







Plastic piping systems and solutions Enabling the movement of water, air, power, chemicals and telecoms



# Welcome to Algawas

At Al Gawas Plastic Industries LLC, conceiving, designing, manufacturing and delivering the most advanced products and systems isn't merely an occupation. It's a passion. One that's based around a few simple beliefs. Expertise isn't an option. Quality always beats quantity. Products are nothing without service and support. Sustainability isn't just a 'green' word. And working with our customers is much better than simply supplying them.



# Manufacturing pvc piping solutions since 1998

Al Gawas Plastic Industries LLC was established in 1998, in United Arab Emirates. We are leading manufacturer of PVC plastic pipes. Company was formed with a philosophy to manufacture and supply the highest quality plastic products in GCC and international markets. Al Gawas has consistently evolved to be a major supplier to various projects and customers around the world.

Al Gawas Plastic products have catered thousands of projects & have created an excellent reputation for its quality, reliability and performance in the most demanding conditions. The company holds an ISO 9001:2008 quality management certification.

# Our philosophy

We are dedicated to designing, manufacturing, and marketing plastic piping systems for the safe and secure conveyance of liquids, gases and power. Our Vision is to become leading provider of environment-friendly plastic piping systems for industry and building technology focusing on water-cycle applications, by 2020.









# Quality standards

Quality has been a trademark at Al Gawas Plastic Industries LLC since our inception. Highly sophisticated on-site testing laboratories feature industry-leading technology and equipment developed to specifications engineered exclusively at Al Gawas Plastic Industries LLC.

Our comprehensive quality standards program has always been based on the continuous improvement tools of Total Quality Management (TQM). We are proud to achieve ISO 9000 series quality certification. By insisting on quality at every level of our operations we have earned a distinctive name in the market. Our entire product range is manufactured according to International Piping standards, such as BS (British Standards), ASTM, DIN.

# Sector specific focus

Al Gawas Plastic Industries LLC, operates through a number of market sector focused businesses. This focus ensures a detailed understanding of the applications in which our systems are used. Our piping systems are mostly used in Water Distribution Network, Irrigation, Borewell, Electrical Systems, Telecommunication Systems and Drainage Networks.







### Residential

Whether for new-build or refurbishment we understand the pressures developers and homeowners face in terms of approvals and Building Regulations, with our knowledge allowing us to provide carefully tailored solutions to help you meet all necessary requirements. Our holistic range is sustainable, energy efficient and cost effective. It includes:

- Above ground drainage systems for soil and waste
- · Below ground drainage and flood resilience
- · Hot and cold plumbing systems

#### Industrial

Our range of PVC pressure pipes systems are ideally suited for the effective movement of chemicals, water, waste and fluids for industrial and manufacturing applications, such as oil&gas industry,, chemical processing, food and beverage or pharmaceutical.

### Civils & Infrastructure

With our civil engineering expertise, Al Gawas Plastic Industries lead the way in replacing traditional materials with high performance engineered plastic solutions for major projects. We offer a full range of solutions. These include:

- Foul and surface water drainage
- · Pipes for electrical and cable management
- Cable protection systems
- Piping solutions for sewage systems,

#### Commercial

We offer complete solutions for buildings such as hospitals, schools, high-rise apartment and office buildings and hotels, including:

- Terrain above ground soil & waste drainage
- Rainwater capture and re-use systems
- Hot and cold water systems
- Pressure systems for water supply

# Our products

Al Gawas Plastic Industries LLC is ISO 9001:2008 certifed company and our entire product range is upto International plastic pipe standards including British standards, ASTM & DIN. We are manufacturing PVC Drainage Pipes, PVC Pressure Pipes and PVC Conduits for cabling and ducting purposes. Our diversifed product range and high production capacity enables us to cater the local market and export market. Our export market includes GCC countries, Asia, North Africa and the subcontinent.







### PVC pressure piping systems

Al Gawas Plastic Industries produces a wide range of UPVC Pressure Pipes to most of the major international standards and dimensions of Metric and Imperial. The pipes are made from virgin UPVC resin and have a minimum required strength MRS=25 mpa so that the pipes meet or exceed the rigorous hydrostatic requirements of the standards. The pipes are produced in a range of colours such as grey & white and carry full printing and identification at Im intervals according to the standard requirements

### PVC drainage piping systems

Al Gawas Plastic Industries produces a range of UPVC pipes for above and below ground use made from virgin UPVC. The pipes are produced in all the major international standards ie: European Standards BS EN 1401, BS EN 1329, as well as the previous standards such as BS 5255, BS 4514, BS 4660, BS 5481. A range complying to ASTM D2655 Sch 40/80 is also available on request.

### Duct & conduit piping systems

Al Gawas Plastics Industries produces a range of upvc schedule 40 ducts in sizes 1/2" to 6" that are in accordance with NEMATC-2A standard and listed to UL 651. The conduits are suitable for above or below ground installations and made from virgin pvc resin. The ducts meet and exceed all the mechanical and performance requirement of both the NEMATC2 and UL 651 standards.

# Pressure Pipe System

# Imperial & Metric Range





ASTM 1785 - ASTM 2241 - BS 3505 - EN 1452-2:2009 - EN ISO 4422-2:1996 - ISO 161/1 DIN 8062:2009



# uPVC pressure pipe system

Al Gawas Plastic Industries LLC manufactures a wide range of UPVC Pressure Pipes to most of the major international standards and dimensions of Metric and Imperial. PVC pressure pipes are manufactured from PVC resin compounded with stabilisers, lubricants and pigments. They do not contain any plasticisers and hence are known as unplasticised PVC and have a minimum required strength MRS=25 mpa so that the pipes meet or exceed the rigorous hydrostatic requirements of the standards. The pipes are produced in a range of colours such as grey, and white and carry full printing and identification at Im intervals according to the standard requirements.

All pipes produced fall under an ISO 9001:2008 Quality Assurance system. For export requirements pipes can be supplied in 5.8m (19ft) lengths so they can be loaded into containers without damaging sockets. Al Gawas Plastic pressure pipes have been operating in demanding conditions for almost 2 decades now.

### Mechanical & Physical Properties

Material Strength	MRS>25MPa	EN921
Impact Resistance	TIR>10%	EN744
Tensile Strength	min 45 N/mm2	ISO 6259
Resistance to Internal Pressure	20oC 42MPa/Ihour	EN921
Vicat Softening	>80oC	EN721
Longitudinal Reversion	Maximum 5%	EN743
Dichloromethane Acid Resistance	No Attack	EN580
Socket strength dia < 90mm	4.2 x [PN]	EN921
Socket strength dia > 90mm	3.6 x [PN]	EN921



# uPVC pressure pipe system cold potable water

### ASTM D 1785 Schedule 40 / Schedule 80

Nominal	Outside	Wall Thi	ckness
Pipe Size Inch	Diameter mm	Schedule 40 mm	Schedule 80 mm
1/	21.2	2.0	3.7
1/2	21.3 26.7	2.8 2.9	3.9
3/4			
I	33.4	3.4	4.5
1/4	42.2	3.6	4.8
I 1/2	48.3	3.7	5.1
2	60.3	3.9	5.5
2 ½	73.0	5.2	7.0
3	88.9	5.5	7.6
4	114.3	6.0	8.6
6	168.3	7.1	11.0
8	219.1	8.2	12.7
10	273.1	9.3	15.1

ASTM D 2241 Class 100 / Class 125 / Class 160 / Class 200 / Class 315

Nominal Pipe Size Inch	Outside Diameter mm	SDR 41 100psi mm	SDR 32.5 125psi mm	SDR 26 160psi mm	SDR 21 200psi mm	SDR13.5 315psi mm	
1/2	21.3					1.6	
3/4	26.7				1.5	2.0	
1	33.4			1.5	1.6	2.5	
1/4	42.2		1.5	1.6	2.0	3.1	
1/2	48.3		1.5	1.9	2.3	3.6	
2	60.3		1.9	2.3	2.9	4.5	
2 ½	73.0		2.2	2.8	3.5	5.4	
3	88.9	2.2	2.7	3.4	4.2	6.6	
4	114.3	2.8	3.5	4.4	5.4	8.5	
6	168.3	4.1	5.2	6.5	8.0	12.5	
8	219.1	5.3	6.7	8.4	10.4		
10	273.1	6.6	8.4	10.5	13.0		

Pressure Pipe System Imperial Range

BS 3505 British Standard

Nominal	Out	side			Wall Th	ickness		
Size	Diam	eter	CLA	SS C	CLA	SS D	CLA	SS E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
(Inches)	mm	mm	mm	mm	mm	mm	mm	mm
1/2	21.2	21.5					1.7	2.1
3/4	26.6	26.9					1.9	2.5
1	33.4	33.7					2.2	2.7
1/4	<b>42.</b> I	42.4			2.2	2.7	2.7	3.2
1/2	48. I	48.4			2.5	3.0	3.1	3.7
2	60.2	60.5	2.5	3.0	3.1	3.7	3.9	4.5
2 ½	75.0	75.3	3.0	3.5	3.9	4.5	4.8	5.5
3	88.7	89.1	3.5	4.1	4.6	5.3	5.7	6.6
4	114.1	114.5	4.5	5.2	6.0	6.9	7.3	8.4
6	168.0	168.5	6.6	7.6	8.8	10.2	10.8	12.5
8	218.8	219.4	7.8	9.0	10.3	11.9	12.6	14.5
10	272.6	273.4	9.7	11.2	12.8	14.8	15.7	18.1

EN 1452-2:2009 **Inch Series** 

Nominal	Out	side			Wall Thi	ckness		
Size	Diam	neter	PN	1 9	PN	112	PN	15
(Inches)	Min. mm	Max. mm	Min. mm	Max. mm	Min. mm	Max. mm	Min. mm	Max. mm
1/2	21.2	21.5					1.7	2.1
3/4	26.6	26.9					1.9	2.5
1	33.4	33.7					2.2	2.8
1 1/4	42.1	42.4			2.2	2.7	2.7	3.3
½	48.I	48.4			2.5	3.0	3.1	3.7
2	60.2	60.5	2.5	3.0	3.1	3.7	3.9	4.5
3	88.7	89.1	3.5	4.1	4.6	5.3	5.7	6.6
4	114.1	114.5	4.5	5.2	6.0	6.9	7.3	8.4
6	168.0	168.5	6.6	7.6	8.8	10.2	10.8	12.5
8	218.8	219.4	7.8	9.0	10.3	11.9	12.6	14.5
10	272.6	273.4	9.7	11.2	12.8	14.8	15.7	18.1

Pressure Pipe System Metric Range

### EN ISO 1452-2:2009

### **Metric Series**

Nominal		١	Nominal (minii	mum) Wall Thic	:kness	
Outside	Series 16	Series 12.5	Series I 0	Series 8	Series 6.3	Series5
Diameter	SDR 33	SDR 26	SDR 21	SDR 17	SDR 13.6	SDR 11
(mm).	١	Nominal Pressure	e PN based or	n service (desig	n) coefficient C	=2.5.
	PN6	PN8	PN10	PN 12.5	PN16	PN20
20	-	-	_	_	1.5	1.9
25	-	-	-	1.5	1.9	2.3
32	-	1.5	1.6	1.9	2.4	2.9
40	1.5	1.6	1.9	2.4	3.0	3.7
50	1.6	2.0	2.4	3.0	3.7	4.6
63	2.0	2.5	3.0	3.8	4.7	5.8
<b>7</b> 5	2.3	2.9	3.6	4.5	5.6	6.8
90	2.8	3.5	4.3	5.4	6.7	8.2
	Nominal Pre	ssure PN based	on service (de	esign)coefficien	t C=2.0	
110	2.7	3.4	4.2	5.3	6.6	8.1
125	3.1	3.9	4.8	6.0	7.4	9.2
140	3.5	4.3	5.4	6.7	6.3	10.3
160	4.0	4.9	6.2	7.7	9.5	11.8
200	4.9	6.2	7.7	9.6	11.9	14.7
225	5.5	6.9	8.6	10.8	13.4	16.6
250	6.2	7.7	9.6	11.9	14.8	18.4



# uPVC pressure pipe system for water distribution

Pressure Pipe System Metric Range

### ISO 161/1 **Metric Series**

Nominal		No	minal (minimum	) Wall Thicknes	s	
Outside Diameter (mm).	Seri SDF PN	R4I SDR		I7 SDR	13.6 SDR I	
25	_	_	1.5	1.9	2.3	
32	_	-	1.9	2.4	2.9	
40	-	1.6	2.4	3.0	3.7	
50	1.3	2.0	3.0	3.7	4.6	
63	1.6	2.5	3.8	4.7	5.8	
<b>75</b>	1.9	2.9	4.5	5.6	6.8	
90	2.2	3.5	5.4	6.7	8.2	
110	2.7	4.2	6.6	8.1	10.0	
125	3.1	4.8	7.4	9.2	11.4	
140	3.5	5.4	8.3	10.3	12.7	
160	4.0	6.2	9.5	11.8	14.6	
200	4.9	7.7	11.9	14.7	18.2	
225	5.5	8.6	13.4	16.6	20.5	
250	6.2	9.6	14.8	18.4	22.7	

### DIN 8062:2009

### **Metric Series**

Naminal					) Wall Thickne			
Nominal Outside Diameter (mm).	Series 25 SDR51 PN 4	Series 16.7 SDR 34.4 PN 6	Nominal Press Series 12.5 SDR 26 PN 8	Series 10 SDR 21 PN 10	Series 8 SDR 17 PN 12.5	or (SF)=2.5 Series 6.3 SDR 13.6 PN 16	Series 5 SDR 11 PN 20	Series 4 SDR 9 PN 25
20						1.5	1.9	2.3
25					1.5	1.9	2.3	2.8
32				1.6	1.9	2.4	2.9	3.6
40			1.6	1.9	2.4	3.0	3.7	4.5
50		1.5	2.0	2.4	3.0	3.7	4.6	5.6
63		1.9	2.5	3.0	3.8	4.7	5.8	7.1
75	1.5	2.2	2.9	3.6	4.5	5.6	6.8	8.4
90	1.8	2.7	3.5	4.3	5.4	6.7	8.2	10.1
110	2.2	3.2	4.2	5.3	6.6	8.1	10.0	12.3
125	2.5	3.7	4.8	6.0	7.4	9.2	11.4	14.0
140	2.8	4.1	5.4	6.7	8.3	10.3	12.7	15.7
160	3.2	4.7	6.2	7.7	9.5	11.8	14.6	17.9
200	3.9	5.9	7.7	9.6	11.9	14.7	18.2	22.4
225	4.4	6.6	8.6	10.8	13.4	16.6	20.5	25.2
250	4.9	7.3	9.6	11.9	14.8	18.4	22.7	27.9

# Pvc Duct & Conduit

# Pipe System





British Standard - BS 3506 - NEMATC-2 - ANSI / UL651



www.algawas.com

For use in electrical, telephone, communication and other duct systems

# British Standard Telephone Duct (B.P.O.)

Size (mm)	OD (mm)	linimum Wall (mm)
Duct 56	53.90	1.55
Duct 54D	96.50	3.25

Pipes can be supplied in 6.07 and 6.1m as per the standard or 6m length if required.

### BS 3506

Nominal Size	Outsic Diame	le Class ter		Thickness n pressure)	
Inch	Min. mm	Max. mm	Average Value mm	Indivio Value Min. mm	lual Max. mm
1 1/2 2 3 4	48.1 60.2 88.7 114.1	48.4 60.5 89.1 114.5	2.2 2.2 2.2 2.8	1.8 1.8 1.8 2.3	2.2 2.2 2.2 2.2 2.8
6 8 10	168.0 218.8 272.6	168.5 219.4 273.4	3.7 3.7 3.7	3.1 3.1 3.1	3.7 3.7 3.7

### **Duct & Conduit**

For use in electrical, telephone, communication and other duct systems

Duct & Conduit UL 651 Listed

# Duct and Conduit UL 651 Listed

Al Gawas Plastic Industries LCC, produces a range of upvc schedule 40 ducts in sizes 1/2" to 6" that are in accordance with NEMATC-2A standard and listed to UL 651. The conduits are suitable for above or below ground installations and made from 100% virgin pvc resin. The ducts meet and exceed all the mechanical and performance requirement of both the NEMATC2 and UL 651 standards.

### **General Properties**

- Fully compliant to NEMATC-2 and UL 651
- Rated for use with 90oC conductors
- Ultraviolet protected
- High impact and deformation properties
- Solvent cement joints with deep sockets
- Can be supplied in various lengths such as 3m, 6m, 2.9m, 5.8m (standard leg lengths 3m, 6m)
- Smooth solid wall
- Produced under an ISO 9001:2008 Quality Assurance System

<b>Mechnanical Properties</b>	ASTM	Typical Value	Fire Resistance Properti	es ASTM	Typical Value
Specific Gravity Tensile Strength (psi) @ 73.4*F Izod Impact - ft lbs/in of notch Flexural Strength (psi) Comprehensive Strength (psi) Hardness (Durometer D)	D792 D638 D256 D790 D695 D2240	1.4 - 1.7 5,000 0.65 - 1.50 12,500 9,000 95	Fire Resistance Flame Spread Smoke Development	E162 E84	Self Extinguishing 10 330
Thermal Properties	ASTM	Typical Value	Electrical Properties	ASTM	Typical Value
Coefficient of Thermal	D696	5.13 × 10-5	Dielectric Strength - volts/mil	D149	1,100
Expansion - in/in/ oC  Coefficient of Thermal  Expansion - in/in/ *F	D696	3.0 × 10-5	Dielectric Constant 60 CPS @ 30 'C	D150	4.00
Deflection Temp. oF Under Load @ 264 psi	D648	140*F	Power Factor 60 CPS @ 30'C	D150	1.93
Thermal Conductivity BTU (hr) (ft) (oF/in)	C177	1.3			

### **Duct & Conduit**

Duct & Conduit
UL 651 Listed

For use in electrical, telephone, communication and other duct systems

### NEMATC-2 AND ANSI / UL65 I Sizes and Dimensions of PVC Conduit

		U.S. Customary U	Jnits				
Nominal Outside Wall Thickness, Inches Socket Size Diameter, EPC-40-PVC Insertion D							
Inches	Average	Maximum	Minimum	Inches			
1 1/4	1.660+0.005	0.160	0.140	15/16 - 2			
1 1/2	1.900+0.006	0.165	0.145	1 1/6 - 2			
2	2.375+0.006	0.174	0.154	1 1/8 - 2			
2 1/2	2.875+0.007	0.227	0.203	1 1/2 - 3			
3	3.500+0.008	0.242	0.216	1 5/8 - 3 1/8			
3 1/2	4.000+0.008	0.253	0.226	1 11/16 - 3 1/4			
4	4.500+0.009	0.265	0.237	1 3/4 - 3 3/8			
5	5.563+0.010	0.289	0.258	1 15/16 - 3 5/8			
6	6.625+0.011	0.314	0.280	2 1/8 - 3 3/4			

Metric Units				
Nominal Size	Outside Diameter,	Wall Thickness, Inches EPC-40-PVC		Socket Insertion Depth
Inches	Average	Maximum	Minimum	Inches
I I/4	42.15+0.13	4.06	3.56	23.8 - 50.8
1 1/2	48.26+0.15	4.19	3.68	27.0 - 50.8
2	60.32+0.15	4.42	3.91	28.6 - 50.8
2 1/2	73.02+0.18	5.77	5.16	38.1 - 76.2
3	88.90+0.20	6.15	5.49	41.3 - 79.4
3 1/2	101.60+0.20	6.43	5.74	42.9 - 82.6
4	114.30+0.23	6.73	6.02	44.5 - 85.7
5	141.30+0.25	7.34	6.55	49.2 - 92.1
6	168.28+0.28	7.98	7.11	54.0 - 95.3

# Drainage Pipe System

# British Standard





BS EN 1329 - BS EN 1401 - BS 5255 - BS 4514 - BS 4660 - BS 5481





### Drainage Pipe System

Al Gawas Plastic Industries produces a range of UPVC pipes for above and below ground use made from virgin UPVC. The pipes are produced in all the major international standards ie: European Standards BS EN 1401, BS EN 1329, as well as the previous standards such as BS 5255, BS 4514, BS 4660, BS 5481. A range complying to ASTM D2655 Sch 40/80 is also available on request. Al Gawas Plastic Industries's drainage pipe system range from 1 1/4" to 10".

### **General Properties of Al Gawas Plastic Drain Pipes:**

- Fully compliant to the main International Standards Tough, impact resistent
- Different lengths available 3m, 2.9m, 6m, 5.8m. Other lengths on request.
- Distinctive colour coded system (ie Light Grey, Brown, White, etc.) with full printing at 1m intervals
- Superior chemical and acid resistance
- Outstanding mechanical properties of tensile strength and resistance to pressure.

### BS 5255 - BS 4514 - BS 4660 - BS 5481

Code	Nominal OD mm(inch)	Minimum OD mm Thickness	Minimum Wall mm	Colour
BS 5255 WASTE				
DR-125 DR-15 DR-2 (50)* DR-2(55)	36 (11/4") 43(11/2") 50(2") 55(2")	36.15 42.75 50.00 55.75	1.8 1.9 2.0 2.0	LG LG LG LG
BS 4514 SOIL				
DR-3/LG DR-4/LG DR-6/LG	82(3")   10(4")   160(6")	82.40 110.00 160.00	3.0 3.2 3.2	LG LG LG
BS 4660 UNDERGR	OUND			
DR-4/BR DR-6/BR	110(4") 160(6")	110.00 160.00	3.2 4.1	BR BR
BS 5481 GRAVITY SEVVER				
DR-8/BR DR-10/BR	200(8") 250(10")	200.00 250.00	4.9 6.1	BR BR



### Mechanical & Physical Characteristics

Characteristics	Requirement	Test Method
Impact Resistance	TIR ≤ 10%	EN 744
Vicat Softening	≥ 79°C	EN 727
Longitudinal Reversion	≤ 5%	EN 743
Dichloromethane Acid Resistance	No attack	EN 580
Elevated Temp. Cycling	No leakage	EN 1055
Long Term Performance of TPE Seals	1.90 days ≥ 1.3 bar	prEN 1989
-	2.100 years ≥ 0.6 bar	•
Resistance to Internal Pressure	No failure during the test 10.0MPA for 1000 hours, at 60°C	EN 921

### BS EN 1329-1:2000

Dimensions in millimeters

Nominal Size DN/OD	Nominal OD	Mean Outsio (dem, min)	de Diameter (dem, max)	Wall Thickness App (e, min)	olication Area "B" (e, max)
36 (1 1/4")	36	36.2	36.5	3.0	3.5
43 (1 1/2")	43	42.8	43.1	3.0	3.5
56 (2")	56	55.8	56.1	3.0	3.5
82 (3")	82	82.0	82.3	3.0	3.5
110 (4")	110	110.0	110.30	3.2	3.8
160 (6")	160	160.0	160.40	3.2	3.8
200 (8")	200	200.0	200.5	3.9	4.5
250 (10")	250	250.0	250.5	4.9	5.6

N.B. Application area "B" for components intended to be used above ground inside the building or outside building fixed to a wall.

### BS EN 1329-1:2000

Dimensions in millimeters

Nominal Size	Nominal	Mean Outsic	Mean Outside Diameter	
DN/OD	OD	(dem, min)	(dem, max)	
110 (4")	110	110.0	110.3	
160 (6")	160	160.0	160.4	
200 (8")	200	200.0	200.5	
250 (10")	250	250.0	250.5	



### **Specifications**

Standards: BS 5255 - Light Grey;

BS 4514 - Light Grey;

BS 4660 - Brown

Material: uPVC Resin

Joints: Female solvent weld sockets

Temp Range: 0°C - 80°C

(for intermittent discharge)

Tensile Strength: Min. 45 N/mm2



# Characteristics of Pipes BS EN1329, BS EN1401

#### **Compound Characteristics:**

The compounds used in Al Gawas Plastic pipes conforming to the standards have the following characteristics.

Modulus of Elasticity = E (1 min) ≥ 3000 mPa

Average Density = 1.4 g/cm<sup>3</sup>

Average Coefficient of

Linear Thermal Expansion = 0.8 mm/mKThermal Conductivity = 0.16 WK-I m-ISurface Resistance =  $> 1012 \Omega$ 

### Raw Material

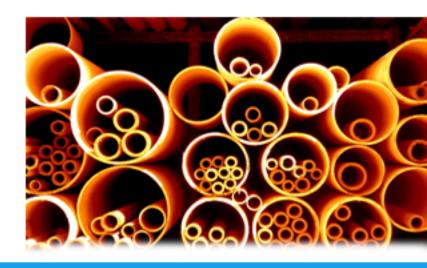
The raw material is PVC-U resin.

#### Colour

BS EN 1329-1:2000 v Light Grey BS EN 1401-1:1998 v Orange Brown

#### Length

Pipes are normally supplied in 6m overall length. Pipes can also be supplied in 5.8m overall length to fit inside containers. Sizes 36, 43 and 56mm are supplied in 4m overall length with plain ends.



### Certification

ISO 9001:2008 Quality Management

# Worldwide Supplier of Quality Piping Solutions Since 1998



### **Certified by:**



All Information in this catalouge is correct to our best knowledge at the time of preparation. However we reserve the rights to alter, amend and update any products, informations and services described in this catalouge

AL GAWAS plastic piping system & solutions



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