

Fend off
corrosion and abrasion
for decades
with TRENCHCOAT
protective film.

TRENCHCOAT Protective Film
for Steel Storm Drain/Culvert Systems





Installed more than 15 years ago in the western slope region of Colorado, this culvert under I-70 is in great condition.

Contents

| | |
|--|---|
| The longest lasting protection for steel storm drain/culvert systems | 2 |
| Superior Corrosion Resistance | 3 |
| Superior Wear Resistance | 3 |
| Superior Bonding | 3 |
| Easy Installation | 3 |
| Easy Repair | 3 |
| Superior Service Life | 4 |
| Approved | 4 |
| Performance Properties | 6 |
| How to Specify TRENCHCOAT Film ... | 7 |
| Want to know more? | 7 |
| Handling Considerations | 8 |

If you're a civil engineer or specifier for storm drainage and culvert pipe systems, and you want your next project to be completed efficiently – and to last for decades to come – consider TRENCHCOAT* protective film.

TRENCHCOAT is a tough, heavy-gauge film that is laminated to both the inside and outside surfaces of corrugated pipe, providing a barrier to corrosion and abrasion that surpasses many other coatings in use today. And, corrugated steel pipe coated with TRENCHCOAT is lighter than concrete pipe and asphalt-coated pipe, so it's easier to transport, handle and install. Once systems are in place, TRENCHCOAT provides proven protection that endures – even in some of the most demanding applications where runoff is increasingly aggressive.

In the pages that follow, you'll find out more about how TRENCHCOAT protective film can help your next storm drainage and culvert pipe project proceed smoothly – and last longer.

*Trademark of The Dow Chemical Company

The longest lasting protection for steel storm drain/culvert systems.

TRENCHCOAT is a tough, heavy-gauge film at least 10-mils thick that is laminated to both the inside and outside surfaces of corrugated pipe by qualified laminators. The laminated stock is then readily corrugated and formed into pipe of various diameters.

Steel pipe protected with TRENCHCOAT can withstand abuse during fabrication, handling, installation and use. Because it provides a superior barrier to abrasion and corrosion, pipe coated with TRENCHCOAT offers more certain long-term service than steel pipe protected by any other material. In fact, pipe coated with TRENCHCOAT outlasts and outperforms competitive systems such as asphalt, galvanizing, fiber-bonded asphalts, PVC plastics, and coal-tar formulations.

Read on and consider how the benefits of TRENCHCOAT film might improve your next project.

Superior Corrosion Resistance

TRENCHCOAT film resists virtually all corrosives such as acids, salts, and alkalines commonly found in today's storm drains and culvert systems.

Superior Wear Resistance

Able to withstand sandy clay runoff and gravel without losing its adhesion to metal, TRENCHCOAT film provides abrasion resistance comparable to more than 50 mils of asphalt. This is better than other polymer pipe coatings on the market today. And, you can achieve additional abrasion protection by paving the invert either with asphalt, Portland cement concrete or mortar, providing worry-free performance for even the toughest drainage applications.

Superior Bonding

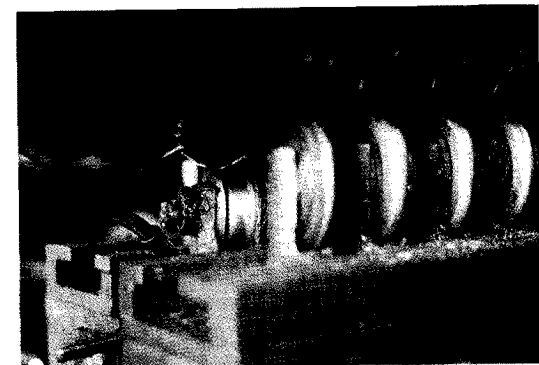
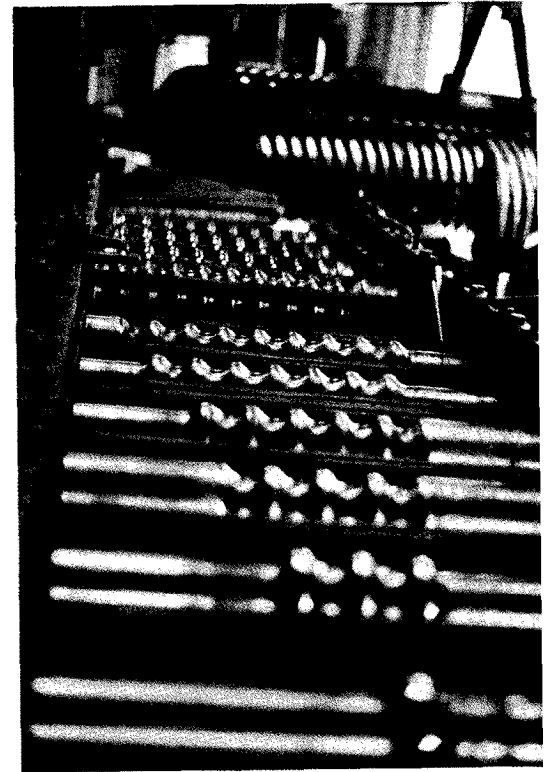
TRENCHCOAT bonds to steel both chemically and physically, so it becomes an integral part of the galvanized steel pipe, able to outlast competitive coating materials.

Easy Installation

TRENCHCOAT adds virtually no weight to sections of corrugated steel pipe. As a result, pipe sections protected with this film can be handled more easily than heavier concrete or asphalt-coated corrugated pipe.

Easy Repair

If repairs are necessary due to torch cutting or abrasion, they can be made easily with a quick touch-up using a sealant such as 5824 protective coating manufactured by 3M.



Galvanized corrugated steel pipe protected with TRENCHCOAT protective film is fabricated on a spiral rolling mill. (Top) Formation of the lock seam on the pipe seals the steel edges in the polymer-protected steel fold. (Bottom)

Superior Service Life

For more than 20 years, TRENCHCOAT film has provided superior protection for storm drains that allows them to last through decades of trouble-free service. Asphalt and other coatings do not offer such long-lasting protection. Depending on the application, TRENCHCOAT film may more than double the service life of storm drain applications. That means you can install pipe protected with TRENCHCOAT film for your most important applications with confidence.

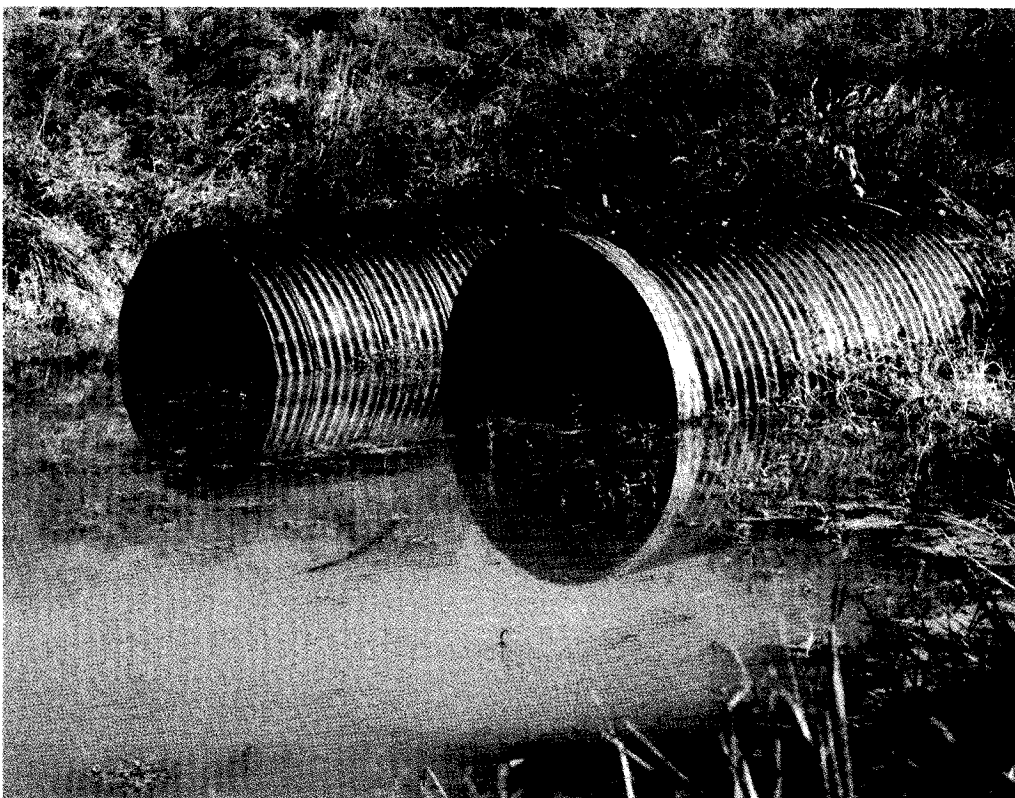
Approved

TRENCHCOAT film has been listed in the bulletin of "Approved Construction Materials" with the Department of Transportation in many states. The National Corrugated Steel Pipe Association (NCSPA) and the National Coil Coaters Association have also recognized TRENCHCOAT as an approved product for added life and durability of corrugated steel pipe.

In 1990, TRENCHCOAT film was included in a study conducted by the U.S. Department of Transportation Federal Highway Administration on the "Durability Estimation of Corrugated Steel Pipe with Protective

Coatings.” The following passage was excerpted from the study’s final report:

“Results of site visits reveal that this type of coating [TRENCHCOAT] has performed well and was still in excellent condition – although it had been subjected to some bed load – after more than 14 years of in-service use ... Based on this study (site visits and published information), this coating with a 10-mil thickness (inside and outside) should provide an add-on life of 28 to 30 years to galvanized CSP.”¹



TRENCHCOAT protective film coated steel pipe has been used for years by the U.S. Department of Agriculture, Soil Conservation Service. These pipes and drop inlets (not shown) were installed in 1977 in Lawrence County, Arkansas.

¹Publication No. FHWA-RD-91, the U.S. Department of Transportation Federal Highway Administration

Performance Properties

The performance of TRENCHCOAT protective film exceeds all specifications of ASTM A 742, AASHTO M-246, and Federal Specification WWP-405-B. The data shown in Table 1 indicate the dependable quality customers count on with TRENCHCOAT film.

Physical/Chemical Characteristics of TRENCHCOAT Film

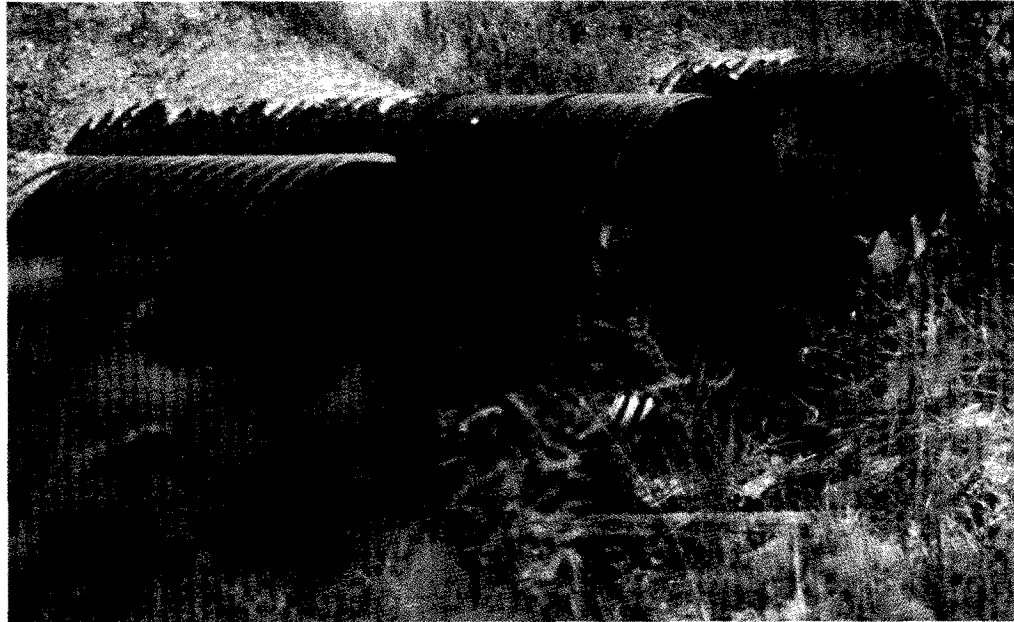
| Properties ¹ | Test Method | Value |
|--|-------------------------------------|---|
| Color | | Black |
| Thickness, mils (minimum) | ASTM D 1005 | 10/10 |
| Yield Tensile Strength, psi | ASTM D 882 | 1300 |
| Ultimate Tensile Strength, psi | ASTM D 882 | 3000 |
| Elongation, % | ASTM D 882 | 550 |
| 2% Secant Modulus, psi | ASTM D 882 | 18500 |
| Elmendorf Tear Strength, gms | ASTM D 1922 | 2800-3200 |
| Dielectric Strength, volts/mil | ASTM D 149 | 2200 |
| Resistance to Acid, 10% HCl | ASTM D 1308 ² | No change |
| Resistance to Acid, 10% HNO ₃ | ASTM D 1308 ² | No change |
| Resistance to Base, 10% NH ₄ OH | ASTM D 1308 ² | No change |
| Resistance to Base, 10% NaOH | ASTM D 1308 ² | No change |
| Resistance to Acid, 30% H ₂ SO ₄ | ASTM D 543, A 742 | No change |
| Resistance to Base, 10% NaOH | ASTM D 543, A 742 | No change |
| Resistance to Salt, 10% NaCl | ASTM D 543, A 742 | No change |
| Adhesion, lb/lin in at 73°F | ASTM D 903 | 114 |
| Imperviousness, 48 hours reagent exposure | ASTM A 742 | No change |
| Resistance to Moist SO ₂ Attack | Kesternich Method DIN 50018,2.OL | 40 cycles, no attack or adhesion loss |
| Cleveland Condensing Humidity Cabinet, 6 months exposures at 130°F | ASTM D 2247-68 | No attack or adhesion loss |
| Weatherability, 3000 hours | ASTM D 3361 | No cracking or delamination |
| Hardness, Shore D, 10 sec | ASTM D 2240 | 46 |

¹Typical properties; not to be construed as specifications.

²Exposure to the coated surface for 1400 hours at 73°C.

How to Specify TRENCHCOAT Film

To ensure the corrugated pipe you specify for your next project is coated with TRENCHCOAT protective film, ask for: **“Corrugated steel pipe, coated on both sides with a protective polymer coating conforming to ASTM A 742 and AASHTO M-246. The polymer coating shall be a minimum 10 mils thick. The polymer shall be composed of polyethylene and acrylic acid copolymer – labeled TRENCHCOAT protective film.”**



For more than 12 years, these culverts have carried rain and spring run-off under a county road in Sharp County, Arkansas.

Want to know more?

For corrugated steel pipe systems that will last for years to come, be sure the pipe you specify is coated with TRENCHCOAT protective film from Dow Plastics. If you need additional information, or if you'd like the names of manufacturers of corrugated steel pipe coated with TRENCHCOAT protective film, contact the Films Group of Dow Plastics, a business group of The Dow Chemical Company, or simply call 1-800-441-4369.

Handling Considerations

TRENCHCOAT protective film is essentially inert and poses no known hazard through skin or other contact. In the unlikely event of a fire involving steel drainage pipe laminated with these films, workers and others should position themselves to assure an adequate supply of fresh air. There are no known adverse effects to solid or to potable water resources as a result of burial of these films.

Flammability

TRENCHCOAT protective film, made of polymers, will burn under the right conditions of heat and oxygen supply. In burning, it will contribute high fuel value. Normal precautions should be taken to avoid exposure to open flame and other ignition sources. Fires can be extinguished with water, CO₂, smothering, or other conventional means. In enclosed areas, fire fighters should use self-contained breathing apparatus.

Disposal

When disposed of in a sanitary landfill, TRENCHCOAT protective film does not evolve gases or leachates known to pollute water resources.

Because it does not provide a food source for bacteria, fungi, insects, or rodents, the film does not attract vermin in landfill disposal.

When burned in controlled industrial or municipal incinerators, TRENCHCOAT protective film will be consumed with very little resultant ash or smoke. The predominant products of combustion are carbon dioxide and water. If the incinerator is not designed to utilize products with the high heat value of plastics, this film should be admixed in small amounts with other normal waste so the combustion capacity of the incinerator is not exceeded.

It is your responsibility to meet all applicable federal, state, and local regulations when disposing of any wastes.

Customer Notice

Dow encourages its customers to review their applications of Dow products from the standpoint of human health and environmental quality. To help ensure that Dow products are not used in ways for which they were not intended or tested, Dow personnel are willing to assist in dealing with ecological and product safety considerations. Your Dow sales specialist can arrange the proper contacts. Dow product literature, including Material Safety Data sheets, should be consulted prior to use of Dow products. Such literature may be obtained from your Dow sales specialist.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our Product Stewardship philosophy by which we assess the health and environmental information on our products and then take appropriate steps to protect employee and public health, and the environment. The success of this Product Stewardship philosophy rests with each and every individual involved with Dow products from initial concept and research, to the manufacture, sale, distribution, use, and disposal of each product.

**TRENCHCOAT Protective Film
for Steel Storm Drain/Culvert Systems**