

## TBK - Directional Drilling Kit

### Multi-Layer Sleeve System For Directional Drilling

Canusa-CPS is a leading manufacturer of specialty pipeline coatings which, for over 30 years, have been used for sealing and corrosion protection of pipeline joints and other substrates. Canusa high performance products are manufactured to the highest quality standards and are available in a number of configurations to accommodate your specific project applications.

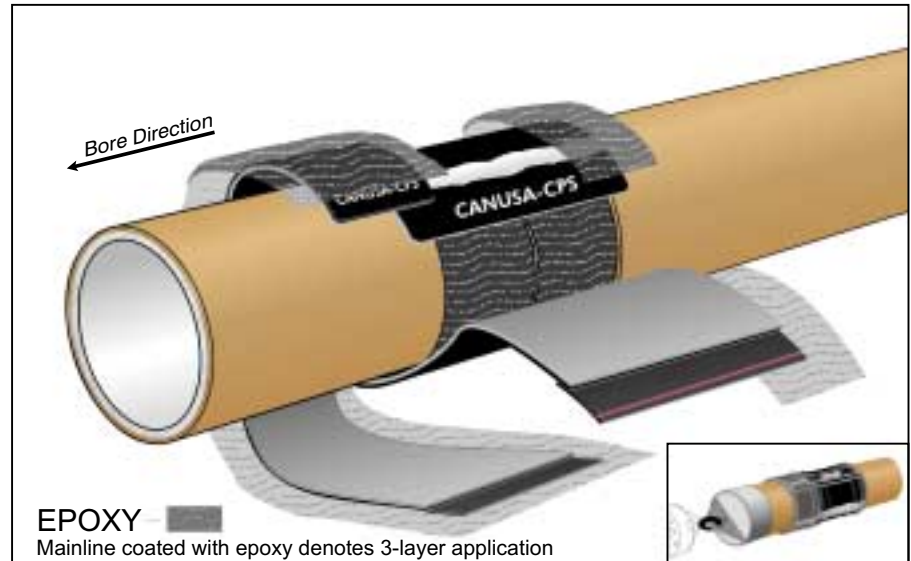
#### Product Description

Canusa's TBK - Directional Drilling Kit is a high performance system designed to protect welded joints on 2 and 3-layer PE, PP and FBE coated pipelines in directional drills. The system consists of three components: a primary heat-shrinkable sleeve which provides corrosion protection at the joint; a secondary heat-shrinkable sleeve which functions as a sacrificial wear cone; and a high-build epoxy top coat at the ends to provide additional protection to the system. An optional epoxy primer is also available for 3-layer systems. The system provides effective protection against abrasion and wear forces that occur during the pull-through operation. The system is fully compatible with cathodic protection systems, resists cathodic disbondment and is designed for a wide range of operating temperatures.

#### Features & Benefits

##### Long Term Corrosion Protection

Canusa's TBK - Directional Drilling Kit provides superior corrosion protection because of the protective shrink sleeve/epoxy primer combination. This primary sleeve provides excellent resistance to cathodic disbondment & excellent durability against abrasion and chemical attack. The result is effective, long term



protection against corrosion. Canusa's standard Directional Drilling Kit is TBK-65, but TBK's are available in a wide range of high performance adhesive systems designed specifically for your application.





##### Superior Abrasion Resistance

Canusa's TBK - Directional Drilling Kit utilizes multi-layer sleeves coated with a heat activated adhesive. The inherent performance properties associated with the sleeve adhesive reduces damage of the coating during pipeline installation and provides excellent resistance to soil stresses and pipe movements. The narrow, epoxy coated sacrificial sleeve is applied to the leading edge of the primary sleeve. The hardened epoxy topcoat provides the additional abrasion and wear resistance to withstand the forces during directional drilling.




##### Convenient Epoxy Kit



Epoxy primer is supplied in kits with all tools required to apply this system. The convenient ready-to-mix epoxy packaging minimizes installation time and labor costs while promoting high production rates.

#### Applications

-  Oil & Gas
-  Water Pipelines
-  Directional Drilling
-  Girth-Weld Joints

#### Configurations

-  2-Layer
-  3-Layer
-  Force-Cure Epoxy

-  Multi-Sleeve Kit
-  Wrapid Sleeve™

#### Pipe Sizes

-  55-1520 (2"-60")

#### Temperature Range

-  Up to 80°C (176°F)

The product selection chart shown here is intended as a guide for standard products. Consult your Canusa representative for specific projects or unique applications.

# TBK - Directional Drilling Kit

## Product Selection Guide

Choose the appropriate TBK system based on selection steps 1-2-3.

## Selection Steps

| Sleeve Operating Characteristics     | Celsius Fahrenheit |      | 2-Layer Systems                  |                                  | 2 or 3-Layer Systems                |                                     |                                     |
|--------------------------------------|--------------------|------|----------------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
|                                      |                    |      | TBK-O                            | TBK-N                            | TBK-C50 <sup>1</sup>                | TBK-65                              | TBK-80                              |
| Expected Pipe Surface Temp.          | 130°               | 266° |                                  |                                  |                                     |                                     |                                     |
| Pipeline Operating Temp.             | 110°               | 230° |                                  |                                  |                                     |                                     |                                     |
| Minimum Installation Temp.           | 90°                | 194° |                                  |                                  |                                     |                                     |                                     |
| Resistance to Circumferential Forces | 70°                | 158° |                                  |                                  |                                     |                                     |                                     |
| Resistance to Soil Stress            | 50°                | 122° |                                  |                                  |                                     |                                     |                                     |
| Resistance to Axial Pipe Movement    | 30°                | 86°  |                                  |                                  |                                     |                                     |                                     |
| Main Line Coating Compatibility      |                    |      | 50 (122)<br>60 (140)<br>75 (167) | 70 (158)<br>80 (176)<br>90 (195) | 45 (113)<br>55 (131)<br>90 (195)    | 55 (131)<br>65 (150)<br>90 (195)    | 70 (158)<br>80 (176)<br>110 (240)   |
|                                      |                    |      | good<br>good<br>good             | good<br>good<br>good             | excellent<br>excellent<br>excellent | excellent<br>excellent<br>excellent | excellent<br>excellent<br>excellent |
|                                      |                    |      | FBE, PE, PP, PU                  | FBE, PE, PP                      | FBE, PE                             | FBE, PE, PP, HPCC                   | FBE, PE, PP, HPCC                   |

- Choose 2 or 3-layer TBK system based on mainline coating
  - Choose TBK system(s) based on expected pipe surface temperature during directional drilling and pipeline operating temperature
  - Choose ultimate TBK system based on pipeline performance requirements and pipe size range
- Product must be installed by pre-heating to the minimum installation temperature.**
- Product must be installed by following the specific Product Installation Guide.**

## Typical Product Properties

| Adhesive              | Test Standard              | Unit              | TBK-O <sup>2</sup> | TBK-N <sup>2</sup> | TBK-C50 <sup>1</sup> | TBK-65           | TBK-80           |                        |
|-----------------------|----------------------------|-------------------|--------------------|--------------------|----------------------|------------------|------------------|------------------------|
|                       |                            |                   |                    |                    |                      |                  |                  |                        |
| Softening point       | ASTM E28                   | °C (°F)           | 102 (216)          | 124 (255)          | 90 (194)             | 94 (201)         | 124 (255)        |                        |
| Lap shear             | DIN 30 672                 | N/cm <sup>2</sup> | 15                 | 40                 | 110                  | 245              | 365              |                        |
| Lap shear             | ASTM D1002                 | psi               | 5.5                | 27                 | 120                  | 230              | 450              |                        |
| Backing               | Specific gravity           | ASTM D792         | 0.95               | 0.95               | 0.93                 | 0.93             | 0.95             |                        |
|                       | Tensile strength           | ASTM D638         | 24 (3480)          | 24 (3480)          | 24 (3480)            | 24 (3480)        | 22 (3150)        |                        |
|                       | Elongation                 | ASTM D638         | 700                | 700                | 700                  | 700              | 550              |                        |
|                       | Hardness                   | ASTM D2240        | Shore D            | 52                 | 52                   | 48               | 50               | 55                     |
|                       | Abrasion resistance        | ASTM D1044        | mg                 | 30                 | 30                   | 35               | 35               | 30                     |
|                       | Volume Resistivity         | ASTM D257         | ohm-cm             | 10 <sup>18</sup>   | 10 <sup>18</sup>     | 10 <sup>17</sup> | 10 <sup>17</sup> | 2.5 x 10 <sup>18</sup> |
| Sleeve                | Dielectric Voltage Brkdown | ASTM D149         | kV/mm              | 20                 | 20                   | 27               | 27               | 39                     |
|                       | Impact                     | DIN 30 672        | class C            | pass               | pass                 | pass             | pass             | pass                   |
|                       | Indentation                | DIN 30 672        | class C            | pass               | pass                 | pass             | pass             | pass                   |
|                       | Peel                       | ASTM D1000        | N/cm (pli)         | 80 (46)            | 115 (66)             | 120 (70)         | 120 (70)         | 45 (26)                |
|                       | Peel                       | DIN 30 672        | N/cm               | 65                 | 90                   | 113              | 86               | 55 (32)                |
|                       | Cathodic Disbondment       | ASTM G8           | mm rad             | 8                  | 17                   | 11               | 10               | 12                     |
|                       | Water Absorption           | ASTM D570         | %                  | 0.05               | 0.05                 | 0.05             | 0.05             | 0.05                   |
| Low Temp. Flexibility | ASTM D2671-C               | °C (°F)           | -14 (7)            | -15 (5)            | -28 (-18)            | >-26 (-18)       | >-20 (-4)        |                        |
| DIN Approval          | DIN 30 672                 | class             | C30                | --                 | C50                  | --               | --               |                        |

## Epoxy Kit Usage

| Pipe Diameter (inches) | Kits Required* | Kits Required* |         |
|------------------------|----------------|----------------|---------|
|                        |                | 2-layer        | 3-layer |
| 4 1/2                  | 115            | 1              | 1       |
| 6.6                    | 170            | 1              | 1       |
| 8.6                    | 230            | 1              | 1       |
| 10 3/4                 | 280            | 1              | 2       |
| 12 3/4                 | 315            | 1              | 2       |
| 14                     | 355            | 1              | 2       |
| 16                     | 400            | 2              | 2       |
| 18                     | 450            | 2              | 2       |
| 20                     | 500            | 2              | 3       |
| 24                     | 610            | 2              | 3       |
| 28                     | 710            | 2              | 3       |
| 30                     | 760            | 2              | 3       |
| 36                     | 915            | 3              | 4       |
| 42                     | 1060           | 3              | 4       |
| 48                     | 1220           | 4              | 5       |
| 60                     | 1520           | 4              | 6       |

**Application Guidelines**  
Refer to specific product Installation Guide.

**Canusa E Primer Properties**  
Pot life @ 23°C (73°F) 20 minutes  
Typical epoxy coated thickness 4 - 6 mils  
Shelf life @ 23°C, out of sunlight 3 years

\* Epoxy Kits Required uses the standard 170 ml. Canusa E Primer Kit and assumes a 300mm (12") cutback, a 0.25mm (10 mil) epoxy overcoat thickness and a 0.15mm (6 mil) mainline epoxy thickness covering (for 3-layer systems).

## How To Order:

| Dimensions & Ordering Info       | Ordering Options - TBK - Directional Drilling Kit (TBK-65 is standard product for T < 65°C) |  |                      |   |                    |                    |
|----------------------------------|---|--|----------------------|---|--------------------|--------------------|
|                                  | TBK-O <sup>2</sup>  | TBK-N <sup>2</sup>   | TBK-C50 <sup>1</sup> | TBK-65  | TBK-80             |                    |
|                                  | <b>TBK-65 115-450 BK</b>  | BK-Black   |                      |   |                    |                    |
|                                  | Colour  | PE, PP<br>Primary Sleeve - 450, 600mm (18, 24")<br>Sacrificial Sleeve - 150mm (6") |                      | FBE, PU<br>Primary Sleeve - 300, 450mm (12, 18")<br>Sacrificial Sleeve - 150mm (6") |                    |                    |
|                                  | Sleeve Width  | 55-610 mm (2-24")  | 55-315 mm (2-12")    | 55-1525 mm (2-60")  | 55-1525 mm (2-60") | 55-1525 mm (2-60") |
|                                  | Pipe Size Range   | Canusa "E" Epoxy   |                      |   |                    |                    |
| Primer                           | 1.5 mm (60 mils)  | 1.1 mm (45 mils)   | 1.7 mm (65 mils)     | 1.1 mm (45 mils)  | 1.25 mm (50 mils)  |                    |
| Adhesive (thickness as supplied) | 0.63 mm (25mils)  | 0.9 mm (36mils)  | 0.9 mm (36mils)      | 0.9 mm (36mils)   | 0.75 mm (30mils)   |                    |
| Backing (thickness as supplied)  | TBK-O <sup>2</sup>  | TBK-N <sup>2</sup>   | TBK-C50 <sup>1</sup> | TBK-65  | TBK-80             |                    |
| Configuration                    |   |  |                      |   |                    |                    |

<sup>1</sup> TBK-C50 has been specially formulated for the European DIN 30 672 standard (C50 approved).

<sup>2</sup> Denotes 2-layer system only.

The above represent standard ordering options.

Consult your Canusa representative for any unique project requirements.



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Canusa warrants that the product conforms to its chemical and physical description and is appropriate for the use stated on the installation guide when used in compliance with Canusa's written instructions. Since many installation factors are beyond our control, the user shall determine the suitability of the products for the intended use and assume all risks and liabilities in connection therewith. Canusa's liability is stated in the standard terms and conditions of sale. Canusa makes no other warranty either expressed or implied. All information contained in this installation guide is to be used as a guide and is subject to change without notice. This installation guide supersedes all previous installation guides on this product. E&OE

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