



A CSW Industrials Company

WHITE PAPER

CLEARDRAIN PVC™

SCH40 PVC Pipe ASTM D1785

OVERVIEW

This document offers guidance on ClearDrain PVC, details about the product technology, how it works, laboratory testing, limitations, and do's and don'ts regarding the terminology used to describe its performance. It should be used for marketing and sales purposes.

SPECIFICATIONS

ClearDrain PVC is an ASTM-approved Schedule 40 PVC pipe system for HVAC and refrigeration condensate drainage. The product conforms to ASTM D1785 (pipe) and ASTM D2466 (fittings). SGS, the world's leading testing, inspection, and certification company, has completed and certified the testing. ClearDrain PVC is currently available in sizes ranging from 3/4" to 1-1/2", manufactured in Schedule 40 PVC and rated for 480 PSI.

TECHNOLOGY

ClearDrain PVC uses technology based on an innovative approach that integrates zinc by modifying the material's mechanical surface properties.

How does it work?

The zinc technology integrates with the PVC plastic before extrusion and injection molding. The technology forms an integral part of the PVC pipe or fitting—it is NOT a coating.

This engineering improves the surface characteristics of the pipe and fittings, making them smoother and with hydrophobic properties. This technique is known as 'passive action.' It makes it more difficult for bacteria and algae to attach to the surface and grow. The surface of the pipe remains cleaner, smoother, and more hygienic, with a lesser chance of biofilm formation and blockages.

For bacteria and algae to grow, they need to adhere to a surface; once attached, they create 'white slime,' also known as biofilm. This biofilm, or white slime, is typically a protein or carbohydrate—the bacteria's food source. Once attached to the surface of the pipe, it is challenging to remove, which is why, in a standard PVC pipe, when you clear a white slime blockage, the problem always comes back and progressively worsens over time.

White slime can form in any part of the HVAC system and enter the drain pipe. The ClearDrain PVC System's unique properties also reduce the white slime's ability to attach to the pipe's surface. ClearDrain PVC keeps the condensate water flowing, reducing the blockage risk and making it easy to remove during maintenance cleaning.

What happens to the bacteria?

There is no killing action from the ClearDrain PVC surface. It is crucial to note that it is not a biocidal product. The bacteria follow their normal life cycle, lose capacity, and enter the death phase. Because they cannot attach, they cannot colonize and grow.

KEY POINTS

- Uses zinc, a common ingredient in toothpaste and multivitamin supplements.
- Improves the pipe's surface characteristics, making it smoother and inhospitable for microorganisms. Thus, it reduces the attachment of bacteria and algae and prevents the growth of white slime (biofilm).
- Reduces the adhesion of white slime (biofilm) already formed in the HVAC system (e.g., in the drain pan).
- Decreases the risk of clogging or blockages caused by white slime (biofilms), leading to water leaks, maintenance issues, and customer downtime.

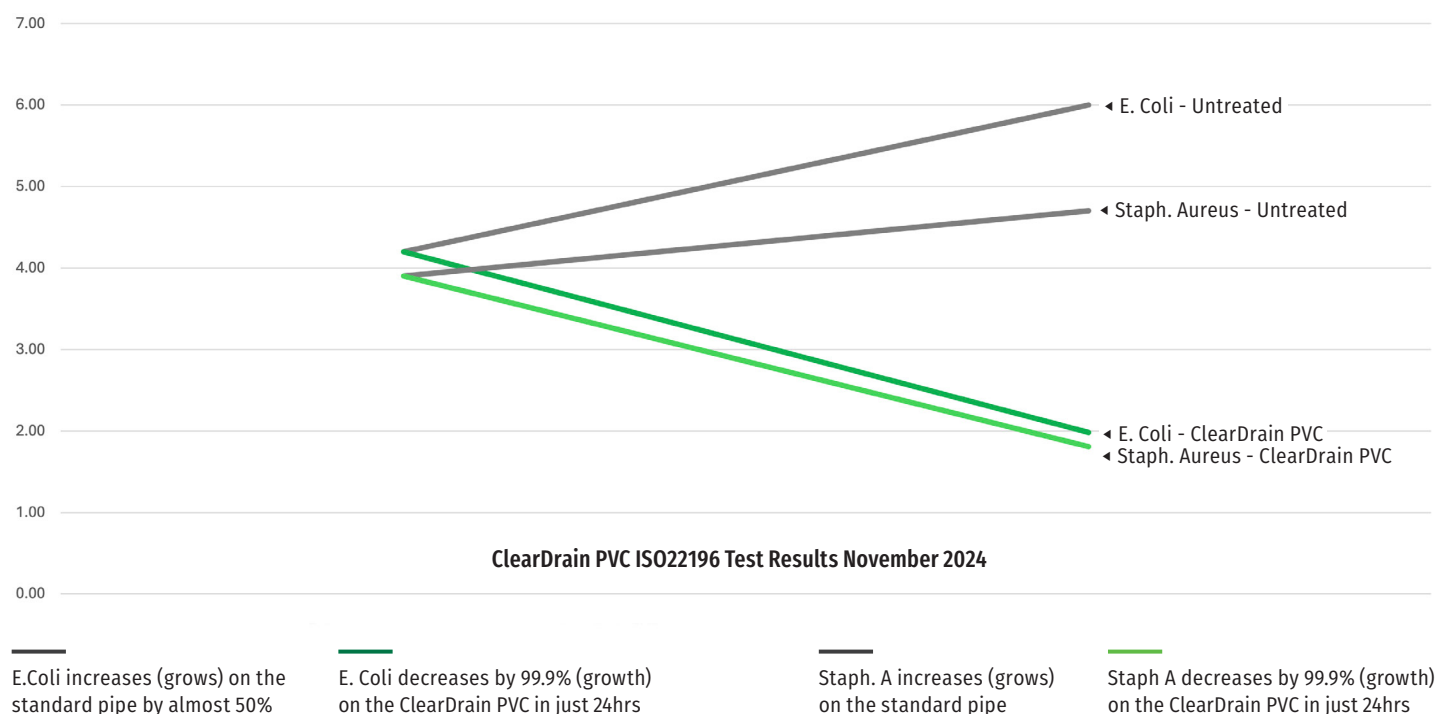
What is the difference between Standard PVC and ClearDrain PVC?

Compared to a standard SCH40 PVC pipe, ClearDrain PVC is up to 1000 times more effective at preventing blockages caused by white slime.

How do we know this?

Independent ISO-22196:2011 Standard measures the antibacterial activity on plastics and other non-porous surfaces and tests to verify the antimicrobial property of a solid/plastic surface, identifying up to Log3 or 99.9% efficacy of the technology or higher. This test compares ClearDrain PVC with a standard PVC pipe. We added bacteria types to the surface of the pipe and measured their growth over 24 hours.

When comparing the results, the growth of E. coli and Staphylococcus Aureus on the standard pipe increases, whereas the bacterial growth on the ClearDrain PVC either remains the same or decreases over the 24 hours. See the graph below.



The reduction in Staph. A & E. Coli bacteria, known to create white slime, is 1000 times less present in ClearDrain than in standard PVC. Therefore, we can confidently conclude that it is 1000 times more effective.

WHY DO WE RECOMMEND CLEARDRAIN PVC?

Standard PVC is prone to white slime blockages because many chemical products are on the market to fight against it. The chemicals used in these prevention products must be replenished or replaced. Over time, the chemicals become less effective. Bacteria learn, develop, and eventually become resistant to these chemicals. Additionally, these chemicals are toxic biocides that can harm the environment.

ClearDrain PVC is different because...

- It contains no toxic chemicals.

- It contains no biocides.
- It does not need to be topped up or replaced.
- Its technology does not leach or migrate from the surface.
- It retains effectiveness over time.

Once installed, the ClearDrain PVC technology will last the system's lifetime. If properly cleaned and maintained, it will continue working as intended.

CONTRACTOR PERSPECTIVE

While contractors earn revenue from repeat callouts to blockages, there are better uses of resources, especially when these individuals are highly skilled technicians. Clearing blocked condensate drains is a dirty job, and in the height of summer, professionals want to focus on breakdowns and help customers get their HVAC systems up and running.

Key Benefits of ClearDrain PVC for Contractors

- Reduces the use of toxic chemicals harmful to the environment.
- Improve contractor/customer relationships by bringing forward-thinking ideas to solve problems.
- Keeps engineers free to tackle more complex problems.
- Saves the contractor and the customer money.
- Reduces damage caused by water leaks and health and safety issues.

INSTALLATION AND MAINTENANCE OF THE CLEARDRAIN PVC SYSTEM

Installation

ClearDrain PVC installs like a standard PVC system.

Installation should conform to the International Plumbing Code (IPC), state and country building regulations, and ASTM Standards.

- The piping shall maintain a horizontal slope in the direction of discharge of not less than one-eighth inch in twelve inches horizontal (1% slope).
- Condensate shall not decrease in size from the drain pan.
- In case of failure, a water-level detection device should be used with this system.
- The system must be installed and configured to allow cleaning, maintenance, and clearing of blockages without the drain line being cut.

Maintenance

To ensure the best possible performance of the ClearDrain PVC System:

1. Maintenance of the ClearDrain PVC is recommended every six months—ideally once in spring/summer and once in fall/winter.
2. To remove dust and debris from the internal surface of the pipe, the ClearDrain PVC System must be flushed through with warm, clean water.
3. Caution must be taken to avoid flushing dirt and debris from the HVAC system's drain pan into the pipe network.
4. A clean internal pipe surface ensures optimal performance of the ClearDrain PVC System.

LIMITATIONS

ClearDrain PVC cannot be used for potable water or reclaimed water systems. It is not certified by NSF. No chemical action is released from the system; keeping the pipe clean and contaminant-free maintains performance.

As with all PVC products, paints, thread sealants, lubricants, plasticized PVC products, foam insulations, caulks, leak detectors, insecticides, termiticides, anti-freeze solutions, pipe sleeves, firestop materials, and other materials must be chemically compatible with PVC. Incompatibility may result in the degradation of pipe or fitting, environmental stress cracking, and plasticizer migration.

TERMINOLOGY DOS AND DO NOTS

Be clear on how you talk about the product to communicate effectively about ClearDrain PVC, its performance, and its technology.

Do NOT use terminology such as:

- Antibacterial
- Antimicrobial
- Antiviral
- Killing bacteria or algae
- Eliminate
- Destroy

Although we show in ISO:22196 testing the antibacterial effectiveness of the product and technology, we are not actively killing bacteria, algae, or viruses. Most products that eliminate bacteria, viruses, or algae are active biocidal products that use chemicals to harm bacteria. ClearDrain PVC does not contain these. Any product with this terminology would be expected to register as a biocide.

DO use terminology such as:

- Reduce adhesion
- Prevent attachment
- Slow growth
- Effective
- Hygienic surface
- Less likely to harbor bacteria
- Fewer germs
- Biofilm/White slime
- Clogging/Blockages

Here are examples of phrases that may be used to describe the ClearDrain PVC:

- ClearDrain PVC has up to 1000 times the cleaning performance of a conventional SCH 40 PVC.
- ClearDrain PVC's non-toxic, biocide-free technology can help reduce the growth of slime-blocking bacteria by up to 99.9%.
- The innovative surface technology of ClearDrain PVC is 1000 times more likely to reduce the risk of clogging.
- ClearDrain PVC's safe, non-toxic technology does not migrate and will last the product's lifetime.
- Enhance your refrigeration system with the hygienic performance of ClearDrain PVC.
- Say goodbye to white slime—ClearDrain PVC's cutting-edge solution is proven to be 1000 times less likely to harbor bacteria than standard PVC Pipes. Experience cleaner, safer, and more efficient plumbing today with ClearDrain PVC!

Limited Warranty



For more information on our product warranty, visit rectorseal.com.

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