

Cured-in-place pipe (CIPP) is one of several different methods that can be used to repair existing underground pipes that may be damaged or leaking due to corrosion, tree root intrusion, frost or other causes. CIPP repair is known as a 'trenchless, rehabilitation' method that uses a joint-less, seamless pipe-within-a-pipe and is one of the most widely used repair methods used in sewer and chemical pipelines.

The advantages of CIPP repair is that it does not require excavation in order to repair a damaged pipe. While a small excavation access hole may need to be made, most repairs can generally be accessed through an existing manhole or other access point. The CIPP liner, which is inverted during installation using water or air-pressure, is 'wet-out' with a thermosetting resin. The thermoset resin is then cured using hot water and/or steam and can take anywhere from one hour to 30 hours to fully cure.

The CIPP liners are typically composed of a felt substrate that is coated with a thermoplastic polymer such as a thermoplastic polyolefin (TPO) or thermoplastic polyurethane (TPU). Different suppliers of CIPP often have different requirements for their thermoplastic coatings and it is not uncommon for them to use custom, proprietary blends.

Most suppliers of CIPP will have their own specific property requirements for the TPO or TPU coating material in regards to flexural modulus, temperature resistance (melting point or Vicat Softening Temperature) and viscosity characteristics. Generally speaking, the following properties are desirable:

 **Flexural Modulus:** A low flexural modulus (75,000 psi) is typically preferred as the CIPP liners need to be flexible enough to be inverted during installation.

 **Temperature Resistance:** A high melting point (320 F) or Vicat temperature (>190F) is typically preferred as the liner coating needs to survive hot water or steam curing without blistering.

 **Viscosity:** Higher viscosity grades of TPO and TPU are often preferred as they will have higher tensile strength which can be an advantage.

Entec Polymers has the practical experience with CIPP coating materials and can assist you with selecting the best TPO or TPU material or blend to meet your specific CIPP coating requirements.