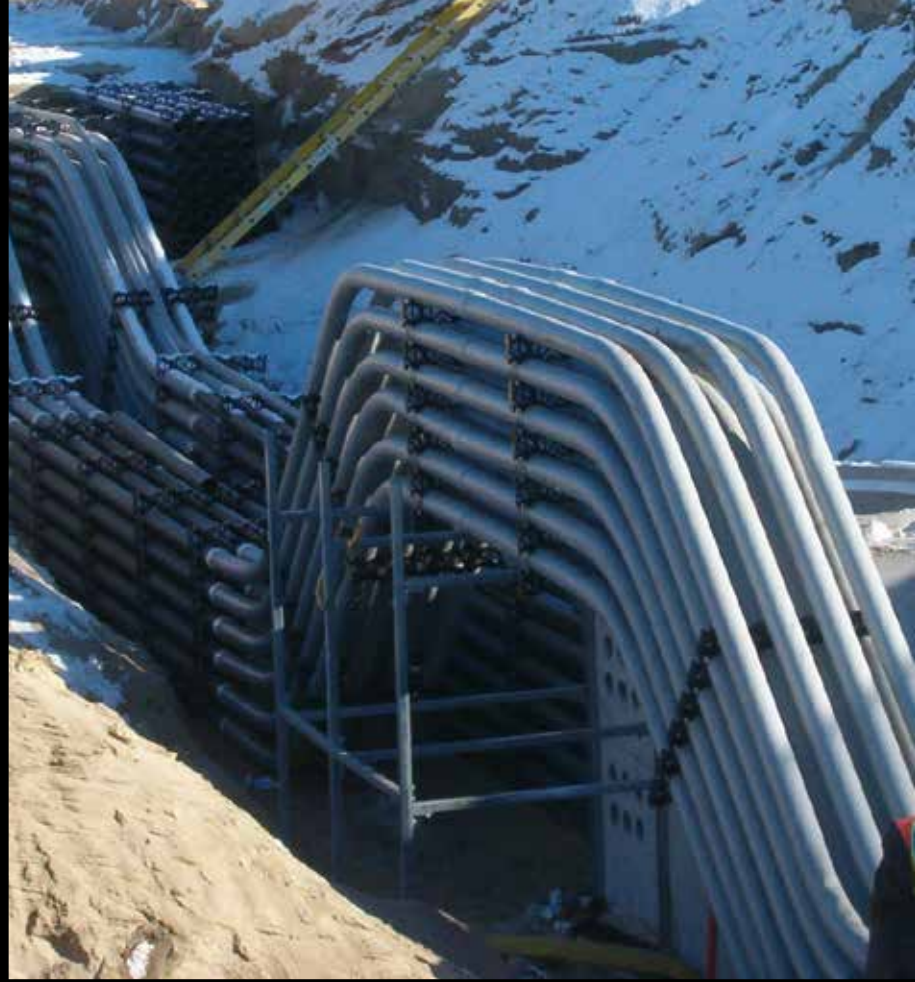


# POWER & COMMUNICATIONS DUCT



**SUPER DUCT<sup>®</sup>**

**ELECTRICAL SYSTEMS**

## **POWER AND COMMUNICATIONS DUCT**

- Light Weight
- Long Lengths with Bell Ends
- Flexible



We build tough products for tough environments<sup>®</sup>

## THE PREMIER DUCTING in the market

The premier ducting product on the market, IPEX Super Duct® is specifically engineered and quality manufactured to deliver the high-impact and crush strength demanded by today's utility companies, for underground ducting applications.



Made from a specially formulated compound, Super Duct can withstand high physical loads, while providing the natural flexibility for field bending to accommodate minor changes in elevation or direction. And Super Duct's smooth bore makes cable pulling easier.

Available in trade sizes from 2" to 6" and supplied in 10' or 20' lengths, Super Duct is bell ended for easy assembly in the field using IPEX solvent cement or polyethylene push-fit couplings. Super Duct conforms to the requirements of CSA Standard C22.2 No. 211.1 for encasement in concrete and direct burial.

### SUPER DUCT DIMENSIONS

| Dimension |     | Minimum ID |        | Nominal Wall |      | Average OD |        |
|-----------|-----|------------|--------|--------------|------|------------|--------|
| in        | mm  | in         | mm     | in           | mm   | in         | mm     |
| 2         | 50  | 2.001      | 50.83  | .082         | 2.08 | 2.250      | 57.15  |
| 3         | 75  | 3.000      | 76.20  | .097         | 2.46 | 3.250      | 82.55  |
| 3-1/2     | 90  | 3.480      | 88.39  | .109         | 2.77 | 3.730      | 94.74  |
| 4         | 100 | 3.941      | 100.10 | .120         | 3.05 | 4.216      | 107.09 |
| 5         | 125 | 4.974      | 126.34 | .153         | 3.89 | 5.299      | 134.60 |
| 6         | 150 | 5.896      | 149.76 | .180         | 4.57 | 6.275      | 159.39 |

## MARKETS

- UTILITIES
- TELECOM
- HOSPITALS / MEDICAL COMPLEXES
- COMMERCIAL BUILDINGS
- COMMUNICATIONS
- CABLE

## ADVANTAGES

### LIGHT WEIGHT

Super Duct is easy to carry and install, reducing labour requirements and costs.

### LONG LENGTHS

Super Duct is available in 10' (3m) and 20' (6.1m) lengths, minimizing the number of connections needed.

### BELL ENDS

Super Duct is bell-ended, allowing for easy assembly in the field.

### HIGH COMPRESSIVE STRENGTH

Super Duct's specially formulated compound is designed to withstand high loads.

### LOW COEFFICIENT OF FRICTION

The smooth bore of Super Duct facilitates cable pulling and eliminates costly cable damage.

### QUALITY CONTROL

Stringent, continuous testing ensures that Super Duct is a consistently high quality product.

### FIELD BENDING

The natural flexibility of IPEX Super Duct allows field bending, to accommodate minor changes in elevation or direction.



# PRODUCT CATALOGUE

## SUPER DUCT PIPE

### CSA Type II – 10' Length Belled

| Dimension (in) | Product Code | Product Code B.C. | Ft/Crate | Weight/100' (lbs) |
|----------------|--------------|-------------------|----------|-------------------|
| 2              | 008220       | *008225           | 2,460    | 33.7              |
| 3              | 008230       | *008233           | 1,120    | 61.2              |
| 3-1/2          | 008235       | *008235           | 810      | 77.3              |
| 4              | 008240       | *008244           | 630      | 99.2              |
| 5              | 008250       | *008253           | 430      | 159.6             |
| 6              | 008260       | *008263           | 280      | 226.6             |

\*Product Codes are for B.C. only.

### CSA Type II – 20' Length Belled

|       |        |         |       |       |
|-------|--------|---------|-------|-------|
| 2     | 008221 | *008226 | 4,920 | 33.7  |
| 3     | 008231 | *008234 | 2,240 | 61.2  |
| 3-1/2 | 008236 | *008236 | 1,620 | 77.3  |
| 4     | 008241 | *008245 | 1,260 | 99.2  |
| 5     | 008251 | *008254 | 860   | 159.6 |
| 6     | 008261 | *008264 | 560   | 226.6 |

\*Product Codes are for B.C. only.

### CSA Type II – Split Duct

| Dimension (in) | Product Code | Ft/Crate | Weight/100' (lbs) |
|----------------|--------------|----------|-------------------|
| 2              | 008222       | 2,460    | 33.7              |
| 3              | 008232       | 1,120    | 61.2              |
| 3-1/2          | 008237       | 810      | 77.3              |
| 4              | 008242       | 630      | 99.2              |
| 5              | 008252       | 430      | 159.6             |
| 6              | 008262       | 280      | 226.6             |



## SUPER DUCT FITTINGS

### 90° Long Sweep Bend

| Size (inches) | Part Number | Product Code | Product Code Prairies |
|---------------|-------------|--------------|-----------------------|
| 2 x 24 R      | 902024      | 029091       | *129091               |
| 2 x 36 R      | 902036      | 029092       | *129092               |
| 2 x 60 R      | 902060      | 029036       | *129036               |
| 3 x 24 R      | 903024      | 029055       | *129055               |
| 3 x 36 R      | 903036      | 029093       | *129093               |
| 3 x 60 R      | 903060      | 029134       | *129134               |
| 3-1/2 x 24 R  | 903524      | 029123       | *129123               |
| 3-1/2 x 36 R  | 903536      | 029094       | *129094               |
| 3-1/2 x 60 R  | 903560      | 029135       | *129135               |
| 4 x 24 R      | 904024      | 029047       | *129047               |
| 4 x 36 R      | 904036      | 029095       | *129095               |
| 4 x 60 R      | 904060      | 029096       | *129096               |
| 5 x 42 R      | 905042      | 029097       | *129097               |
| 5 x 60 R      | 905060      | 029037       | *129037               |
| 6 x 60 R      | 906060      | 029098       | *129098               |

\*Product Codes are for the Prairie Provinces only.

### 45° Long Sweep Bend

|              |        |        |         |
|--------------|--------|--------|---------|
| 2 x 24 R     | 452024 | 029111 | *129111 |
| 2 x 36 R     | 452036 | 029112 | *129112 |
| 3 x 24 R     | 453024 | 029082 | *129082 |
| 3 x 36 R     | 453036 | 029113 | *129113 |
| 3-1/2 x 36 R | 453536 | 029114 | *129114 |
| 4 x 24 R     | 454024 | 029128 | *129128 |
| 4 x 36 R     | 454036 | 029115 | *129115 |
| 4 x 60 R     | 454060 | 029116 | *129116 |
| 5 x 42 R     | 455042 | 029117 | *129117 |
| 6 x 60 R     | 456060 | 029118 | *129118 |

\*Product Codes are for the Prairie Provinces only.

### 22 1/2° Long Sweep Bend

|          |        |        |         |
|----------|--------|--------|---------|
| 3 x 36 R | 223036 | 029085 | *129085 |
| 4 x 36 R | 224036 | 029204 | *129204 |
| 5 x 42 R | 225042 | 029249 | *129249 |

\*Product Codes are for the Prairie Provinces only.

Note: Special radius bends are available upon request.



# PRODUCT CATALOGUE

## SUPER DUCT FITTINGS



### PVC Coupling - Solvent Weld

| Size (inches) | Part Number | Product Code |
|---------------|-------------|--------------|
| 2             | SWC020      | 029001       |
| 2 (long)      | SWC020L     | 029009       |
| 3             | SWC030      | 029002       |
| 3-1/2         | SWC035      | 029003       |
| 4             | SWC040      | 029004       |
| 5             | SWC050      | 029005       |
| 6             | SWC060      | 029006       |



### Polyethylene Coupling - Push Fit\*

|       |        |        |
|-------|--------|--------|
| 2     | PFC020 | 029011 |
| 3     | PFC030 | 029012 |
| 3-1/2 | PFC035 | 029013 |
| 4     | PFC040 | 029014 |
| 5     | PFC050 | 029015 |
| 6     | PFC060 | 029016 |

\* Suitable for concrete-encased applications only



### PVC 5° Coupling - Solvent Weld

|       |        |        |
|-------|--------|--------|
| 2     | 5ACS20 | 029041 |
| 3     | 5ACS30 | 029042 |
| 3-1/2 | 5ACS35 | 029043 |
| 4     | 5ACS40 | 029044 |
| 5     | 5ACS50 | 029045 |
| 6     | 5ACS60 | 029046 |



### Polyethylene 5° Coupling - Push Fit\*

|       |        |        |
|-------|--------|--------|
| 2     | SAPF20 | 029020 |
| 3     | 5APF30 | 029030 |
| 3-1/2 | 5APF35 | 029502 |
| 4     | 5APF40 | 029998 |
| 5     | 5APF50 | 029050 |

\* Suitable for concrete-encased applications only



### Reducer Coupling - Solvent Weld

|           |        |        |
|-----------|--------|--------|
| 3 x 2     | RC3020 | 029021 |
| 3-1/2 x 2 | RC3520 | 029039 |
| 3-1/2 x 3 | RC3530 | 029022 |
| 4 x 2     | RC4020 | 029023 |
| 4 x 3     | RC4030 | 029024 |
| 4 x 3-1/2 | RC4035 | 029025 |
| 5 x 4     | RC5040 | 029026 |
| 6 x 4     | RC6040 | 029027 |

## SUPER DUCT FITTINGS



### Split Wye – Solvent Weld

| Size (inches) | Part Number | Product Code |
|---------------|-------------|--------------|
| 2             | SPLY20      | 029463       |
| 3             | SPLY30      | 029052       |
| 3-1/2         | SPLY35      | 029053       |
| 4             | SPLY40      | 029054       |



### PVC Bell Ends

|       |        |        |
|-------|--------|--------|
| 2     | BELL20 | 029061 |
| 3     | BELL30 | 029062 |
| 3-1/2 | BELL35 | 029063 |
| 4     | BELL40 | 029064 |
| 5     | BELL50 | 029065 |
| 6     | BELL60 | 029066 |



### Terminator with Knock-Out Plugs

|                |         |        |
|----------------|---------|--------|
| 3              | TERM30  | 029826 |
| 3 1/2          | TERM35  | 029523 |
| 4 (with holes) | TERM40H | 029822 |
| 4 (no holes)   | TERM40W | 029827 |



### Cap – Solvent Weld

|       |        |        |
|-------|--------|--------|
| 2     | SWCA20 | 029071 |
| 3     | SWCA30 | 029072 |
| 3-1/2 | SWCA35 | 029073 |
| 4     | SWCA40 | 029074 |
| 5     | SWCA50 | 029075 |
| 6     | SWCA60 | 029076 |



### Expansion Joint

|       |        |        |
|-------|--------|--------|
| 2     | EXPJ20 | 029151 |
| 3     | EXPJ30 | 029152 |
| 3-1/2 | EXPJ35 | 029153 |
| 4     | EXPJ40 | 029154 |



### Tapered Plug

|       |        |        |
|-------|--------|--------|
| 2     | PLUG20 | 029131 |
| 3     | PLUG30 | 029132 |
| 3-1/2 | PLUG35 | 029133 |
| 4     | PLUG40 | 029078 |
| 5     | PLUG50 | 029079 |
| 6     | PLUG60 | 029136 |

# PRODUCT CATALOGUE

## SUPER DUCT FITTINGS



### Universal Pipe Plug

| Size (inches) | Part Number | Product Code |
|---------------|-------------|--------------|
| 2 & 2-1/2     | UPP35       | 029386       |
| 3 & 3-1/2     | UPP45       | 029387       |
| 4             | UPP55       | 029388       |
| 5             | UPP60       | 029389       |
| 6             | UPP65       | 029390       |



### Female Adapter

|       |        |        |
|-------|--------|--------|
| 2     | FEMA20 | 029141 |
| 3     | FEMA30 | 029142 |
| 3-1/2 | FEMA35 | 029143 |
| 4     | FEMA40 | 029144 |
| 5     | FEMA50 | 029145 |
| 6     | FEMA60 | 029146 |



### Reducing Adapter Coupling – Duct to PVC Conduit

|       |          |        |
|-------|----------|--------|
| 3 x 2 | ARIG3020 | 029191 |
| 4 x 2 | ARIG4020 | 029192 |
| 4 x 3 | ARIG4030 | 029187 |



### PVC Adapter Coupling – Asbestos Cement or Bituminous Fibre

|       |        |        |
|-------|--------|--------|
| 3-1/2 | ACFB35 | 029163 |
| 4     | ACFB40 | 029164 |

### Conduit to Duct Adapter

|          |         |        |
|----------|---------|--------|
| 2        | ARIG20  | 029181 |
| 2 (long) | ARIG20L | 029188 |
| 3        | ARIG30  | 029182 |
| 3-1/2    | ARIG35  | 029183 |
| 4        | ARIG40  | 029184 |
| 5        | ARIG50  | 029185 |
| 6        | ARIG60  | 029186 |

Note: Duct to RTRC Conduit Adapters are available on request.



# SUGGESTED SPECIFICATIONS

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## Product

Duct shall be IPEX Super Duct or approved equal. Duct, fittings, Monobloc spacers and solvent cement shall be provided by the same manufacturer to assure system integrity.

The duct is to be secured mechanically with IPEX Monobloc or vertical lock spacers to prevent disturbance to the alignment during installation.

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## Identification

Duct shall be identified for type and manufacturer and shall be traceable to plant location, date, shift and machine of manufacture. The markings shall be legible and permanent.

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## Material

Duct for use in underground, encased or direct burial applications shall be made from PVC compound that includes inert modifiers to give high modulus of elasticity, improved weatherability and deflection characteristics.

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## Standards

Type DB-2 Super Duct and Solvent Cement Fittings as manufactured by IPEX Inc. shall be used for direct burial and/or concrete encased applications. The duct and fittings must be certified to CSA Standard C22.2 No. 211.1 and be installed in accordance with the Canadian Electrical Code Part 1, Rule 12-1150 through 12-1166. Polyethylene push-fit couplings are only to be used in concrete-encased application.



# ENGINEERING DATA

## % DEFLECTION OF IPEX SUPER DUCT IN DIRECT BURY APPLICATIONS SUBJECTED TO CAN/CSA S6-06 MAX. WHEEL LOAD OF 87.5 KN

| Embedment Material                      | Density                 | Dia. (in) | Cover in Feet |     |     |     |     |     |     |     |     |     |
|---|-------------------------|-----------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|   |                         |           | 2             | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |
| Crushed Stone<br>Class I                | 90%<br>$E' = 3,000$ psi | 2         | 0.8           | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
|   |                         | 3         | 0.8           | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
|   |                         | 3.5       | 0.8           | 0.5 | 0.4 | 0.4 |     | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
|   |                         | 4         | 0.8           | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
|   |                         | 5         | 0.8           | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| Crushed Stone with Fines<br>Class II    | 90%<br>$E' = 2,000$ psi | 2         | 1.1           | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | 0.6 |     |
|   |                         | 3         | 1.1           | 0.8 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |     |
|   |                         | 3.5       | 1.1           | 0.8 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |     |
|   |                         | 4         | 1.1           | 0.8 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |     |
|   |                         | 5         | 1.1           | 0.8 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |     |
| Sand and Gravel<br>Class II             | 80%<br>$E' = 1,000$ psi | 2         | 2             | 1.3 | 1.1 | 1   | 1   | 1   | 1.1 | 1   | 1.1 |     |
|   |                         | 3         | 2.2           | 1.5 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 |     |
|   |                         | 3.5       | 2.2           | 1.5 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 |     |
|   |                         | 4         | 2.2           | 1.5 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 |     |
|   |                         | 5         | 2.2           | 1.5 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 |     |
| Sand and Gravel with Fines<br>Class III | 85%<br>$E' = 500$ psi   | 2         | 3.3           | 2.2 | 1.8 | 1.7 | 1.7 | 1.7 | 1.8 | 1.6 | 1.8 |     |
|   |                         | 3         | 3.9           | 2.7 | 2.2 | 2   | 2   | 2   | 2.2 | 2   | 2.2 |     |
|   |                         | 3.5       | 3.9           | 2.7 | 2.2 | 2   | 2   | 2   | 2.2 | 2   | 2.2 |     |
|   |                         | 4         | 4             | 2.7 | 2.2 | 2   | 2   | 2   | 2.2 | 2   | 2.2 |     |
|   |                         | 5         | 4             | 2.7 | 2.2 | 2   | 2   | 2   | 2.2 | 2   | 2.2 |     |
| Silt and Clay<br>Class IV               | 85%<br>$E' = 400$ psi   | 2         | 3.8           | 2.6 | 2.1 | 1.9 | 1.9 | 1.9 | 2.1 | 1.9 | 2.1 |     |
|   |                         | 3         | 4.7           | 3.2 | 2.6 | 2.4 | 2.4 | 2.4 | 2.6 | 2.3 | 2.6 |     |
|   |                         | 3.5       | 4.7           | 3.2 | 2.6 | 2.4 | 2.4 | 2.4 | 2.6 | 2.4 | 2.6 |     |
|   |                         | 4         | 4.8           | 3.2 | 2.7 | 2.5 | 2.5 | 2.5 | 2.7 | 2.4 | 2.7 |     |
|   |                         | 5         | 4.8           | 3.2 | 2.7 | 2.5 | 2.5 | 2.5 | 2.7 | 2.4 | 2.7 |     |
| 6                                       | 4.8                     | 3.2       | 2.7           | 2.5 | 2.5 | 2.5 | 2.7 | 2.4 | 2.7 |     |     |     |

## SUPER DUCT (TYPE DB-2)

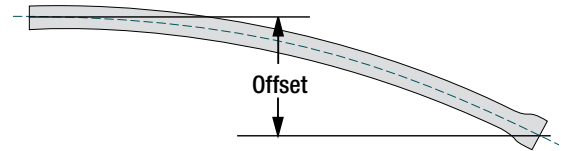
| Description         | CSA Requirements  | Reference           |
|---------------------|---|---------------------|
| Pipe Stiffness @ 5% | 43.5 psi (300 kPa)  | CSA C22.2 No. 211.1 |
| Crush Resistance    | 198 lbs. @ 73°F (90 kg @ 23°C)<br>10% max. residual deflection                        | CSA C22.2 No. 211.1 |
| Impact Resistance   | 45 ft. lbf @ 73°F (61J @ 23°C)<br>25 ft. lbf @ 0°F (34J @ -18°C)                      | CSA C22.2 No. 211.1 |
| Residual Stress     | 149°F (65°C) for 4 hours.<br>Allow to cool to 73°F (23°C).<br>0.5% shrinkage allowed. | CSA C22.2 No. 211.1 |
| Joint Tightness     | 5 psi (35 kPa) internal water pressure applied for 24 hours.                          | CSA C22.2 No. 211.1 |

Note: Super Duct meets or exceeds all CSA requirements.

## FIELD BENDING

Field bending can accommodate minor changes in elevation or direction without the use of special sweeps or fittings. The following table indicates typical maximum offset bends that can be achieved by cold bending.

## ALLOWABLE OFFSET FOR SUPER DUCT



| Size  |     | Max Allowable Offset 10' Length |     | Max Allowable Offset 20' Length |       |
|-------|-----|---------------------------------|-----|---------------------------------|-------|
| in.   | mm  | in.                             | mm  | in.                             | mm    |
| 2     | 50  | 20                              | 508 | 79                              | 2 007 |
| 3     | 75  | 14                              | 356 | 56                              | 1 422 |
| 3-1/2 | 90  | 12                              | 305 | 49                              | 1 245 |
| 4     | 100 | 11                              | 279 | 43                              | 1 092 |
| 5     | 125 | 7                               | 178 | 35                              | 889   |
| 6     | 150 | 7                               | 178 | 29                              | 737   |

## NOTES:

1. Axial deflection should not be attempted at the joints.
2. The above values were established for ambient temperatures above the freezing point. Increased radii may be desirable at below-freezing temperatures.

## BENDS

Standard 90°, 45° and 22 1/2° bends are available from sizes 2" through to 6" in 24", 36", 42" and 60" radius. All bends are supplied with 6" (15.2cm) tangents. The centre line lay length (L) can be calculated using;

$$L = \left( \pi r \times \frac{\text{§}}{180} \right) + 2 (\text{tangent})$$

Where:  $\pi$  = 3.14

L = centre line lay length

r = radius of bend

§ = angle of bend

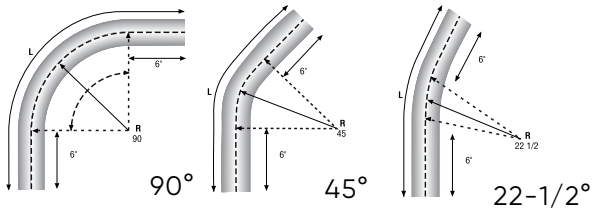
tangent = 6"

Example: for a 3" 90° bend with a 36" radius - calculate the lay length:

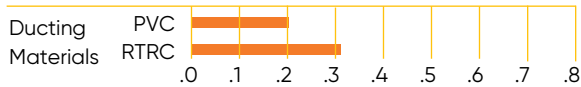
$$L = \left( 3.14 \times 36 \times \frac{90^\circ}{180} \right) + 2 (6)$$

$$L = 69 \text{ inches}$$

$$L (\text{metres}) = \frac{L \text{ imperial}}{12 \times 3.281} = \frac{69}{39.37} = 1.75\text{m}$$



## STATIC FRICTION COEFFICIENT

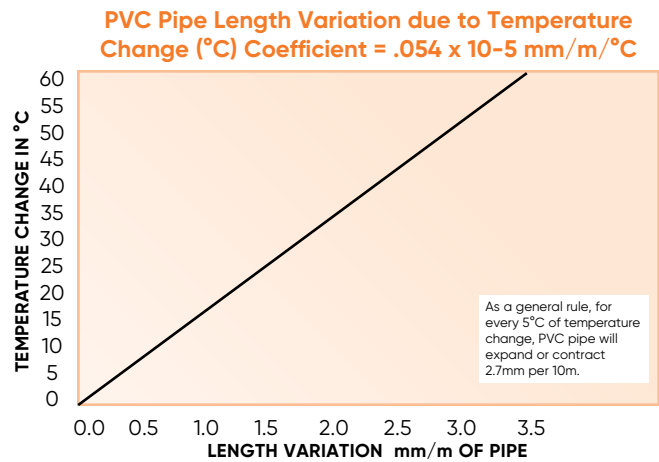
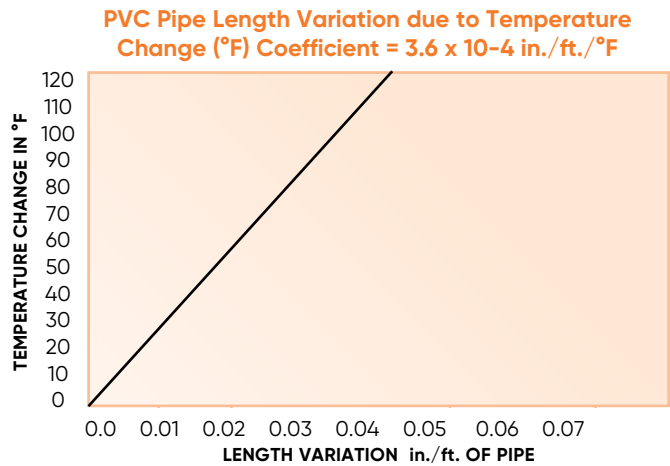


## EXPANSION AND CONTRACTION

The following precautions should be exercised when extreme temperature variations are anticipated during the installation of IPEX Super Duct.

1. Allow extra duct footage at each tie-in for contraction when duct temperature is higher than soil temperature. Allow extra room for expansion if reverse condition exists.
2. Backfill from tie-in point toward end of duct run.

The coefficient of thermal expansion of IPEX Super Duct is  $3 \times 10^{-5}$  in./in./°F ( $5.4 \times 10^{-5}$  mm/mm/°C). These charts show the expansion that can be expected at various temperature ranges for unburied (unrestrained) duct.



# INSTALLATION

1

## CONCRETE ENCASED DUCT INSTALLATION

For multipurpose power cable and communication duct banks, spacing between ducts is critical for optimum performance. IPEX has designed the Monobloc and Vertical Lok Spacer systems to accommodate all specification and field installations.

These light weight spacers provide the vertical and horizontal separation required in a trench.

With spacers in place on the trench bottom, lay the first tier of ducts. When using a concrete base, lay the bottom tier before the base has taken initial set. Place subsequent tiers of spacers on top of the tier until the required number of ducts are installed. Then tie the entire assembly together. It is not necessary to weight or brace the bank unless the concrete mix is very wet.

### THE CONCRETE POUR

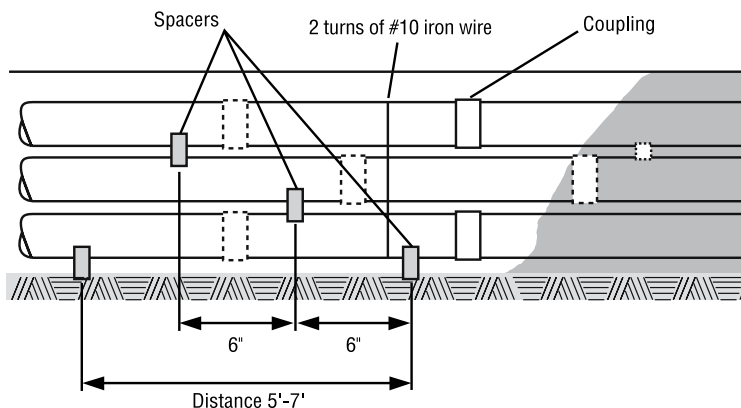
Do not allow a heavy mass of concrete to fall directly onto the duct. If this is a possibility, use a plank to direct the concrete down the sides of the bank assembly to the trench bottom. The concrete will flow to the centre of the bank and rise up in the middle, uniformly filling all open spaces. Voids can be eliminated by carefully working a long, flat slicing bar or spatula up and down between the vertical rows of ducts. Concrete should then flow between and under all of the ducts.

### DUCT BANK ELEVATION

Monobloc spacers should be staggered. It is recommended that spacers be located approximately one-fifth of duct length from each end. Vertical Lok spacers should be located to a maximum of every 5.5 ft. (1.7m).

### BACKFILLING

Backfill with regular excavated soil after the concrete has set.



## 2

### CONCRETE ENCASED TIER-BY-TIER INSTALLATION

The advantage of this method is the production of a solid, void-free concrete envelope. Simply pour each tier independently.

#### TRENCH BOTTOM

After grading the trench, place a foundation of 3" of concrete on the bottom. It should be smooth and graded.

#### BANK ASSEMBLY

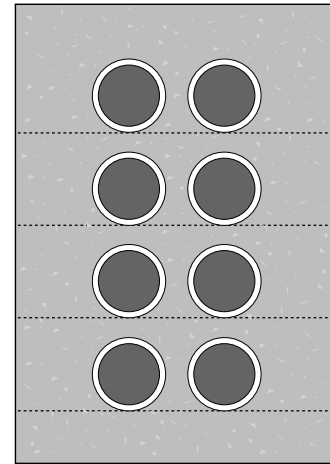
Lay the bottom tier of ducts on the concrete base. Ducts should be spaced with wooden combs (two per duct length). Concrete the first tier level to the top of the comb. Remove combs and fill the voids. Light tamping will ensure an even surface. Repeat this sequence until the bank is built up.

#### CONCRETING

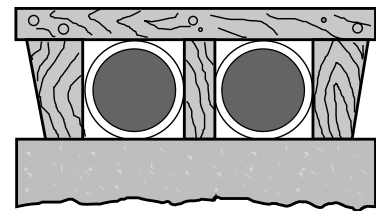
If the concrete is allowed to set before assembling the next tier, the concrete will be stronger and more dense and the ducts will be aligned straighter. One problem with this method is that the bank will be in a series of layers and therefore more likely to heave and separate under frost conditions. If successive tiers are laid before the concrete has set, a satisfactory bond will be achieved by tamping the dry concrete.

#### BACKFILLING

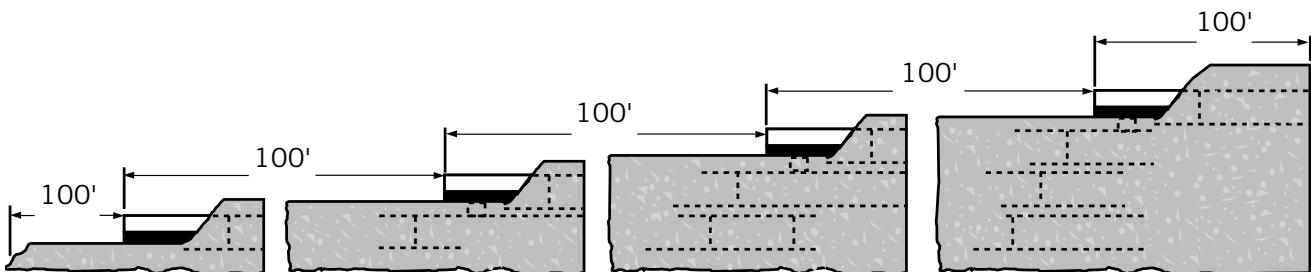
Backfill with regular excavated soil when the bank is complete.



Cross-section of tier-by-tier method.



Type of wood comb used.



Duct is usually laid in 100' sections once the trench is excavated. Therefore, concreting can be a continuous process.

# INSTALLATION

3

## DIRECT BURIAL INSTALLATION

### TRENCH BOTTOM

The trench bottom should provide a continuous, firm and uniform support for the duct bank construction. Care should be taken to avoid lumps, ridges, depressions and stones causing "point" contacts or uneven bearing.

### ROCK OR SHALE

Excavate 3" below the desired depth and bring the trench back to grade with selected tamped soil. This will provide the duct with a uniform bedding surface.

### UNSTABLE SOILS

Tests should be conducted to establish the soil strength in marshy or swampy areas. It may be necessary in these conditions to dig deeper and refill with crushed stone or gravel, or to employ mats, timbers or a concrete base.

### PLACEMENT OF DUCT

After the first tier of ducts is installed, backfill and compact as outlined below. If wood combs are employed for spacing, remove them as the backfill is placed and tamped. Then begin the next tier.

### INITIAL BACKFILLING

1. Fit side and centre to the top of the ducts. Use a hand tamper only to tamp firmly.
2. Backfill over the duct to the required thickness (see note) and tamp firmly, using only a hand tamper.

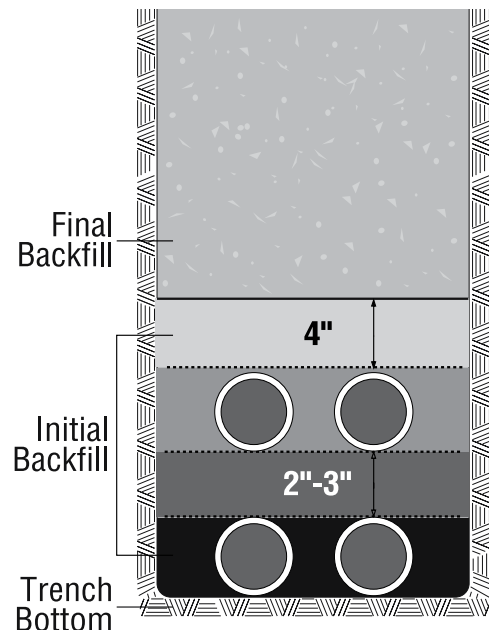
### FINAL BACKFILLING

When the last tier is placed, hand-place the backfill to 4" over the duct with soil that does not contain stones larger than 3/8". Hand-tamping of this layer is optional, depending on the specifications.

From this point, backfill may be completed by hand or by pneumatic tamping in layers from 4" to 12" depending on the degree of compaction desired.

When placing backfill by machine, avoid the use of large rocks until a protective layer (minimum of 12") is established.

Note: In direct burial, no spacer should be used with Type 2; spacers provide "point" support instead of the continuous bed required. Backfill thickness between ducts is usually 2" to 3".



## SOLVENT CEMENTING

After cutting IPEX Super Duct, sharp edges or burrs from inside the duct should be removed with a knife. Thoroughly clean the end of the pipe and inside the fitting with IPEX pipe cleaner. Apply a generous amount of solvent cement to both surfaces; slide together and give a quarter turn to ensure solvent is spread evenly on the material. Hold together for a few seconds until the joint is made.

| Super Duct Size |     | # of Joints per Litre<br>(2 gal) |
|-----------------|-----|----------------------------------|
| in              | mm  |                                  |
| 2               | 50  | 80                               |
| 3               | 75  | 60                               |
| 3-1/2           | 90  | 50                               |
| 4               | 100 | 40                               |
| 5               | 125 | 16                               |
| 6               | 150 | 14                               |

## POLYETHYLENE PUSH-FIT COUPLINGS

These couplings make it easy to rapidly assemble cut lengths of concrete-encased Super Duct. Push the spigot end of the duct into the fitting socket and hammer lightly against a piece of wood located at the end of the coupling or pipe until end of duct butts up against the inside shoulder of the fitting. Push-fit couplings are not watertight and are only recommended for use when encased in concrete.

## SPLIT DUCT

IPEX Split Duct is the simple solution to installing duct around existing cables, and repairing existing duct without costly cutting and re-splicing of cables.



## SALES AND CUSTOMER SERVICE

Customers call IPEX Electrical Inc.

Toll free: (866) 473-9462

[www.ipexna.com](http://www.ipexna.com)

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As leading suppliers of thermoplastic piping systems, IPEX by Aliaxis provides our customers with some of the world's largest and most comprehensive product lines. All IPEX by Aliaxis products are backed by more than 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, we have earned a reputation for product innovation, quality, end-user focus and performance.

Markets served by IPEX by Aliaxis products are:

- Electrical systems
- Telecommunications and utility piping systems
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- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems

Product is manufactured by IPEX Electrical Inc.

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A policy of ongoing product improvement is maintained. This may result in modifications of features and/or specifications without notice.



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