Medical Grade Polycaprolactone (PCL)

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Main features and benefits of Polycaprolactone:

- medical grade, certified according ISO13485
- purity: > 99.0 %
- high viscosity for high tenacity yarns
- synonym: poly(hexano-6-lactone)
- CAS number: 24980-41-4

Polycaprolactone (PCL) is a long-term biodegradable polyester with a low melting point of around 60 °C and a glass transition temperature of about −60 °C. PCL is prepared by ring-opening polymerization of ε-caprolactone and is FDA approved for drug delivery devices and as adhesion barriers.

PCL is highly soluble in chlorinated hydrocarbons and can be used for thermal processing like extrusion, fiber spinning, injection molding and 3D-printing.

PCL is degraded by hydrolysis of its ester linkages in physiological conditions (such as in the human body) and has therefore received a great deal of attention for use as an implantable biomaterial, especially for the manufacture of long-term implantable medical devices. Due to the high viscosity of 1.6-2.2 dl/g, PCL granules from ITVP Denkendorf are excellently suited for the production of high-tenacity monofilament- and multifilament yarns and for barbed face-lift systems.

Polycaprolactone (PCL)

Description	ITVP-PCL is a medical grade homopolymer of ε-caprolactone with an inherent viscosity midpoint of 1.9 dl/g. It is supplied as white to light tan granules.		
Specification	**Test**	**Method**	**Specification**
	Appearance	Visual	White to light tan
	Identification	NMR	Conforms to reference
	Purity	NMR	> 99.0 %
	Melting range	DSC, 10 °C/min	55 – 60 °C (131 – 140 °F)
	Glass transition temperature	DSC, 10 °C/min	-55 – -65 °C (-55 – -85 °F)
	Residual monomer	NMR	< 1.0 %
	Inherent viscosity **	Viscosimetry	1.6 – 2.2 dl/g
	Water content *	Titration	< 0.5 %
	Heavy metal *	ICP	Tin content < 30 ppm, other heavy metals < 10 ppm
Identification	Chemical name	Poly(hexano-6-lactone)	
	Molecular formula	$(C_6H_{10}O_2)_n$	
	CAS-No.	24980-41-4	
Packaging	ITVP-PCL can be supplied in 1 kg and 5 kg packages. Usual packaging consists of an inner PE and an outer bag of aluminum coated polyester-PE laminate. Products are shipped in additional boxes.		
Storage and Handling	ITVP recommends to store PCL in the original packaging at low temperatures (< -15 °C). Allow PCL to warm up to room temperature before opening the packaging. After opening the original packaging, please store PCL under inert atmosphere at low temperatures.		

* Water content and heavy metals are measured statistically. Heavy metal content is measured from an external certificated laboratory.
** Inherent viscosity is measured in HFIP, 30 °C, Oa, c = 0.8 g/dl.

ITV Denkendorf Produktservice GmbH (ITVP) is a subsidiary of the DITF (German Institutes of Textile and Fiber Research Denkendorf). ITVP is certified according ISO 13485 for the development and production of polymers, pre-products and devices for medical applications, but is not actively marketing medical devices for the final consumer. The main focus lies on absorbable polymers, textile-based implants like e.g. surgical sutures and ligaments for wound treatment, meshes for hernia operations, vascular prostheses for blood vessel replacement and membranes for treatment of burns.

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DAkkS Deutsche Akkreditierungsstelle D-PL-17474-01-02

Accredited laboratory by DAKKS according to DIN EN ISO/IEC 17025. The accreditation is valid only for the scope listed in the annex of the accreditation certificates D-PL-17474-01-00 respectively D-PL-17474-01-02.