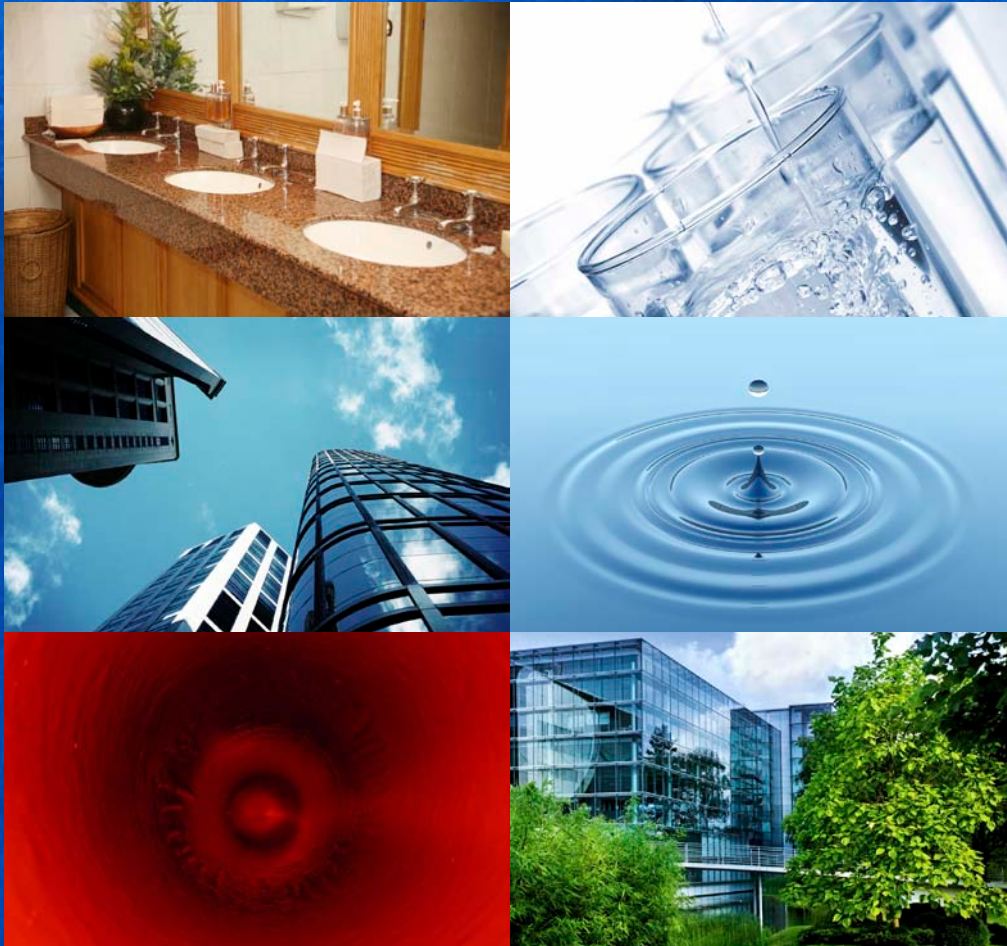


# Blown-In Epoxy Coating



**NU FLOW**  
RELINING REPAIR RENEW®

Where life interacts with infrastructure.

# What is “In-place epoxy pipe lining?”

## Why is it better than replacing the pipes?

In-place epoxy pipe lining is an effective procedure that restores corroded or eroded piping systems without the costly expense and disruption of pipe replacement.

Pipe replacement in aging facilities, the traditional alternative to pipe lining, comes with a host of concerns and issues that must be dealt with, some of which can render such work highly prohibitive. These include:

- Destruction of existing walls, ceilings, floors and underground structures
- Patching and repair of the damaged structure
- Inconvenience and disruption to building/facility occupants or residents
- Safety concerns where asbestos insulation or other contaminants are present
- The need to temporarily vacate occupants and dwelling tenants
- High monetary cost

### Pipe lining provides an efficient, effective alternative with many benefits, which include:

- Significant savings over other methods
- Increases useful life of piping system
- Very little disruption, if any
- Preservation of building structure and surrounding landscape or hardscape
- Eco-friendly practices
- Safe, inert coating prevents corrosion and leaching of harmful elements into water

### Common failures with clean water and mechanical pipe systems include:

- Minerals leaching from pipes into drinking water
- Mineral deposits that limit water flow
- Corrosion of the pipes and discolored water
- Pinhole leaks
- Plugged fixtures and aerators
- Joint failure
- Electrolysis

**Don't replace! Renew with Nu Flow!**



## About Nu Flow

The Nu Flow Companies manufacture and install innovative, noninvasive, eco-friendly technologies for the restoration of failing pipe systems. Nu Flow is the only small diameter pipe lining company to provide dual lining technologies from a single source and is master licensee for the longest time-tested small diameter epoxy lining in North America. Our blown-in epoxy lining technology restores aging potable water, HVAC, compressed air, fire suppression and electrical conduit piping systems in place, greatly extending their useful lives at a fraction of the cost of traditional replacement.

Epoxy pipe lining was brought to North America in 1987 by American Pipe Lining. The company began employing its epoxy lining technology as a sole source contractor to the United States Navy aboard its carrier vessels. American Pipe Lining's success with the U.S. Navy brought immediate attention to land-based clients that required similar services in their buildings and underground piping installations. Following EPA approval of its coating in 1988, American Pipe Lining began providing in-place pipe restoration services to clients that faced aging potable water systems and poor water quality, including a variety of low and high-rise housing developments, schools, industries and water utilities.

In 2006, APL granted an exclusive license to Nu Flow to utilize all technologies and patent rights, making Nu Flow the only pipe and drain rehabilitation company which both manufactures and installs combined technologies for potable water lines, as well as trenchless sewer repair. Nu Flow acquired APL in early 2008, solidifying Nu Flow's position as the industry leader in small diameter pipe restoration.

The Nu Flow Companies have several regional offices throughout the United States and Canada, with 300+ licensees throughout North America and the globe. Nu Flow offers a full turnkey in-place pipe restoration service to a variety of customers.



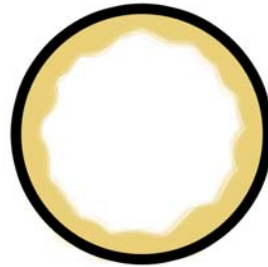
# Process Features

The in-place pipe restoration process is an economical and efficient alternative to traditional pipe system replacement. Our technology allows us to restore aged, corroded piping systems in-place to a "better than new" condition without the use of chemicals or mechanical devices. The epoxy coating applied to the pipes' interior, will seal and protect the system from further deterioration, dramatically extending the system's life. The process can be used on a variety of pipe materials, which includes galvanized steel, cast/black iron, copper and lead.

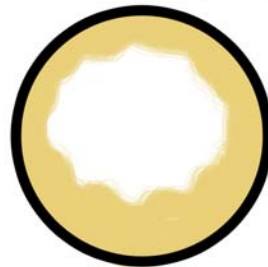
Nu Flow's blown-in epoxy coating process is unique and patented. This noninvasive procedure permits residents and workers to continue with their daily activities, preventing displacement, business closure and pipe system downtime.

Our method uses heated air to move a non-toxic abrading agent through designated pipe runs and segments. The movement of the agent through the pipe dislodges the corrosion buildup and transports it to an exit opening in the pipe, where it is collected in a cyclonic grit unit and dust collection system. The corrosion waste is non-toxic and easily disposed of without any harm to the environment. The result is a clean, rust-free and polished surface inside the pipe. Following pipe cleaning, a liquid epoxy (potable water safe and UL certified to NSF 61 standards) is distributed through the pipe system using clean and heated controlled air flow to facilitate optimal adhesion and curing. The coating cures within 12 to 24 hours. Once the system is inspected for leaks, it is returned to service. The pipe system is left with a smooth and durable interior finish that is resistant to further corrosion, deterioration and pinhole leaks.

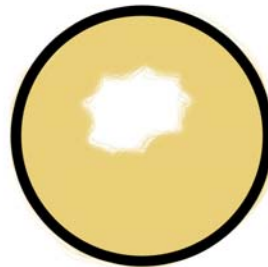
## Pipe Corrosion Over Time



After 10 Years (30%)



After 15 Years (50%)



After 20 Years (70%)

## Examples of Applicable Pipe Systems:

- Potable and gray water systems
- HVAC systems
- Fire suppression systems
- Compressed air systems
- Conduit piping
- Water risers and water mains
- 1/2" to 12"+ diameter pipes
- Residential, Commercial, Industrial, Municipal and Federal Properties

# Pipe Restoration General Work Sequence

## Step 1: Pipe system diagnosis and set-up

The existing pipe system is inspected for integrity and spot repairs on excessively worn joints and fittings. Valves are removed and their locations temporarily fitted with unions and/or couplings that remain through the restoration sequence. Sitting water is drained from the pipe system and air is introduced into the system to test for leaks. Temporary bypass water piping provisions are installed as necessary.

## Step 2: Pipe cleaning

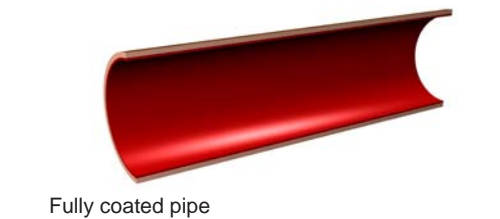
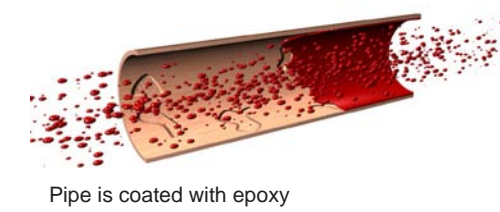
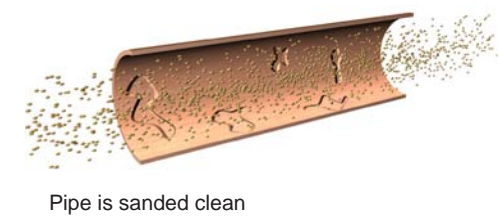
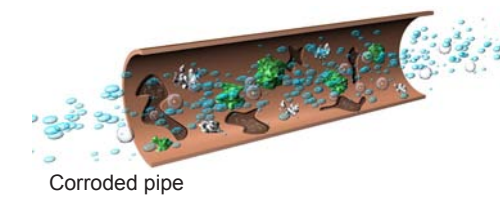
The pipes are dried with heated, compressed air to remove all moisture. The air is then used to distribute an abrading agent throughout the pipe to remove all rust and corrosion products. The removed corrosion material is subsequently gathered into a collection unit. Air is again surged through the pipe system to remove any residual debris and fine dust.

## Step 3: Pipe lining

The cleaned pipe system is reheated to create an optimal internal pipe surface environment prior to epoxy coating. An air pressure leak test is again performed prior to coating. Clean, compressed air is then introduced into the pipe system to uniformly distribute the epoxy lining throughout the pipe segment. Following the coating application, continuous and controlled air is sent through the piping to facilitate epoxy curing.

## Step 4: System re-assembly and evaluation

After the epoxy coating has cured, all removed valves and fittings are returned to their original locations. A final leak test and inspection is performed. Water quality, volume and flow are tested.



# Process Benefits

**1. Safe And Durable** - The pipe cleaning process is safe and simple. It does not use toxic chemicals or mechanical devices. This patented pipe lining method utilizes a closed system, safe for use inside buildings and their surroundings. Removed corrosion products do not require special handling for disposal.

Recent and ongoing research by the EPA has conveyed a growing concern over the adverse effects of high lead and copper levels in infants, children and pregnant women. The U.S. Dept. of Health and Human Services postulates that lead is the number one environmental threat to our children's health, with increasing exposure rates caused by the continued consumption of water from aging, corroded potable water systems, many of which are still fitted with original lead-based plumbing fixtures. **Epoxy pipe lining provides a long-term protective barrier within the pipe halting the further leaching of these and other harmful elements.**

The epoxy coating is non-toxic and is UL classified to NSF61 standards, approved for use in cold and hot potable water applications down to 1/2" in pipe diameter. The cured epoxy product is extremely durable and impervious to the corrosive action of acids, alkalis and petroleum.

**2. Cost Effective** - Building and ground demolition is unnecessary with in-place restoration, making the process highly cost-effective over traditional pipe replacement. Extended downtime and related loss of revenue to businesses is alleviated. In U.S. Navy applications, new pipes have been lined as a preventative measure with compounded long term maintenance cost savings. Pipes occluded with corrosion build-up also require more pumping power to maintain required flow levels and water capacity. This in-place rehabilitation technology allows for existing pipe to retain original flow and capacity, thereby conserving both water and power.

**3. Flexible** - The process can be applied wherever plumbing is installed: residential properties, schools, hotels, office buildings, hospitals, manufacturing facilities, municipal and federal structures, underground utilities, fuel transport piping and ocean vessels. A wide variety of piping materials can be cleaned and lined, including galvanized steel, copper, cast iron, black iron and lead. In-place pipe restoration can be used on a variety of piping applications, such as piping laterals, elbows in all configurations, above and underground piping systems, risers, gradient piping, branches, etc. The process will also accommodate pipe lengths that have varying pipe diameters in a single pipe segment as short as 10 feet or as long as 1,000 feet.

**4. Fast** - In-place pipe rehabilitation is quick and involves little or no disruption to ongoing resident, tenant, student, personnel or public activities. Pipe segments being restored are typically completed in 2-3 days and returned to service prior to commencing work on subsequent pipe runs.

**5. Guaranteed** - All potable lining restoration work performed includes a full 10 year installation guarantee. The coating used in potable water applications has a rated life of up to 50 years under normal use and has exhibited a potential useful life of up to 80 years in accelerated laboratory mechanical testing.



# Experience

The Nu Flow Companies have combined experience of over 60 years. With the largest base of installers and the highest success rate in the industry, Nu Flow has completed thousands of restoration projects ranging from residential homes to naval ships and commercial skyscrapers to industrial structures. No job is too big or too small.

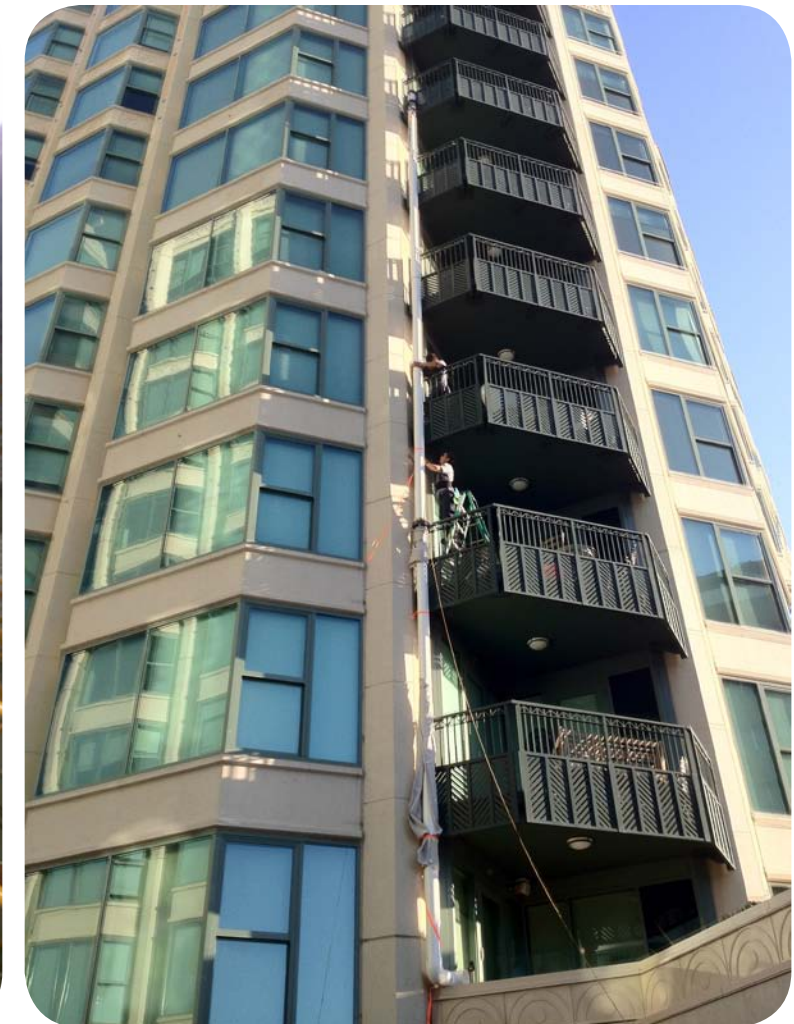
Nu Flow has committed itself to working closely with industry groups such as the American Water Works Association Research Foundation, Naval Research Laboratory and others in the development of new applications for in-place epoxy solutions to corrosion and toxicity control issues.

Based on the number of clients and variety of pipe systems lined, no company is better equipped to meet all of your pipe lining needs.

Applicable reference lists can be provided upon request.



*Clean air distribution system hoses used to push the epoxy through this power station's black steel cooling system.*



*Technicians install an air collection riser that runs along the outside of this high-rise condominium to reduce disruption to residents.*

# Why Is "In-Place" Pipe Lining Better Than Replacing the Pipes?

Nu Flow's patented epoxy coating technology restores corroded or eroded piping systems without the costly expense and disruption from a traditional pipe replacement. During a typical repipe, the failed pipes are removed, which causes destruction and inconvenience to the property. Replacing the pipe does not extinguish the root of the problem, so the new pipe system will inevitably suffer the same fate. That is why Nu Flow's blown-in pipe lining solution is the preferred, long-term solution for clean water and mechanical piping systems.



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Where life interacts with infrastructure.

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