

2019 Award Nomination

Title of Innovation: Lift Off Rest (LOR)

Nominee(s): Martin Schutte, Founder and CEO, “Lift-Off” Pipe Supports®



Category:

(select one below)

Coatings and Linings

Cathodic Protection

Materials Design

Chemical Treatment

Instrumentation

Testing

Integrity Assessment

Other—fill in

Dates of Innovation Development: (from April, 2013 to September, 2018)

Web site: <https://liftoffpipe.com/>

Summary Description: The Lift Off Pipe Rest (LOR) is a glass reinforced composite resin pipe support that provides a non-corrosive barrier between pipes and beams eliminating corrosion, designed to meet the thermal and mechanical requirements of load bearing supports.

This innovative pipe support does not absorb moisture, spreads the pipe load 4 times greater than existing supports, prevents electrolysis, and is qualified for temperatures as low as -265°F and as high as 412°F (continuous) and up to 550°F (intermittent). The LOR continually maintains position without external support and is designed with grooves for an additional fluid shed and corrosion protection.

Other features of the LOR include: not degrading/disintegrating due to the exposure of chemicals in the immediate environment over a long term of time; won't burn, won't smoke,

can't catch fire; with high compression strength won't extrude; glass-reinforced composite support won't crack in service; does not usually require any changes to piping so no hot work; support over a larger area at multiple points reduces point stress on the supported pipe, coating, and underlying structural beam; has end tabs to keep it properly installed and scuff base to keep it in place long-term usually without need for U-bolts; can be specified to a specific color to identify lines in the pipe rack, and smooth surface to enable easy cleaning, and preventing accumulation of surface material over time.



Full Description:

(Please provide complete answers to the questions below. Graphs, charts, and photos can be inserted to support the answers.)

1. What is the innovation?

The Lift Off Pipe Rest (LOR) is a pipe support that provides a corrosion free barrier between the pipe and the beam support where major corrosion occurs in piping systems throughout plants and buildings where pipes are run. Shown here with a U-Bolt arrangement the pipe supports have a high friction surface on the bottom and many applications do not need the U-Bolts which reduce the performance on the I-beam support.



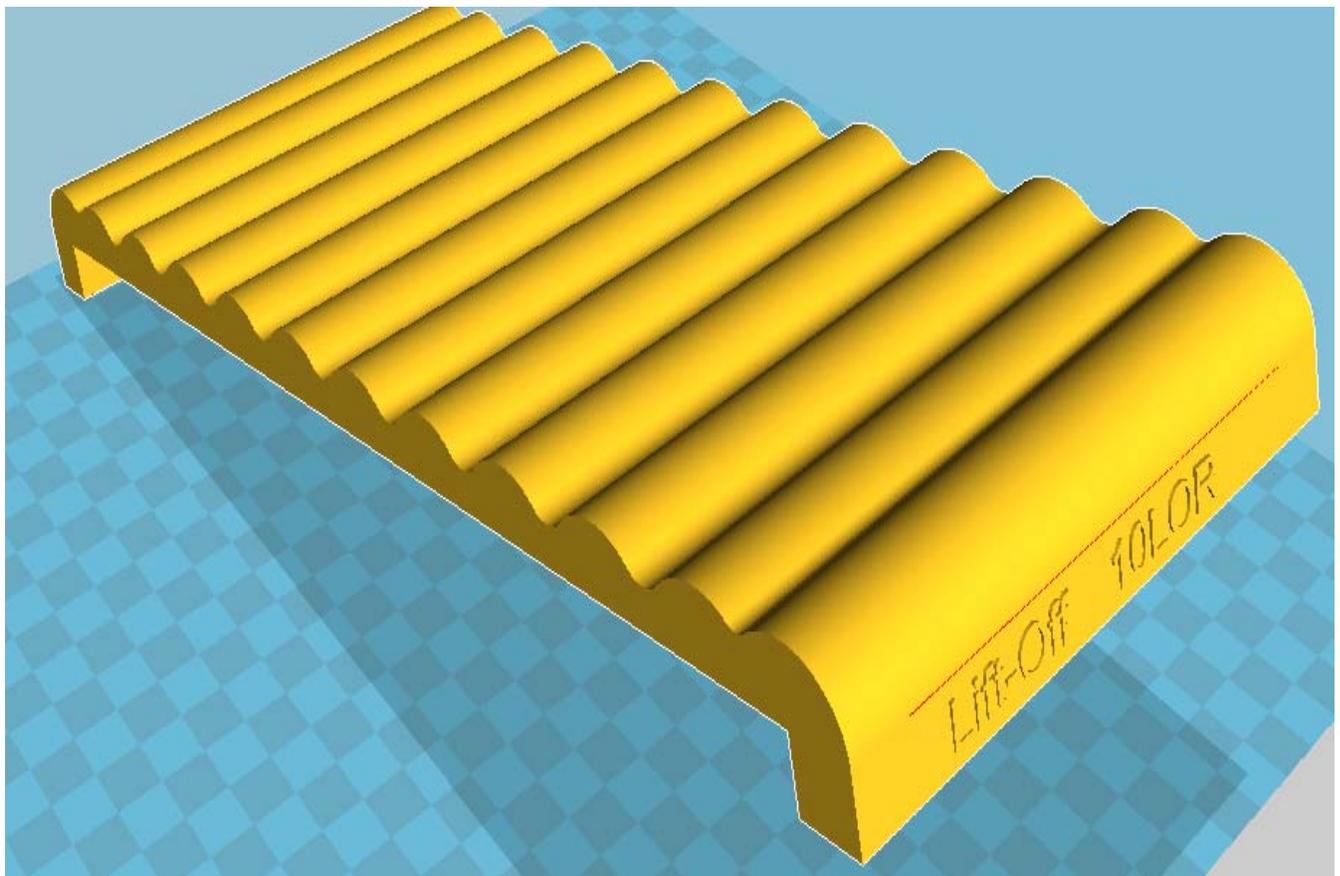
2. How does the innovation work?

The Lift Off Pipe Rest (LOR) is a composite resin and glass material that is produced as a flat piece of material formed to fit specific beam sizes with a nominal thickness of 1/2" which can be changed as required by the required spacing. The LORs are designed with grooves providing water egress, an extra feature to mitigate any chance of corrosion. This barrier design eliminates corrosion and provides the thermal and mechanical requirements of load bearing supports. The top surface is smooth to allow, where needed, for pipe motion, and the bottom has high surface friction to prevent movement in many cases avoiding a need for U-bolts. The design is made to grip the pipe support against horizontal movement avoiding in most cases a need to drill and secure the pipe support with bolts.

3. Describe the corrosion problem or technological gap that sparked the development of the innovation? How does the innovation improve upon existing methods/technologies to address this corrosion problem or provide a new solution to bridge the technology gap?

Where piping is run in Marine, Oil and Gas, Chemical, Pharmaceutical and virtually any other

industry, corrosion typically initiates at the crevice formed where the pipe sits on the beam support. Although the piping and beams are typically coated with an anti-corrosion coating, over time, the weight of the pipe, standing water, and load shifting, stresses this rest point and corrosion occurs. Existing technology has the ability to raise the pipe from the beam but does not provide the load bearing, temperature ratings, or ability to remain static even during pipe shifting due to subsidence and vibration. The Lift Off Pipe Rest (LOR) provides a corrosion free barrier between at the pipe/beam crevice which eliminates standing water; meets the proper load bearing and thermal specifications, does not move due to external forces, and is virtually indestructible. Surveys of existing technology have indicated that existing pipe supports may need to be changed out several times in the lifetime of the plant: Lift off pipe supports do not need to be changed out, saving significant costs in the lifetime cycle of the plant. In addition to the static load and expansion, the Lift-Off Supports do not slide over the beam due to a high friction coating under the Lift-Off support, holding it in place.



4. Has the innovation been tested in the laboratory or in the field? If so, please describe any tests or field demonstrations and the results that support the capability and feasibility of the innovation.

- These pipe supports have been tested in 2 major company's plants and deemed a success.
- Tests have been carried out for fire resistance and beam loading capacity.
- The Lift Off Pipe Rest (LOR) has been fully tested at the manufacturing facility and also in the field.



“Lift Off” Pipe Supports

A “500 Projects” LLC Company



“Lift-Off Rest” (LOR) Pipe Support Barrier

Our LOR is an insulating composite material especially designed to meet the thermal and mechanical requirements of load bearing supports.

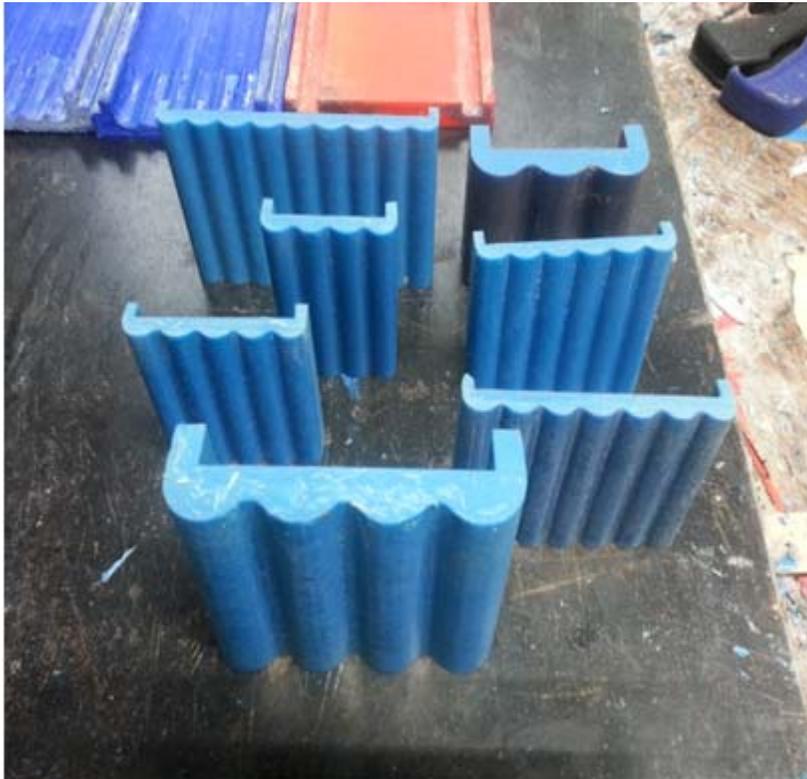
LOR is manufactured from a special formulation of selected synthetic resins in combination with high-strength glass reinforcements.

Whether cryogenic or high temperature, the LOR will ensure it meets the need for your application.

Material Specifications

General Information	Procedure	Specifications
Color		Gray
Max Service Temp		550 °F (288 °C) Intermittent
Low Service Temperature:		-265 °F (-165 °C)
Continuous Use Temp		412 °F (211 °C)
Form		Profile
Mechanical Properties		
Flexural Strength	ASTM D790	31,000 psi
Tensile	ASTM D638	> 11,000 psi
Compressive Strength @ 75° F (24° C)	ASTM D695	49,000 psi
Compressive Modulus	ASTM D695	1,800,000 psi
IZO Impact Strength (notched)	ASTM D256	8 ft lb / in
Flexural / Bending Strength	ASTM D790	29,000 psi
Flame-Resistance Properties		
UL Subject 94	UL 94	HB
Physical Properties		
Water Absorption	ASTM D570	0.2 % by weight
Specific Gravity	ASTM D792	123 lbs / ft ³
Coefficient of Thermal Expansion	ASTM D696	1.228 ln / ln / °F x 10 ⁻⁶
Coefficient of Friction (μ)		0.08 - 0.2
Thermal Conductivity	ASTM C177	Ca. 0.30 W / m °K
Electrical Conductance	ASTM D149	2 kV / mm
<p>NOTE: The above values are measured and are believed to be accurate. However final determination regarding the suitability of material should be evaluated by the end user.</p>		

Whether cryogenic (down to -265°F) or high temperature (up to 400°F), the LOR will ensure it meets the need for your application.



5. How can the innovation be incorporated into existing corrosion prevention and control activities and how does it benefit the industry/industries it serves (i.e., does it provide a cost and/or time savings; improve an inspection, testing, or data collection process; help to extend the service life of assets or corrosion-control systems, etc.)?

The Lift Off Pipe Rest (LOR) is made for traversing beams, multiple or single uninsulated lines to suit lines sizes from 2" to 48". Where corrosion is found at the pipe / beam connection point, the LOR provides a barrier to eliminate corrosion reducing inspections and piping maintenance increasing the life of piping assets. In short - "Lift-Off" pipe support systems are developed to increase the life span of piping systems by reducing crevice corrosion. The "Lift-Off" pipe supports:

- Are lightweight and do not require hot work to install (Lift-Set-Lower-Next)
- Eliminate electrolysis
- Reduce acoustic and mechanical vibration transmission
- Are inert to most chemicals
- Are non-flammable
- Have a high compressive strength and do not deform
- Have a high tensile strength and do not crack
- Provide 4 times better load spreading to maintain pipe and coating integrity
- Eliminate holes and self-lock into position
- Low coefficient of friction: $\mu=0.05$ to 0.2 .

- Are colored to support pipe service identification
- Carry the full documentation, material traceability and identification.

Overall costs are competitive with existing pipe supports and savings result from not having to replace supports over the lifetime of the plant.

Bespoke pipe support shapes can be made with the same principle to fit specific unusual piping arrangements often with minimal extra cost and prompt delivery.

6. Is the innovation commercially available? If yes, how long has it been utilized? If not, what is the next step in making the innovation commercially available? What are the challenges, if any, that may affect further development or use of this innovation and how could they be overcome?

The Lift Off Pipe Rest (LOR) is commercially available and in production since 2014. LORs are manufactured according to the pipe and beam sizes. Pipe supports are manufactured in the USA.

7. Are there any patents related to this work? If yes, please provide the patent title, number, and inventor.

Yes.

The “Lift-Off” design is a “patented pipe support system”. Invented by Martin Schutte under patent number: 10,066,764 B2.