

# TECHNICAL DATA SHEET

## UHMWPE Rod - Medical Grade

(Purity: 99.9%, Diameter: 25mm, Length: 500mm)

Stock No: NHS01-00002, CAS: 9002-88-4

<b>Product</b>	:	<b>UHMWPE Rod</b>
Stock No	:	NHS01-00002
CAS	:	9002-88-4
Purity	:	99.9%
Grade	:	Medical
<b>Diameter</b>	:	<b>25mm</b>
<b>Length</b>	:	<b>500mm</b>
Molecular Formula	:	(CH <sub>2</sub> C <sub>52</sub> ) <sub>n</sub>
Molecular weight	:	4 million
Form	:	Solid
Colour	:	White

<b>Material Properties</b>	<b>Specification</b>	<b>Standard</b>	<b>Units</b>
Average molecular weight	approx. $5 * 10^6$		g/mol
Elongation Stress F (150/10)	>0.2		(Mpa)
Viscosity number (VN)	> 2000		(ml/g)
Density	927 – 944	ISO 1183	(kg/m <sup>3</sup> )
Water absorption at 23° C until saturation	< 0,01	ISO 62	(%)

<b>Mechanical Properties</b>	<b>Specification</b>	<b>Standard</b>	<b>Units</b>
Tensile stress at yield	> 21	ISO 527	(MPa)
Tensile stress at break	> 35	ISO 527	(MPa)
Elongation at break	> 300	ISO 527	(%)
Tensile modulus	approx. 720	ISO 527	(MPa)
Impact strength	no break	ISO 179	(kJ/m <sup>2</sup> )
Notched impact strength	> 180	ISO 11542-2	(kJ/m <sup>2</sup> )
Ball indentation hardness	30 – 35	ISO 2039-1	(N/mm <sup>2</sup> )
Shore-Hardness D, 15 s value	60 – 65	ISO 868	(-)

<b>Thermal properties</b>	<b>Specification</b>	<b>Standard</b>	<b>Unit</b>
Melting point DSC, 10 K/min	130 – 135	ISO 3146	(°C)
Vicat softening point	80	ISO 306	(°C)
Thermal expansion between 23 and 80° C	2 * 10 <sup>-4</sup>	ISO 11359	<b>(K-1)</b>
Heat deflection temperature	42	ISO 75, Teil	(°C)
Thermal conductivity	approx. 0,4	ISO 52612	(W/[m*K])

<b>Electrical properties</b>	<b>Specification</b>	<b>Standard</b>	<b>Unit</b>
Relative permittivity at 100 Hz	2,1	IEC 60250	(-)
Dissipation factor at 100 Hz	3,9 * 10 <sup>-4</sup>	IEC 60250	(-)
Volume resistivity	> 10 <sup>14</sup>	IEC 60093	(Ohm*m)
Surface resistivity	> 10 <sup>13</sup>	IEC 60093	(Ohm)
Dielectric strength	45	IEC 60243	(kV/mm)

### **Physiological properties**

#### **Food conformances according to**

	<b>Specification</b>
EU Directive 2002/72/EC	Yes
FDA Regulation 21CFR177.1520	Yes
FDA Regulation 21CFR178.2010	N/A
FDA Regulation 21CFR178.3297	N/A

### **Sterilisation**

	<b>Specification</b>
Etyhlene oxide	Yes
Gas plasma	Yes
Gamma (inert atmosphere)	Yes
Superheated steam 121/134° C	No/No

### **Conformances**

	<b>Specification</b>
USP Class VI	Yes
Cytotoxicity	Yes
Drug Master File – DMF	10916-EU
Drug Master File – DMF	10904-USA
Device Master File – MAF	588
ISO 5834-2	Type 1
ASTM F 648	Type 1

### **Main Inspect Verifier**

**Date of Print**

**Version**

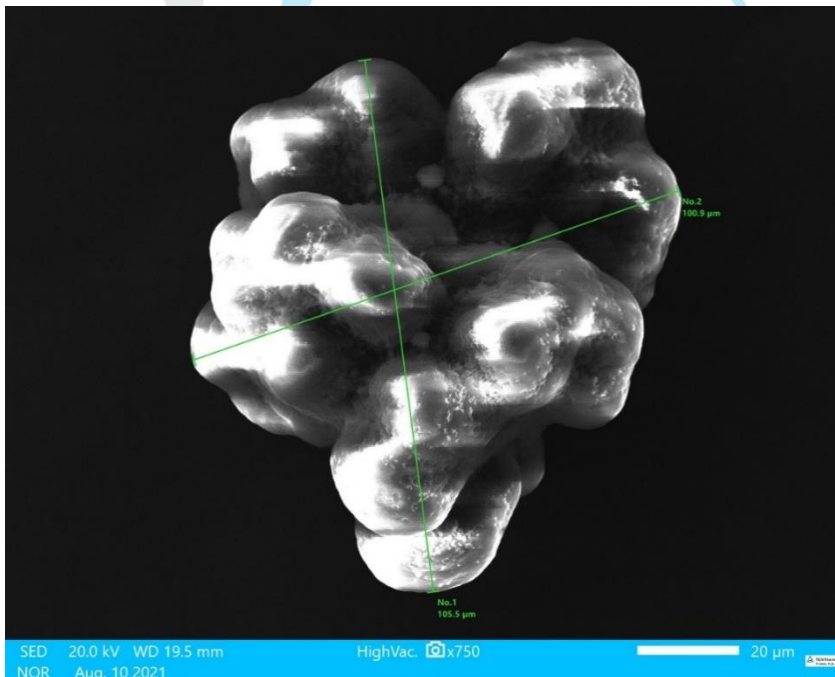
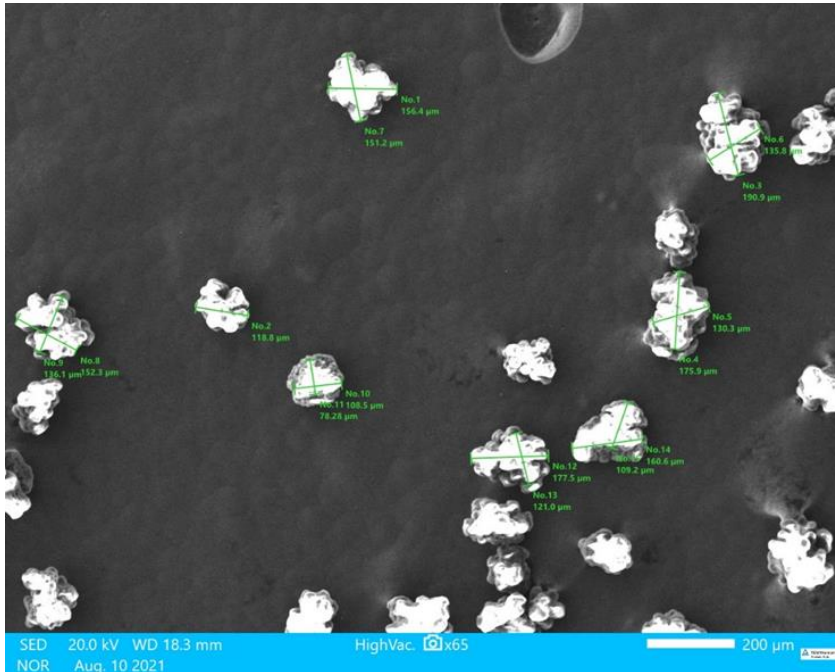
**Manager QC**

**October 2021**

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**Note:** Product Specification are subject to amendment and may change over time

## Scanning Electron Microscope (SEM) Analysis: Item: UHMWPE Powder



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**Works:** I Hub, Ground Floor, AMTZ Campus, Pragati Maidan, VM Steel Project SO, Visakhapatnam – 530031 AP (INDIA)

**Regd office:** Plot #: 123, Industrial Area (Ph-2), Panchkula -134113 HR (INDIA)

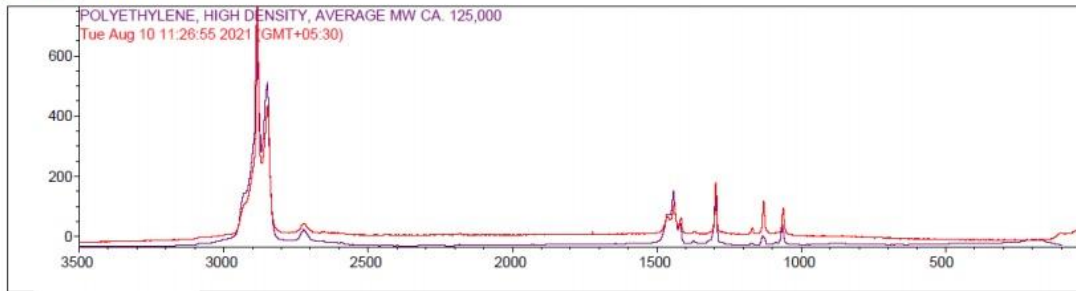
**Tel:** +91-9815 85 9815, 9815 50 9815 | ✉ [sales@nanoshel.com](mailto:sales@nanoshel.com), [nanoshelhealthcare@gmail.com](mailto:nanoshelhealthcare@gmail.com)

## RAMAN ANALYSIS OF UHMWPE

Item: UHMWPE Powder

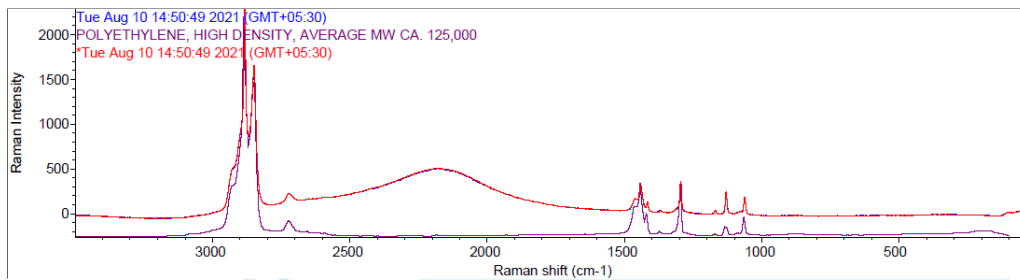
### Raman Analysis:

Item: UHMWPE Powder



**Result:** The powder is identified as high density Polyethylene (HDPE)

Item: UHMWPE Extruded Bar



**Result:** The extruded bar is identified as high density Polyethylene (HDPE), with broadening observed between 2000-2400 cm-1.

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# UHMWPE

## RODS

### Medical Grade

**NANOSHEL HEALTHCARE PVT. LTD.**

**Manufacturing Unit:**

I Hub B1, Ground Floor, Andhra Pradesh  
Medtech Zone Ltd, Survey No 480/2, Nadupuru  
Village Pedagantyada Mandal, Visakhapatnam,  
Andhra Pradesh, 530031 (India)



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**Nanoshel Healthcare Pvt. Ltd.**

\*Manufacturers of UHMWPE Rods and Medical Implants



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