

# NF-220 No-Flow Underfill

## Features

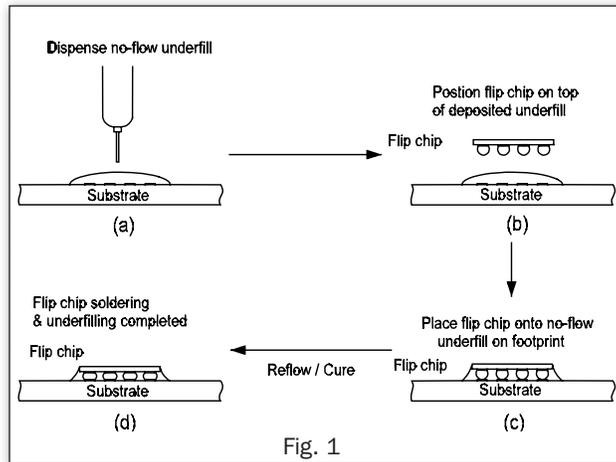
- Enables large die mounting
- Enhances CSP reliability
- Reduces costs by combining soldering and underfilling in one heating pass
- Increases yield – no die-drifting, excellent solder wetting
- Increases reliability – no voiding and delamination
- Compatible with wide range of reflow profiles

## Introduction

**NF-220** No-Flow Underfill is designed for Flip Chip or Chip Scale Package (CSP) assembly and packaging application using a single reflow process. It exhibits fluxing capability for solder reflow to form solder joints. It also underfills the chip, thus provides reliability reinforcement and environmental protection for the chip. **NF-220** is fully compatible with the SMT process and allows broad profile window for solder reflow and underfill curing. It is designed for Sn63Pb37 soldering process. Furthermore, the underfill curing is completed in one reflow pass and no post cure is required. This no-flow underfill not only has low cost process advantage over capillary flow underfill, but also achieves high yield.

## Process Recommendations

**NF-220** is compatible with a variety of passivations, interconnect substrates, and substrate finishes including copper-nickel-gold and organic solder preservative (OSP). Fig.1 shows the application process. No preheat of substrate is required when applying the material.



Physical Properties	Value	Test Method
Color	Amber liquid	Visual
Viscosity@25°C, Brookfield, Kcps (typical)	40	Model HB DVII+ -CP (0.5 rpm)
Shelf Life@-40°C, months	6	
Pot Life@25°C, hours	8	
Hardness, Shore D	>90	(One reflow pass)
Glass Transition Temperature (Tg), °C (typical)	126	TMA
Coefficient of Linear Thermal Expansion		
Alpha 1, ppm/°C (typical)	56	TMA
Alpha 2, ppm/°C (typical)	184	TMA
Lap Shear Strength (psi) (typical)	3178	
Extractable Ionic Content		MIL-STD-883, 5011.4
Chloride (Cl <sup>-</sup> ), ppm	<5	
Nitrate (NO <sub>3</sub> <sup>-</sup> ), ppm	<5	
Sulfate (SO <sub>4</sub> <sup>-</sup> ), ppm	<5	
Sodium (Na <sup>+</sup> ), ppm	<5	
Ammonium (NH <sub>4</sub> <sup>+</sup> ), ppm	<5	
Process Yield (typical)	100%	
Underfill Voids (typical)	None	CSAM
Delamination (96hs pressure cooking)	No	JEDEC level-3 preconditioning and accelerated moisture testing

All information is for reference only. Not to be used as incoming product specifications.

OVER →

Form No. 97764 R4

www.indium.com askus@indium.com

ASIA: Singapore: +65 6268 8678  
 CHINA: Suzhou, Shenzhen, Liuzhou: +86 (0)512 628 34900  
 EUROPE: Milton Keynes, Torino: +44 (0) 1908 580400  
 USA: Utica, Clinton, Chicago: +1 315 853 4900



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## NF-220 No-Flow Underfill

### Storage and Handling

**NF-220** has a shelf life of 6 months when stored at -40°C and a shelf life of 1 month when stored at -10 to 0°C. **NF-220** should be stored tip down and sealed inside a plastic bag with desiccant. Before use, allow the material to reach room temperature while remaining sealed inside the plastic bag. For better results, thaw inside a humidity dry box (20%RH, 25°C).

### Cleaning of Uncured NF-220

The uncured epoxy flux in flux deposition devices can be cleaned with methyl ethyl ketone easily, although isopropyl alcohol can also be used for cleaning.

### Packaging

**NF-220** is generally available in 10cc or 30cc syringes. However, other packages can be provided according to user's requirements.

### Safety

**NF220** is a very benign, non-toxic material. Under typical reflow profile, very little amount of volatiles is generated. General hygiene practice is recommended in handling **NF220** and the fumes generated.

### Material Safety Data Sheet

The MSDS for this product can be found online at <http://www.indium.com/techlibrary/msds.php>

### Reflow

#### Recommended Profile:

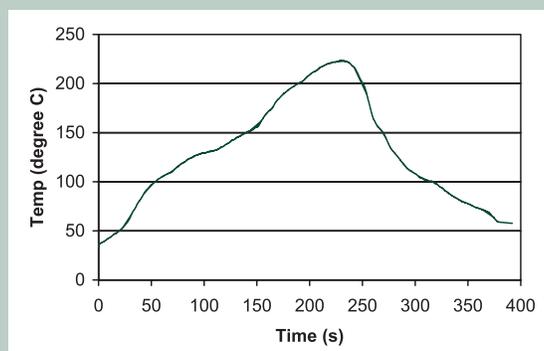


Fig. 2

**NF-220** can be used in infrared, convection, conduction or vapor phase soldering systems. A protective nitrogen atmosphere is recommended for achieving reliable solder joints. This is particularly true for reflow profiles that require an extended soak time. Although most 63Sn37Pb and 62Sn36Pb2Ag reflow profiles can be used for **NF-220** applications, a recommended profile is shown in Fig. 2. The time from ambient to peak temperature should be four minutes with a peak temperature of approximately 220°C.

This product data sheet is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products

described which are sold subject exclusively to written warranties and limitations thereon included in product packaging and invoices.

[www.indium.com](http://www.indium.com)    [askus@indium.com](mailto:askus@indium.com)

ASIA: Singapore: +65 6268 8678  
 CHINA: Suzhou, Shenzhen, Liuzhou: +86 (0)512 628 34900  
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