ASTRAL PIPES

CIN NO: L25200GJ1996PLC029134

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ISO 9001 CERTIFIED COMPANY
By Bureau Veritas (India) Pvt. Ltd.

ASTRAL TOLL FREE 1800 233 7957
Please get in touch with us between 10 a.m. to 6 p.m.

AWG/PC/000
REV. 00/10/19

ASTRAL PIPES

Wire Guard®

CONDUIT PIPES AND FITTINGS FOR PROTECTION OF CONCEALED WIRING

PRODUCT CATALOGUE

CONTENTS

1st TO INTRODUCE CPVC IN INDIA

1st TO INTRODUCE UPVC LEAD FREE PIPES IN INDIA

1st TO INTRODUCE LOW NOISE PP DRAINAGE PIPES IN INDIA

1st TO INTRODUCE FOAMED PVC DRAINAGE PIPES IN INDIA

1st TO INTRODUCE LEAD FREE COLUMN PIPES IN INDIA

1st TO INTRODUCE POLYMER BASED INDUSTRIAL PIPING SYSTEM IN INDIA

1st TO INTRODUCE NSF APPROVED SOLVENT CEMENT IN INDIA

1st TO INTRODUCE CPVC PIPING FOR AUTOMATIC FIRE SPRINKLER SYSTEM IN INDIA

ASTRAL, INDIA'S PROGRESSIVE PIPE COMPANY

Established in 1996 with the aim to manufacture best-in-globe plastic piping systems, Astral Pipes fulfils emerging piping needs of millions of houses and adds extra mileage to India's developing real estate fraternity with the hallmark of unbeaten quality and innovative piping solutions. Keeping itself ahead of the technology curve, Astral has always been a front runner in the piping category by bringing innovation and getting rid of old, primitive and ineffective plumbing methods. Bringing CPVC in India, and pioneering in this technology, have set Astral apart and its highest quality enabled it to obtain NSF approval for its CPVC pipes and fittings. Astral went beyond the category codes by launching many industry firsts, like launching India's first lead-free uPVC pipes for plumbing as well as for stream water, just to name a few.

Astral Pipes offers the widest product range across this category when it comes to product applications. Astral Pipes is equipped with production facilities at Santej and Dholka in Gujarat, Hosur in Tamil Nadu, Ghiloth in Rajasthan and Sangli in Maharashtra to manufacture plumbing systems, drainage systems, agriculture systems, fire sprinkler piping systems, industrial piping and electrical conduit pipes with all kinds of necessary fittings.

Astral Pipes' Infrastructure division Rex offers a comprehensive product range including corrugated piping for drainage and cables, polyolefin cable channels, sewage treatment plants, plastic sheathing ducts, suction hoses, and sub-surface drainage systems. This range helps Astral to establish a strong foothold in infrastructure and agriculture sector in the constantly evolving business of piping.

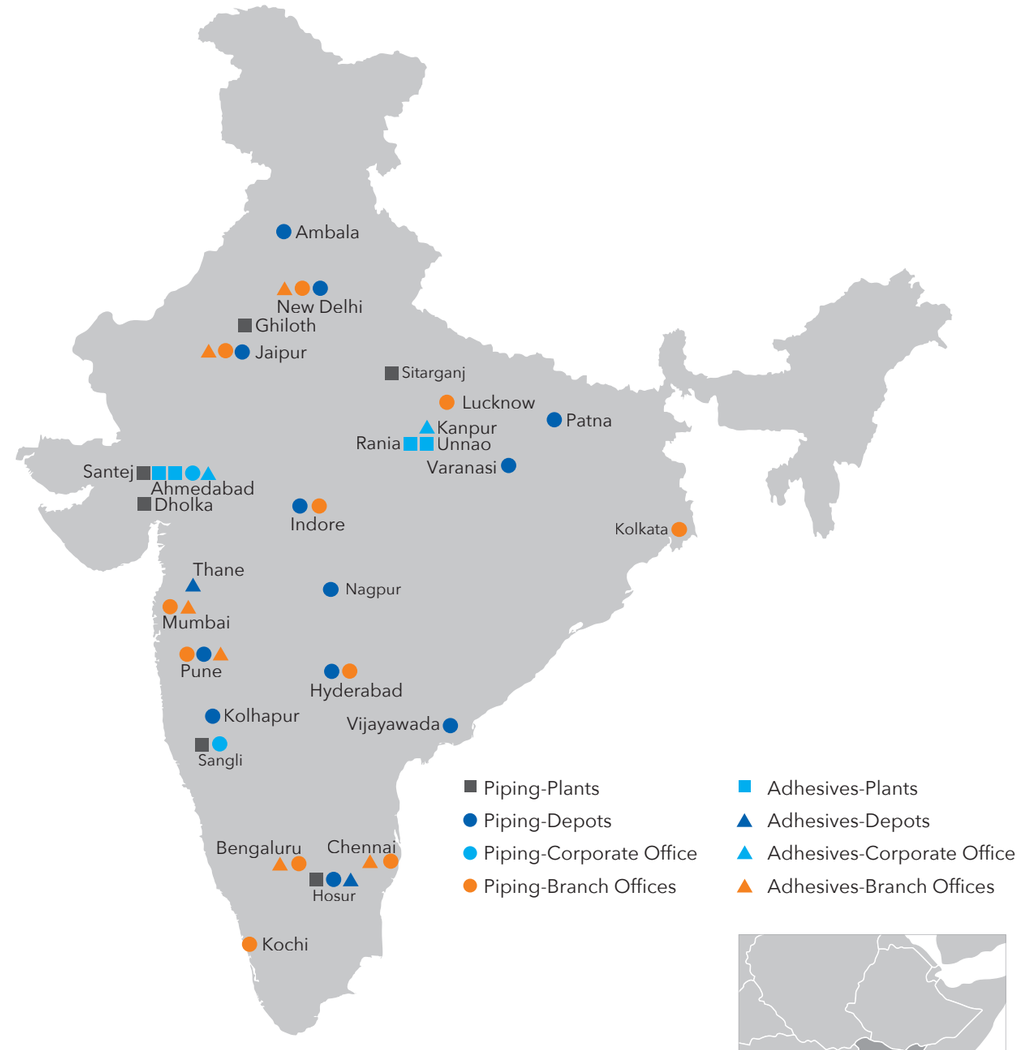
In 2014, Astral forayed into the adhesives category by acquiring UK-based Seal It Services Ltd. and Kanpur based Resinova Chemie Ltd., which manufacture adhesives, sealants and construction chemicals. With five manufacturing facilities now in this business segment, Astral has strengthened its presence in the category and made rapid inroads.

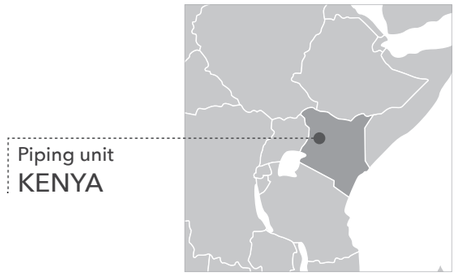
INNOVATION & RECOGNITIONS

- First to introduce CPVC piping system in India (1999)
- First to launch lead free uPVC piping system in India (2004)
- Corp Excel- National SME Excellence Award (2006)
- First to get NSF Certification for CPVC piping system in India (2007)
- First to launch lead-free uPVC column pipes in India (2012)
- Enterprising Entrepreneur of the year (2012-13)
- Business Standard Star SME of the year (2013)
- Inc. India Innovative 100 for Smart Innovation under category of 'Technology' (2013)
- India's Most Promising Brand Award (2014)
- Value Creator Award during the first ever Fortune India Next 500 (2015)
- India's Most Trusted Pipe Brand Award (2016 & 2019)
- ET Inspiring Business Leaders of India Award (2016)
- India's Most Attractive Pipe Brand Award (2016)
- Fortune India 500 Company (2016)
- Consumer Validated Superbrands India (2017 & 2019)

MARKETING NETWORK

ASTRAL has a marketing network of more than 800 distributors and 30,000 dealers spread all over India with branch offices at Mumbai, Pune, Delhi, Bengaluru, Chennai, Hyderabad, Jaipur, Lucknow and Kochi. Apart from that ASTRAL has its own warehouses at Bengaluru, Vijaywada, Hyderabad, Delhi, Ghaziabad, Kolhapur, Pune, Nagpur, Indore, Varanasi, Jaipur & Hosur to deliver the material as quick as possible. More than 400 techno marketing professionals and administrative personnel are on the board to coordinate with architects, plumbing contractors and plumbers to utilize the best plumbing techniques and to get the best from the products.





Piping unit
KENYA

ABOUT Wire Guard®

Fire is one of the major hazards to life and property, and electrical installations are perhaps one of the primary sources for generation and propagation of fire. Protection of cables and raceways against fire is therefore an important and primary consideration in the design and industry standards.

ASTRAL WIRE GUARD conduit pipes and fittings have good impact strength, low conductivity and chemical resistance. They have high heat deflection temperature and ductile behavior even at low temperatures.

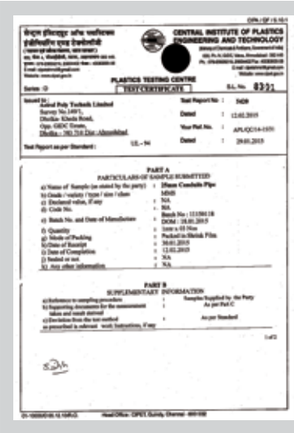
ASTRAL WIRE GUARD conduit is the very light in weight compared to other materials and reasonable in terms of cost. ASTRAL WIRE GUARD conduit pipes are available in three different wall thicknesses with the thin-wall variety being suitable for embedded use in concrete and heavier grades suitable for direct burial and exposed work.

ASTRAL WIRE GUARD conduit pipes and fittings resist moisture and most corrosive substances. Joints to fittings are made with slip-on solvent welded connections, which stick rapidly on assembling and attain full strength in about a few hours.

APPROVALS

ERDA CERTIFICATE

CPRI CERTIFICATE



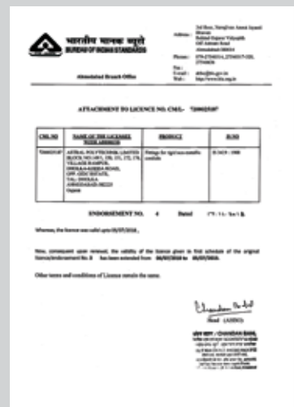
CIPET CERTIFICATE

CIPET CERTIFICATE

ISO 9001:2015
QMS CERTIFICATE

ISO 9001:2015
QMS CERTIFICATE

MCGM CERTIFICATE



IS 3419:1988
CERTIFICATE

IS:9537 (PART-3):1983
CERTIFICATE

PRODUCT
SPECIFICATION

ASTRAL Rigid uPVC Wire Guard conduit pipes are manufactured in accordance with Bureau of Indian Standards specifications IS:9537 (Part-3) in the range of 20 mm to 63 mm with light, medium and heavy range and fittings confirming with IS:3419.

COLOUR

ASTRAL Wire Guard electrical conduits and fittings are available in Black & Ivory colours. Other colours are available on request.

MARKING COLOUR CODES FOR CLASS OF PIPES

- BLUE : Light Mechanical Stress (LMS)
- YELLOW : Medium Mechanical Stress (MMS)
- WHITE : Heavy Mechanical Stress (HMS)

IS:9537 (Part-3)

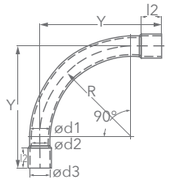
ONLY THOSE PRODUCTS BEARING
THE ABOVE MARKS ARE CERTIFIED

DIMENSIONAL DETAILS OF PVC CONDUITS AS PER IS:9537 (Part-3)

Out Side Diameter (cm)	Out Side Diameter (mm)	Tolerance on OD (mm)	Light (mm)			Medium (mm)			Heavy (mm)		
			Min. ID	Min. Wall Thickness	Max. Wall Thickness	Min. ID	Min. Wall Thickness	Max. Wall Thickness	Min. ID	Min. Wall Thickness	Max. Wall Thickness
2.0	20.0	-0.3	17.4	1.15	1.30	16.90	1.40	1.55	15.80	1.95	2.10
2.5	25.0	-0.4	22.1	1.25	1.45	21.40	1.60	1.80	20.60	2.00	2.20
3.2	32.0	-0.4	28.6	1.50	1.70	27.80	1.90	2.10	26.60	2.50	2.70
4.0	40.0	-0.4	35.8	1.90	2.10	35.40	2.10	2.30	34.40	2.60	2.80
5.0	50.0	-0.5	45.1	2.20	2.45	44.30	2.60	2.85	43.20	3.15	3.40
6.3	63.0	-0.6	57.0	2.70	3.00	–	–	–	–	–	–

DIMENSIONAL DETAILS OF
FITTINGS AS PER IS:3419

SLIP TYPE COUPLING BEND



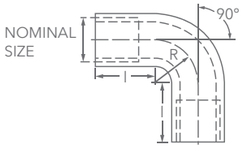
IS:3419

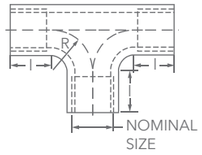
ONLY THOSE PRODUCTS BEARING
THE ABOVE MARKS ARE CERTIFIED

Nominal Size	Outside Diameter of Bend (d_1)		Minimum Inside Diameter of Bend (d_2)	Inside Diameter of Collar (d_3)		R	Y	l2
	Min.	Max.		Min.	Max.			
20	19.7	20.0	16.9	20.1	20.3	65	115	35
25	24.7	25.0	21.3	25.1	25.4	90	160	25
32	31.7	32.0	27.9	32.1	32.4	125	215	45
40	39.7	40.0	35.5	40.1	40.5	160	260	45
50	49.7	50.0	44.7	50.1	50.5	210	310	55

All dimensions are in mm

NORMAL TYPE ELBOW & TEE



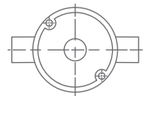


Nominal Size	Inside Diameter of Collar		l	R	Minimum Wall Thickness
	Min.	Max.			
20	20.1	20.3	35	20	1.2
25	25.1	25.4	35	25	1.4

All dimensions are in mm

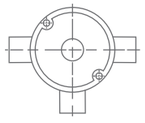
SPOUT TYPE CIRCULAR BOX

(A) TERMINAL



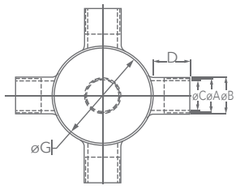
(B) THROUGH

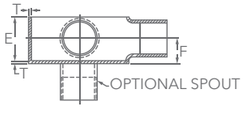
(C) ANGLE



(D) THREE-WAY

(E) FOUR-WAY
INTERSECTION





Nominal Size	B Min.	C		D Min.	E Min.	F		G		T Min.
		Min.	Max.			Min.	Max.	Min.	Max.	
20	23.0	17.00	17.25	20	25	13.5	14.5	60	61.5	1.6
25	29.5	22.75	23.00	23	28	16.5	17.5	60	61.5	1.6

All dimensions are in mm

KEY PROPERTIES

HIGH CORROSION RESISTANT

Astral Wire Guard is non-corrosive by nature and remains unaffected by corrosive, salty atmosphere & excessive humidity. Besides, these are immune to chemical and galvanic corrosion. Hence they are ideal electrical conduits.

EASY WIRING

Astral Wire Guard has smooth interior walls which help in reducing the friction thus ensuring easy wiring.

LIGHT WEIGHT

Astral Wire Guard has low specific gravity, which implies that it is much lighter than the pipes made from other traditional materials. Astral Wire Guard pipes are therefore easier to handle. This results in reduced transportation & installation costs.

NO MAINTENANCE

Astral Wire Guard is Maintenance-free due to its excellent weather protected properties.

FIRE RESISTANT

Astral Wire Guard does not support combustion and is self-extinguishing once the source of ignition is removed.

EASY TO INSTALL

Astral Wire Guard can be shaped and joined with the slightest ease. Astral Wire Guard pipes are joined by solvent cement, which is simpler, easier and highly cost effective.

DURABILITY

Astral Wire Guard electrical conduit pipes having service life of more than 50 years.

ENVIRONMENTAL IMPACT

Astral Wire Guard is environment friendly as it pollutes neither land nor water during the manufacturing process or service life and can be recycled after prolonged service life.

NON-CONDUCTIVE

Astral Wire Guard is non-conductor of electricity and thus prevents electrical shocks. Hence they are most suitable for electrical conduits.

HIGH MECHANICAL STRENGTH

Astral Wire Guard has high mechanical strength that is attested by tests conducted as specified in IS:9537 (PART-3). Hence it can be used both in open / surface and concealed installation.

TECHNICAL
SPECIFICATION

BASIC PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	CONDITION	UNIT	TYPICAL VALUES
GENERAL				
Density	ASTM D792	73°F / 23°C	gm/cm^3	1.40 to 1.46
Water Absorption	ASTM D570	73°F / 23°C	%	0.03
		212°F / 100°C	%	0.55
Rockwell Hardness	ASTM D785	73°F / 23°C	----	119
MECHANICAL				
Izod Impact	ASTM D256	73°F / 23°C	J/m	60
Tensile Strength	ASTM D638	73°F / 23°C	N/mm^2	48
Tensile Modulus	ASTM D638	73°F / 23°C	N/mm^2	2500
Flexural Strength	ASTM D790	73°F / 23°C	N/mm^2	104
Flexural Modulus	ASTM D790	73°F / 23°C	N/mm^2	2860
Compressive Strength	ASTM D695	73°F / 23°C	N/mm^2	62
Compressive Modulus	ASTM D695	73°F / 23°C	N/mm^2	1350
THERMAL				
Coefficient of Thermal Expansion	ASTM D696	----	m/m/°K	6.3 x 10^{-5}
Thermal Conductivity	ASTM C177	----	Wm/°K/m^2	0.14
Heat Distortion Temperature @ 66 psi	ASTM D638	----	°C	80
FIRE RESISTANCE PROPERTY				
Flammability Rating	UL 94	----	----	V-0, 5VB, 5VA
Flame Spread	ASTM E84	0.062 in/0.157 cm	----	15
Smoke Developed	ASTM E84	----	----	70-125
Limiting Oxygen Index	ASTM D2863	----	%	45
ELECTRICAL				
Dielectric Strength	ASTM D147	----	V/cm	4,30,000
Dielectric Constant	ASTM D150	60Hz, 30°F/-1°C	----	3.70
Power Factor	ASTM D150	60Hz, 73°F/23°C	----	0.0096
Volume Resistivity	ASTM D257	73°F / 23°C	ohm/cm	5.4 x 10^{15}
Insulation Resistance	ASTM D876	----	Ω	>100




PRODUCT

RANGE

uPVC ROUND CONDUIT
PLAIN END CONDUIT PIPES

LMS - LIGHT MECHANICAL STRESS (BLACK)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
2.0*	M151180301	100 x 3
2.5*	M151180302	100 x 3
3.2*	M151180303	50 x 3
4.0*	M151180304	25 x 3
5.0*	M151180305	25 x 3
6.3*	M151180306	18 x 3

LMS - LIGHT MECHANICAL STRESS (IVORY)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
2.0*	M1511803011	50 x 3
2.5*	M1511803021	50 x 3
3.2*	M1511803031	50 x 3
4.0*	M1511803041	25 x 3
5.0*	M1511803051	25 x 3
6.3*	M1511803061	18 x 3

MMS - MEDIUM MECHANICAL STRESS (BLACK)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
2.0*	M151190301	100 x 3
2.5*	M151190302	100 x 3
3.2*	M151190303	50 x 3
4.0*	M151190304	25 x 3
5.0*	M151190305	25 x 3

MMS - MEDIUM MECHANICAL STRESS (IVORY)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
2.0*	M1511903011	50 x 3
2.5*	M1511903021	50 x 3
3.2*	M1511903031	50 x 3
4.0*	M1511903041	25 x 3
5.0*	M1511903051	25 x 3

HMS - HEAVY MECHANICAL STRESS (BLACK)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
2.0*	M151200301	50 x 3
2.5*	M151200302	50 x 3
3.2*	M151200303	50 x 3
4.0*	M151200304	25 x 3
5.0*	M151200305	25 x 3

HMS - HEAVY MECHANICAL STRESS (IVORY)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
2.0*	M1512003011	50 x 3
2.5*	M1512003021	50 x 3
3.2*	M1512003031	50 x 3
4.0*	M1512003041	25 x 3
5.0*	M1512003051	25 x 3

* Conforms to ISI

uPVC ROUND CONDUIT
SOCKET END CONDUIT PIPES

ASTRAL Wire Guard

LMS - LIGHT MECHANICAL STRESS (BLACK)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
1.9	M211180319	100 x 3
2.0*	M211180301	100 x 3
2.5*	M211180302	100 x 3
3.2*	M211180303	50 x 3
4.0*	M211180304	25 x 3
5.0*	M211180305	25 x 3
6.3*	M211180306	18 x 3

LMS - LIGHT MECHANICAL STRESS (IVORY)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
1.9	M2111803191	50 x 3
2.0*	M2111803011	50 x 3
2.5*	M2111803021	50 x 3
3.2*	M2111803031	50 x 3
4.0*	M2111803041	25 x 3
5.0*	M2111803051	25 x 3
6.3*	M2111803061	18 x 3

MMS - MEDIUM MECHANICAL STRESS (BLACK)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
1.9	M211190319	100 x 3
2.0*	M211190301	100 x 3
2.5*	M211190302	100 x 3
3.2*	M211190303	50 x 3
4.0*	M211190304	25 x 3
5.0*	M211190305	25 x 3

MMS - MEDIUM MECHANICAL STRESS (IVORY)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
1.9	M2111903191	50 x 3
2.0*	M2111903011	50 x 3
2.5*	M2111903021	50 x 3
3.2*	M2111903031	50 x 3
4.0*	M2111903041	25 x 3
5.0*	M2111903051	25 x 3

HMS - HEAVY MECHANICAL STRESS (BLACK)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
1.9	M211200319	50 x 3
2.0*	M211200301	50 x 3
2.5*	M211200302	50 x 3
3.2*	M211200303	50 x 3
4.0*	M211200304	25 x 3
5.0*	M211200305	25 x 3

HMS - HEAVY MECHANICAL STRESS (IVORY)

Size (cm)	Product Code	Std. Pkg. (Nos. x mtr)
1.9	M2112003191	50 x 3
2.0*	M2112003011	50 x 3
2.5*	M2112003021	50 x 3
3.2*	M2112003031	50 x 3
4.0*	M2112003041	25 x 3
5.0*	M2112003051	25 x 3

* Conforms to ISI

uPVC ROUND CONDUIT
SOCKET END CONDUIT PIPES

CORRUGATED PIPES (BLACK)

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Roll)
2.0	M371265001B	50 mtr	10
2.5	M371262502B	25 mtr	10
3.2	M371262503B	25 mtr	5
4.0	M371262004B	20 mtr	5
5.0	M371261505B	15 mtr	2
6.3	M371261506B	15 mtr	2

CORRUGATED PIPES (WHITE)

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Roll)
2.0	M371265001W	50 mtr	10
2.5	M371262502W	25 mtr	10
3.2	M371262503W	25 mtr	5
4.0	M371262004W	20 mtr	5
5.0	M371261505W	15 mtr	2
6.3	M371261506W	15 mtr	2

uPVC ROUND CONDUIT
FITTINGS

CORRUGATED FLEXIBLE CONDUIT GLAND - BLACK

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202005103	50	250
2.5	M202005104	50	200

CORRUGATED FLEXIBLE CONDUIT GLAND - WHITE

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202005103W	50	250
2.5	M202005104W	50	200

* Conforms to ISI

uPVC ROUND CONDUIT
FITTINGS

ASTRAL Wire Guard®

CIRCULAR BOX - TERMINAL 1 WAY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202001903	20	200
2.5*	M202001904	15	150

CIRCULAR BOX - ANGLE 2 WAY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202002003	20	200
2.5*	M202002004	15	150

CIRCULAR BOX - THROUGH 2 WAY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202002103	20	200
2.5*	M202002104	15	150

CIRCULAR BOX - TEE 3 WAY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202002203	20	200
2.5*	M202002204	15	150

CIRCULAR BOX - INTERSECTION 4 WAY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202002303	20	120
2.5*	M202002304	15	150

CIRCULAR LID

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
6.5	M202003411	150	1500

* Conforms to ISI

Please Note: Kindly suffix 'I' after each product code to order ivory colour fittings

uPVC ROUND CONDUIT
FITTINGS

DEEP CIRCULAR BOX - TERMINAL 1 WAY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202002403	10	100
2.5*	M202002404	10	100
3.2	M202002405	10	90

DEEP CIRCULAR BOX - THROUGH 2 WAY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202002603	10	100
2.5*	M202002604	10	100
3.2	M202002605	10	80

DEEP CIRCULAR BOX - INTERSECTION 4 WAY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202002803	10	80
2.5*	M202002804	10	80
3.2	M202002805	10	50

DEEP CIRCULAR BOX - ANGLE 2 WAY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202002503	10	100
2.5*	M202002504	10	100
3.2	M202002505	10	80

DEEP CIRCULAR BOX - TEE 3 WAY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202002703	10	100
2.5*	M202002704	10	100
3.2	M202002705	10	70

PRESS FIT LID

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
6.5	M202005511	150	750

Please Note: Kindly suffix 'I' after each product code to order ivory colour fittings

* Conforms to ISI

BRANCH - 2 WAY (U)

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202002903	20	200
2.5	M202002904	20	120

BRANCH - 3 WAY (Y)

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202003003	20	200
2.5	M202003004	20	120

BRANCH - 4 WAY (H)

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202003103	15	150
2.5	M202003104	20	120

ROUND 'U' CLIP

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202003803	200	2400

SADDLE BASES AND SCREWS

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202003503	200	1200
2.5	M202003504	150	1500
3.2	M202003505	100	1000
4.0	M202003506	100	1000
5.0	M202003507	100	600
6.3	M202003508	50	500

SADDLE STRAP

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M206003603	200	1200
2.5	M206003604	150	1500

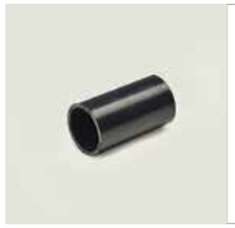
REDUCER BUSH

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.5 x 2.0	M202001509	250	1500

uPVC ROUND CONDUIT
FITTINGS

REDUCER COUPLER

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.5 x 2.0	M202005409	100	800
3.2 x 2.5	M202005410	50	400



COUPLER

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202001403	200	2000
2.5	M202001404	125	750
3.2	M202001405	60	360
4.0	M202001406	30	180
5.0	M202001407	20	200

FEMALE BUSH ADAPTER

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202001603	200	1200
2.5	M202001604	100	1000
3.2	M202001605	75	750
4.0	M202001606	50	300
5.0	M202001607	25	200

SLIP TYPE BEND

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
1.9	F182005600B	50	300
2.0*	F182005601	50	300
2.5*	F182005602	25	150
3.2*	F182005603	15	90
4.0*	F182005604	6	36
5.0*	F182005605	4	24
6.3	F182005606	-	14

SLIP TYPE LONG BEND 90° BLACK

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	F182005601L	25	150
2.5	F182005602L	15	90
3.2	F182005603L	10	60

SLIP TYPE LONG BEND 90° IVORY

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	F182005601IL	25	150
2.5	F182005602IL	15	90

Please Note: Kindly suffix 'I' after each product code to order ivory colour fittings

* Conforms to ISI

MOULDED BEND

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202005601	50	300
2.5	M202005602	25	150
3.2	M202005603	15	90

ROUND ELBOW

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202000503	125	750
2.5	M202000504	75	450

ROUND TEE

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202000103	50	500
2.5	M202000104	50	300

* Conforms to ISI

INSPECTION BEND WITH LID

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202001103	40	400
2.5	M202001104	20	200

INSPECTION ELBOW WITH LID

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202000603	125	750
2.5*	M202000604	75	450

INSPECTION TEE WITH LID

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0*	M202000201	50	300
2.5*	M202000202	25	200

uPVC ROUND CONDUIT
FITTINGS

FAN BOX WITH ROD

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0 / 2.5	M202004520	14	14

FAN BOX WITHOUT ROD

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0 / 2.5	M202004521	24	24

SMALL FAN BOX

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202004503	18	18
2.5	M202004504	18	18

FAN SHEET - BIG

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
17.0	M202005223	20	200

FAN SHEET - SMALL

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
9.8	M202005324	100	600

CIRCULAR EXTENTION RING

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202003203	50	500
2.5	M202003204	40	400

LOOP IN BOX

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	M202003303	30	300

Please Note: Kindly suffix 'I' after each product code to order ivory colour fittings

SWITCH BOX - FLUSH MOUNTED

Size cm (inch)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
7.5 x 7.5 x 6.3 (3 x 3 x 2.5)	M202004220	10	100
16.0 x 7.5 x 6.3 (6 x 3 x 2.5)	M202004221	10	60

LID SURFACE SWITCH BOX

Size cm (inch)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
7.5 x 7.5 (3 x 3)	M202004418	60	720
16.0 x 7.5 (6 x 3)	M202004419	75	900

SOLVOBOND PLUS

Size (ml)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
50	SBP50MC	-	48
100	SBP100MC	-	24
200	SBP200MC	-	24
500	SBP500MC	-	12
1000	SBP1000MC	-	12

SURFACE SWITCH BOX

Size cm (inch)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
7.5 x 7.5 (3 x 3)	M202004318	12	120
16.0 x 7.5 (6 x 3)	M202004319	10	100

ADAPTABLE BOX WITH LID

Size cm (inch)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
7.5 x 7.5 x 50 (3 x 3 x 2)	M202003912	10	10
11.0 x 11.0 x 7.5 (4 x 4 x 3)	M202003913	10	10
16.0 x 11.0 x 7.5 (6 x 4 x 3)	M202003914	10	10
16.0 x 16.0 x 7.5 (6 x 6 x 3)	M202003915	10	10
22.5 x 22.5 x 7.5 (9 x 9 x 3)	M202003916	10	10
30.0 x 30.0 x 11.0 (12 x 12 x 4)	M202003917	10	10

uPVC ROUND CONDUIT FITTINGS

METAL BOX MODULE

Size L x W x H (cm)	Thick (inch)	Product Code	Module	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
7.8 x 7.8 x 5.0	0.80	T131-001	1/2	20	200
9.7 x 7.8 x 5.0	1.00	T131-002	3	20	120
13.5 x 7.8 x 5.0	1.00	T131-003	4	10	100
20.6 x 7.8 x 5.0	1.00	T131-004	6	10	80
13.5 x 13.1 x 6.0	1.00	T131-005	8	05	60
23.2 x 7.8 x 5.0	1.00	T131-006	8H	10	80
20.8 x 13.0 x 5.5	1.00	T131-007	12	05	50
23.0 x 14.2 x 5.5	1.00	T131-008	16	05	50
20.6 x 20.6 x 6.0	1.00	T131-009	18	05	40

FLEXIBLE BENDING SPRING

Size (cm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
2.0	FBS-MMS-20	01	10
2.0	FBS-MMS-20	01	10
2.5	FBS-MMS-25	01	10
2.5	FBS-HMS-25	01	10

LONG SCREW

Size (mm)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
-	SCR-M4-40-CSK	100	6000

Please Note: Kindly suffix 'I' after each product code to order ivory colour fittings

ASTRAL Wire Guard®

INSULATION TAPE

Size (cm x mtr.)	Product Code	Std. Pkg. (Nos.)	Mst. Pkg. (Nos.)
1.8 x 6	PVC-TAPE-BLK-6	30	360
1.8 x 6	PVC-TAPE-BLU-6	30	360
1.8 x 6	PVC-TAPE-GRN-6	30	360
1.8 x 6	PVC-TAPE-RED-6	30	360
1.8 x 6	PVC-TAPE-YEL-6	30	360

RESCUE TAPE

Size (ft.)	Product Code	Std. Pkg. (Nos.)
5	RSCU-TAPE-05-CLR	120
5	RSCU-TAPE-05-RED	120
5	RSCU-TAPE-05-BLK	120
10	RSCU-TAPE-10-CLR	120
10	RSCU-TAPE-10-RED	120
10	RSCU-TAPE-10-BLK	120
15	RSCU-TAPE-15-CLR	120
15	RSCU-TAPE-15-RED	120
15	RSCU-TAPE-15-BLK	120

PTFE TAPE

HSN CODE: 3919

Size (Mtr.)	Product Code	Std. Pkg. (Nos.)
5	PTFE-1205	As Req.
10	PTFE-1210	As Req.
20	PTFE-1220	As Req.

QUALITY CONTROL

ASTRAL® is equipped with state-of-the-art laboratory which specializes in high quality testing as per the ISI standards for testing of all uPVC electrical conduit & accessories. The high quality performance is attained and ensured throughout the plant in all the processes through experienced and well-qualified staff and skilled workers.

Each batch of ASTRAL WIRE GUARD pipes & fittings are rigorously tested as per Bureau of Indian Standard's relevant scheme of testing and inspection. ASTRAL® conducts the following high critical tests in its laboratory and the products are passed only after a strict quality check process :

BATCH WISE TESTING BEFORE DISPATCHING FOR PIPES

1. Checking of dimensions
2. Bending Test
3. Compression Test
4. Impact Test
5. Collapse Test
6. Resistance to Heat
7. Resistance to Burning
8. Electrical Characteristics

TESTING FOR FITTINGS

1. Visual, Construction & Marking
2. Checking of Dimensions
3. Resistance to Heat
4. Resistance to Burning
5. Moisture Absorption Test
6. Resistance to Chemical Action
7. Resistance to Oil
8. Resistance to Impact
9. Copper Test
10. Electrical Characteristics

INSTALLATION

INSTALLATION PROCEDURES

Open : Use clamps to hold.

Concealed : Make a slot of appropriate width in wall, fix pipe in slot and cover with mortar.

RECOMMENDED PRACTICE

Astral Wire Guard non-metallic conduits are manufactured in a manner that the conduit can be bent easily with the aid of bending spring and all the conduits and conduit fittings are of unthreaded type. The number of single core, PVC insulated non-sheathed cables that run in one conduit shall be such that it permits easy drawing of the cables. The actual number of cables 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.

For each size of cable that is intended to be used, 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.

CAPACITY OF CONDUITS

TABLE - 01

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

Nominal Cross Sectional area of conductor (mm)	Size of Conduit (mm)					
	20	25	32	40	50	63
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	10
50.0	-	-	2	3	5	7
70.0	-	-	-	2	4	6

TABLE - 02

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

Nominal Cross Sectional area of conductor (mm)	Size of Conduit (mm)					
	20	25	32	40	50	6.
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	18	-
35.0	-	-	2	3	6	9
50.0	-	-	-	2	4	7
70.0	-	-	-	-	3	5

TABLE - 03

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

Nominal Cross Sectional area of conductor (mm)	Size of Conduit (mm)					
	20	25	32	40	50	63
1.5	6	11	-	-	-	-
2.5	4	8	-	-	-	-
4.0	3	6	-	-	-	-
6.0	2	4	8	-	-	-
10.0	-	2	4	6	10	-
16.0	-	2	3	5	9	12
25.0	-	-	2	3	5	7
35.0	-	-	-	2	4	6
50.0	-	-	-	-	3	4
70.0	-	-	-	-	2	3

TABLE - 04

CABLE FACTOR

Nominal Cross Sectional area of conductor mm²	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 - 05

ASTRAL WIRE GUARD FACTOR

Conduit Size mm	20	25	32	40	50	63
upto 10 mtr. Without Bend	244	442	783	1092	1943	2715
Upto 10 mtr. with 1 Bend	196	358	643	883	1571	2429
Upto 10 mtr. With 2 Bend	141	260	474	646	1149	1527

EXPANSION AND CONTRACTION

All conduit pipes 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 uPVC 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.

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.

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

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

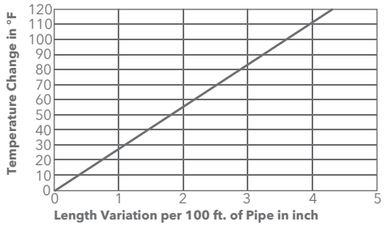
$$\text{Number of Expansion Joints} = \frac{\text{Total expansion}}{4}$$

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 :

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

uPVC Pipe Length Variation Due to Temperature Change (°F) Coeffecient = $3.6X10^{-5}$ in./ft./°F



LOCATION OF EXPANSION JOINTS

Proper functioning of an expansion joint depends on three procedures :

1) The correct placement of the expansion joint.
2) The proper installation of rigid uPVC conduit and the expansion joint.
3) 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 uPVC 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 uPVC 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.

JOINING METHOD

1. CUT PIPE

- Cut pipe square. As joints are sealed at the base of the fitting socket. An angled cut may result in joint failure.

2. REMOVE BURR & BEVEL

- Remove all burr from inside and outside of pipe with a knife-edge file, or deburring tool. Chamfer (bevel) the end of the pipe 10° -15°

  CLEAN : Remove surface dirt, grease, or moisture with a clean dry cloth.
- With light pressure, pipe should go one third to one half of the way into the fitting socket. Pipes and fittings that are too tight or too loose should not be used.

3. APPLICATOR

- Use an applicator that is one half the pipe diameter.
- Too large an applicator will force excessive cement into the inside of small diameter fittings. Too small an applicator will not apply sufficient cement to large diameter systems.

4. CEMENT

- Apply a full even layer of cement to the outer side of a pipe and medium layer of cement to the inner side of a fitting.

5. JOIN PIPE & FITTING

- Assemble pipe and fitting socket till it contacts socket bottom. Hold pipe and fitting together until the pipe does not back out. Remove excessive cement from the exterior. A perfectly made joint will show a continuous bead of cement around the perimeter.

DOS & DON'TS

DOS

- Always insist to use ASTRAL® uPVC solvent cement for making joints.
- Cut the pipe straight, as improper cut may lead to joint failure.

DON'TS

- Do not insert the pipe into socket of fitting without chamfering. This can create disturbance while pulling wires.
- Do not install pipeline without properly placed pipe clips. This is required to ensure efficient working of the system.

GOOD
SITE PRACTICE

HANDLING

- Take all reasonable care while handling ASTRAL WIRE GUARD pipes particularly in very cold conditions when the impact strength of the material is reduced.
- Do not throw or drop pipes, or drag them along hard surfaces.
- In case of mechanical handling, use protective slings and padded supports. Metal chains and hooks should not make direct contact with the pipe.

ON-SITE STORAGE

- ASTRAL WIRE GUARD™ Conduit Pipes and fittings may be stored indoors or outside. If stored outside, Pipes and fittings should be protected from direct exposure to sunlight and Pipes should be properly supported to prevent sagging or bending. Pipe should be stored at the job site on level ground in the unit package (skids) provided by the supplier. Caution must be exercised to avoid compression, damage or deformation. When unit packages are stacked, care must be taken to ensure that the weight of the upper unit dose not cause deformation of lower units.
- ASTRAL WIRE GUARD Pipes must not be stored in tightly enclosed areas subject to elevated temperatures. or close to heat producing sources such as boilers, heaters, steam lines, engine exhaust etc. Exposure to excessive temperatures will result in distortion and deformation of pipe.
- Stack pipe lengths - Either on a flat base or on level ground.
- Ideally, stacks should contain one diameter pipe size only. Where this is not possible, stack largest diameter pipes at base of stack. Small pipes may be nested inside larger pipes.
- Store all materials in well ventilated, shady conditions.
- If stored in the open for long periods or exposed to strong sunlight, cover the stack with opaque sheeting.
- Store fittings under cover. Do not remove from cartons or packaging until required.
- Store solvent cement and cleaning fluid in a cool place out of direct sunlight and away from any heat source.

FREQUENTLY ASKED QUESTIONS
(FAQs)

1. **WHAT IS V0 GRADE MATERIAL? DO ASTRAL WIRE GUARD PIPES COMPLY WITH V0 GRADE?**
   UL 94 is the standard for safety of flammability of plastic material and V0 is the classification. This V0 classification means that the burning stops within 10 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed. Astral Wire Guard pipes and fittings are manufactured from the material which have V0 flammability rating as per UL 94.

2. **WHAT IS FRLS? WHAT ARE THE BENEFITS OF FRLS CONDUITS OVER REGULAR CONDUITS?**
   FRLS means Fire Retardant Low Smoke. FRLS conduits produce less amount of smoke when burned. Hence in situation of fire, this gives room to people to exit from the building. The lower smoke also reduces the damage to human respiratory system as it produces very less or no halogen gas when burnt.

3. **WHAT IS THE APPROX. LIFE OF uPVC CONDUIT?**
   uPVC conduit is designed for service life span of more than 50 years.

4. **WHAT IS THE DIFFERENCE BETWEEN uPVC & PVC?**
   uPVC means unplasticized Poly Vinyl Chloride. Rigid is also used for unplasticized. So uPVC, RPVC and PVC all three words reflects the same product. Certain regions of the world have preferred using the term uPVC while USA and some other regions have preferred using the term PVC only for same material.

5. **WHAT ARE THE ADVANTAGES OF uPVC CONDUIT OVER ELECTRICAL METALLIC TUBING (EMT)?**
   uPVC conduits are not prone to rust even after many years. So this gives greater life span and the pipes can be used for generations. Also smooth bore and light weight enable easy installation with less manpower requirement. uPVC conduits are economical and also can be manufactured and supplied consistently as the raw material availability is fairly sufficient. uPVC is non condutive and hence there is no chance of short circuit.

6. **HOW TO IDENTIFY CLASS OF CONDUIT PIPES AND THEIR STRENGTH? (LMS/MMS/HMS)**
   There is change in thickness of pipes. Based on the thickness, classification has been done. This is easily identified by colour markings put on the pipes. For LMS, there is Blue colour code, for MMS there is Yellow code and for HMS, white colour code is in place.

7. **DO ASTRAL WIRE GUARD UPVC CONDUIT PIPES AND FITTINGS HAVE ANY IMPACT ON ENVIRONMENT?**
   No. Astral Wire Guard conduit pipes and fittings are environment friendly as manufacturing process is quite energy efficient and the pipes can be recycled after prolonged service life.

8. **WHY SHOULD WE USE SOLVENTS OR SOLUTIONS TO CONNECT TWO PIPES OR PIPES AND FITTINGS?**
   Use of Solvent cement imparts proper fusion with pipe and fitting and gives a permanent - homogenous joint between the two. So Solvent cement must be used to join conduit pipes and fittings.

9. **WILL ASTRAL WIREGUARD WORK WELL WITH CEMENT AND CONCRETE IN SPITE OF SMOOTH SURFACE?**
   There will not be any detrimental effect due to high mechanical strength of Astral Wire Guard conduits.

10. **WHY IS ASTRAL WIREGUARD NOT SHINING OR GLOSSY FROM OUTER SURFACE?**
    More shining and glossiness can be achieved by using higher lubricant and improper sizing method which eventually increases brittleness in the long run. Astral Pipes believes in providing standard quality products hence we use optimum quantity of lubricants and vacuum sizing method which imparts matt finish to the piping.

NOTES