



THE ADVANCEMENT IN TECHNOLOGY FOR CURED IN PLACE PIPE (CIPP) RENOVATION

Presented by Phil Steele,
Sales Director, RSM Lining
Supplies Global Ltd

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INTRODUCTION:

RSM Lining Supplies Global Ltd:

We will be exploring:

- The introduction of the Cured In Place Pipe lining renovation technique.
- Traditional curing and installation techniques.
- New curing technology & its impact upon the industry.
- New installation technology & its impact upon the industry.

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INTRODUCTION:

RSM Lining Supplies Global Ltd:

- Established in 2003.
- World leading suppliers of CIPP materials, equipment, and service.
- Our ethos is to introduce choice and technology to the industry, positioning us as a forward thinking, market leading supplier that our customers trust and rely upon.
- UK based head office – with an Australasian office and a number of distributors world-wide.
- We supply materials and equipment daily both nationally and across the globe, making us a pivotal player within the CIPP industry.



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INTRODUCTION:

A Brief History:

- Cured In Place Pipe Repair was developed by Eric Wood to repair the ventilation system on a mushroom farm!
- 1971: CIPP first used in a sewer at Marsh Lane, London. Eric Wood called the process 'Trotufilm'.
- 1970s: First hot cure systems developed to speed up the curing time.
- 1976: First rising main liner installed in Reading.
- 1990: First UV CIPP lining systems developed.
- 1991: Marsh Lane Liner was checked by Witc and its material strength had increased.
- CIPP's rapid development has led to the swift expansion of different curing methods - ambient, hot cure, steam cure, UV, and UV LED cure.

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TRADITIONAL CURING TECHNOLOGIES

Ambient Cure & Hot Cure

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AMBIENT CURE TECHNOLOGY:

Strength & Limitations:

Strengths

- Resin can be manipulated for longer or shorter curing times.
- Small on-site team required – small on site footprint.
- Limited equipment needed.
- Cost effective.
- Relatively fast installation process.

Limitations

- Not practical for use on longer length, larger diameter jobs – generally recommending ambient cure installations only go up to 225mm diameter.
- Limitations on lengths of liner that can be installed due to time constraints of resin.

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AMBIENT CURE TECHNOLOGY:

Methodology:

- Probably the most utilised installation method in the CPP industry
- This method means that the liner cures in the ambient temperature.
- Liner must be impregnated by the engineer on site before being dragged or inverted into place – no possibility for factory impregnation due to working time of the resin.
- Variety of resins available for ambient cure – Polyester, Epoxy & Silicate.




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HOT CURE TECHNOLOGY:

Methodology:

- Involves the addition of heat (using a hot water boiler) to cure the liner after it has been inverted or dragged into the pipe.
- Hot cure liners are factory impregnated & delivered to site in refrigerated transport.
- The hot cure methodology is used for long length and large diameter installations.
- RSM's largest hot cure impregnation to date was for a 1600mm diameter liner that was successfully impregnated & installed back in 2019.

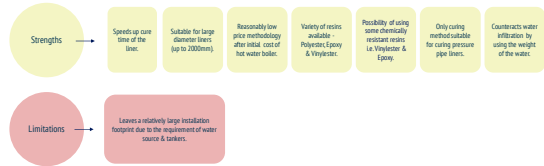


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HOT CURE TECHNOLOGY:

Strength & Limitations:



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STEAM CURE TECHNOLOGY:

Methodology:

- Involves the addition of steam (using a steam boiler) to cure the liner after it has been inverted or dragged into the pipe.
- Like hot cure, steam cure liners are factory impregnated & delivered to site in refrigerated transport.
- Once a liner has been installed, steam (generated by a boiler) is fed through the lines at the appropriate temperature & pressure until it is cured.



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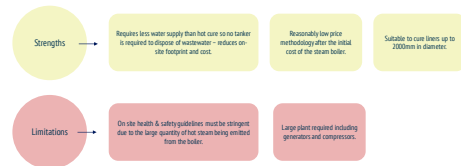
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ADVANCEMENTS IN CURING TECHNOLOGIES

Steam Cure, UV Cure & UV LED Cure

STEAM CURE TECHNOLOGY:

Strength & Limitations:



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UV CURE TECHNOLOGY:

Methodology:

- Developed back in the 1990's & popularity has increased over the years.
- Liner is pulled through the host pipe using a winch and a UV light train is run through the pipe, prompting the liner to cure.
- Suitable for larger diameter liners up to 1600mm.



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UV LED CURE TECHNOLOGY:

Methodology:

- UV LED is the newest curing method in the CPP industry.
- Back in 2018, Sewertronics spearheaded the growth of the UV & LED curing market by beginning a partnership with RSM Lining Supplies Global Ltd, introducing the Speedyliner LED Curing System to the Sewer Renovation industry.
- Fast, safe and simple installation and cure process.
- Much smaller footprint than any other curing method.
- Only method that can cure standard UV glass-reinforced liners and felt liners impregnated with UV LED resin.

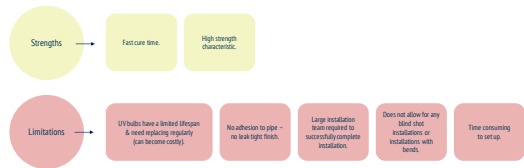


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UV CURE TECHNOLOGY:

Strength & Limitations:

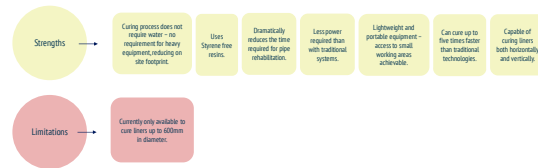


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UV LED CURE TECHNOLOGY:

Strength & Limitations:



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TRADITIONAL INSTALLATION TECHNIQUES

Drag-In Lining & Scaffold Tower Inversion

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DRAG-IN LINING:

Strength & Limitations:

Strengths

Simple & easy installation methodology

Cost effective installation method

Suitable for short length applications.


Limitations

Only suitable for ambient cure liners.

Only suitable for straight runs.

No potential for a leak-tight finish.

Not suitable for larger diameter, longer length installs.



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DRAG-IN LINING:

Methodology:

- Drag-in lining is the traditional method of installation for small diameter repairs in which there are two points of access to the sewer.
- The Liner is impregnated with the engineer's choice of resin and then dragged (pulled) into the host pipe.
- Calibration hose can be inverted with water through a drop tube or with air via an inversion drum.








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SCAFFOLD TOWER INVERSION LINING:

Methodology:

- Inversion lining has become the industry standard method of installation for most CIPP applications (especially if the diameter is greater than 225mm).
- The liner is secured to a scaffold and inverted using water.
- The liner is then cured either ambiently or with the assistance of hot water.

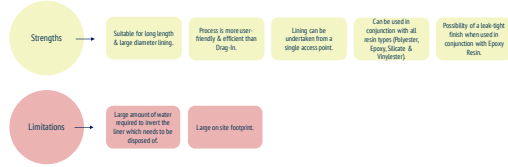


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SCAFFOLD TOWER INVERSION LINING:

Strength & Limitations:



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INVERSION DRUMS:

Methodology:

- Inversion Drums can be used for both Drag-In and Inversion Lining.
- Rather than water, compressed air is used to invert the liner or calibration hose.
- This promotes safer working practices as engineers do not have to work at heights.
- Drums can be used for any diameter but in large diameters the equipment becomes large and can be difficult to transport to site.



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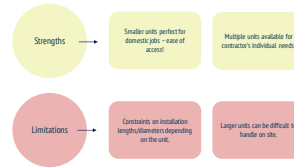
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ADVANCEMENTS IN INSTALLATION TECHNIQUES

Inversion Drums & Stauices

INVERSION DRUMS:

Strength & Limitations:



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SLUICE INVERSION:

Methodology:

- Since the Sluice has been introduced to the market they have become an invaluable resource for inversion lining.
- The Sluice inverts liners in continuous lengths due to its open bladder style design.
- This promotes safer working practices as engineers do not have to work at heights.
- Can be used for all methods of curing including ambient, hot and UV LED
- Any diameter of Sluice can be manufactured up to 1800mm



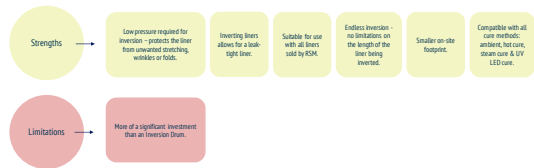
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OVERVIEW OF ADVANCEMENTS IN THE CIPP INDUSTRY

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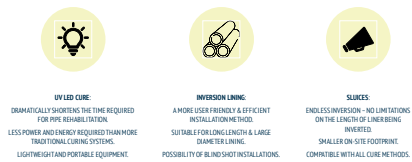
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OVERVIEW:

Advancements of Installation Methods & Curing Techniques:



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