



An Engineered Solution
for Storm Drain/Culvert Systems



TRENCHCOAT

Protective Film

Contents

What Is TRENCHOAT Protective Film?	2
The Longest Lasting Protection	3
Superior Corrosion Resistance	3
Superior Wear Resistance	3
Superior Bonding	4
Easy Installation	4
Easy Repair	4
Superior Service Life	4
Approved	5
Performance Properties	5
How to Specify TRENCHOAT Film	6
Want to Know More?	6
Handling Considerations	7

What Is TRENCHCOAT Protective Film?

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 protective film is a tough, heavy-gauge film that is laminated to both the inside and outside surfaces of corrugated pipe by qualified laminators, producing a barrier to corrosion and abrasion that surpasses many other coatings in use today.

Corrugated steel pipe (CSP) coated with TRENCHCOAT film is lighter than concrete pipe and asphalt-coated pipe, so it's easier to transport, handle, and install.

Once systems are in place, TRENCHCOAT film provides proven protection that endures – even in some of the most demanding applications where runoff is extremely aggressive. TRENCHCOAT protective film can help your next storm drainage or culvert pipe project flow smoothly – and last longer.



TRENCHCOAT protective film provides outstanding long-term protection to steel storm drain and culvert pipe systems regardless of size, length, terrain, or environmental conditions.

The Longest Lasting Protection

Steel pipe protected with TRENCHCOAT film can withstand abuse during fabrication, handling, installation, and use. Because it provides a superior barrier to abrasion and corrosion, pipe coated with TRENCHCOAT protective film offers improved long-term service compared to steel pipe protected by any other material. In fact, pipe coated with TRENCHCOAT film outlasts and outperforms competitive systems such as asphalt, galvanizing, fiber-bonded asphalts, polyvinyl chloride (PVC) plastisols, coal-tar, and Aluminized Type II formulations.

Superior Corrosion Resistance

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

Superior Wear Resistance

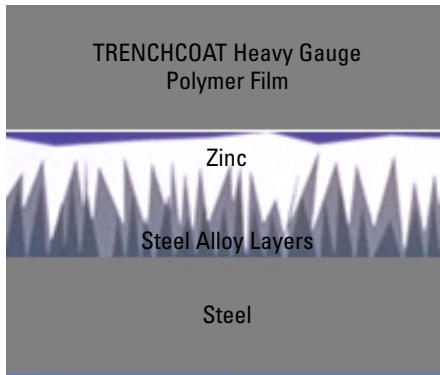
Able to withstand sandy clay run-off and gravel without losing its adhesion to metal, TRENCHCOAT film provides abrasion resistance comparable to more than 50 mils of asphalt. This is better than other polymer pipe coatings on the market today.

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.



TRENCHCOAT protective film resists damage by sandy clay run-off and gravel, as well as acids, salts, and alkalines.

TRENCHCOAT film bonds both chemically and physically to galvanized steel pipe, resulting in superior long-term corrosion and abrasion resistance.



Not to scale

Superior Bonding

TRENCHCOAT protective film is engineered to bond to steel both chemically and physically, so it becomes an integral part of the galvanized steel pipe. This unique characteristic allows TRENCHCOAT film to outlast competitive coating materials.

Easy Installation

TRENCHCOAT protective film 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 sticky, grimy, 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. For a list of sealant suppliers, contact your local fabricator or Dow representative.

Superior Service Life

For nearly 30 years, TRENCHCOAT protective film has provided superior protection for storm drains and culverts, allowing them to last through decades of trouble-free service. Asphalt and other coatings do not offer such long-lasting protection. In fact, depending on the application, TRENCHCOAT film may more than triple the service life of storm drain/culvert applications. That means you can install pipe protected with TRENCHCOAT film for your most important applications with confidence.

100 years of service life?

One laboratory study used microscopic and infrared microspectroscopic analysis of CSP samples coated with TRENCHCOAT protective films that had been in service for up to 22 years. The samples were examined for cracking with an optical microscope.

In all samples, the TRENCHCOAT protective film coating (effluent side) was in good physical condition. None of the micrographs showed evidence of chemical degradation or cracking, although some of the samples did show evidence of physical abrasion to the exposed surface.

In the study, Don Waters, P.E., vice president of Corpro Companies, Inc., stated: "Since we have not seen any measurable degradation, we can only predict a long service life for CSP protected with the TRENCHCOAT polymer film. We cannot find any data to suggest that this pipe coating would not provide at least 100 years of service life."

Approved

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

Performance Properties

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



TRENCHCOAT film meets or exceeds the specifications of key industry groups, and is listed among "Approved Construction Materials" by most states.

Table 1: Physical/Chemical Characteristics of TRENCHCOAT Film

Properties ⁽¹⁾	Test Method	English Values	Metric Values
Color	–	Black	Black
Thickness, (minimum)	ASTM D 1005	10/10 mils	254/254 mm
Yield Tensile Strength	ASTM D 882	1300 psi (MPa)	90 bars
Ultimate Tensile Strength	ASTM D 882	3000 psi (MPa)	207 bars
Elongation, %	ASTM D 882	550	550
2% Secant Modulus	ASTM D 882	18,500 psi (MPa)	1275 bars
Elmendorf Tear Strength	ASTM D 1922	2800-3200 g	2800-3200 g
Dielectric Strength	ASTM D 149	2200 volts/mil	2200 volts/ 0.0254 mm
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, at 73°F (23°C)	ASTM D 903	114 lb/lin	7.8 bars/lineal 2.54 cm
Imperviousness, 48 hours reagent exposure	ASTM A 74	No change	
Resistance to Moist SO ₂ Attack	Kesternich Method DIN 50018,2.0L	40 cycles, no attack or adhesion loss	
Cleveland Condensing Humidity Cabinet, 6 months exposure at 130°F (54°C)	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	46

⁽¹⁾ Typical properties; not to be construed as specifications.

⁽²⁾ Exposure to the coated surface for 1400 hours at 73°F (23°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 it by name... "TRENCHCOAT." This will ensure that the polymer-coated corrugated steel pipe will conform to ASTM 742 and AASHTO M-246.

Want to Know More?

For corrugated steel pipe systems that will last for decades to come, be sure the pipe you specify is coated with TRENCHCOAT protective film from Dow. 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 Engineered Films & Laminates business group at The Dow Chemical Company, call the Dow Customer Information Group at 1-800-441-4369, or visit www.dowfilms.com.

Handling Considerations

Material Safety Data (MSD) sheets for TRENCHCOAT Protective Film are available from The Dow Chemical Company to help customers/users further understand the proper handling of the product. A current MSD sheet should be requested from your Dow sales representative prior to working with the product.

Health & Safety

TRENCHCOAT protective film products present no unusual health hazards when used in their intended manner. Observe usual industrial safe handling practices. Protect workers from possible contact with hot or molten film. Assure workers of a fresh air supply by appropriate exhaust and ventilation of work areas, especially where film is located. Avoid breathing dusts if such are generated.

During manufacture, handling, or use, most film webs will develop and retain a static electrical charge. The magnitude of the charge and how long it will be stored are dependent upon the composition of the web, the kind of handling, and the atmospheric conditions, particularly humidity. TRENCHCOAT protective film can discharge such stored electrical energy in the form of a spark, and therefore should not be handled in a flammable or explosive environment. Consult a current MSD sheet prior to working with the product.

Combustion Characteristics

TRENCHCOAT protective film is made of organic ethylene polymers and therefore will burn under the right conditions of heat and oxygen supply. When burning, the product may 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, carbon dioxide, or other conventional means, with water fog preferred. In enclosed areas, firefighters should use a self-contained breathing apparatus.

Disposal

When burned in controlled industrial or municipal incinerators, these films 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 manage products having the high heat value of plastics, these films should be admixed (<10%) with low heat value waste so the combustion capacity of the incinerator is not exceeded.

When disposed of in a sanitary landfill, these films do not evolve gases or leachates known to pollute water resources. Because they do not provide a food source for bacteria, fungi, insects, or rodents, the films do not attract vermin or vectors in landfill disposal.

In any disposal of wastes, be certain all applicable federal, state, and local regulations are met.

ISO 9000 Certification

The Engineered Films & Laminates business has well defined and documented quality systems at each site. The business has an established quality network with a business quality leader and plant quality coordinators to support maintenance of the quality systems. The quality systems at each site have been third party certified to the ISO 9000 standard. Operation of disciplined quality systems is extremely important to us. This is how we assure we can produce and deliver quality products and services that our customers expect.

cGMP

The films produced by The Dow Chemical Company in North America are produced in facilities that follow the Good Manufacturing Practices Guide for Bulk Pharmaceutical Excipient. This guide has been created by an international consortium to address the needs of Excipients. This product may be produced and sold in Europe, which does not require the adherence to the FDA Good Manufacturing Principles. Please contact the business product stewardship specialist if more details are needed.

Product Stewardship

The Dow Chemical Company 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 of our product stewardship philosophy by which Dow assesses the health and environmental information on our products and then takes appropriate steps to protect employee and public health and the environment. The Dow product stewardship program rests with every individual involved with Dow products from initial concept and research to the manufacture, sale, distribution, and disposal of each product.

Customer Notice

Dow encourages its customers and potential users of Dow products to review their applications for such products from the standpoint of human health and environmental quality. Dow personnel will assist customers in dealing with ecological and product safety considerations. Your Dow sales representative can arrange the proper contacts. Dow product literature, including Material Safety Data sheets, should be consulted prior to the use of Dow products. These may be obtained from your Dow sales representative.

Contact Information:

The Dow Chemical Company
200 Larkin
1605 Joseph Drive
Midland, MI 48674 USA

Dow Customer Information Group

From North America:
1-800-441-4369 or 1-989-832-4569
Fax: 1-989-832-1465

From Europe :
800 3 694 6367⁽¹⁾
or +32 3 450 2240
Fax: +32 3 450 2815

From Italy: Tel: 800 783 825
From South Africa: Tel: 0800 99 5078

⁽¹⁾International toll free from Austria, Belgium, Denmark, France, Germany, Hungary, Ireland, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and Finland (use prefix +990).

www.dowfilms.com

NOTICE: No freedom from any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Dow assumes no obligation or liability for the information in this document. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

Published October 2003



Living.
Improved daily.