Kalister

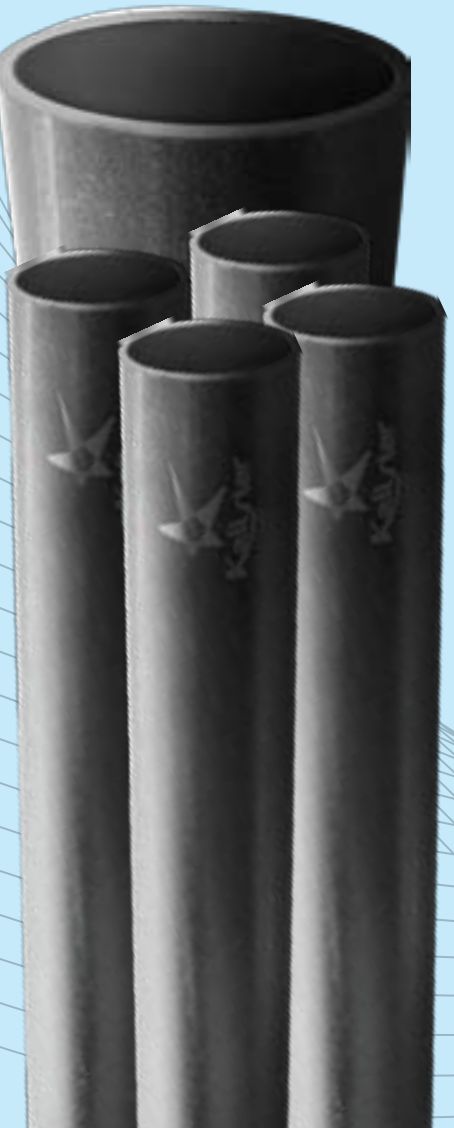
Reliable

Cable Management System

Conduits

The need for improved quality and reduced cost of wiring installations puts demands on all concerned in the project from consultants to contractors

Kalister conduit systems offer the expertise and facilities to handle these demands effectively and economically. We designed our conduits, slab boxes and accessories to create an integrated raceway system tough enough to meet the rugged day to day challenges of the construction Industry.



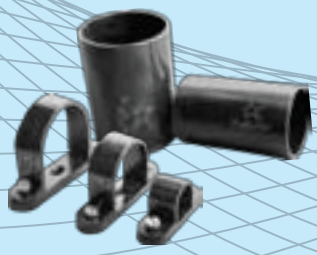
Kalister PVC Nonmetallic Tubes (Electrical rigid Conduits) are designed to use as Electrical cable/ wire raceways. Protection is provided from dust, oil, dirt, water as well as a wide range of corrosive atmosphere.

Kalister Conduits and fittings set new standards in performance and aesthetic appeal. They are the natural choice for fast moving environments with versatility built in. Kalister offers Adapters, couplings, elbows, access fittings, boxes, cover plates, expansion fittings and spacers- Virtually any fitting required to complete the PVC Conduit system

Innovation

Kalister Firm – Core PVC pipes have solid PVC inner and outer walls which enclose a cellular core layer. This technique offers good die electric and thermal properties to suit electrical industries

Kalister conduits are specifically designed for use in premise and rapid transit applications that require zero halogen content and flame retardance requirements. The Kalister conduit utilizes zero halogen compounds instead of chlorine and fluorine, minimizes acid generation when the product exposed to a fire outbreak. This will minimize corrossivity which is harmful for very sensitive electronic equipments.



Features

- Firm core structure (Double Wall) gives added die electric properties
- Self extinguishing PVC
- Standard Electrical Black
- Impact Resistant PVC
- Non Corroding
- Non Combustible 2 Hours
- Fire Resistant
- Flexible enough to be bend by hand, yet tough enough to withstand crushing and breaking
- Interior surface significantly reduces the amount of friction when pulling cables through long runs, even in runs with 90° bends.

Strength

Kalister PVC Fittings offer both high impact and high tensile strength

Corrosion Resistant

PVC is resistant to external corrosion and pitting and will not rust. This ensures a lower maintenance cost and longer performance life.

Non Conductive

PVC eliminates the most dangerous second point to contact in phase to ground faults. The use of separate ground conductor gives a complete and positive ground for the entire system

Chemical Resistant

Kalister conduit and fittings are resistant to a wide range of chemicals such as acids, alkalies, or salt solutions.

Fire Resistance

As a building material PVC offers outstanding performance characteristics. PVC will not burn unless an external flame source is applied, and will not sustain ignition once the flame source is removed. Kalister PVC Conduits and fittings has a flash ignition temperature of 850° F

Conduits

Specification

Electrical Round Rigid Conduit & Fittings

• Product Name	Kalister UPVC Conduit Systems
• Application	Conduit for LV Systems, Electrical Power & Light, Data, Telecommunication, used in Building wiring
• Length	3 m
• Colour	Black/ White
• Manufactured according to	BS 4607, BS 6099, BS EN 50086-1:1994
• Manufactured to meet	UL 1653, NEMA TC-13
• Chemical Name	Base Resin: Co Polymer Resin

Applicable Standard

Comply with the requirements of BS 4607 Parts 1 & 5 KSS 230 & 231 of 1986

Mechanical Properties

Tensile strength, Yield	ASTM D 638	7,800 PSI
Flexural Modulus	ASTM D 790	9,200 PSI
Thermal Properties		
Melting Point	ASTM D 789	420 F

Heavy Guage (HG)

High Impact

Size	Cat No	Std Packing
20 mm	20 CHG	100 Lengths
25 mm	25 CHG	100 Lengths
32 mm	32 CHG	100 Lengths
38 mm	38 CHG	100 Lengths
50 mm	50 CHG	100 Lengths

Medium Gauge

Medium Impact

Size	Cat No	Std Packing
20 mm	20 CMG	100 Lengths
25 mm	25 CMG	100 Lengths
32 mm	32 CMG	100 Lengths
38 mm	38 CMG	100 Lengths
50 mm	50 CMG	100 Lengths

Low Gauge

Low Impact

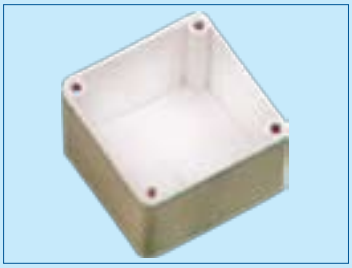
Size	Cat No	Std Packing
20 mm	20 CLG	100 Lengths
25 mm	25 CLG	100 Lengths
32 mm	32 CLG	100 Lengths
38 mm	38 CLG	100 Lengths
50 mm	50 CLG	100 Lengths

Accessories

UPVC Conduit Accessories

Comply with the requirements of BS 4607 parts 1 & 5 KSS 230 & 231 of 1986.

Adaptable Box 75mm x 75mm (AB) for one, angle, through, three and four way entries of 32 x 38 mm diameters.



Adaptable Box 110 mm x 110 mm (AB) For one, angle, through, three and four way entries of 20, 25, 32, 38 and 50mm diameter.

One Gang Switch Box (1GSB)

Two Gang Switch Box (2GSB) provided with 20mm knock-outs.

Surface Switch Box 78 x 78 x 32 mm (SSB) provided with 20mm knock-out on opposite sides.

Surface Switch Box Double (SSBD)

Bends (BE)

Circular Junction Boxes
available in sizes of 20 and 25 mm.

Loop –in

CLB 20

Angle

CBA 20
CBA 25

U-way

CBU 20
CBU 25

Terminal

CBTR 20
CBTR 25

Tee

CBT 20
CBT 25

Y-way

CBY 20
CBY 25

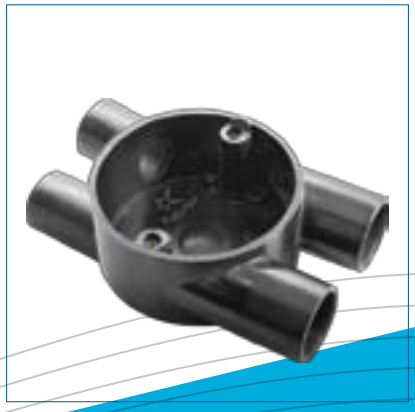
Through

CBTH 20
CBTH 25

Intersection

CBI 20
CBI 25

H-way



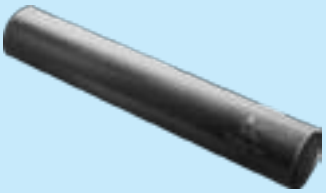
CBH 20
CBH 25

Accessories

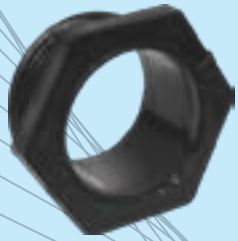
Couplers (CC)

Sizes :
20mm
25mm
32mm
38mm
50mm

Expansion Couplers (ECC)



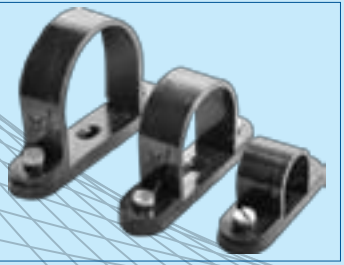
Sizes :
20mm
25mm
32mm
38mm
50mm



Female Adaptor (FA)

Sizes:
20mm
25mm
32mm
38mm
50mm

Saddle, Bases & Screws (CSBS)



Sizes:
20mm
25mm
32mm
38mm
50mm

Reducer (CR)
Size: 25 x 20mm

Circular Lids (CL)

Square Lids (SLSB)
With two fixing points for
1 Gang Switch Box

Circular Extension Ring (CER)
12.5mm, 35.0mm

Installation

Installation

Kalister raceways, fittings, boxes, and accessories shall be installed in accordance with Article 362 of the 2002 National Electrical Code

Where conduit penetrates a fire rated wall, floor or ceiling assembly, an approved fire stop system as listed in UL Building Materials directory or other nationally recognized testing laboratory shall be used.

Assembly

Join PVC fittings with PVC Conduits by Kalister Solvent cement. After cutting PVC Conduit, sharp edges or burrs from inside the conduit should be removed with a knife. Thoroughly clean the end of the pipe and inside the fitting with a pipe cleaner. Apply a generous amount of solvent cement to both surfaces, side 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.

Expansion and Contraction

All conduit pipe and fittings expand and contract with changes in temperature. All materials expansion and contraction rates are represented by coefficients of thermal expansion.

A general rule of thumb is that for every 100˚F temperature change in a 100 ft. run of PVC conduit; the conduit will undergo 3.6” of expansion or contraction.

Use of Expansion Joints

In installations where the expected temperature variation exceeds 25˚F expansion joints must be used. An expansion joint consists of two tubes, one telescoping inside another. When installing expansion joints alignment of the piston and barrel is important. Straps should be placed approximately one foot on either side of the joint to ensure that any movement is directed squarely into the joint.

Installation

When expansion joints are required the following steps should be followed:

1. DETERMINE NUMBER OF JOINTS REQUIRED:

Use the following formula to calculate the total expected expansion in the run.

$$\text{Total Expansion} = \frac{\text{Total Temp. Change °F} \times \text{Length of run ft.} \times 0.36}{10 \times 100}$$

The expansion joints should then be installed at even intervals throughout the run.

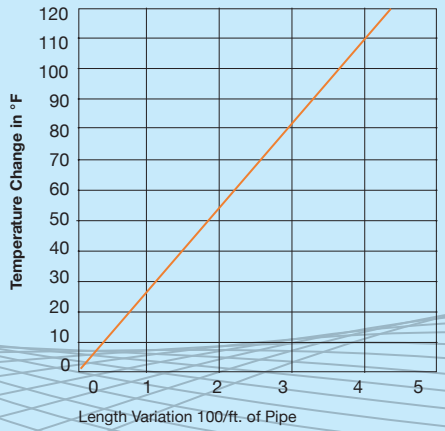
$$\text{Number of Joints} = \frac{\text{Total expansion}}{4}$$

2. DETERMINE PISTON OPENING

The expansion joint must be installed to allow both expansion and contraction of the conduit run. Because installation temperatures may vary, the piston setting must be determined. The correct piston opening is determined using the following formula:

$$\text{Piston (in)} = \frac{\text{max temperature (°F)} - \text{installing temperature (°F)} \times 4}{\text{Temperature change (°F)}}$$

PVC Pipe Length Variation
Due to Temperature Change (°F)
Coefficient = 3.6 x 10 $^{-4}$ in./ft./°F



Installation

Location of Expansion Joints

Proper functioning of an expansion joint depends on three procedures:

- The correct placement of the expansion joint.
- The proper installation of rigid PVC conduit and the expansion joint.
- The proper placement and fastening of support straps.

One Expansion Joint

If only one expansion joint is needed between two boxes, the barrel of the joint should be rigidly fastened close to the first box. Rigid PVC conduit should then be loosely supported with straps, allowing the conduit to move freely as it expands and contracts.

Two Expansion Joints

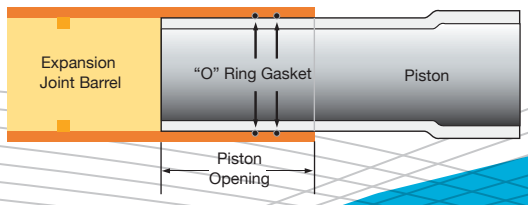
If two expansion joints are needed, the joints should be firmly fastened back to back at the center of the run. Rigid PVC conduit should be loosely supported with straps, allowing the conduit to move freely as it expands and contracts.

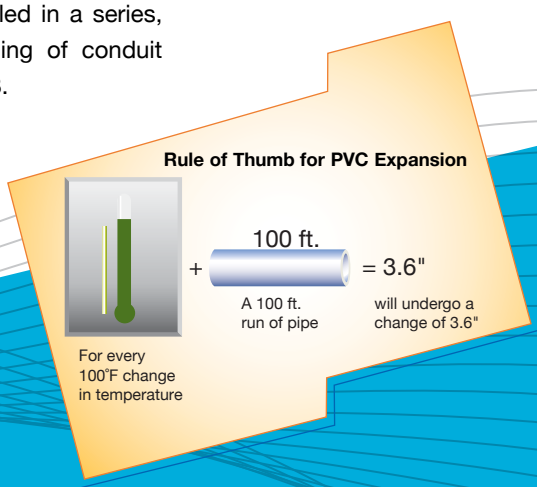
Two Expansion Joints (Alternative)

Alternatively, the center of the run and the two expansion joints (located at the boxes) should be rigidly fastened. All other support straps should be loosely fastened.

Three or More Expansion Joints

If more than two joints are needed in a very long run, they should be put in a series, one after the other. Each barrel must be rigidly fastened while conduit is loosely supported with straps allowing the conduit to move freely as it expands and contracts. When installed in a series, each section acts independently of the other. Spacing of conduit supports must be in accordance with NEC article 347-8.





Recommended Practice

Kalister non-metallic conduits are so constructed that it will be possible to bend the conduit easily with the aid of bending spring and all conduits and conduit fittings are of unthreaded type. The number of single core, PVC insulated non-sheathed cables run in one conduit shall be such that it permits easy drawing of the cables. The actual number of cables drawn into any conduit shall not be greater than the number given in the appropriate table. Where different sizes of cables are drawn into a conduit, the number and sizes of cables installed shall be selected in accordance with the method detailed in tables. A separate insulated earth wire shall be drawn into all rigid non-metallic conduits.

Capacity of Conduits

Table 1

Capacity of conduits for simultaneous drawing of single core PVC insulated cable for a straight run upto 10m without bends.

Nominal cross sectional area of conductor	Size of Conduit (mm)				
	20	25	32	38	50
1.5	11	-	-	-	-
2.5	8	-	-	-	
4.0	5	10	-	-	-
6.0	4	7	13	-	-
10.0	2	4	7	10	-
16.0	2	3	6	9	
25.0	-	2	4	5	10
35.0	-	-	3	4	7
50.0	-	-	2	3	5
70.0	-	-	-	2	4

Table 2

Capacity of conduits for simultaneous drawing of single core PVC insulated cables for a run upto 10m with one bend.

Nominal cross sectional area of conductor	Size of Conduit (mm)				
	20	25	32	38	50
1.5	8	-	-	-	-
2.5	6	-	-	-	-
4.0	4	8	-	-	-
6.0	3	6	11	-	-
10.0	-	3	6	8	-
16.0	-	2	5	7	12
25.0	-	-	3	4	8
35.0	-	-	2	3	6
50.0	-	-	-	2	4
70.0	-	-	-	-	3

Table 3

Capacity of conduits for simultaneous drawing of single core PVC insulated cables for a run upto 10m with 2 bends

Nominal cross sectional area of conductor	Size of Conduit (mm)				
	20	25	32	38	50
1.5	6	11	-	-	-
2.5	4	8	-	-	-
4.0	3	6	-	-	-
6.0	2	4	8	11	
10.0	-	2	4	6	10
16.0	-	2	3	5	9
25.0	-	-	2	3	5
35.0	-	-	-	2	4
50.0	-	-	-	-	3
70.0	-	-	-	-	2

For each size of cable it is intended to use, obtain the appropriate factor from Table 4.
Add all the cable factors so obtained and compare with the conduit factor given in Table 5.
The conduit size which will satisfactorily accommodate the cables is that size having a factor equal to or exceeding the sum of the cable factor.

Table 4

Cable Factor

Nominal cross sectional area of conductor mm^2	1.5	2.5	4.0	6.0	10.0	16.0	25.0	35.0	50.0	70.0
Cable Factor	22	30	43	58	105	121	193	253	342	451

Table 5

Conduit Factor

Conduit Size mm	16	20	25	32	38	50
Upto 10mm without bend	150	244	442	783	1092	1943
Upto 10mm with one bend	120	196	358	643	883	1571
Upto 10mm with 2 bend	86	141	260	474	646	1149

Corrugated Conduit

Product

- Liquid tight raceway.
- Component, extra-flexible non-metallic mechanical protection tubing
- Corrugated flame resistant PVC with integral reinforcing member.
- Non-conductive raceway
- Impact resistant UV stabilised PVC Corrugated conduit

Temperature Rating

- 60˚C Dry
- 60˚C wet and oily

Applications

- Recognized component for use in protection of insulated wire in assemblies or consoles of electrical apparatus.
- Non-UL liquid tight raceway.

References & Rating

- Recognized component Liquidtight Mechanical Protection Tubing under UL File Number E79977
- Designed to BS 4607 & IEC423

Code	Size (mm)	Coil Length (m)	Bend radius (mm)
SFC 12	12	50	12.25
SFC 16	16	50	15.75
SFC 20	21	50	20.75
SFC 25	27	50	27.50
SFC 35	35	50	35.00
SFC 40	41	50	39.75
SFC 50	53	50	51.00

NB: All dimensions and are subject to normal manufacturing tolerances.

Construction
Superflex conduit has a circular cross section with a smooth polyvinyl chloride (PVC) inner surface and an integral reinforcing member within the conduit wall.

Grounding
Where applicable a separate grounding conductor is required for all trade sizes.

Markings
The product marking is contained on the outer carton.

Specification

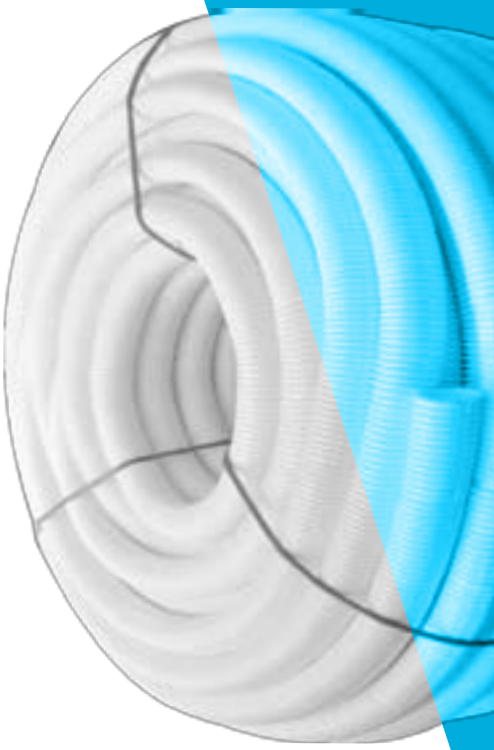
Description

- Recognized component extra flexible non-metallic mechanical protection tubing and
- Non-Ul Extra-Flexible Non-metallic conduit

Starflex® Non Metallic Corrugated conduit is designed for use in connection with the support of and protection of insulated wires, placed within the conduit that are used to interconnect separate component assemblies or console of electrical apparatus.

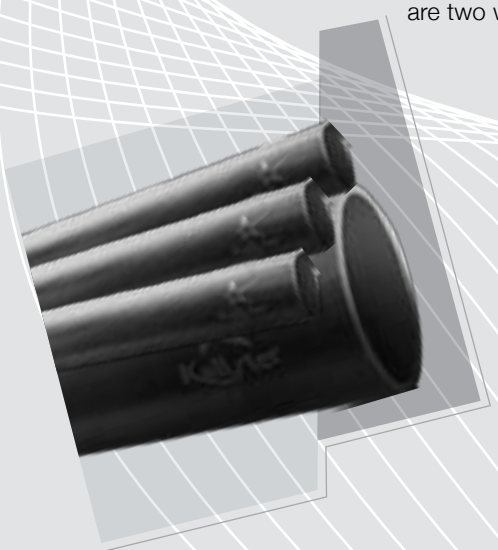
The acceptable use of this material is limited to the following conditions:

- Starflex® conduit may be used for the routing of internal wiring between electrical components of electrical equipment. The protection afforded to the internal wiring by the tubing may be considered equivalent to the protection afforded the internal conductors by the jacket of a Type SJT flexible cord.
- Starflex® conduit is suitable for use at a maximum temperature of 60˚C.
- Starflex® conduit shall be terminated at each end of the console or appliances to which connected to provide strain relief to withstand a 30-pound pull for 1.0 minute. Fittings available from us meet this requirement.
- The percent fill of the conduit with conductors shall not exceed 75% where percent fill is defined as : Percent Fill = Area of Enclosed Conductors x 100 / Internal Area of Tubing Fill Factor.
- The minimum bend radius shall not be less than the outside diameter of the conduit.
- The manufacturer's fittings were subjected to the Oil Spray Test in accordance with international standards



Starflex® conduit is designed for use in wet, dry or oily locations as a flame resistant, non-metallic raceway for power, control and communications cables. The product is intended for use at 60˚C (140˚F) in a dry location, 60˚C (140˚F) in a wet location and 60˚C (140˚F) in oily location. It is sunlight resistant.

"Quality" and "Environment-Care"
are two watch-words at Kalister Group



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