CUSTOMER SUPPORT**

Further customer support on the process with this product is available by contacting NB Technologies GmbH.

**BATH ANALYSIS SERVICE**

NB Technologies supports the bath analysis and provides special shipping kits including shipping box, sample bottles and labels.

**DATA LOGGING**

Keep a record of ampere-hours of use to determine replenishment volumes. Examples of process log sheets are available by contacting NB Technologies GmbH.

**HANDLING AND SAFETY INSTRUCTIONS**

For detailed information consult the material safety data sheets for this product.  
Please read material safety data sheets carefully before using this product.

**DISCLAIMER**

All recommendations and suggestions in this bulletin concerning the use of our products are based upon tests and data believed to be reliable. Since the actual use by others is beyond our control, no guarantee expressed or implied, is made by NB Technologies GmbH, its subsidiaries or distributors, as to the effects of such use or results to be obtained, nor is any information to be construed as a recommendation to infringe any patent.

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