

# LOCTITE ECI 7004HR E&C

June 2022

## PRODUCT DESCRIPTION

LOCTITE ECI 7004HR E&C provides the following product characteristics:

<b>Technology</b>	Thermoplastic
Appearance	Black liquid
Filler Type	Carbon
Product Benefits	<ul style="list-style-type: none"> <li>• High resistivity</li> <li>• Screen printable</li> <li>• Flexible low temperature drying cycles</li> </ul>
Maximum Operating Temperature	105°C
<b>Cure</b>	Heat drying
<b>Application</b>	Electrically conductive ink, Inks and coatings
Typical Assembly Applications	Force sensitive modules, Printed resistors and Sensing devices
Key Substrates	Treated polyester, Polyimide

LOCTITE ECI 7004HR E&C is a screen printable, high resistance carbon solvent-based ink. It is specifically designed to allow for blending with NCI 7002 E&C. The blended material will provide sheet resistance adjustments required in the manufacture of force sensors with slow responsive sensitivity profiles. LOCTITE ECI 7004HR E&C is also recommended for use in the assembly of printed temperature sensors.

## TYPICAL PROPERTIES OF UNDRIED MATERIAL

Solids Content, %	22.8
Density, g/cm <sup>3</sup>	1.1
Viscosity, Brookfield, 20 °C, mPa·s (cP):	
Speed 20 rpm, after 15 minutes	10,000
Theoretical coverage @ 10 µm dry film thickness, m <sup>2</sup> /kg	19.4

## TYPICAL SCREEN PRINTING PROCESS

<b>Emulsion Thickness</b>	
Emulsion Thickness, µm	20 to 40
<b>Recommended Squeegee</b>	
Polyurethane, durometer	70 to 75
<b>Recommended Screen Type</b>	
Monofilament polyester, threads/cm	61 to 90
Stainless steel screen, threads/cm	77 to 110

## Printing Equipment Type

Manual  
Semi-automatic  
High speed reel-to-reel

## TYPICAL DRYING CYCLE

### Recommended Drying Cycle

10 minutes @ 120°C

LOCTITE ECI 7004HR E&C mixed with LOCTITE NCI 7002 E&C can be dried using forced air or infrared systems. Higher temperatures for longer time exposure will improve the performance. Care should be taken with infrared. Too much energy can destroy the coating. Design drying rates for the maximum the substrate and production speeds can tolerate.

The above drying profile is a guideline recommendation. Conditions (time and temperature) may vary based on customers' experience and their application requirements, as well as customer drying equipment, oven loading and actual oven temperatures.

## TYPICAL PROPERTIES OF DRIED MATERIAL

### Physical Properties

Adhesion on treated PET, ASTM 3359, grade 5B

### Electrical Properties

Sheet Resistivity @ 25 µm dry film thickness, Ohm/sq:

    After 5 minutes @ 120°C 3,500

Sheet Resistivity

Blending ratios of LOCTITE ECI 7004HR E&C and LOCTITE NCI 7002 E&C

LOCTITE ECI 7004HR E&C (% by weight)	LOCTITE NCI 7002 E&C (% by weight)	Sheet Resistivity (Ohm/sq/25µm)
100	0	3,500
90	10	5,800
80	20	10,100
70	30	17,300
60	40	33,600
50	50	96,000
40	60	360,000
30	70	Not conductive

If used in China, the amount of LOCTITE ECI 7004HR E&C in the blend with LOCTITE NCI 7002 E&C should be equal or less than 70 % by weight to ensure compliance with VOC regulations.

## GENERAL INFORMATION

**For safe handling information on this product, consult the Safety Data Sheet, (SDS).**

## DIRECTIONS FOR USE

1. LOCTITE ECI 7004HR E&C is supplied ready for use and does not require dilution.
2. Stir LOCTITE ECI 7004HR E&C prior to each use.
3. When mixing with LOCTITE NCI 7002 E&C, use a stirrer.
4. If dilution is necessary, use 2-butoxy ethyl acetate (butylglycol acetate).
5. If a gel structure forms after extended storage, the product may be warmed slightly in a water bath (not exceeding 50°C) and stirred. Very often, stirring is enough to obtain a proper viscosity again.

## Not for product specifications

The technical data contained herein are intended as reference only. Please contact your local Henkel representative for assistance and recommendations on the specifications of this product.

## STORAGE

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

**Optimal Storage: 8 to 28°C. Storage below 8°C or above 28°C can adversely affect product properties.**

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Henkel Representative.

## Conversions

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$   
 $\text{kV/mm} \times 25.4 = \text{V/mil}$   
 $\text{mm} / 25.4 = \text{inches}$   
 $\text{N} \times 0.225 = \text{lb/F}$   
 $\text{N/mm} \times 5.71 = \text{lb/in}$   
 $\text{N/mm}^2 \times 145 = \text{psi}$   
 $\text{N/mm}^2 = \text{MPa}$   
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$   
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$   
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$   
 $\text{mPa}\cdot\text{s} = \text{cP}$

## Disclaimer

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product. Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

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