

## COAGULATED DISPERSION GRADE CD097E

### Description

Fluon® CD097E is a white free flowing powder made by coagulating an aqueous dispersion of polytetrafluoroethylene. The polymer has a trace quantity of comonomer incorporated in the molecule to modify its crystallinity and resulting properties. The process to make CD097E does not use ammonium salts of perfluorooctanoic acid (PFOA).

### Processing

Fluon® CD097E can be processed by paste extrusion of a lubricated mix followed by drying and sintering. Further information on these techniques may be found in Technical Service Note F3/4/5, "The processing of Fluon® PTFE coagulated dispersion powders".

### End Uses

Fluon® CD097E is a low extrusion pressure polymer which has been designed for paste extrusion at high reduction ratio for wire coating or small diameter tubing with good transparency.

Typical end uses include various types of wire, for example, hook-up wires and computer back panel wires, and small diameter tubing including spaghetti tubing where good transparency and surface finish are required.

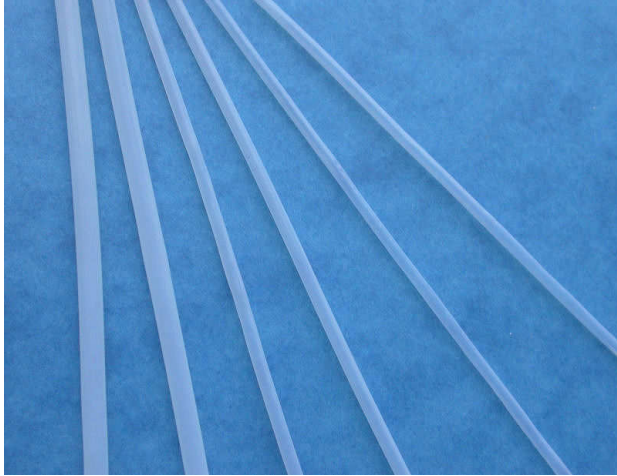
The benefits of the grade include low extrusion pressure, high quality extrusion at high reduction ratio, low fault rates, excellent surface finish, good clarity and colour definition and good powder handling properties.

This information sheet contains typical property data which should not be used for specification purposes.

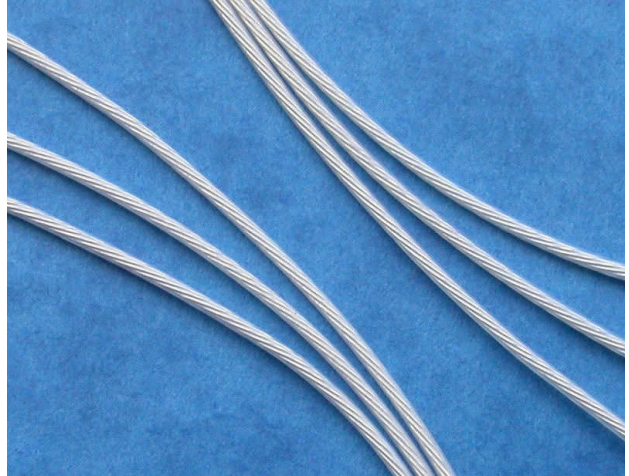
### Typical Properties

Property	Typical Value	Units	Test Method	
Bulk density	480	kg / m <sup>3</sup>	FTM126	ISO 12086-2/10.3
Mean particle size	510	microns	FTM125	ISO 12086-2/8.6
Moisture content (Desiccant pack weight increase 3 days after packing)	<6	g	FTM121	
Moisture (weight loss)	<0.05	%	FTM140	
Extrusion pressure at reduction ratio 1600:1 (0.79 mm die)	38	MPa	FTM19	ISO 12086-2/10.4
SSG	2.177	-	FTM128	ISO 12086-2/10.6
Reduction ratio range	100-4000:1	-	-	-
Colour	White	-	-	-

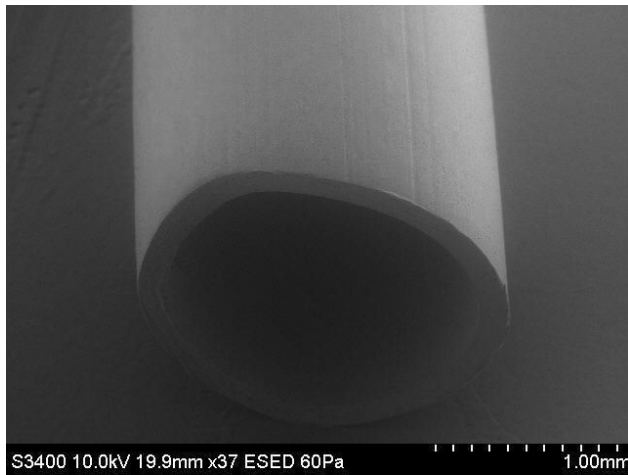
### Applications



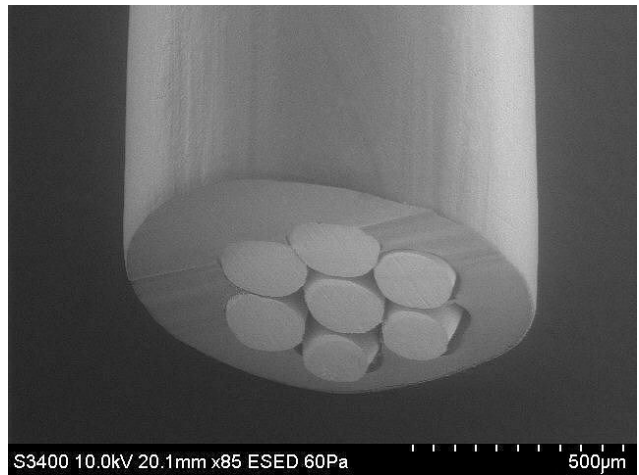
CD097E 1.8, 2.0 and 3.0 mm tubes



CD097E coated wire



SEM of CD097E tube x 37



SEM of CD097E coated wire x 85

### Wire Coating

The following conditions have been used to coat wire with CD097E using a Davis extruder with in-line drying and sintering followed by air quenching.

Reduction ratio	1800:1	
Machine	Davis	
Lubricant (VM&P Naphtha)	18%	
Conditioning time/temperature	24 hr/25°C	
Preform pressure	500 lb/in <sup>2</sup>	(35.15 kg/cm <sup>2</sup> )
Extrusion cylinder	1.5 in	(38.1 mm)
Mandrel diameter	0.25 in	(6.35 mm)
Die diameter	0.042 in	(1.07 mm)
Die angle	20°	
Wire	7/0.20	
Type	A	
Guide tip ID	0.026 in	(0.66 mm)
Guide tip clearance	0.036 in	(0.91 mm)
Ram speed	13.5 mm/min	
Extrusion rate (wire speed)	75 feet/min	(22.86 m/min)
Extrusion pressure	52 MPa	
<b>Drying:</b>		
Vaporising 1 (3.0 m)	250°C	
Total drying oven length	3.0 metres	
Drying residence time	0.13 min	
<b>Sintering:</b>		
Sintering 1 (3.0 m)	500°C	
Sintering 2 (2.4 m)	500°C	
Total sintering oven length	5.4 metres	
Sintering residence time	0.24 min	
OD of coated wire	0.036 in	(0.91 mm)

## Tubing

The following conditions have been used to make tubing on a Havelock vertical ram extruder with batch drying and sintering followed by air quenching.

	<b>3.0 mm Tube</b>	<b>2.0 mm Tube</b>	<b>1.8 mm Tube</b>
Machine	20 te Havelock	20 te Havelock	20 te Havelock
Lubricant (VM&P Naphtha)	18%	18%	18%
Conditioning time/temperature	24 hr/25°C	24 hr/25°C	24 hr/25°C
Preform pressure	500 lb/in <sup>2</sup> (35.15kg/cm <sup>2</sup> )	500 lb/in <sup>2</sup>	500 lb/in <sup>2</sup>
Extrusion cylinder	1.625 in (41.275 mm)	1.625 in	1.625 in
Mandrel diameter	0.375 in (9.52 mm)	0.375 in	0.375 in
Die diameter	0.125 in (3.175 mm)	0.083 in (2.108 mm)	0.078 in (1.98 mm)
Die angle	20°	20°	20°
Core pin diameter	0.105 in (2.667 mm)	0.07 in (1.778 mm)	0.07 in (1.778 mm)
Reduction ratio	543:1	1256:1	2111:1
Extrusion rate (tube speed)	11 meters/min	22 meters/min	32 meters/min
<b>Drying:</b>			
Temperature	120°C	120°C	120°C
<b>Sintering:</b>			
Temperature	380°C	380°C	380°C
Sintering time	5.0 minutes	5.0 minutes	5.0 minutes

Tubes made under these conditions have excellent transparency and a smooth surface finish.

## Rod Extrusion and Tensile Strength

The following conditions have been used to make extruded rod on a Havelock vertical ram extruder with batch drying and sintering followed by air quenching for tensile testing.

<b>1.27 mm Rod</b>	
Machine	20 te Havelock
Lubricant (VM&P Naphtha)	18%
Conditioning time/temperature	24 hr/25°C
Preform pressure	500 lb/in <sup>2</sup> (35.15 kg/cm <sup>2</sup> )
Extrusion cylinder	1.625 in (41.275 mm)
Die diameter	0.050 in (1.27 mm)
Die angle	20°
Reduction ratio	1056:1
<b>Drying:</b>	
Temperature	150°C
<b>Sintering:</b>	
Temperature	380°C
Sintering time	5.0 minutes
<b>Tensile Strength</b>	35.5 MPa
<b>Elongation</b>	854%

### Packaging

Fluon® CD097E is packed in plastic kegs with plastic lids, containing 25 kg.

### Disposal

Waste polymer should be disposed of by landfill in accordance with any local regulations for the disposal of products of low toxicity or may be incinerated under approved controlled conditions.

### Safety In Use

Users must refer to the relevant Material Safety Data Sheet.

### Storage and Handling

Fluon® CD097E should be stored in clean dry conditions between 15°C and 18°C to ensure it does not become compacted and is easy to sieve.

The lubricated mixes of powder should be stored at 25°C for 24 hours before use in air tight containers to ensure that the lubricant is evenly distributed and that the powder will preform and extrude uniformly.

### Food Contact Approval

Information on food contact approval is available from the AGC Chemicals Europe, Ltd Sales Office.

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Fluon® grades are general industrial grades. It is the responsibility of the purchaser to check that the specification is appropriate for any individual application. Particular care is required for special applications such as pharmaceutical, medical devices or food. Not all grades are suitable for making finished materials and articles for use in contact with foodstuffs. It is advisable to contact the AGC Chemicals Europe, Ltd sales office for the latest position. Users of Fluon are advised to consult the relevant Health and Safety literature which is available from the AGC Chemicals Europe, Ltd sales office.

**Fluon® is a registered trademark of the Asahi Glass Company.**



## TECHNICAL INFORMATION SHEET

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