



# Alternative Fusible PVC™ Pipe Improves Water Quality And Cuts Cost for Rural Québec Municipality

When the small agricultural municipality of Saint Paulin, Québec needed to connect several residents to the town's sewer and drinking water systems for improved water quality, they wanted to ensure that it was done properly, quickly and cost effectively. Located in the historical Trois-Rivières area between the cities of Montréal and Québec, the municipality was also faced with the challenge of running the new sewer and water pipe system under the Rivière du Loup. Ultimately, the town needed to decide between using traditional HDPE (high-density polyethylene) pipe or alternative Fusible PVC (polyvinyl chloride).

## **An Improved Alternative Choice**

Recent water quality testing completed on the wells of several residents not connected to Saint Paulin's existing sewer and water distribution system showed water contamination in the drinking water. The source of the contamination was thought to be caused by the traditional septic systems used in this area of the municipality.

Following the testing, the

Ministère des Affaires Municipales Québec required Saint Paulin to extend the water distribution and sewer system to those residents experiencing water quality problems. With 80% funding provided under programs overseen by the Ministère des Affaires Municipales, Saint Paulin set out to deploy the new system. The town first needed to decide between using traditional HDPE pipe, which has long been installed in trenchless applications, or PVC, which has grown steadily in popularity throughout North America and is fast becoming the most widely installed material in water systems today.

Municipalities who have been used to using HDPE in trenchless applications for several decades are not always fast to change, and Saint Paulin was no exception. Fortunately, IPEX has introduced CIOD (cast-iron outside diameter) Fusible Brute™ PVC pipe that enables fully restrained joints with a tensile strength equal to that of the pipe. By combining the mechanical properties of PVC with an innovative patent-pending butt fusion process (in Canada, patented in the US), Fusible Brute PVC pipe is capable of being installed in long contin-

uous trenchless applications.

"At first, the municipality was hesitant to use PVC in the trenchless application. We met with the engineering consultant, explained the differences between PVC and HDPE, showed him the testing and specification information and demonstrated how Fusible PVC could ultimately offer more cost-effective installation and long-term maintenance," recalls Alain Charky, manufacturer representative for IPEX.

With HDPE, Saint Paulin would have to special order the pipe and use expensive transition fittings due to its nonstandard outer and inner diameter that didn't match the town's existing PVC water system. In addition, HDPE's overall weight and material for the given pressure class would have resulted in a higher material and installation cost.

On the other hand, Fusible PVC would allow for easy connections to Saint Paulin's existing PVC water distribution and sewer system via simple standard fittings, providing material consistency across the entire municipality. PVC's reduced wall thickness also requires less material and yields better flow.

In addition to ensuring reduced initial deployment costs, the total cost of ownership was also a concern for a small municipality like Saint Paulin. CIOD Fusible PVC pipe is easy to maintain over the life of the system because all the accessories are readily available and can be deployed by the town's public works employees. The Fusible PVC's gasket-free joints and excellent abrasion and scratch-resistant proper-

ties also ensure long-term reliability and reduced maintenance of the system.

"When the consultant took everything into consideration, from the installation to the life of the system, they clearly saw that Fusible PVC was the better choice for the municipality," says Charky. "It was a win-win situation."

### An Innovative Fusion Process

For the forced sewer system, Saint Paulin used a total of 2,208 meters of 100mm (4 inch) pressure-rated 165 psi (cast-iron outside diameter) CIOD Fusible Brute PVC pipe (DR25). For the potable drinking water system, they used a total of 2,611 meters of 150 mm (6 inch) pressure-rated 235 psi CIOD Fusible Brute PVC pipe (DR18). The Fusible Brute PVC pipe meets CSA B137.3, AWWA C900, AWWA C905, NSF-61, NQ 3660-950 and ASTM cell classification 12454. For the majority of the system, the two pipes run side by side, separated by approximately one meter (3.3 feet).

The Fusible Brute PVC pipe is available in 12.2-meter lengths. To create longer pipe lengths for the installation, the patent-pending fusion process for the Fusible Brute PVC incorporates a proprietary PVC formulation and a unique combination of heat, pressure, and time, using slightly modified standard industry fusion machines. The fusion process is carried out by trained and licensed individuals to ensure consistent, reliable fusion that creates piping systems of unparalleled strength.

Fusion time with Fusible Brute PVC is comparable to other thermoplastic materials. The overall fusion of the Saint Paulin system was accomplished at an average of 19 joints per day, which took place at the

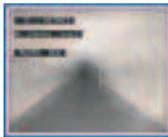


*The town of Saint Paulin Quebec selected IPEX Fusible HDD pipe to connect its rural residents to the town's sewer and drinking water systems.*



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*The shelter of a tent combined with the heat from the fusion machine was enough to keep the pipe ends at the required temperature for fusing.*

end of October 2009 and was complete by 10 November 2009. Fusion also can be performed under any temperature, as long as the pipe ends are maintained at a temperature above 4°C and both the pipe ends and fusion machinery are sheltered from the elements.

For the Saint Paulin system, a remote field was used as the staging area and a tent was set up to shelter the fusion process from the elements. Under the tent, heat from the fusion machinery itself was enough to keep the pipe ends above 4°C. Once the fusion was complete, the lightweight, flexible lengths of pipe were then simply dragged from the staging area to the installation site.

### **A Cost-Effective, Greener Deployment**

For maximum cost-effectiveness and limited disturbance for residents, Saint Paulin specified a trenchless application using horizontal directional drilling (HDD) methods. HDD offers several key benefits, including faster installation, ability to place pipe under natural and man-made obstacles and a greener more environmentally-friendly approach. The use of HDD eliminates the need to excavate a trench, which often requires tearing up asphalt and disturbing roadways, destroying the surrounding natural environment, and risking damage to other underground systems. These can require significant repair costs after the pipe is installed.

It wasn't just cost concerns that had Saint Paulin specifying HDD methods. In 1988, the village of Saint Paulin merged with the township of Hunterstown. This increased the number of residents

to approximately 1,600. Today, Saint Paulin encompasses more than forty farms and 90 small and medium-sized businesses. The urban section of the original Hunterstown area is crossed by the Rivière du Loup, and it was under this river that the new water system needed to traverse to reach residents on the other side. Only HDD could be used for this 84 meter (276 feet) section of the new water system.

"HDD equipment bored one path for the sewer and water pipes under the river, and when the drilling head reached the other side, it was replaced with pulling equipment that pulled both lines of the pre-fused lengths of Fusible Brute PVC pipe side-by-side under the river," explains Charky. In addition to the 84-meter pull under the river, the entire Saint Paulin project consisted of approximately another 25 pulls, with the longest pull being 207 meters.

The full-strength butt fusion joints of the Fusible Brute PVC pipe offered Saint Paulin a greater pull force rating than they would have had with HDPE and other restrained PVC systems. A greater pull force offers safer installation in tough conditions for HDD trenchless applications. In addition, the smaller outside diameter of the Fusible PVC pipe means that the drilling equipment can make smaller bore holes. A smaller bore hole makes for an easier, faster drilling process and reduces the amount of drilling fluid required. In turn, using less drilling fluid reduces the

amount of fluid waste that has to be disposed of, making the project even more environmentally friendly.

### **A Better System in Place**

After the new Saint Paulin system was installed, a one hour 125 psi pressure test was completed in accordance with ASTM D-638 methods on 1800 meters of the 150mm (6 inch) pressure-rated 235 psi CIOD Fusible Brute PVC pipe (DR18) used for the drinking water distribution system. The pipe passed with no make-up water required, indicating absolutely no leakage in the system.

The water distribution system located south of Rivière du Loup, which makes up most of the project, is currently in service. The forced sewer system and remaining water distribution system will be up and running by mid 2010. Thanks to innovative Fusible Brute PVC pipe from IPEX, the small rural municipality of Saint Paulin, Québec has a reliable system that will solve its water quality issues. At the same time, they achieved a more environmentally-friendly deployment and ensured an overall lower cost of ownership through easier installation, stronger fused joints and reduced maintenance. ●



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