



Temperature Maintenance Pipe Heating Application

For over two centuries, DuPont has put science to work by creating sustainable solutions essential to a better, safer, healthier life for people everywhere. DuPont offers a wide range of innovative products and services for markets including agriculture, nutrition, electronics, communications, safety and protection, home and construction, transportation and apparel.

Often DuPont looks to outside vendors for creative design solutions to support their processes. In this case, they called on Banner-Day to assist with process piping temperature maintenance in the form of impedance pipe heating.

DuPont has been defining the fiber industry for more than 50 years with the discovery and commercialization of well-known fibers such as nylon, rayon and spandex. With the introduction of Sorona[®] DuPont has commercialized the most advanced polymer platform in over six decades. Sorona[®] is made partially with agricultural feedstocks instead of petrochemicals, reducing their dependency on oil. In addition to fibers and fabrics, Sorona[®] can be used in films, filaments, engineering resins and other applications.

At a DuPont facility in North Carolina, they recognized a need for maintaining certain process materials at a temperature in excess of 400° F as it is transferred within the plant. When considering solutions for this pipe heating application they looked for a system that would provide:

- consistent pipe and product temperature under normal variable flow rate operations
- ability to heat and thaw product contained in the filled piping from ambient to the process operating temperature within an 8 hour process startup period
- operate without localized hot spots causing damage to the temperature sensitive product and fouling of piping
- ease of installation and low maintenance requirements.

Banner-Day's TraceFREE™ electric impedance pipe heating technology met all of these requirements.

Banner-Day

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First and foremost, DuPont needed to maintain the temperature of the piping in excess of 400° F while the monomer material is transferred from one building to another. This was important to ensure the material temperature didn't drop down to a point that it either became stiff and difficult to move through the pipe or actually solidified. If at any time the process experienced an outage, scheduled or unscheduled, the solidified monomer would have to be heated (thawed) from ambient temperature to the process operating temperature in advance of restarting the process and re-establishing material transfer flow.

In addition, the pipe heating system had to be capable of accommodating the varying outside temperatures experienced throughout the year in North Carolina. Although the temperature swings are not as severe as other parts of the country they do vary and they needed to be accounted for in the process.

Other important considerations for this pipe heating system were high reliability and minimal maintenance. Because the heated piping would be installed on a crowded and elevated pipe bridge located outdoors and difficult to access, local maintenance personnel weighed in with the desire to have the pipe heating system as close to maintenance free as possible. Past high maintenance and poor reliability experiences with conventional trace element type pipe heating systems motivated local plant personnel to seek a pipe heating solution with greater reliability and minimal maintenance requirements. The Banner-Day TraceFREE™ pipe heating system met these needs with minimal maintenance and operates with an extremely high degree of reliability.

In most cases, Banner-Day provides onsite installation, startup and commissioning support; however, in this instance, the TraceFREE™ impedance pipe heating system installation and startup requirements were deemed within the capabilities of local DuPont plant personnel and their contractors. Banner-Day, did however, provide thorough pre-project support as well as extensive drawings and installation instructions helping insure the installation and startup were successful.

Application Summary:

Facility: Chemical Plant

Location: North Carolina

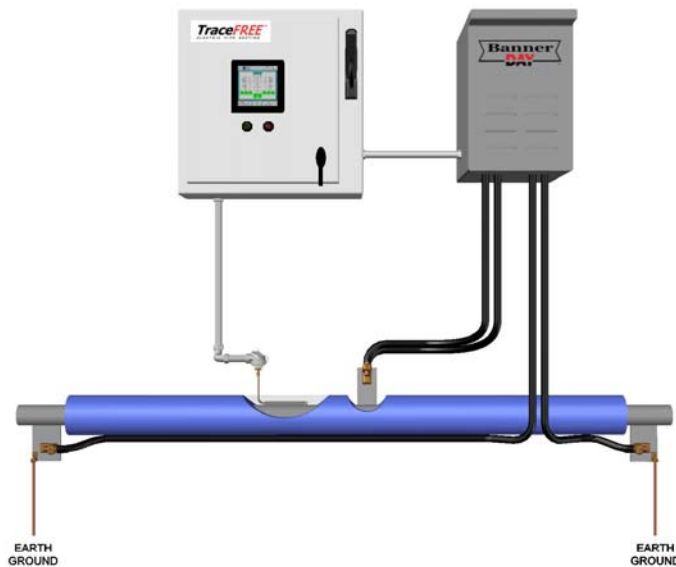
Application: Temperature Maintenance and Cold Startup Thaw

- Design Maintenance Temperature: 428± 9°F
- Minimum Design Ambient: 20° F
- Pipe Length: 450 ft (approx.)
- Pipe Material: 304 Stainless Steel
- Pipe Size: 2" – Schedule 40
- Product: Monomer
- TraceFREE™ Impedance Pipe Heating System Type: Center Tap
- Impedance Pipe Heating System Transformer Size: 22 KVA
- Number of Systems Transformers Required: 1

TraceFREE™ Center Tap

With Banner-Day's electric impedance pipe heating system the customer has the option of utilizing an end feed system or center tap system. For the recent DuPont application, the **TraceFREE™ center tap system** was applied. Center Tap systems are typically better suited for longer piping systems configured without branch lines or drops. They are also excellent for mid-range and high temperature applications (temperatures greater than 300° F to the pipe material temperature limits).

In addition, an attractive installation feature of Center Tap systems is that they do not require dielectric pipe joints or gasketed flanges at the extents of the pipe heating system. This allows system application to continuous welded piping or process piping transporting corrosive or toxic materials. Reducing the number of flange joints reduces the potential for hazardous leaks.



TraceFREE™ Center Tap Impedance Pipe Heating System (Typical)

Summary/Conclusion

Selecting the right system for your pipe heating requirements takes advanced planning to correctly achieve your process goals. In this case the right system was a TraceFREE™ center tap impedance pipe heating system that provided DuPont the ability to maintain 400+°F consistently for their process with the ability to effectively heat the process materials from cold startup (ambient) conditions to the process operating temperature in a defined and predictable period of time. This was all achieved with a highly reliable system requiring minimal maintenance to sustain its proper operation.

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