



ROYAL FLEX ENT

Pipe and Fittings



Royal Pipe Systems

Great Ideas Taking Shape.



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PRODUCT DESCRIPTION & APPLICATIONS

Royal Pipe Systems™ manufactures a complete line of Electrical Non-Metallic Tubing (ENT) and fittings. Royal Flex ENT is a corrugated flexible conduit that is used for electrical raceways. Our ENT and fittings are certified to the CSA Standard C22.2 No.227.1. Royal Flex ENT is available in ½ - 2" (12 - 50mm) diameters, FT-4 rated and comes on reels, coils or 10' (3m) straight lengths.

Royal Flex ENT is lightweight, durable and concrete tight; it is easy to pull cables and wires through the tubing. It can be installed in concrete slabs, fire-rated interior walls or directly buried.

Royal Flex ENT systems are used in encased concrete and direct burial applications. Our Royal Flex ENT and fittings are used in many applications, including:

- Commercial Buildings
- Institutional and Industrial Buildings
- Residential High-Rises
- Parking Lots - Direct Burial Pole to Pole Lighting

STANDARDS

Royal Flex ENT and fittings meet the requirements of the following codes:



Certified to
CSA C22.2 No. 227.1



UL 1653

CODES

Canadian Electrical Code (CEC)
Part I, Rules 12-1500 to 12-1514

This comprehensive manual was created with engineers, contractors, electricians and utilities in mind. It includes applications, benefits, design and installation guidelines for our high quality rigid PVC conduit and fittings. There is a complete section devoted to our fittings that includes dimensions, product codes and drawings for each fitting we offer. We hope that you find this manual useful in designing your next conduit system.

BENEFITS

Labour Savings

Royal Flex ENT is easy to install and simple to cut and join. No special tools are required for cutting or bending.

Reel Sizes

Royal Flex ENT is available in coils, reels and 10' (3m) straight lengths. The large reels have up to 2,000ft (610m) of ENT on each and allow for long continuous runs, therefore saving time and money.

Light Weight Material

Royal Flex ENT is much lighter than electrical metallic tubing (EMT).

Nominal Size in (mm)	ENT lb/1,000ft	EMT lb/1,000ft
1/2 (12)	100	295
3/4 (19)	125	440
1 (25)	175	668
1 1/4 (32)	185	970
1 1/2 (38)	220	1,100
2 (50)	319	1,517

Corrugated Interior

The inside of our ENT is corrugated therefore reducing build-up of friction compared to pulling cable through solid wall pipe.

Outside Diameters

The outside diameter of Royal Flex ENT is the same as the outside diameter of rigid PVC conduit. This allows for rigid PVC conduit fittings to be used with ENT.

Pull-out

All of our ENT and fitting connections meet the requirements of CSA C22.2 No.227.1 for pull-out resistance.

FT-4 Rating

Royal Flex ENT has achieved the designation FT-4 Rating in accordance to the Vertical Char Test in CSA C22.2 No.227.1 and UL 1653.

Flame Spread & Smoke Development Ratings

Royal Flex ENT has achieved the following flame spread and smoke development ratings as per CAN/ULC-S102.2M88.

Nominal Size in (mm)	Flame Spread Rating	Smoke Development Rating
1/2 (12)	0	50
3/4 (19)	0	50
1 (25)	0	85
1 1/4 (32)	5 - 15	305 - 490
1 1/2 (38)	5 - 15	305 - 490
2 (50)	5 - 15	305 - 490

Concrete Tight

When properly installed, Royal Flex ENT and fittings are concrete tight.

Corrosion Resistant

Our ENT and fittings are non-metallic therefore there is no risk of corrosion when exposed to naturally corrosive soil conditions. They will not rust or corrode from electrochemical and galvanic environments.

Direct Burial

Royal Flex ENT can be direct buried according to Rule 12-1502(1) of the Canadian Electrical Code (CEC).

Fittings

We offer a complete line of fittings to be used with our ENT. Fast, reliable slurry tight installations can be achieved with our snap-in couplings, connectors and adapters.

Quality Control & Assurance

Our ENT and fittings undergo extensive testing and inspection in our manufacturing facilities. Our products are certified to the CSA and UL Standards.



Diagram 1. ENT encased in a concrete application.

APPLICATIONS

Royal Flex ENT systems can be used in both combustible and non-combustible buildings. It can be used in all types of buildings including:

- low and high rise residential (single and multi family dwellings)
- low and high rise commercial
- non-patient areas of nursing homes and hospitals
- schools and dormitories
- recreational vehicles and parks
- marinas
- solar photovoltaic systems



Diagram 2. ENT and fittings in a High-Rise application.

Royal Flex ENT can be used for fire alarm systems in non-combustible buildings providing the following two conditions are satisfied.

1. The raceway is embedded in at least 2 inches (50mm) of masonry or poured concrete.
2. The transition from ENT to metal raceways is made in the concrete using a Royal transition fitting.

INSTALLATION

Cutting

No special tools are needed to cut Royal Flex ENT. It can be easily cut using conduit cutters, hacksaw or a fine-toothed hand saw. Deburr the cut end using a knife or file.

Bending

Royal Flex ENT can be bent by hand, however, ensure that the radius is at least six times the internal diameter of the tubing.

Tying

Royal Flex ENT needs to be tied down to the rebar at 3 foot (one-metre) intervals, if it is being encased in concrete. This is to prevent the ENT from floating to the top when the concrete is poured. Tie ENT down using wire, tie wraps or tape.

Fittings

For installation of fittings, insert the end of the ENT into the fitting, ensure that 2 full corrugations snap into the fitting beyond the flexible tabs.



Diagram 3. ENT is tied to the rebar in intervals.

Fire Separations

If ENT passes through a fire rated separation, a fire stopping device needs to be installed through the penetration.

Transitions

Couplings can be used as a transition from ENT to conduit, just solvent weld conduit end into coupling. We also offer a transition coupling with a set screw to go from ENT to EMT.

Procedure to Solvent Weld ENT

- Do not use chemical primer or cleaner.
- Apply uniform coat of solvent cement.
- Use a brush to apply, not a dauber.
- Brush excess cement out of corrugations.
- While cement is wet, insert ENT into fitting until stop is reached and give tubing a quarter turn.
- Do not disturb until joint is set.



Diagram 4. ENT is bendable and flexible.

IDENT-A-BOXES™ AND ISOLATOR MODULE BOXES

Ident-A-Boxes™

Our Ident-a-Box™ slab boxes are made from a high impact polymer material. They are available with hub extensions and moulded connectors or with knockouts. They have an extra large body size of 51.0 cubic inches (835cm³) with threaded brass inserts. When our slab boxes are used, it creates a completely non-metallic system, that will not corrode or conduct.

We offer connectors, adapters and couplings to connect the electrical system together. The locking tabs on the connectors create a secure connection that exceeds the CSA requirements for pull-out and are concrete tight.

Our slab boxes can be used with ceiling fans up to 35lb (15.9kg) and luminaries up to 50lb (22.7kg).

We offer 1" (25mm) slab box extension rings to be used with our slab boxes when the slab pour is thicker than normal and the rebar is of a heavier gauge (typically in parking garages, elevator shafts and stairwells).

We offer colour-coded lids on our Ident-a-Box™ slab boxes for easy identification of services both before and after the concrete is poured. They are available in grey, green, white, blue, yellow and red. Typical uses for each colour:

- Grey - generic
- Green - security, cable, telephone
- White - hydro 600 volt
- Blue - hydro 120 volt
- Yellow - emergency lighting/exit signs
- Red - fire alarm systems



Diagram 5. Colour coded lids for easy electrical identification.



Diagram 5. Ident-A-Box™ with Hub Extensions.

Isolator Module Boxes

Isolator Module Boxes are used with fire alarm systems in low and high rise residential construction. These boxes provide an approved non-conductive PVC slab box for the isolator indicator module in buildings.

CSA Certified

All of our Ident-a-Box™ slab boxes, extension rings, Isolator Module Boxes along with our ENT pipe and fittings are all certified to the CSA C22.2 No.227.1 Standard.

COILS

Nominal Size in (mm)	Average Inside Diameter in (mm)	Average Outside Diameter in (mm)	Length Per Coil ft (m)	Length Per Skid ft (m)	Weight Per Coil lb (kg)
1/2 (12)	0.574 (15)	0.840 (21)	370 (112.8)	4,440 (1,353.6)	37 (16.8)
3/4 (19)	0.778 (20)	1.050 (27)	240 (73.1)	2,880 (877.2)	30 (13.6)
1 (25)	1.000 (25)	1.315 (33)	160 (48.8)	1,920 (585.6)	28 (12.7)
1 1/4 (32)	1.340 (34)	1.660 (42)	500 (152.4)	1,500 (457.2)	102 (46.3)
1 1/2 (38)	1.574 (40)	1.897 (48)	300 (91.4)	900 (274.2)	72 (32.7)
2 (50)	2.020 (51)	2.375 (60)	225 (68.6)	675 (205.8)	62 (28.1)

REELS

Nominal Size in (mm)	Average Inside Diameter in (mm)	Average Outside Diameter in (mm)	Length Per Reel ft (m)	Weight Per Reel lb (kg)
1/2 (12)	0.574 (15)	0.840 (21)	2,000 (609.6)	250 (113.4)
3/4 (19)	0.778 (20)	1.050 (27)	1,500 (457.2)	240 (108.9)
1 (25)	1.000 (25)	1.315 (33)	1,000 (304.8)	225 (102.1)
1 1/4 (32)	1.340 (34)	1.660 (42)	1,000 (304.8)	198 (89.8)
1 1/2 (38)	1.574 (40)	1.897 (48)	750 (228.6)	180 (81.6)
2 (50)	2.020 (51)	2.375 (60)	500 (152.4)	205 (93.0)

STRAIGHT LENGTHS 10' (3M)

Nominal Size in (mm)	Average Inside Diameter in (mm)	Average Outside Diameter in (mm)	Length Per Bundle ft (m)	Length Per Skid ft (m)	Weight Per Skid lb (kg)
1/2 (12)	0.574 (15)	0.840 (21)	100 (30.5)	3,600 (1,097.2)	390 (176.9)
3/4 (19)	0.778 (20)	1.050 (27)	100 (30.5)	4,000 (1,219.1)	582 (264.0)
1 (25)	1.000 (25)	1.315 (33)	100 (30.5)	2,400 (731.5)	457 (207.3)

SPECIFICATION


All wiring shall be installed in Royal Flex ENT and secured by means of proper fittings.
All ENT and fittings shall be manufactured by Royal Pipe Systems™ and are FT-4 rated.


ENT and fittings shall be certified to CSA C22.2 No.227.1/ UL 1653.

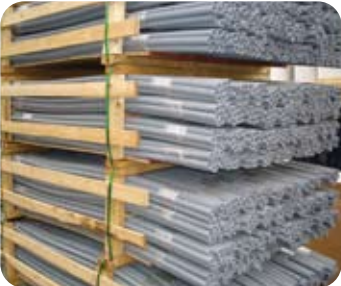
All slab boxes shall be colour-coded Ident-a-Boxes™.




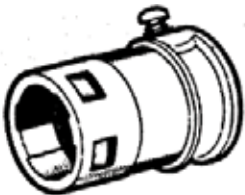
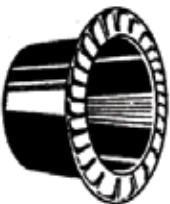
Penetration of fire-rated walls, floors and ceilings shall have firestopping devices installed.


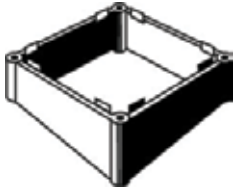
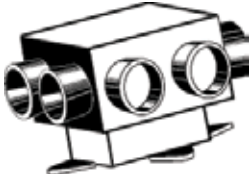


ROYAL FLEX ENT AND FITTINGS

Description	Product Number	UPC Number	Size	Feet/Coil
ENT COILS 	EN050	14300	1/2"	370
	EN075	14310	3/4"	240
	EN100	14320	1"	160
	EN125	14330	1 1/4"	500
	EN150	14335	1 1/2"	300
	EN200	14340	2"	225

Description	Product Number	UPC Number	Size	Feet/Reel
ENT REELS 	ENR050	14350	1/2"	2,000
	ENR075	14360	3/4"	1,500
	ENR100	14370	1"	1,000
	ENR125	14380	1 1/4"	1,000
	ENR150	14385	1 1/2"	750
	ENR200	14390	2"	500

Description	Product Number	UPC Number	Size	Feet/Bundle
ENT STRAIGHT LENGTHS 10 Feet Per Length 	EN10050	14325	1/2"	100
	EN10075	14326	3/4"	100
	EN10100	14327	1"	100
Sold in Full Skid Quantities Only				

Description	Product Number	UPC Number	Size	Carton Quantity
PVC COUPLINGS FOR ROYAL FLEX™ 	RKC10	49530	1/2"	150
	RKC15	49540	3/4"	100
	RKC20	49550	1"	50
	RKC25	49554	1 1/4"	50
	RKC30	49556	1 1/2"	40
	RKC35	49558	2"	15
PVC QUICK CONNECTORS FOR ROYAL FLEX™ C/W Lock Nut 	RKTA10	49750	1/2"	150
	RKTA15	49760	3/4"	100
	RKTA20	49770	1"	50
	RKTA25	49774	1 1/4"	50
	RKTA30	49776	1 1/2"	50
	RKTA35	49778	2"	25
PVC QUICK-SNAP CONNECTOR 	RKTS10	49700	1/2"	150
	RKTS15	49710	3/4"	100
	RKTS20	49715	1"	50
PVC QUICK ADAPTER ROYAL FLEX™ TO E.M.T. 	RKTC10	49580	1/2"	125
	RKTC15	49590	3/4"	100
	RKTC20	49600	1"	50
ROYAL FLEX™ TAPERED PLUGS 	RTP10	49780	1/2"	250
	RTP15	49790	3/4"	100
	RTP20	49800	1"	100

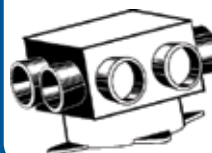
Description	Part Number	UPC Number	Size	Carton Quantity
ROYAL FLEX™ STUBBYS 	RECM10	49610	1/2"	150 / 500
	RECM15	49620	3/4"	150 / 500
	RECM20	49630	1"	200
	RECM25	49640	1 1/4"	200
SLAB BOX 1" EXTENSION RING C/W Long Screws Price per 100 units 	RSMBEXTENSION	49996	-	10
ISOLATOR MODULE SLAB BOX Price per 100 units 	RSMB10/15-IMB	49867	4" x 1/2"	20
			4" x 3/4"	
HEAVY DUTY LOCK NUT Price per 100 units 	RLN10	49670	1/2"	200
	RLN15	49680	3/4"	200
	RLN20	49690	1"	200
ENT CUTTERS Call for pricing 	RFCUT	49560	1/2" - 2"	25
	REPLACEMENT BLADES	49570	-	-
*Cutter will cut up to 2" ENT.				

PVC UNDERGROUND DUCT FITTINGS

Royal Slab Ident-A-Box™ - Quick Snap PVC Slab Box with Hub Extensions
Comes with Moulded Connectors and Extra Large Body Design (51.0 in3)

Description	Part Number	UPC Number	Lid Colour	Carton Quantity
8 x 1/2"	RSMB-H-10	49720	GREY	25
	RSMB-H-10G	49721	GREEN	25
	RSMB-H-10W	49722	WHITE	25
	RSMB-H-10B	49723	BLUE	25
	RSMB-H-10Y	49724	YELLOW	25
	RSMB-H-10R	49725	RED	25
8 x 3/4"	RSMB-H-15	49801	GREY	25
	RSMB-H-15G	49802	GREEN	25
	RSMB-H-15W	49803	WHITE	25
	RSMB-H-15B	49804	BLUE	25
	RSMB-H-15Y	49805	YELLOW	25
	RSMB-H-15R	49806	RED	25
4 x 1/2" 4 x 3/4"	RSMB-H-10/15	49730	GREY	25
	RSMB-H-10/15G	49731	GREEN	25
	RSMB-H-10/15W	49732	WHITE	25
	RSMB-H-10/15B	49733	BLUE	25
	RSMB-H-10/15Y	49734	YELLOW	25
	RSMB-H-10/15R	49735	RED	25
NEW 4 x 3/4" 4 x 1"	RSMB-H-15/20	49836	GREY	25
	RSMB-H-15/20G	49837	GREEN	25
	RSMB-H-15/20W	49838	WHITE	25
	RSMB-H-15/20B	49839	BLUE	25
	RSMB-H-15/20Y	49846	YELLOW	25
	RSMB-H-15/20R	49847	RED	25
4 x 1/2" 4 x 1"	RSMB-H-10/20	49742	GREY	25
	RSMB-H-10/20G	49841	GREEN	25
	RSMB-H-10/20W	49842	WHITE	25
	RSMB-H-10/20B	49843	BLUE	25
	RSMB-H-10/20Y	49844	YELLOW	25
	RSMB-H-10/20R	49845	RED	25
4 x 1/2" 2 x 3/4" 2 x 1"	RSMB-H-10/15/20	49740	GREY	25
	RSMB-H-10/15/20G	49831	GREEN	25
	RSMB-H-10/15/20W	49832	WHITE	25
	RSMB-H-10/15/20B	49833	BLUE	25
	RSMB-H-10/15/20Y	49834	YELLOW	25
	RSMB-H-10/15/20R	49835	RED	25

IDENT-A-BOX™ COLOUR LEGEND



Grey: Generic
 Green: Security, Cable, Telephone
 White: Hydro - 600 Volt
 Blue: Hydro - 120 Volt
 Yellow: Emergency and Lighting Signs
 Red: Fire Alarm

ROYAL FLEX ENT AND FITTINGS

Royal Slab Ident-A-Box™ - Quick Snap PVC Slab Box with Knockouts Extra Large Body Design (51.0 in3)

Description	Part Number	UPC Number	Lid Colour	Carton Quantity
8 x 1/2"	RSMB-10	49852	GREY	25
	RSMB-10G	49853	GREEN	25
	RSMB-10W	49854	WHITE	25
	RSMB-10B	49855	BLUE	25
	RSMB-10Y	49856	YELLOW	25
	RSMB-10R	49857	RED	25
8 x 3/4"	RSMB-15	49870	GREY	25
	RSMB-15G	49871	GREEN	25
	RSMB-15W	49872	WHITE	25
	RSMB-15B	49873	BLUE	25
	RSMB-15Y	49874	YELLOW	25
	RSMB-15R	49875	RED	25
4 x 1/2" 4 x 3/4"	RSMB-10/15	49860	GREY	25
	RSMB-10/15G	49861	GREEN	25
	RSMB-10/15W	49862	WHITE	25
	RSMB-10/15B	49863	BLUE	25
	RSMB-10/15Y	49864	YELLOW	25
	RSMB-10/15R	49865	RED	25
NEW 4 x 3/4" 4 x 1"	RSMB-10/20	49866	GREY	25
	RSMB-10/20G	49867	GREEN	25
	RSMB-10/20W	49868	WHITE	25
	RSMB-10/20B	49869	BLUE	25
	RSMB-10/20Y	49876	YELLOW	25
	RSMB-10/20R	49877	RED	25
4 x 1/2" 2 x 3/4" 2 x 1"	RSMB-10/15/20	49891	GREY	25
	RSMB-10/15/20G	49892	GREEN	25
	RSMB-10/15/20W	49893	WHITE	25
	RSMB-10/15/20B	49894	BLUE	25
	RSMB-10/15/20Y	49895	YELLOW	25
	RSMB-10/15/20R	49896	RED	25
4 x 3/4" 2 x 1" 2 x 1/2"	RSMB-15/20/10	49990	GREY	25
	RSMB-15/20/10G	49991	GREEN	25
	RSMB-15/20/10W	49992	WHITE	25
	RSMB-15/20/10B	49993	BLUE	25
	RSMB-15/20/10Y	49994	YELLOW	25
	RSMB-15/20/10R	49995	RED	25

IDENT-A-BOX™ COLOUR LEGEND



Grey:	Generic
Green:	Security, Cable, Telephone
White:	Hydro - 600 Volt
Blue:	Hydro - 120 Volt
Yellow:	Emergency and Lighting Signs
Red:	Fire Alarm



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