TECHNICAL DATA SHEET #1700 - LMK656PR

STORAGE, HANDLING AND MIXING - LMK656PR RESIN SYSTEM

Storage and Handling:

PROMOTED LMK656PR RESIN

- The promoted thermoset polyester resin should be stored in a cool, dry area.
- **Prior to use, chill resin to a temperature between 25°F to 35°F.**
- Avoid excessive heating and cooling of the resin prior to use. Keep the thermoset resin out of direct sunlight, away from sparks and open flame.
- Shelf life of LMK656PR Polyester resin is 6 months.
- Personal Protective Equipment (PPE) should be worn when handling this product. See SDS sheet for further information.

CATALYST

- The catalyst should be stored in a cool, dry area.
- **DO NOT FREEZE THE CATALYST.**
- Keep out of direct sunlight.
- Keep catalyst away from excessive heat, sparks and open flames.
- Protective gear should be worn when handling this product. See SDS sheet for further information.

Mixing Resin:

1. **IMPORTANT** – LMK656PR resin must be mixed prior to dispensing, pouring off or adding catalyst. LMK656PR resin is a filled and pre-promoted mixture and natural settling and separation will occur. Mix thoroughly before adding catalyst and/or dispensing into smaller containers.

Failure to mix the resin as directed will cause premature curing and negatively affect physical properties.

5-Gallon Pail: Mix Chilled Resin Until Thoroughly Mixed (minimum 2 minutes) PRIOR TO ADDING CATALYST
55-Gallon Drum: MIX BULK RESIN FOR 1 HOUR PRIOR TO DISPENSING WITH PROPER MIXING EQUIPMENT

2. Add premeasured catalyst according to the charts on page 2.

3. Mix resin immediately and thoroughly after adding catalyst.

MIX RESIN AND CATALYST FOR A MINIMUM 2 – 3 MINUTES UNTIL THOROUGHLY MIXED

4. After full inversion begin your steam cure process as outlined in the T-Liner® training manual. The steam temp gauge at the boiler truck should read between 240°-260°F. The steam cure process should take 30 minutes after 150°F is read with a temperature gauge at the cleanout and should be extended an additional 15-30 minutes in colder times of the year and/or if cold ground water is present. The proper procedure is to increase the steam cure time, not increase the steam temperature.

5. Cool down procedures are outlined as half the steam cure process time and in colder conditions including snow melt and ground thaw, the steam supply micro valve should be closed slowly at a rate of 30° F temperature drop every 10 minutes as read at the steam reel temp gauge until the gauge reads 180°F or less. At this time the cleanout temperature reading needs to be 100°F or less. This procedure allows the cured liner to cool down before closing the steam micro valve completely and finishing the cool down procedure.

CURE TIME AND CATALYST CHART ON PAGE 2
RESIN USAGE ON PAGE 3

AMBIENT CURE SYSTEM

CATALYST % AND ESTIMATED CURE TIME PROMOTED RESIN

Resin Temperature Should be **25°F to 35°F**

Liner Length in Feet	Ambient Temperature	Catalyst %	Cure Time
0-30 ft.	< 50°F (10°C)	4.00%	2.5 - 3.0 hours
0-30 ft.	50°F to 75°F (10°C to 23.9°C)	3.75%	2.0 - 2.5 hours
0-30 ft.	above 75°F (23.9°C)	3.50%	1.5 - 2.0 hours
31 ft. to 60 ft.	< 50°F (10°C)	4.00%	2.0 - 2.5 hours
31 ft. to 60 ft.	50°F to 75°F (10°C to 23.9°C)	3.75%	2.0 - 2.5 hours
31 ft. to 60 ft.	above 75°F (23.9°C)	3.00%	1.5 - 2.0 hours
over 60 ft.	< 50°F (10°C)	3.50%	2.0 - 3.0 hours
over 60 ft.	50°F to 75°F (10°C to 23.9°C)	3.50%	1.50 - 2.0 hours
over 60 ft.	above 75°F (23.9°C)	2.50%	1.5 - 2.0 hours

NOTE: For extreme site conditions such as difficult installations, hot temperatures, and long liners:
*** The use of an ice water trough for cooling resin saturated liner tubes will improve working time.**
*** Cooling T-Launchers in a freezer, and cooling Launch Tanks by placing ice or dry ice in the tank will improve working time.**

STEAM CURE SYSTEM

CATALYST % AND ESTIMATED CURE TIME PROMOTED RESIN

Resin Temperature Should be **25°F to 35°F**

Liner Length in Feet	Ambient Temperature	Catalyst %	Working Time
0-30 ft.	< 50°F (10°C)	2.5%	1.5 - 2.0 hours
0-30 ft.	50°F to 75°F (10°C to 23.9°C)	2.0%	1.5 - 2.0 hours
0-30 ft.	above 75°F (23.9°C)	2.0%	1.0 - 2.0 hours
31 ft. to 60 ft.	< 50°F (10°C)	2.5%	1.5 - 2.0 hours
31 ft. to 60 ft.	50°F to 75°F (10°C to 23.9°C)	2.0%	1.5 - 2.0 hours
31 ft. to 60 ft.	above 75°F (23.9°C)	2.0%	1.0 - 2.0 hours
over 60 ft.	< 50°F (10°C)	2.5%	1.5 - 2.0 hours
over 60 ft.	50°F to 75°F (10°C to 23.9°C)	2.0%	1.5 - 2.0 hours
over 60 ft.	above 75°F (23.9°C)	1.50%	1.0 - 2.0 hours

NOTE: For extreme site conditions such as difficult installations, hot temperatures, and long liners:
*** The use of an ice water trough for cooling resin saturated liner tubes will improve working time.**
*** Cooling T-Launchers in a freezer, and cooling Launch Tanks by placing ice or dry ice in the tank will improve working time.**

RESIN CONSUMPTION

Lateral Tube SKV2[1] (diameter - resin usage per foot of liner)	**T-Liner® Mainline Sheet Lined Pipe[2,3]** (mainline diameter - resin usage per liner)	**T-Liner® Mainline Sheet Unlined Pipe[2,3]** (mainline diameter - resin usage per liner)	**Sectional Spot Repair[1,3]** (diameter - resin usage per foot of liner)
3.75”- 1.16 lbs./ft.	6”- 2.10 lbs.	6”- 2.30 lbs.	6”- 1.90 lbs./ft.
4”- 1.24 lbs./ft.	8”- 3.08 lbs.	8”- 3.08 lbs.	8”- 3.02 lbs./ft.
5”- 1.57 lbs./ft.	10”- 3.67 lbs.	10”- 3.87 lbs.	10”- 3.78 lbs./ft.
5.75”- 1.82 lbs./ft.	12”- 4.46 lbs.	12”- 4.66 lbs.	12”- 4.58 lbs./ft.
6”- 1.90 lbs./ft.	15”- 7.50 lbs.	15”- 11.55 lbs.	15”- 9.89 lbs./ft.
8”- 2.56 lbs./ft.	18”- 9.07 lbs.	18”- 18.42 lbs.	18”- 15.83 lbs./ft.
	21”- 10.65 lbs.	21”- 21.58 lbs.	24”- 21.10 lbs./ft.
	24”- 12.23 lbs.	24”- 24.73 lbs.	27” - 23.75 lbs./ft.
			30” - 37.70 lbs./ft.
			36” - 45.34 lbs./ft.

1. Determine total length of liner and multiply by lbs./ft.
2. For T-Liner - determine the lateral length and multiply by the lbs./ft. and then add the appropriate amount for the Mainline Sheet.
3. To facilitate measuring, all usage requirements have been rounded to the nearest half pound.

To calculate catalyst usage multiply the total amount of resin by 454 to convert lbs. to grams. Multiply the result by the catalyst percent [i.e. total x .03(3.00%)] and add 5 grams to the total.

Resin Disposal Instructions:

- With large quantities of unused poly resin, LMK recommends that you contact a state licensed hazardous material disposal company.
- Small quantities (1-2 pails) may be disposed of by adding catalyst (4% of resin weight) to the resin. Mix thoroughly in a well ventilated outside area. Allow the resin to cure and harden completely. Cool completely which will take approximately 24 hours. When the resin is cured and cooled the chemicals are now in an inert state and are no longer hazardous and may be disposed of in the trash.
- Always use appropriate Personal Protection Equipment (PPE), when handling resin and catalyst.
- Refer to the SDS sheet available at www.lmktechnologies.com for more information.