



COMPANY PROFILE

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MODERN PLASTIC INDUSTRY L.L.C.

Over 30 years of Excellence



Reliability, Quality and Value



Profile

Modern plastic industry is a part of AL SHIRAWI GROUP OF COMPANIES which is one of the largest and most diversified business conglomerates in the Arabian Gulf. From its inception in 1971 as a trading and contracting company, the Group has broadened its scope to encompass a cross section of products, services and industries ranging from printing, heavy fabrication, engineering, electromechanical, electronics, trucks and logistics.

Established in 1987, Modern Plastic industry (MPI) has pioneered the manufacturing of UPVC pressure pipe fittings in the UAE. Today Modern Plastic has a wide range of SWR drainage, high pressure UPVC, PPR, PP-RCT, CPVC, PP Compression and Duct pipes & fittings.

MPI products have been used extensively in the irrigation, construction, plumbing and Landscaping industry and are playing a significant role in the development of the Gulf region and Middle East.

STATE-OF-THE-ART FACILITY

MPI products are manufactured in a state-of-the-art facility at Dubai Investment Park with Precision moulds for fittings and high quality State-of-the-art Microprocessor based Injection Moulding Machines and High Quality Extrusion Machines for pipes.

Technology is the backbone of ongoing development and the right design selection headed by a team of experienced and well-trained professionals complements the development process.

MPI has established an in-house tool room with the latest CNC machines and EDM machines, which are used to manufacture moulds as per the needs of market.

GLOBAL PRESENCE

MPI has been the leader in the Gulf market mainly because it can offer the widest range of UPVC Drainage High Pressure and PPR Pipes and Fittings which are specially designed to meet the harsh climatic conditions with more emphasis of Quality, Reliability and Economy.

MPI is managed by a team of experienced and well trained professionals, and markets its range of products in the AGCC region, the Middle East, Africa, Europe, CIS Country and the Asian subcontinent.

PP-R / PP-RCT / PP-R FIBER



PP-R PIPES, FIBER PIPES

20mm TO 160mm - SDR 6, SDR 7.4, DIN 8077/8078,
EN ISO 15874 - 2

PP-R FITTINGS

20mm TO 63mm - SDR 5,
75mm TO 110mm - SDR 6
DIN 16962, EN ISO 15874 - 3

PP-R PIPES AND FITTINGS:

20mm – 160mm (SDR 5 and SDR 6)

- Corrosion resistance.
- Low thermal conductivity.
- Reduced pressure losses.
- Acoustic isolation.
- Organoleptical properties.
- Adjusted useful life.
- Installation reduced time.
- Can withstand constant temperature up to 70°C with a minimum service life of 50 years.

APPLICATION

- Potable water • Plumbing • Heating and cooling • Swimming pool • Chemical transport • Under floor heating and low temperature radiators.

PP-R CT PIPES

20mm TO 160mm - SDR 9, SDR 7.4, 160mm - SDR 11, SDR 7.4, DIN 8077/8078, EN ISO 15874 - 2

PP-R CT FITTINGS

20mm TO 63mm - SDR 5,
75mm TO 110mm - SDR 6
EN ISO 15874 - 3

PP-RCT PIPES AND FITTINGS:

20mm – 110mm (SDR 5, SDR 6, SDR 7.4 and SDR 11)

- Improved impact strength .
- Reduced expansion.
- Lower wall thickness and higher hydraulic capacity.
- Exceptionally high flow rates and velocities.
- 50% higher in long term strength than regular PPR.
- Can be used in potable water system, heating systems, thermal water systems and industrial systems.
- Withstand both chilled water and near to boiling temperatures.

UPVC SOIL / WASTE & DRAINAGE



32mm TO 315mm - CONFORM TO BS-EN 1329
GREY COLOUR - SOIL AND WASTE PIPES
& FITTINGS

110mm TO 400mm - CONFORM TO BS-EN 1401
ORANGE COLOUR - DRAINAGE PIPES &
FITTINGS

**DRAINAGE SYSTEMS OFFER A
COMPLETE RANGE OF PIPES AND
FITTINGS FOR WASTE. SOIL AND
DRAINAGE APPLICATIONS TO CATER TO
THE GROWING NEEDS OF THE BUILDING
CONSTRUCTION INDUSTRY.**

RAW MATERIAL

The raw material used is 100% UPVC virgin material, with necessary additives/chemicals needed to facilitate the manufacturing process.

APPEARANCE

The internal and external surface of the pipes are smooth, clean and free from surface defects.

COLOUR

THE PIPES ARE COLOURED
THROUGHOUT THE WALL AS FOLLOWS:

- Above Ground : BS EN 1329-1 : Grey.
- Below Ground : BS EN 1401-1 : Orange
Brown / Terra Cotta.

EFFECTIVE LENGTH

All Pipes are manufactured in 4m and
6/5.8m lengths.

SOCKETS

THE PIPES ARE SUPPLIED AS FOLLOWS:

32mm, 36mm(1 1/4"), 43mm(1 1/2") &
56mm (2")

pipes are supplied with plain ends.

82mm(3"), 110mm(4"), 160mm(6"),
200mm(8"), 250mm(10"), 315mm(12") &
400mm(16")

pipes are supplied with solvent cement
socket or rubber ring socket.

UPVC PRESSURE PIPES, FITTINGS & VALVES



HIGH PRESSURE UPVC PIPES & FITTINGS
1/2" TO 12" CONFORMING TO BS-EN
ISO 1452-2 / 3 (BS 3505); ISO 7 - 1
Fittings 20mm TO 200mm CONFORMING
TO DIN 8063/; ISO 7 - 1

Pipes 20mm TO 400mm CONFORMING TO
8061 & DIN 8062

**PIPES & FITTINGS ARE UPVC PRESSURE
SYSTEM FOR COLD WATER DISTRIBUTION,
PRECISELY DESIGNED FOR COLD SOLVENT
WELDING AS WELL AS RUBBER RING
JOINTING.**

RAW MATERIAL

The raw material used is 100% UPVC virgin material, with necessary additives/chemicals needed to facilitate the manufacturing process.

APPEARANCE

The internal and external surface of the pipes are smooth, clean and free from surface defects.

COLOUR

The colour of the pressure pipes & fittings is grey.

EFFECTIVE LENGTH

All Pipes are manufactured in 4m and 6/5.8m lengths.

WORKING PRESSURE

All pipes & fittings, depending upon the size are made for permissible continuous working pressure at 20°C as below:
Inch system pipes & fittings: upto 15 Bar
Millimeter system pipes & fittings: upto 16 Bar

CPVC PRESSURE PIPES & FITTINGS



HIGH PRESSURE CPVC PIPES & FITTINGS

20mm TO 160mm CONFORMING
TO DIN 8079 / 8080; ISO 15877- 2
& ISO 15877 - 3; ISO 7 - 1

MPI PIPES AND FITTINGS ARE THE “CPVC
(CHLORINATED POLYVINYL CHLORIDE)
PIPES AND FITTINGS SYSTEM”
FOR COLD AND HOT WATER
DISTRIBUTION PRECISELY DESIGNED
FOR SOLVENT WELDING JOINTING.

RAW MATERIAL

The raw material used is 100% CPVC virgin
compounded material.

APPEARANCE

The internal and external surface of the
Pipes and Fittings are smooth, clean and
free from surface defects.

COLOUR

The colour of the Pipes and Fittings are
Cream for DIN Standards.

EFFECTIVE LENGTH OF PIPES

All pipes are manufactured in 3meter
/ 4meter lengths or as per customer's
requirement.

WORKING PRESSURE

All CPVC Pipes and Fittings depending upon
the standards are made for permissible
continious working
pressure PN 16 ; PN 20 and PN 25.

PP COMPRESSION FITTINGS



PP COMPRESSION FITTINGS.

from D20mm to D63mm-16 Bar,
and D75mm to 110mm-10 Bar.
Conforming to ISO 3458, ISO 3501,
ISO 3503, ISO 14236, DIN 8076-3, UNI
9562,
UNI 9561, BS 5114/75.

**MPI PP COMPRESSION FITTINGS AND
CLAMP SADDLES ARE DESIGNED
PARTICULARLY FOR CONNECTING
POLYETHYLENE PIPES USED TO CONVEY
FLUIDS FOR DRINKING WATER AND
IRRIGATION SYSTEMS.**

RAW MATERIAL

Body, Thrust Bush and Nut in Polypropylene
Co-Polymer, Clinching Ring in White Acetal
Resin, O-Ring Gasket in NBR, Reinforcement
ring in AISI 430.

APPEARANCE

The internal and external surface of the
Fittings are smooth, clean and free from
surface defects.

COLOUR

The colour of the Fitting Body, Thrust Bush
and Nut are generally Black; Clinching Ring
in White.

Blue nut colour is available.

PRESSURE RATING AT 20°C

D 20 mm to D 63 mm - 16 bar

D 75 mm to D 110mm - 10 bar.

UPVC DUCT PIPES & FITTINGS



DUCT PIPE

- AS PER DIN 8062 - 25mm TO 315mm
- AS PER 3506 - 1 1/4" TO 12"
- AS PER EN 1452

DUCT PIPE TELEPHONE CABLE D56 & D54

DUCT FABRICATED FITTINGS

DUCTS ARE USED IN TELEPHONE CABLES, HIGH VOLTAGE UNDERGROUND CABLES, STREET AND HOUSING POWER SUPPLIES, FACTORY AND INDUSTRIAL APPLICATIONS, SHEATHING OF WATER AND GAS SERVICES.

RAW MATERIAL

The raw material used is 100% material with necessary additives / chemical needed to facilitate the manufacturing process

COLOUR

The colour of the pipe shall be Grey / Black or as per customer requirement.

Effective Length.

The standard length shall be 6m with socket or as per customer requirement.

BENDS

Short radius and Long radius 22.5°, 45°, 90°

JUNCTIONS

Square and Sweep Tees, Crosses and Fittings, Double Sockets, Bellmouths, End Caps.

GENERAL PROPERTIES

Specific Gravity : 1.41

Vicat Softening Temperature : Min 80°C

Tensile strength : > 45 MN/ sq cm at 20°C

Flammability : UPVC is self-extinguishing and will not support combustion

Specific heat : 1040 J/ Kg / °C

UPVC FABRICATED PRODUCTS



PUDDLE FLANGE

SOIL/DRAINAGE/ PRESSURE, SLOTTED
LAND DRAIN PIPES,
SEALED DRY MANHOLES, GREASE TRAPS
(TYPE A,B & C), CATCH BASIN & RAMP
CHANNEL, DRY GULLY TRAP

MODERN PLASTICS INDUSTRY HAS
LED THE FIELD IN THE DESIGN AND
MANUFACTURE OF SPECIALIZED PVC
FABRICATED FITTINGS.

OUR SKILLED WORK FORCE OPERATES
WITHIN THE PARAMETERS LAID DOWN
BY THE BSI, TO PRODUCE HIGHEST
QUALITY FABRICATED FITTINGS FROM
MPI KITEMARKED PIPES & FITTINGS TO
FORM, SHAPE AND ADAPT A MULTITUDE
OF PLASTIC PRODUCT TO PRECISE

SPECIFICATION.

All the welded joints are spark tested to ensure the weld is strong, air and water tight. Small fabrication of Electric Bell Mouth to complete fabrication of any building plumbing system, our team is fully equipped to provide our valuable clients with the complete solutions suited to their specific tailor made requirements.

MPI Fabricated products are designed and supplied to complement our UPVC molded product range, to resolve the requirements of any on site specials & custom made Fabricated fittings to complete the range for our valued and prestigious projects for our valued customers.

MPI Fabricated products committed with
“Quality & Precision“

REFERENCE PROJECTS



BLUE TOWER - DUBAI



MIRA OASIS VILLAS, EMAAR, DUBAI



SOFITEL HOTEL, PALM JUMEIRAH, DUBAI



GROSVENOR HOUSE, DUBAI



DUBAI MARINA 101 TOWER



DUJA TOWER, DUBAI

QUALITY CERTIFICATES



WHY MPI

Proven research capability and ability to provide products to suit customer application needs.

Value pipes & fittings at a competitive price.

Technical service and installation backup.

One stop facility - wide range of pipes & fittings in UPVC (SWR Drainage), UPVC high pressure, CPVC & PP Compression and PP-R / PP-RCT.

Prompt deliveries in-house manufacturing facilities for all the pipes and fittings in UAE.

Quality - according to international standards (KITEMARK, WRAS, DVGW, SKZ, HY, KIWA)

Quality management system (ISO 9001:2015).

Operational excellence - precision manufacturing according to the standards using state of the art machinery.

Duty exemption in GCC countries.

Reliability - 24 hours customer service.

صناعة البلاستيك الحديثة (ش.ذ.م.م.)

MODERN PLASTIC INDUSTRY (L.L.C.)

(A Member of Al Shirawi Group of Companies)



ص.ب: ٣١٥٥، دبي - ا.ع.م، تليفون: ٩٧١-٤-٨٨٥ ١٣٠٠، فاكس: ٩٧١-٤-٨٨٥ ١٣٠١

P.O. Box: 31550, Dubai - U.A.E., Tel.: +971-4-8851300, Fax: +971-4-8851301

E-mail: info@mpi.ae Web Location: <http://www.mpi.ae>

TRADE LICENSE

رخصة صناعية Industrial License

تفاصيل الرخصة / License Details

License No.	300321	رقم الرخصة
Company Name	MODERN PLASTIC INDUSTRY (L.L.C.)	اسم الشركة
Trade Name	MODERN PLASTIC INDUSTRY (L.L.C.)	الاسم التجاري
Legal Type	Limited Liability Company - Single Owner(LLC - SO)	الشكل القانوني
Expiry Date	21/07/2024	تاريخ الإنتهاء
D&B D-U-N-S ®	645797168	الرقم العالمي
Register No.	1996276	رقم السجل التجاري
Issue Date	22/07/1987	تاريخ الإصدار
Main License No.	300321	رقم الرخصة الام
DCCI No.	12646	عضوية الغرفة

الأطراف / License Members

Share / الحصص	Role / الصفة	Nationality / الجنسية	Name / الاسم	No./رقم الشخص
100.00%	Shares Owner / مالك حصص	United Arab Emirates / الامارات	شركة الواحة للاستثمار	538007
	Manager / مدير	India / الهند	OASIS INVESTMENTCO.L.L.C SUBHASH MOTILAL SHIRBHAIYE MOTILAL NARAYAN SHIRBHAIYE	904336

نشاط الرخصة التجارية / License Activities

Plastic Caps & Lids Manufacturing	صناعة الاغطية البلاستيكية
Plastic Pipes & Fittings Manufacturing	صناعة الأنابيب البلاستيكية ولوازمها

العنوان / Address

Phone No	971-4-8851300	تليفون	P.O. Box	31550	صندوق بريد
Fax No	971-4-8851302	فاكس	Parcel ID	598-1036	رقم القطعة
Mobile No	971-50-1893299	هاتف متحرك	Email / البريد الإلكتروني	مستودع ملك مجمع دبي للاستثمار الاول - بر دبي - شارع الامارات	

الملاحظات / Remarks

تم اضافة نشاط في 23/11/2022
تم تغيير المدير في 2021-01-20.
تم اضافة نشاط للسجل التجاري في 23/03/2023
تم اضافة نشاط للسجل التجاري في 04/05/2023
تم انسحاب شريك وتغيير الشكل القانوني في 02/06/2023

Print Date 27/07/2023 17:05 تاريخ الطباعة

Receipt No. 15127028 رقم الإيصال



يمكنك الآن تجديد رخصتك التجارية من خلال الرسائل النصية القصيرة، أرسل رقم الرخصة إلى 6969 (دو/اتصالات) للحصول على إذن الدفع.
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وثيقة إلكترونية معتمدة وصادرة بدون توقيع من دائرة الاقتصاد والسياحة في دبي. لمراجعة صحة البيانات الواردة في الرخصة يرجى مسح رمز الاستجابة السريعة
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شهادة شهر قيد شركة في السجل التجاري
Commercial Register

تفاصيل القيد / Register Details

Main Lice. Nr	300321	رقم الرخصة الأم	Register No.	1996276	رقم القيد
Company Name	صناعة البلاستيك الحديثة (شركة ذات مسؤولية محدودة)				
Legal Type	MODERN PLASTIC INDUSTRY (L.L.C.)				
Legal Type	شركة ذات مسؤولية محدودة - الشخص الواحد (ذ.م. - SO)				
Expiry Date	21/07/2024	تاريخ الإنتهاء	Reg. Date	30/05/1996	تاريخ الإصدار
D&B D-U-N-S No.	645797168				

تفاصيل رأس المال / Capital Details

Nominated	3,700,000	الإسمى
Paid	3,700,000	المدفوع
No. of Shares	3,700	عدد الأسهم
Currency	UAE Dirhams	العملة

عنوان الرخصة / License Address

مستودع ملك مجمع دبي للاستثمار الاول بر دبي - شارع الامارات

عنوان السجل التجاري / Commerce Address

ملك عقارات حكومة دبي - بواسطة شركة عمان للتصويل - الرمول - ص ب 93 ت : 3338700

أنشطة السجل / Register Activities

Plastic Pipes & Fittings Manufacturing	صناعة الأنابيب البلاستيكية ولوازمها
Pipes & Fittings Trading	تجارة الانابيب والمواسير
Builders' Plastics Ware Trading	تجارة الاشغال البلاستيكية للابنية
Plastic & Nylon Raw Materials Trading	تجارة خامات البلاستيك والنايلون
Plastic Bags & Containers Trading	تجارة العبوات والاكياس البلاستيكية
Plastic Sheets Trading	تجارة الألواح البلاستيكية
Packing & Packaging Materials Trading	تجارة مواد التعبئة والتغليف
Plastic Bottles & Containers Manufacturing	صناعة القوارير والعبوات البلاستيكية
Glass Bottles Trading	تجارة القوارير الزجاجية
Plastic Caps & Lids Manufacturing	صناعة الاغطية البلاستيكية

Print Date 27/07/2023 17:05 تاريخ الطباعة

Receipt No. 15127028 رقم الإيصال



يمكنك الآن تجديد رخصتك التجارية من خلال الرسائل النصية القصيرة، أرسل رقم الرخصة إلى 6969 (دو/اتصالات) للحصول على إذن الدفع.
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وثيقة إلكترونية معتمدة وصادرة بدون توقيع من دائرة الاقتصاد والسياحة في دبي. لمراجعة صحة البيانات الواردة في الرخصة يرجى مسح رمز الاستجابة السريعة
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ISO - KITEMARK - WRAS CERTIFICATE

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Modern Plastic Industry LLC.

Main Site: Plot No: 598-1036, P.O. Box 31550, Dubai Investment Park 1,
Dubai, United Arab Emirates

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

Certified by Intertek since: 13 April 2023

The management system is applicable to:

Manufacture of Injection Moulded and Extrusion Products like Plastic
Pipes & Fittings and Plastic Packing Products like Caps & Lids for Food,
Pharma and Industrial Applications

Certificate Number:

0146820

Initial Certification Date:

07 July 1999

Date of Certification Decision:

16 May 2023

Issuing Date:

16 May 2023

Valid Until:

15 May 2026



intertek



014

A handwritten signature in black ink, appearing to read 'Calin Moldovean'.

Calin Moldovean

President, Business Assurance

Intertek Certification Limited, 10A Victory Park,
Victory Road, Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS
accredited body under schedule of
accreditation no. 014.



CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Modern Plastic Industry LLC.

Main Site: Plot No: 598-1036, P.O. Box 31550, Dubai Investment Park 1,
Dubai, United Arab Emirates

has been registered by Intertek as conforming to the requirements of:

ISO 14001:2015

The management system is applicable to:

Manufacture of Injection Moulded and Extrusion Products like Plastic
Pipes & Fittings and Plastic Packing Products like Caps & Lids for Food,
Pharma and Industrial Applications

Certificate Number:

0149217

Initial Certification Date:

16 May 2023

Date of Certification Decision:

16 May 2023

Issuing Date:

16 May 2023

Valid Until:

15 May 2026



intertek



014

A handwritten signature in black ink, reading "Calin Moldovean".

Calin Moldovean

President, Business Assurance

Intertek Certification Limited, 10A Victory Park,
Victory Road, Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS
accredited body under schedule of
accreditation no. 014.



CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Modern Plastic Industry LLC.

Main Site: Plot No: 598-1036, P.O. Box 31550, Dubai Investment Park 1,
Dubai, United Arab Emirates

has been registered by Intertek as conforming to the requirements of:

ISO 45001:2018

The management system is applicable to:

Manufacture of Injection Moulded and Extrusion Products like Plastic
Pipes & Fittings and Plastic Packing Products like Caps & Lids for Food,
Pharma and Industrial Applications

Certificate Number:

0149219

Initial Certification Date:

16 May 2023

Date of Certification Decision:

16 May 2023

Issuing Date:

16 May 2023

Valid Until:

15 May 2026



intertek



014

A handwritten signature in black ink, reading "Calin Moldovean".

Calin Moldovean

President, Business Assurance

Intertek Certification Limited, 10A Victory Park,
Victory Road, Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS
accredited body under schedule of
accreditation no. 014.



Kitemark™ Certificate

This is to certify that:

Modern Plastics Industry LLC
Premise number: 598990135
598, Dubai Investment Park 1
Jebel Ali
PO Box 31550
Dubai
United Arab Emirates

Holds Certificate Number:

KM 556843

In respect of:

BS EN ISO 1452-2

Plastic piping Systems for water supply and for buried and above-ground drainage and sewerage under pressure - Unplasticized poly (vinyl chloride) (PVC-U) Part 2: Pipes

This issues the right and licence to use the Kitemark in accordance with the Kitemark Terms and Conditions governing the use of the Kitemark, as may be updated from time to time by BSI Assurance UK Ltd (the "Conditions"). All defined terms in this Certificate shall have the same meaning as in the Conditions.

The use of the Kitemark is authorized in respect of the Product(s) detailed on this Certificate provided at or from the above address.



For and on behalf of BSI:

Shahm Barhom, Group Product Certification Director

First Issued: 2014-04-14

Effective Date: 2022-09-14

Latest Issue: 2022-09-14

Expiry Date: 2024-10-29



Page: 1 of 4

Kitemark™ Certificate

No. KM 556843

BS EN 1452-2:2009 - Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly (vinyl chloride) (PVC U). Pipes.

The scope of this certificate covers the following products:

Imperial

Pipe Size and Socket End Type	Pressure Class
½" Plain ended & Solvent Type	PN-15 (Class-E)
¾" Plain ended & Solvent Type	PN-15 (Class-E)
1" Plain ended & Solvent Type	PN-15 (Class-E)
1¼" Plain ended & Solvent Type	PN-15 (Class-E) PN-12 (Class-D)
1½" Plain ended & Solvent Type	PN-15 (Class-E) PN-12 (Class-D)
2" Plain ended & Solvent Type and Rubber Ring Type	PN-15 (Class-E) PN-12 (Class-D) PN-9 (Class-C)
3" Plain ended & Solvent Type and Rubber Ring Type	PN-15 (Class-E) PN-12 (Class-D) PN-9 (Class-C)
4" Plain ended & Solvent Type and Rubber Ring Type	PN-15 (Class-E) PN-12 (Class-D) PN-9 (Class-C)
6" Plain ended & Solvent Type and Rubber Ring Type	PN-15 (Class-E) PN-12 (Class-D) PN-9 (Class-C)
8" Plain ended & Solvent Type and Rubber Ring Type	PN-15 (Class-E) PN-12 (Class-D) PN-9 (Class-C)
10" Plain ended & Solvent Type and Rubber Ring Type	PN-15 (Class-E) PN-12 (Class-D) PN-9 (Class-C)

First Issued: 2014-04-14

Effective Date: 2022-09-14

Latest Issue: 2022-09-14

Expiry Date: 2024-10-29

Page: 2 of 4

This certificate has been issued by and remains the property of BSI Assurance UK Ltd, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP, United Kingdom and should be returned immediately upon request.
To check its validity telephone +44 (0) 345 080 9000. An electronic certificate can be authenticated [online](#).

BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A member of BSI Group of Companies.

Kitemark™ Certificate

No. KM 556843

BS EN 1452-2:2009 - Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly (vinyl chloride) (PVC U). Pipes.

Imperial (continued)

Pipe Size and Socket End Type	Pressure Class
12" Plain ended & Solvent Type and Rubber Ring Type	PN-15 (Class-E) PN-12 (Class-D) PN-9 (Class-C)

Metric

Pipe Size and Socket End Type	Pressure Class
20mm Plain ended & Solvent Type	PN-16
25mm Plain ended & Solvent Type	PN-16
32mm Plain ended & Solvent Type	PN-16 PN-10
40mm Plain ended & Solvent Type	PN-16 PN-10 PN-6
50mm Plain ended & Solvent Type	PN-16 PN-10 PN-6
63mm Plain ended & Solvent Type and Rubber Ring Type	PN-16 PN-10 PN-6
75mm Plain ended & Solvent Type and Rubber Ring Type	PN-16 PN-10 PN-6
90mm Plain ended & Solvent Type and Rubber Ring Type	PN-16 PN-10 PN-6

First Issued: 2014-04-14

Effective Date: 2022-09-14

Latest Issue: 2022-09-14

Expiry Date: 2024-10-29

Page: 3 of 4

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A member of BSI Group of Companies.

Kitemark™ Certificate

No. KM 556843

BS EN 1452-2:2009 - Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly (vinyl chloride) (PVC U). Pipes.

Metric (continued)

Pipe Size and Socket End Type	Pressure Class
110mm Plain ended & Solvent Type and Rubber Ring Type	PN-16 PN-10 PN-6
160mm Plain ended & Solvent Type and Rubber Ring Type	PN-16 PN-10 PN-6

Products on this certificate may be manufactured under the following trade names:

ATLAS and **FLOWTECH**

First Issued: 2014-04-14

Latest Issue: 2022-09-14

Effective Date: 2022-09-14

Expiry Date: 2024-10-29

Page: 4 of 4

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BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A member of BSI Group of Companies.

Kitemark™ Certificate

This is to certify that:

Modern Plastics Industry LLC
Premise number: 598990135
598, Dubai Investment Park 1
Jebel Ali
PO Box 31550
Dubai
United Arab Emirates

Holds Certificate Number:

KM 507156

In respect of:

BS EN ISO 1452-3

Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC-U) Part 3: Fittings

This issues the right and licence to use the Kitemark in accordance with the Kitemark Terms and Conditions governing the use of the Kitemark, as may be updated from time to time by BSI Assurance UK Ltd (the "Conditions"). All defined terms in this Certificate shall have the same meaning as in the Conditions.

The use of the Kitemark is authorized in respect of the Product(s) detailed on this Certificate provided at or from the above address.



For and on behalf of BSI:

Shahm Barhom, Group Product Certification Director

First Issued: 2007-01-05

Effective Date: 2022-09-14

Latest Issue: 2022-09-14

Expiry Date: 2024-10-29



Page: 1 of 8

Kitemark™ Certificate

No. KM 507156

BS EN ISO 1452-3:2010 - Plastic Piping Systems for water supply (PVC-U), Part 3 Fittings

6 " Fittings

Product Description	Socket Type
6" Elbow 90°	Solvent Cement
6" Elbow 45°	Solvent Cement
6" Tee	Solvent Cement
6" Socket	Solvent Cement
6x4" Reducer Bush	Solvent Cement
6x3" Reducer Bush	Solvent Cement
6" Flange and Stub	Solvent Cement
6" Cap	Solvent Cement

4 " Fittings

Product Description	Socket Type
4" Elbow 90°	Solvent Cement
4" Elbow 45°	Solvent Cement
4" Tee	Solvent Cement
4" Socket	Solvent Cement
4" Male Adaptor	Solvent Cement
4" Cap	Solvent Cement
4" Thread Cap	Solvent Cement
4" x 3" Reducer Bush	Solvent Cement
4" x 3" Reducing Tee	Solvent Cement
4" x 2" Reducer Bush	Solvent Cement
4" x 2" Reducing Tee	Solvent Cement
4" Female Socket Adaptor	Solvent Cement
4" Flange & stub	Solvent Cement

First Issued: 2007-01-05

Latest Issue: 2022-09-14

Effective Date: 2022-09-14

Expiry Date: 2024-10-29

Page: 2 of 8

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Kitemark™ Certificate

No. KM 507156

BS EN ISO 1452-3:2010 - Plastic Piping Systems for water supply (PVC-U). Part 3 Fittings

3 " Fittings

Product Description	Socket Type
3" Elbow 90°	Solvent Cement
3" Female Elbow 90°	Solvent Cement
3" Elbow 45°	Solvent Cement
3" Tee	Solvent Cement
3" Female Tee	Solvent Cement
3" Socket	Solvent Cement
3" Male Adaptor	Solvent Cement
3" Cap	Solvent Cement
3" Thread Cap	Solvent Cement
3" Female Socket Adaptor	Solvent Cement
3" Flange & stub	Solvent Cement
3" x 1½" Reducer Bush	Solvent Cement
3" x 2" Reducer Bush	Solvent Cement
3" x 2" Reducing Tee	Solvent Cement

2" Fittings

Product Description	Socket Type
2" Elbow 90°	Solvent Cement
2" Elbow 45°	Solvent Cement
2" Tee	Solvent Cement
2" Socket	Solvent Cement
2" Male Adaptor	Solvent Cement
2" Cap	Solvent Cement
2" Thread Cap	Solvent Cement
2" Female Socket Adaptor	Solvent Cement
2" Female Elbow 90°	Solvent Cement
2" x ½" Reducer Bush	Solvent Cement
2" x ¾" Reducer Bush	Solvent Cement

First Issued: 2007-01-05

Latest Issue: 2022-09-14

Effective Date: 2022-09-14

Expiry Date: 2024-10-29

Page: 3 of 8

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Kitemark™ Certificate

No. KM 507156

BS EN ISO 1452-3:2010 - Plastic Piping Systems for water supply (PVC-U), Part 3 Fittings

2" Fittings (continued)

Product Description	Socket Type
2" x 1" Reducer Bush	Solvent Cement
2" x 1¼" Reducer Bush	Solvent Cement
2" x 1½" Reducer Bush	Solvent Cement
2" x ½" Female Reducer Bush	Solvent Cement
2" Female Tee	Solvent Cement
2" Female Slip Adaptor	Solvent Cement
2" x ½" Reducer Tee	Solvent Cement
2" x ¾" Reducer Tee	Solvent Cement
2" x 1" Reducer Tee	Solvent Cement
2" x 1½" Reducer Tee	Solvent Cement
2" x ½" Reducer Female Tee	Solvent Cement
2" x ¾" Reducer Female Tee	Solvent Cement
2" Flange & stub	Solvent Cement
2" "Y"	Solvent Cement

1½" Fittings

Product Description	Socket Type
1½" Elbow 90°	Solvent Cement
1½" Elbow 45°	Solvent Cement
1½" Tee	Solvent Cement
1½" Socket	Solvent Cement
1½" Male Adaptor	Solvent Cement
1½" Cap	Solvent Cement
1½" Thread Cap	Solvent Cement
1½" Female Socket Adaptor	Solvent Cement

First Issued: 2007-01-05

Latest Issue: 2022-09-14

Effective Date: 2022-09-14

Expiry Date: 2024-10-29

Page: 4 of 8

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Kitemark™ Certificate

No. KM 507156

BS EN ISO 1452-3:2010 - Plastic Piping Systems for water supply (PVC-U), Part 3 Fittings

1½" Fittings (continued)

Product Description	Socket Type
1½" Female Elbow 90°	Solvent Cement
1½" x ½" Reducer Bush	Solvent Cement
1½" x ¾" Reducer Bush	Solvent Cement
1½" x 1" Reducer Bush	Solvent Cement
1½" x 1¼" Reducer Bush	Solvent Cement
1½" x ½" Female Reducer Bush	Solvent Cement
1½" Female Tee	Solvent Cement
1½" Female Slip Adaptor	Solvent Cement
1½" x ½" Reducer Tee	Solvent Cement
1½" x ¾" Reducer Tee	Solvent Cement
1½" x 1" Reducer Tee	Solvent Cement
1½" x ½" Reducer Female Tee	Solvent Cement
1½" x ¾" Reducer Female Tee	Solvent Cement
1½" x 1" Reducer Female Tee	Solvent Cement
1½" Male Plug	Solvent Cement
1½" "Y"	Solvent Cement
1½" Hex Nipple	Solvent Cement

1¼" Fittings

Product Description	Socket Type
1¼" Elbow 90°	Solvent Cement
1¼" Elbow 45°	Solvent Cement
1¼" Tee	Solvent Cement
1¼" Socket	Solvent Cement
1¼" Male Adaptor	Solvent Cement
1¼" Cap	Solvent Cement

First Issued: 2007-01-05

Latest Issue: 2022-09-14

Effective Date: 2022-09-14

Expiry Date: 2024-10-29

Page: 5 of 8

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Kitemark™ Certificate

No. KM 507156

BS EN ISO 1452-3:2010 - Plastic Piping Systems for water supply (PVC-U), Part 3 Fittings

1¼" Fittings (continued)

Product Description	Socket Type
1¼" Thread Cap	Solvent Cement
1¼" Female Socket Adaptor	Solvent Cement
1¼" Female Elbow 90°	Solvent Cement
1¼" x ¾" Reducer Bush	Solvent Cement
1¼" x 1" Reducer Bush	Solvent Cement
1¼" Female Tee	Solvent Cement
1¼" Female Slip Adaptor	Solvent Cement
1¼" Male Plug	Solvent Cement
1¼" "Y"	Solvent Cement

1" Fittings

Product Description	Socket Type
1" Elbow 90°	Solvent Cement
1" Elbow 45°	Solvent Cement
1" Tee	Solvent Cement
1" Socket	Solvent Cement
1" Male Adaptor	Solvent Cement
1" Cap	Solvent Cement
1" Thread Cap	Solvent Cement
1" Female Socket Adaptor	Solvent Cement
1" Female Elbow 90°	Solvent Cement
1" x ½" Reducer Bush	Solvent Cement

First Issued: 2007-01-05

Latest Issue: 2022-09-14

Effective Date: 2022-09-14

Expiry Date: 2024-10-29

Page: 6 of 8

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Kitemark™ Certificate

No. KM 507156

BS EN ISO 1452-3:2010 - Plastic Piping Systems for water supply (PVC-U), Part 3 Fittings

1" Fittings (continued)

Product Description	Socket Type
1" x 3/4" Reducer Bush	Solvent Cement
1" x 1/2" Female Reducer Bush	Solvent Cement
1" x 3/4" Female Reducer Bush	Solvent Cement
1" Female Tee	Solvent Cement
1" Female Slip Adaptor	Solvent Cement
1" Male Plug	Solvent Cement
1" "Y"	Solvent Cement
1" x 1/2" Reducer Tee	Solvent Cement
1" x 3/4" Reducer Tee	Solvent Cement
1" x 1/2" Reducer Female Tee	Solvent Cement
1" x 3/4" Reducer Female Tee	Solvent Cement
1" Hex Nipple	Solvent Cement

3/4" Fittings

Product Description	Socket Type
3/4" Elbow 90°	Solvent Cement
3/4" Elbow 45°	Solvent Cement
3/4" Tee	Solvent Cement
3/4" Socket	Solvent Cement
3/4" Male Adaptor	Solvent Cement
3/4" Cap	Solvent Cement
3/4" Thread Cap	Solvent Cement
3/4" Female Socket Adaptor	Solvent Cement
3/4" Female Elbow 90°	Solvent Cement
3/4" x 1/2" Reducer Bush	Solvent Cement
3/4" x 1/2" Female Reducer Bush	Solvent Cement
3/4" Female Tee	Solvent Cement
3/4" Female Slip Adaptor	Solvent Cement

First Issued: 2007-01-05

Latest Issue: 2022-09-14

Effective Date: 2022-09-14

Expiry Date: 2024-10-29

Page: 7 of 8

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Kitemark™ Certificate

No. KM 507156

BS EN ISO 1452-3:2010 - Plastic Piping Systems for water supply (PVC-U). Part 3 Fittings

3/4" Fittings(continued)

Product Description	Socket Type
3/4" Male Plug	Solvent Cement
3/4" "Y"	Solvent Cement
3/4 x 1/2" Reducer Tee	Solvent Cement
3/4" x 1/2" Reducer Female Tee	Solvent Cement
3/4" Hex Nipple	Solvent Cement

1/2" Fittings

Product Description	Socket Type
1/2" Elbow 90°	Solvent Cement
1/2" Elbow 45°	Solvent Cement
1/2" Tee	Solvent Cement
1/2" Socket	Solvent Cement
1/2" Male Adaptor	Solvent Cement
1/2" Cap	Solvent Cement
1/2" Thread Cap	Solvent Cement
1/2" Female Socket Adaptor	Solvent Cement
1/2" Female Elbow 90°	Solvent Cement
1/2" Female Tee	Solvent Cement
1/2" Female Slip Adaptor	Solvent Cement
1/2" Male Plug	Solvent Cement
1/2" Hex Nipple	Solvent Cement

Notes

Products on this certificate may be manufactured under the following trade names: "Atlas", "MPI".

Products on this certificate are manufactured using the following material: Sabic K67S.

First Issued: 2007-01-05

Latest Issue: 2022-09-14

Effective Date: 2022-09-14

Expiry Date: 2024-10-29

Page: 8 of 8

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Approval Number 2203531
Test Report: J-00427172



Water Regulations Approval Scheme Ltd.
Unit 13,
Willow Road,
Pen y Fan Industrial Estate,
Crumlin,
Gwent,
NP11 4EG

4th April 2022

Modern Plastic Industry LLC
Dubai Investment Park,
PO Box No. 31550,
Dubai,
United Arab Emirates

**WATER REGULATIONS APPROVAL SCHEME LTD. (WRAS)
MATERIAL APPROVAL**

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6920-1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

POLYVINYLCHLORIDE (PVC, PVC-U AND CPVC)- COMPONENTS.

5301

'Atlas Pipe'. grey coloured, extruded UPVC pipe. For use with water up to 65°C.

APPROVAL NUMBER: 2203531

APPROVAL HOLDER: MODERN PLASTIC INDUSTRY LLC

The Scheme reserves the right to review approval.

Approval 2203531 is valid between March 2022 and March 2027

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, "Materials which have passed full tests of effect on water quality".

The Directory may be found at: www.wrasapprovals.co.uk/approvals-directory/

Yours Faithfully

Ian Hughes
WRAS Approvals Manager

Approval Number 2203532
Test Report: J-00427174



4th April 2022

Modern Plastic Industry LLC
Dubai Investment Park,
PO Box No. 31550,
Dubai,
United Arab Emirates

Water Regulations Approval Scheme Ltd.
Unit 13,
Willow Road,
Pen y Fan Industrial Estate,
Crumlin,
Gwent,
NP11 4EG

**WATER REGULATIONS APPROVAL SCHEME LTD. (WRAS)
MATERIAL APPROVAL**

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6920-1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

POLYVINYLCHLORIDE (PVC, PVC-U AND CPVC)- COMPONENTS.

5301

'Atlas Fittings'. Grey coloured, injection moulded UPVC fitting. For use with water up to 65°C.

APPROVAL NUMBER: 2203532

APPROVAL HOLDER: MODERN PLASTIC INDUSTRY LLC

The Scheme reserves the right to review approval.

Approval 2203532 is valid between March 2022 and March 2027

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, "Materials which have passed full tests of effect on water quality".

The Directory may be found at: www.wrasapprovals.co.uk/approvals-directory/

Yours Faithfully

Ian Hughes
WRAS Approvals Manager

TEST REPORTS / CERTIFICATES



صناعة البلاستيك الحديثة (ش.ذ.م.)
MODERN PLASTIC INDUSTRY (L.L.C.)

Paid - up Capital AED 3,700,000, Commercial Registration No. 46900

(A Member of Al Shirawi Group of Companies)

ص.ب. : ٣١٥٥٠، دبي - ا.ع.م، تليفون : ٩٧١-٤-٨٨٥١٣٠٠، فاكس : ٩٧١-٤-٨٨٥١٣٠١

P.O. Box : 31550, Dubai - U.A.E., Tel. : +971-4-8851300, Fax : +971-4-8851301

E-mail : info@mpi.ae Website : www.mpi.ae



TEST CERTIFICATE

DATE: 10/08/2023

UPVC PIPES TO BS 3505 - EN 1452-2

Manufacturer : Modern Plastic Industry LLC
Product : 1" UPVC High Pressure Pipe (Class-E / PN-15), ATLAS

The above Pipe manufactured by MPI was tested in accordance to BS 3505 - EN 1452-2

The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 33.40 - 33.70	33.50	Pass
		Wall thickness : 2.20 - 2.80	2.22 - 2.38	Pass
3	Heat reversion	Maximum 5 %.	2.10%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.90°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.


QC Manager

MODERN PLASTIC INDUSTRY (L.L.C.)
DUBAI-U.A.E.



صناعة البلاستيك الحديثة (ش.ذ.م.م.)
MODERN PLASTIC INDUSTRY (L.L.C.)
Paid - up Capital AED 3,700,000, Commercial Registration No. 46900
(A Member of Al Shirawi Group of Companies)
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P.O. Box : 31550, Dubai - U.A.E., Tel. : +971-4-8851300, Fax : +971-4-8851301
E-mail : info@mpi.ae Website : www.mpi.ae



TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BS 3505 - EN 1452-2

Manufacturer : Modern Plastic Industry LLC
Product : 2" UPVC High Pressure Pipe (Class-E / PN-15), ATLAS

The above Pipe manufactured by MPI was tested in accordance to BS 3505 - EN 1452-2

The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 60.20 - 60.50	60.40	Pass
		Wall thickness : 3.90 - 4.50	3.98 - 4.25	Pass
3	Heat reversion	Maximum 5 %.	2.10%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.90°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

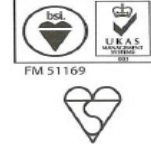
Note: The above results are based on the sample tested, which are conducted in good faith for the customer.


QC Manager

MODERN PLASTIC INDUSTRY (L.L.C.)
DUBAI-U.A.E.



صناعة البلاستيك الحديثة (ش.ذ.م.م.)
MODERN PLASTIC INDUSTRY (L.L.C.)
Paid - up Capital AED 3,700,000, Commercial Registration No. 46900
(A Member of Al Shirawi Group of Companies)
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P.O. Box : 31550, Dubai - U.A.E., Tel. : +971-4-8851300, Fax : +971-4-8851301
E-mail : info@mpi.ae Website : www.mpi.ae



TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BS 3505 - EN 1452-2

Manufacturer : Modern Plastic Industry LLC
Product : 4" UPVC High Pressure Pipe (Class-E / PN-15), ATLAS

The above Pipe manufactured by MPI was tested in accordance to BS 3505 - EN 1452-2

The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 114.10 - 114.50	114.30	Pass
		Wall thickness : 7.30 - 8.40	7.50 - 7.90	Pass
3	Heat reversion	Maximum 5 %.	2.10%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.90°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.


QC Manager

MODERN PLASTIC INDUSTRY (L.L.C.)
DUBAI-U.A.E.



صناعة البلاستيك الحديثة (ش.ذ.م.)
MODERN PLASTIC INDUSTRY (L.L.C.)
Paid - up Capital AED 3,700,000, Commercial Registration No. 46900
(A Member of Al Shirawi Group of Companies)
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P.O. Box : 31550, Dubai - U.A.E., Tel. : +971-4-8851300, Fax : +971-4-8851301
E-mail : info@mpi.ae Website : www.mpi.ae



TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BS 3505 - EN 1452-2

Manufacturer : Modern Plastic Industry LLC
Product : 6" UPVC High Pressure Pipe (Class-E / PN-15), ATLAS
The above Pipe manufactured by MPI was tested in accordance to BS 3505 - EN 1452-2
The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 168.00 - 168.50	168.30	Pass
		Wall thickness : 10.80 - 12.50	10.94 - 11.86	Pass
3	Heat reversion	Maximum 5 %.	3.10%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.90°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.

QC Manager
MODERN PLASTIC INDUSTRY (L.L.C.)
DUBAI-U.A.E.



صناعة البلاستيك الحديثة (ش.ذ.م.)
MODERN PLASTIC INDUSTRY (L.L.C.)
Paid - up Capital AED 3,700,000, Commercial Registration No. 46900
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TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BS 3505 - EN 1452-2

Manufacturer : Modern Plastic Industry LLC
Product : 8" UPVC High Pressure Pipe (Class-E / PN-15), ATLAS
The above Pipe manufactured by MPI was tested in accordance to BS 3505 - EN 1452-2
The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 218.80 – 219.40	219.00	Pass
		Wall thickness : 12.60 – 14.50	12.66 - 13.12	Pass
3	Heat reversion	Maximum 5 %.	2.80%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.80°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.


QC Manager

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TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BS 3505 - EN 1452-2

Manufacturer : Modern Plastic Industry LLC
Product : 10" UPVC High Pressure Pipe (Class-E / PN-15), ATLAS
The above Pipe manufactured by MPI was tested in accordance to BS 3505 - EN 1452-2
The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 272.60 – 273.40	273.20	Pass
		Wall thickness 15.70 – 18.10	15.76-16.12	Pass
3	Heat reversion	Maximum 5 %.	2.50%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.90°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.


QC Manager

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TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BS 3505 - EN 1452-2

Manufacturer : Modern Plastic Industry LLC
Product : 12" UPVC High Pressure Pipe (Class-E / PN-15), ATLAS
The above Pipe manufactured by MPI was tested in accordance to BS 3505 - EN 1452-2
The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 323.40 – 324.30	324.10	Pass
		Wall thickness 18.70 – 21.60	18.78 – 19.22	Pass
3	Heat reversion	Maximum 5 %.	2.25%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.90°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.

QC Manager
MODERN PLASTIC INDUSTRY (L.L.C.)
DUBAI-U.A.E.



TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO BS4346 (BSEN 1452-3)

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (Class-E) "ATLAS"
Size & Name : 1" Socket

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to BS 4346 (BS EN 1452-3)
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Depth (Min). 22.5mm	23.50	Pass
		Mean Inside Dia at Mid-Point : 33.50 - 33.70mm	33.64	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	12%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 74°C or more	74.9°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
6	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.


QC Manager
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TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO BS4346 (BSEN 1452-3)

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (Class-E) "ATLAS"
Size & Name : 2" Elbow 90°

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to BS 4346 (BS EN 1452-3)
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Length (Min). 36.0mm	37.50	Pass
		Mean Inside Diameter of Socket : 60.30 – 60.50	60.42	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	15%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 74°C or more	74.8°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
6	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.

QC Manager
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DUBAI-U.A.E.



TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO BS4346 (BSEN 1452-3)

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (Class-E) "ATLAS"
Size & Name : 4"x 45° Elbow

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to BS 4346 (BS EN 1452-3)
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Depth (Min). 63.0mm	64.0	Pass
		Mean Inside Dia at Mid-Point : 114.20 - 114.50mm	114.32	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	11%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 74°C or more	74.9°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
6	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.

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DUBAI-U.A.E.

TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO BS4346 (BSEN 1452-3)

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (Class-E) "ATLAS"
Size & Name : 6" Elbow 45°

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to BS 4346 (BS EN 1452-3)
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Depth (Min). 90.0mm	92	Pass
		Mean Inside Dia at Mid-Point : 168.20 - 168.50mm	168.38	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	15%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 74°C or more	74.9°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
6	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.



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TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO ASTM D2467

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings "ATLAS"
Size & Name : 8" Elbow 90°

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to ASTM D2467
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Length (Min). 101.60mm	104.50	Pass
		Mean Inside Diameter of Socket : 219.0 – 219.40	219.32	Pass
3	Effects of Heating	Sample shall be not showing any excessive cracks, blistering or delamination.	11%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 74°C or more	74.80° C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 15 at 20°C for 1 hour	OK	Pass
6	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.


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TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO DIN 8063

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (PN-16) " ATLAS "
Size & Name : 32mm Elbow 90°

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to DIN 8063
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Depth (Min). 22.00mm	23.50	Pass
		Mean Inside Dia at Mid-Point : 32.10 - 32.30mm	32.20	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	12.00%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 76°C or more	76.90°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	OK	Pass
6	Opacity Test	Sample shall not transmit light more than 0.2%	OK	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.



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DUBAI-U.A.E.

TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO DIN 8063

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (PN-16) " ATLAS "
Size & Name : 50mm Cap Plain

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to DIN 8063
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Depth (Min). 31.00mm	32.00	Pass
		Mean Inside Dia at Mid-Point : 50.10 - 50.30mm	50.22	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	13.00%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 76°C or more	76.90°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	OK	Pass
6	Opacity Test	Sample shall not transmit light more than 0.2%	OK	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.



QC Manager
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TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO DIN 8063

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (PN-16) " ATLAS "
Size & Name : 63mm Tee Plain

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to DIN 8063
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Depth (Min). 38.00mm	38.50	Pass
		Mean Inside Dia at Mid-Point : 63.10 - 63.30mm	63.20	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	14.00%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 76°C or more	76.8°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	OK	Pass
6	Opacity Test	Sample shall not transmit light more than 0.2%	OK	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.



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TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO DIN 8063

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (PN-16) " ATLAS "
Size & Name : 90mm Tee Plain

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to DIN 8063
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Depth (Min). 51.00mm	52.00	Pass
		Mean Inside Dia at Mid-Point : 90.10 - 90.30mm	90.24	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	13.00%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 76°C or more	76.70°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	OK	Pass
6	Opacity Test	Sample shall not transmit light more than 0.2%	OK	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.



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TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO DIN 8063

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (PN-16) " ATLAS "
Size & Name : 110mm Socket Plain

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to DIN 8063
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Depth (Min). 61.00mm	63.00	Pass
		Mean Inside Dia at Mid Point : 110.10 110.40mm	110.32	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	10.00%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 76°C or more	76.9°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	OK	Pass
6	Opacity Test	Sample shall not transmit light more than 0.2%	OK	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.



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TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO DIN 8063

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (PN-16) " ATLAS "
Size & Name : 160mm Tee Plain

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to DIN 8063
The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Depth (Min). 86.00mm	90.00	Pass
		Mean Inside Dia at Mid Point : 160.20 – 160.50mm	160.38	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	10.00%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 74°C or more	74.9°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	At 16bar 1 hour	Pass
6	Opacity Test	Sample shall not transmit light more than 0.2%	0.00	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.



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TEST CERTIFICATE

Date: 10/08/2023

UPVC FITTINGS TO DIN 8063

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Fittings (PN-10) " ATLAS "
Size & Name : 200mm Elbow 90°

The above Fittings manufactured by Modern Plastic Industry LLC, was tested in accordance to DIN 8063

The test result of a typical sample of the above Fitting is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Socket Depth (Min). 106.00mm	108.00	Pass
		Mean Inside Dia at Mid Point : 200.20 – 200.60mm	200.46	Pass
3	Effects of Heating	Sample shall be not show any excessive cracks, blistering or delamination.	10.00%	Pass
4	Vicat Softening Temperature (VST)	The VST shall be 74°C or more	74.9°C	Pass
5	Resistance to Internal Pressure test	No Failure at PN 10 at 20°C for 1 hour	At 10bar 1 hour	Pass
6	Opacity Test	Sample shall not transmit light more than 0.2%	0.00	Pass

We certify that the above Fittings meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which were conducted in good faith for the customer.



QC Manager
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TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BSEN ISO 1452-2

Manufacturer : Modern Plastic Industry LLC
 Product : UPVC High Pressure Pipe, ATLAS, 32mm (PN-16)

The above Pipe manufactured by Modern Plastic Industry LLC, was tested in accordance to BSEN ISO 1452-2
 The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 32.00 - 32.20	32.10	Pass
		Wall thickness : 2.40 - 2.90	2.42-2.66	Pass
3	Heat reversion	Maximum 5 %.	3.50%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.8°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.


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TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BSEN ISO 1452-2

Manufacturer : Modern Plastic Industry LLC

Product : UPVC High Pressure Pipe, ATLAS, 50mm (PN-16)

The above Pipe manufactured by Modern Plastic Industry LLC, was tested in accordance to BSEN ISO 1452-2

The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 50.00 - 50.20	50.10	Pass
		Wall thickness : 3.70 - 4.30	3.76-4.12	Pass
3	Heat reversion	Maximum 5 %.	3.00%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.8°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.



QC Manager
MODERN PLASTIC INDUSTRY (L.L.C.)
DUBAI-U.A.E.

TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BSEN ISO 1452-2

Manufacturer : Modern Plastic Industry LLC

Product : UPVC High Pressure Pipe, ATLAS, 63mm (PN-16)

The above Pipe manufactured by Modern Plastic Industry LLC, was tested in accordance to BSEN ISO 1452-2

The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 63.00 - 63.20	63.20	Pass
		Wall thickness : 4.70 - 5.40	4.72-5.08	Pass
3	Heat reversion	Maximum 5 %.	3.00%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.9°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.


QC Manager
MODERN PLASTIC INDUSTRY (L.L.C.)
DUBAI-U.A.E.

TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BSEN ISO 1452-2

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Pipe, ATLAS, 90mm (PN-16)

The above Pipe manufactured by Modern Plastic Industry LLC, was tested in accordance to BSEN ISO 1452-2
The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 90.00 - 90.30	90.20	Pass
		Wall thickness : 6.70 - 7.60	6.74-7.04	Pass
3	Heat reversion	Maximum 5 %.	2.75%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.7°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.



QC Manager
MODERN PLASTIC INDUSTRY (L.L.C.)
DUBAI-U.A.E.

TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BSEN ISO 1452-2

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Pipe, ATLAS, 110mm (PN-16)

The above Pipe manufactured by Modern Plastic Industry LLC, was tested in accordance to BSEN ISO 1452-2
The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 110.00 - 110.30	110.20	Pass
		Wall thickness : 6.60 - 7.50	6.64-6.98	Pass
3	Heat reversion	Maximum 5 %.	2.50%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	OK	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	OK	Pass
8	Vicat Softening Temperature	Min. 80°C	80.9°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.



QC Manager
MODERN PLASTIC INDUSTRY (L.L.C.)
DUBAI-U.A.E.

TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BSEN ISO 1452-2

Manufacturer : Modern Plastic Industry LLC
 Product : UPVC High Pressure Pipe, ATLAS, 160mm (PN-16)

The above Pipe manufactured by Modern Plastic Industry LLC, was tested in accordance to BSEN ISO 1452-2
 The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 160.00 - 160.40	160.30	Pass
		Wall thickness : 9.50 – 10.70	9.54-9.78	Pass
3	Heat reversion	Maximum 5 %.	2.50%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	No Attack	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at PN 16 at 20°C for 1 hour	At 16 bar 1 hour	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	0.00	Pass
8	Vicat Softening Temperature	Min. 80°C	80.8°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.


QC Manager
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TEST CERTIFICATE

Date: 10/08/2023

UPVC PIPES TO BSEN ISO 1452-2

Manufacturer : Modern Plastic Industry LLC
Product : UPVC High Pressure Pipe, ATLAS, 200mm (PN-16)

The above Pipe manufactured by Modern Plastic Industry LLC, was tested in accordance to BSEN ISO 1452-2
The test result of a typical sample of the above Pipe is as stated below.

S NO	Description	Std Requirement	Results	Remark
1	Colour/Surface	Grey / Inner & outer surfaces shall be smooth	OK	Pass
2	Dimensions(mm)	Mean Outside Diameter : 200.00 - 200.40	200.30	Pass
		Wall thickness : 11.90 – 13.30	11.94 – 12.44	Pass
3	Heat reversion	Maximum 5 %.	2.00%	Pass
4	Resistance to Dichloromethane	No attack at any part of the surface of pipe	No Attack	Pass
5	Impact test	At 0±1°C, TIR < 10 %.	0/25	Pass
6	Resistance to Internal Pressure test	No Failure at 16 bar at 20°C for 1 hour	OK	Pass
7	Opacity Test	Shall not transmit more than 0.2% visible light	0.00	Pass
8	Vicat Softening Temperature	Min. 80°C	80.8°C	Pass

We certify that the above Pipe meets the standard based on the strength of these results.

Note: The above results are based on the sample tested, which are conducted in good faith for the customer.



QC Manager
MODERN PLASTIC INDUSTRY (L.L.C.)
DUBAI-U.A.E.

COMPLIANCE STATEMENT



صناعة البلاستيك الحديثة (ش.م.م.)
MODERN PLASTIC INDUSTRY (L.L.C.)
Paid - up Capital AED 3,700,000, Commercial Registration No. 46900
(A Member of Al Shirawi Group of Companies)
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E-mail : info@mpi.ae Website : www.mpi.ae



Date: 24-08-2023

COMPLIANCE STATEMENT

TO WHOMSOEVER IT MAY CONCERN

Product Description : uPVC High Pressure Pipes & Fittings

Please be informed that our proposed products uPVC High Pressure Pipes, Class E, PN 15 1/2" to 12". Fittings (1/2" to 6") Class E, dark grey colour conform to the standards BS EN 1452-2 and BS EN 1452-3 (formerly BS 3505 for Pipes and BS 4346 for fittings, Class E). Our products are fully compliant with submitted catalogue. Further, these will be suitable for the intended purpose.

Pipes 1/2" to 12" – Kitemark certified

Fittings 1/2" to 6" – Kitemark

certified & WRAS certified

High Pressure Pipes	-	printed specs.: BS 3505/BS EN ISO 1452-2
High Pressure Fittings up to 6"	-	impregnated specs.: BS EN 1452-3
Fittings 8" size	-	SH 80, ASTM D2467

for Modern Plastic Industry (L.L.C.)





صناعة البلاستيك الحديثة (ش.م.م.)
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Date: 24-08-2023

COMPLIANCE STATEMENT

TO WHOMSOEVER IT MAY CONCERN

Product Description : uPVC High Pressure Pipes & Fittings – PN16

Please be informed that our proposed products uPVC High Pressure Pipes & Fittings – PN16 conform to the standard BS EN 1452 (metric) - Kitemarked / & DIN 8063 respectively. Our products are fully compliant with the submitted catalogue. Further, these will be suitable for the intended purpose.

Pipes 20mm to 160mm – Kitemark certified

for Modern Plastic Industry (L.L.C)



COUNTRY OF ORIGIN CERTIFICATE



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MODERN PLASTIC INDUSTRY (L.L.C.)
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Date: 24/08/2023

COUNTRY OF ORIGIN CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

Modern Plastic Industry (L.L.C) hereby confirms that all uPVC Soil & Drainage for Above and Below Ground application, Slotted Pipes, High Pressure, Duct/Sleeve - Pipes and Fittings, PPR Pipes & Fittings, Long Radius Bend, Gully Trap, Catch Basin, Puddle Flange, Dry Manholes, Sand Trap Basket, Grease Traps, Parking Drain, Pressure Breaking Chamber and Floor Traps are manufactured / fabricated in-house using the state of art, microprocessor controlled injection moulding machines, high quality precision moulds and pipe extruders in our own facility located at Dubai Investment Park1, Dubai, U.A.E. complying to the British and DIN standards.

For Modern Plastic Industry (L.L.C)



LIST OF PROJECTS



صناعة البلاستيك الحديثة (ش.ذ.م.م.)
MODERN PLASTIC INDUSTRY (L.L.C.)

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LIST OF PROJECTS			
PROJECT	LOCATION	CONSULTANT	CONTRACTOR
GRANDE B4, RESIDENTIAL BUILDING	DUBAI	WSP	CSCEC
GATE HOUSES & POOL HOUSES- VILLANOVA	DUBAI	WS ATKINS	ALI MOOSA
DEIRA WATERFRONT DEVELOPMENT PLOT12	DUBAI	AE7	TRINITY
ABU DHABI FUTURE SCHOOL PROGRAM PHASE 7 PACKAGE 03	AL AIN	ALTORATH INTERNATIONAL	NAEL
THE AKOYA OXYGEN 455 VILLAS, CAVILI CLUSTER	DUBAI	CONIN	MBM
RESIDENTIAL BUILDING 8 NOS AND TOWNHOUSES 148 NOS FOR MAG CITY, PHASE 1	DUBAI	VX STUDIO	DYNAMIC DELTA
96 TOWNHOUSES IN SECTOR R11B – MARBELLA VILLAGE IN DUBAI SPORTS CITY	DUBAI	KHATIB & ALAMI	ROYAL ADVANCE
DESIGN & DEVELOPMENT OF OUD METHA, SATWA BUS STATION	DUBAI	NEB	RAQ
OPERA DISTRICT PLOTS B1B2	DUBAI	KEO	CSCEC
HESSA TOWER B+G+3P+16F	DUBAI	KHATIB & ALAMO	MAC
ROVE HOTEL	DUBAI	ARCHGROUP	NATIONAL PROJECT
AL MAMSHA 33 NOS. BUILDING	SHARJAH	LACECO	AL HAMAD
PARK HEIGHTS – I & II	DUBAI	KHATIB & ALAMI	SHAPOORJI
BELLA ROSE	DUBAI	CONIN	CONDOR
NASMA RESIDENCE PHASE 3	DUBAI	ARCADIA	INTERMASS
EXPO 2020 – MOBILITY PAVILION	DUBAI	WSP	ALEC
AL KHAIL GATE INTERNATIONAL	DUBAI	PARSONS	POWER POINT
ICON BAY RESIDENTIAL	DUBAI	WME	ROYAL ADVANCE
REEM DEVELOPMENT PHASE2 – MIRA OASIS TOWNHOUSES 1393 NOS	DUBAI	NEB	TROJAN
REEM DEVELOPMENT– MIRA TOWNHOUSES (COMMUNITY 1, 2, 3 & 4)	DUBAI	BH.NS	ARABTEC
DUBAI CREEK HARBOUR GATE2	DUBAI	NORR	TRINITY
ACT 1 & ACT 2 TOWRES	DUBAI	ARCHGROUP	RELIANCE
SOCIO PARK HEIGHTS III (B+G+13+MECH. FLOOR),	DUBAI	RICE PERRY	DUBCO
MBR GARDENS – DUBAI HILLS, SIDRA 3	DUBAI	AL GURG	TROJAN
DOWNTOWN VIEWS II	DUBAI	ARCHGROUP	CSCEC
THE COVE	DUBAI	HOLDFORDS	SOBHA
AL ZAHIA RESIDENTIAL	SHARJAH	BIN DALMOUK/DSA	VERGER
AKOYA OXYGEN PHASE 1 - 547 VILLAS	DUBAI	KEO	DELTA EMIRATES
NEW YORK UNIVERSITY	ABU DHABI	WSP	BK GULF



صناعة البلاستيك الحديثة (ش.ذ.م.م.) MODERN PLASTIC INDUSTRY (L.L.C.)

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LIST OF PROJECTS			
PROJECT	LOCATION	CONSULTANT	CONTRACTOR
SOFITEL HOTEL & RESORTS PALM JUMEIRAH	DUBAI	MIRK CONSULTANTS	BK GULF
G+37 - OLAGANA TOWER	DUBAI	AL THURATH ENG. CONSULTANTS	DELTA EMIRATES
G+27 - 2 BLDGS. AL FATTAN TOWER, UMM RAMOOL	DUBAI	AE7 CONSULTANCY	DELTA EMIRATES
1582 VILLAS - MIRA COMMUNITY, EMMAR	DUBAI	TURNER	EFECO / ARABTECH
1500- MEYDAAN VILLAS	DUBAI	AE7 CONSULTANCY	MS CONSTRUCTION
1050 VILLA TOWN SQUARE DEVELOPMENT, NASHAMA	DUBAI	ARIF & BINTOAK	BEAVER GULF
NEW PASSENGER CREW TERMINAL	DUBAI	ATKINS	FALCON ELECTROMECHANICAL
DUBAI DOWNTOWN DEVELOPMENT - TROLLEY SYSTEM PHASE 1 A	DUBAI	WSP	RELIANCE ELECTROMECHANICAL
DWTC PHASE 1	DUBAI	WSP	VOLTAS
G + 20 & G + 30 BLDG. SAHARA 4 & SAHARA 5	SHARJAH	CONSULTAIR ENGINEERS & CONSULTANTS	ETA MNE
AL MARYAH CENTRAL	ABU DHABI	WSP	JAMES L WILLIAM MIDDLE EAST
G + 15 - 2 BUILDINGS - TANMIYAT GLOBAL	DUBAI	AL AJMI CONSULTANTS	PEPCO ENGINEERING
G + 15 BLDG. - AL JEDDAF	DUBAI	DESIGN CENTER CONSULTANTS	RADIANT MEP
G+7 - 8 BLDGS. - TIJARA TOWN	DUBAI	AL HASHEMI ENG. CONSULTANTS	AL SHIRAWI ELECTROMECHANICAL
G+6 - 12 BLDGS. - ARMY BUILDING	DUBAI	ARIF & BINTOAK	AL SHIRAWI ELECTROMECHANICAL
G+6 - 6 BLDGS. - ARMY BUILDING	SHARJAH	ARIF & BINTOAK	MIRK ELECTROMECHANICAL
G+6 - 6 BLDGS. - ARMY BUILDING	ABU DHABI	ARIF & BINTOAK	AKAR TECHNICAL SERVICES
MIRDIFF HOUSING PROJECT	DUBAI	ARIF & BINTOAK	SHAPOORJI PALLONJI MIDEAST
404 VILLAS - MUDON PHASE II	SHARJAH	ARIF & BINTOAK	SHAPOORJI PALLONJI MIDEAST
G+30 - WADI TOWER - CITY OF ARABIA	DUBAI	MEECON	BIN LAHEJ ELECTROMECHANICAL
ARCADIA SCHOOL	DUBAI	GODWIN AUSTIN JOHNSON ARCHITECTS	AL SHIRAWI ELECTROMECHANICAL
AL ZEINA BLDGS. FOR ALDAR	ABU DHABI	PELL FRISHMANN	B K GULF
2B+G+6 BLDG., AL BARSHA	DUBAI	SHEIKH MUBARAK ARCHITECTURAL & ENGINEERING CONSULTANTS	BIN LAHEJ ELECTROMECHANICAL
G+4 BLDG. - ETIHAD AIRWAYS	ABU DHABI	PELL FRISHMANN	JAMES L WILLIAMS ELECTROMECHANICAL
G + 24, DREAM TOWER - DUBAI MARINA	DUBAI	NATIONAL ENGINEERING BUREAU	MAG INTERNATIONAL
G + 22, WEST AVENUE TOWER DUBAI MARINA	DUBAI	NATIONAL ENGINEERING BUREAU	PRIME STAR ELECTROMECHANICAL
150 VILLA - JUMEIRAH VILLAGE	DUBAI	DAR	BLUESKY ELECTROMECHANICAL
105 VILLA - JUMEIRAH VILLAGE	DUBAI	DAR	AL SHIRAWI ELECTROMECHANICAL
505 VILLA - JUMEIRAH VILLAGE	DUBAI	DAR	POWERPOINT ELECTROMECHANICAL
G+20, DELTA TOWER I & II DUBAI MARINA	DUBAI	NEB	UNITED MASTER



صناعة البلاستيك الحديثة (ش.ذ.م.م.)

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LIST OF PROJECTS			
PROJECT	LOCATION	CONSULTANT	CONTRACTOR
EMAL SMELTER COMPLEX	ABU DHABI	SNC LAVALIN	LAING O'RURKEE CONTRACTING
HABSHAN SULPHUR PLANT	ABU DHABI	GASCO	DODSAL ENGINEERING
LID PLANT & 4 LAKES	DUBAI	IN HOUSE	ENGINEERS OFFICE
MEENA PLAZA BLDGS.	ABU DHABI	NATIONAL ENGINEERING BUREAU	RELIANCE ELECTROMECHANICAL
101 TOWER - DUBAI MARINA	DUBAI	NATIONAL ENGINEERING BUREAU	RELIANCE ELECTROMECHANICAL
105 VILLA - PALMAROASA, PALM JUMEIRAH	DUBAI	DAR	AL HAMAAD CONTRACTING
105 VILLA - DIC	DUBAI	AL HAWRAA ENG. CONSULTANTS	EVERSAFE GENERAL CONTRACTING
505 VILLA - THE LEGENDS	DUBAI	AL BURJ CONSULTANTS	DELTA EMIRATES
DM IRRIGATION PROJECTS	DUBAI	DUBAI MUNICIPALITY	DESERT LANDSCAPE
DM IRRIGATION PROJECTS	DUBAI	DUBAI MUNICIPALITY	GREENSCAPES
DM IRRIGATION PROJECTS	DUBAI	DUBAI MUNICIPALITY	PROSCAPE LANDSCAPING
DM IRRIGATION PROJECTS	DUBAI	DUBAI MUNICIPALITY	HILLS & FORT LANDSCAPING
MARINA BAY	ABU DHABI	ARCHITECTURAL ENGINEERING GROUP	BIN SHAFAR ELECTROMECHANICAL
COMMERCIAL CENTRE / MOSQUE FALCON CITY OF WONDERS	DUBAI	AREX CONSULTANTS	SEIDCO GENERAL CONTRACTING
G+37 - M TOWER	ABU DHABI	AL EWAN ENG. CONSULTANTS.	GALAXY ADVANCED ELECTROMECHANICAL
G + 50 BLDG. - DUJA TOWER	DUBAI	NATIONAL ENGINEERING BUREAU	RADIANT MEP
G + 25 - SPORTS CITY	DUBAI	AL HAWRAA CONSULTANTS.	EGYCO CONTRACTING
SKY CENTRAL HOTEL - TEECOM	DUBAI	AL HAWRAA ENG. CONSULTANTS.	STERLING MEP
300 VILLAS - MEERAS	DUBAI	ARIF & BINTOAK	SHAPOORJI PALLONJI
C-14 HOTEL APARTMENTS & RESIDENCES - PALM JUMEIRAH	DUBAI	NATIONAL ENGINEERING BUREAU	RADIANT MEP
AL AHLI CLUB BLDG.	DUBAI	NATIONAL ENGINEERING BUREAU	AL NABOODAH CONTRACTING
G + 7 - 4 BLDGS. - LIWAN	DUBAI	NATIONAL ENGINEERING BUREAU	AL HANI CONTRACTING
EMIRATES PARK HOTEL	DUBAI		BILT MIDDLE EAST
HYDRA VILLAS	ABU DHABI	NATIONAL ENGINEERING BUREAU	TROJAN GENERAL CONTRACTING
CORAL TOWER	DUBAI		ARJ CONSTRUCTION
G + 24 BLDG.	SHARJAH		MANOLYA CONSTRUCTION
SPINNEYS & AL SEER WAREHOUSE	DUBAI	IN HOUSE	AL BAWARDY ENGINEERING
PREFAB BUILDINGS	DUBAI	IN HOUSE	MAMMUT BUILDING SYSTEMS
G + 25 - 2 BUILDINGS	SHARJAH	NATIONAL ENGINEERING BUREAU	STERLING MEP
ST. REGIS HOTEL - LANDSCAPE	DUBAI	KHATIB & ALAMI	GULF LANDSCAPE - 5 STAR
AKOYA LANDSCAPE WORKS	DUBAI	AECOM	GREEN RANCHES
380 VILLA AIN AL FAYDA - PHASE 2	AL AIN	AL SALAAM ENG. CONSULTING ARCHITECTS	CREST POWER ELECTROMECHANICAL



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PROJECT	LOCATION	CONSULTANT	CONTRACTOR
AJMAN BANK BLDG.	AJMAN	AJ DESIGN CONSULTANTS	UNITED SEVEN CONSTRUCTIONS
G+8+ ROOF BLDG. SILICON OASIS	DUBAI	MIMAR ENG. CONSULTANTS	SENSAIRE ELECTROMECHANICAL
B+G+2P+7 HOTEL APARTMENTS	DUBAI	ABDUL RAHIM ARCHITECTURAL CONSULTANTS	JAMS CONTRACTING
B+G+6 BLDG.	DUBAI	GERMAN ENGINEERING CONSULTANTS.	PRECISION STAR ELECTROMECHANICAL
G+7 GOLF APARTMENTS (G19, G20, & G21 - (3 CLUSTERS) @ AKOYA BY DAMAC	DUBAI	AECOM	SEIDCO GENERAL CONTRACTING
PLOT RS6-C4-AL REEM ISLAND	ABU DHABI	KN INTERNATIONAL	GULF CONTRACTORS
ARABIAN RANCHES 2 DEVELOPMENT, RASHA - LANDSCAPE WORKS-PACKAGE 9	DUBAI	PARSONS	GULF LANDSCAPE & IRRIGATION SYSTEMS LLC
KHALIFA UNIVERSITY EXTENSION	ABU DHABI	ELITE DESIGN & ENGINEERING CONSULTANCY LLC	FIBREX
MAMSHA AL SAADIYAT, PHASE-1	ABU DHABI	DEWAN ARCHITECTS ENGINEERING	SWIFTLINE ELECTROMECHANICAL
B+G+1 FLOORS SHOPPING CENTRE – SPRINGS 7	DUBAI	WME CONSULTANTS	HAYDON MEP LLC
GRAND VIEWS – ROAD & UTILITIES INFRASTRUCTURE	DUBAI	CHAWLA ARCHITECTURAL & CONSULTING ENGINEERS	GBH INTERNATIONAL CONTRACTING
MANAZEL AL REEF 2 VILLA DEVELOPMENT	ABU DHABI	DORSCH GRUPPE	FIBREX
DIP-AL YALAYIS ROUNDAABOUT FOR DIP @ HEADQUARTER ENTRANCE	DUBAI	KHATIB & ALAMI	AL BAYADER IRRIGATION AND CONTRACTING LLC
CONSTRUCTION OF AL-RAQAYEB SERVICE STATION IN AJMAN	AJMAN	DORCH CONSULT	ELMA
DPAM-0013 – AL KHAIL GATE INTERNATIONAL PLOT DEVELOPMENT	DUBAI	PARSONS OVERSEAS LIMITED	POWER POINT
B+G+4 (4 NOS) RESIDENTIAL BUILDING	DUBAI	CVTEC CONSULTING ENGINEERS	AL MABNA CONTRACTING
PT-175 TECOM BUSINESS PARKS GATE DESIGN, ENHANCEMENT & BRANDING	DUBAI	AECOM	AL BAYADER IRRIGATION AND CONTRACTING LLC
3B+G+P+15 RESIDENTIAL BUILDING	DUBAI	DESIGN CENTER	ADNAN CONTRACTING L.L.C
G+1 (ONE TYPE 5 VILLAS)	DUBAI	ERGA PROGRESS ENGINEERING CONSULTANTS	KHJ CONTRACTING L.L.C
DUBAI WHOLE CITY SPINE ROAD STAGE-1	DUBAI	AECOM	EMIRATES ROAD CONTRACTING
G+5+15 TYP+R	SHARJAH	VISION ENGINEERING CONSULTANT	MODERN BUILDING CONTRACTING
DEIRA WATER FRONT DEVELOPMENT	DUBAI	AE7 CONSULTANCY	SHINRYO CORPORATION MIDDLE EAST
MEYDAN BEACH HOTEL – MOCK UP	DUBAI	AE7 CONSULTANCY	FIBREX
MAG 5 BOULEVARD RESIDENTIAL BUILDING	DUBAI	AL JABAL ENGG. CONSULTANCY	FUJAIRAH NATIONAL CONSTRUCTION
B+G+M+1 COMMERCIAL BUILDING	DUBAI	LACASA ARCHITECTS & ENGG.	SEMCO
TOWN SQUARE DEVELOPMENT	DUBAI	PARSONS	GULF LANDSCAPE
G+3P+19 STORY RESIDENTIAL BUILDING	DUBAI	LACASA ARCHITECTS & ENGG.	BIN LAHEJ ELECTROMECHANICAL



صناعة البلاستيك الحديثة (ش.م.م.) MODERN PLASTIC INDUSTRY (L.L.C.)

Paid - up Capital AED 3,700,000, Commercial Registration No. 46900

(A Member of Al Shirawi Group of Companies)

ص.ب. : ٣١٥٥٠، دبي - ا.ع.م، تليفون : ٨٨٥١٣٠٠ - ٩٧١، فاكس : ٨٨٥١٣٠١ - ٩٧١

P.O. Box : 31550, Dubai - U.A.E., Tel. : +971-4-8851300, Fax : +971-4-8851301

E-mail : info@mpi.ae Website : www.mpi.ae



FM 51169



LIST OF PROJECTS

PROJECT	LOCATION	CONSULTANT	CONTRACTOR
DUBAI HILLS :MBR-DH-ACACIA 1	DUBAI	NATIONAL ENGINEERING BUREAU	SOBHA ENGG. & CONTRACTING
DESIGN & CONSTRUCT 3D PRINTED LAB BUILDING AND ASSOCIATED WORKS	DUBAI	DEWA	CONVERGNT VALUE ENGINEERING
SERENA BELLA CASA	DUBAI	DEWAN ARCHITECTS & ENGINEERS	VERGER DELPORTE UAE LTD
MUDON DEVELOPMENT PHASE 3 - ARABELLA 1	DUBAI	NAGA	TROJAN GENERAL CONTRACTING
DEVELOPMENT OF MASJID PARK	DUBAI	DUBAI MUNICIPALITY	HILLS & FORT LANDSCAPE
IR207 AUTOMATIC IRRIGATION SYSTEM FOR SHK. KHALIFA EXPRESS WAY AT FUJAIRAH ENTRANCE	FUJAIRAH	DUBAI MUNICIPALITY	HILLS & FORT LANDSCAPE
NAD EL SHIBA 4TH SEWERAGE & DRAINAGE (C617) GRAVITY NETWORK	DUBAI	MWH	NAEL CONSTRUCTION
G+4 LABOUR ACCOMMODATION	JEBEL ALI	AL KHAWAJAH ENGINEERING CONSULTANCY	C J TEC CONTRACTING LLC
CONSTRUCTION OF 1338 VILLAS-VILLANOVA	DUBAI	ATK ENGINEERING CONSULTANCY	EFECO
DUBAI CREEK HARBOUR DEVELOPMENT - THE COVE	DUBAI	HOLFORDS ASSOCIATES	SOBHA ENGINEERING & CONTRACTING LLC
DUBAI CREEK HARBOUR - HARBOUR GATE PROJECT, PLOT A030	DUBAI	GROUP CONSULTANT INTERNATIONAL-GCI	ROYAL ADVANCE ELECTROMECHANICAL
CENTARA RESORT, DEIRA ISLAND	DUBAI	DAR AL-HANDASAH	CONVERSION ELECTROMECHANICAL CO.
MEYDAN ONE MALL	DUBAI	AE7 ENGINEERING CONSULTANT	MS CONSTRUCTION LLC FZ
RESIDENTIAL BUILDING (5B+G+30+ROOF) - AHAD TOWER	DUBAI	VE EXPERTS	TECH ENGINEERING LLC
(B+G+M+63F) TOWER + (B+G+9F+R) PARKING BUILDING - "A" TOWER	DUBAI	NATIONAL ENGINEERING BUREAU (NEB)	AL ITTIHAD ELECTROMECHANICAL CO.
4B+G+M+4P+44+MECH+ROOF "CORPORATE TOWER"	DUBAI	AL HAWRAA ENGINEERING CONSULTANTS	HEAT&POWER LLC
SHAMS DEVELOPMENT REEM TOWER 1 & 2	ABU DHABI	UNII ENGINEERING CONSULTANCY	POWERSPRAY ELECTROMECHANICAL
REMRAAM RESIDENTIAL BUILDINGS PHASE 2B	DUBAI	ATK ENGINEERING CONSULTANT	DELTA AL EMARATE
BARAKAH NUCLEAR POWER PLANT	ABU DHABI	EMIRATES NUCLEAR ENERGY CORPORATION	SEMCO
INTERNAL & LINK ROADS - SOUTHERN ZONE	DUBAI	CORE ENGINEERING	AL NUAIMI
WAHAT AL ZAWEYA DEVELOPMENT	ABU DHABI	HYDER	PRIME ENGINEERING
SHK. KHALIFA BIN ZAYED AL NAHYAN MASJED	AL AIN	ICON	TWAM AGRICULTURE
ONE AT PALM JUMEIRAH	DUBAI	AREX	PLAFOND
JEBEL ALI SEWAGE TREATMENT PLAT PHASE 2	DUBAI	AECOM	LARSEN & TOUBRO
RESIDENTIAL & COMMERCIAL TOWER	DUBAI	ARCHGROUP	SHAPOORJI
IR 173 - IRRIGATION SYSTEM FOR INTERCHANGE OF SH. MOHAMMAD BIN ZAYED ROAD WITH AL REBAT ROAD	DUBAI	PARSONS	GREEN SCAPES
THE STERLING	DUBAI	ARKIPLAN	AL HANI GULF CONT CO.



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LIST OF PROJECTS			
PROJECT	LOCATION	CONSULTANT	CUSTOMER
AL QUSAIS RESIDENTIAL DEVELOPMENT (WASL)	DUBAI	SCHUSTER PECHTOLD	TECH ENGINEERING LLC
G+4P+12+HC COMMERCIAL/RESIDENTIAL	DUBAI	NATIONAL ENGINEERING BUREAU	RADIANT TECHNICAL WORKS
RESIDENTIAL COMPOUND (38 VILLAS)	DUBAI	ARCHITECTURAL & ENGINEERING	BUILDIX
DUBAI SOUTH MALL	DUBAI	ATKINS	EFECO
MBR GARDENS-MAPLE 2 – 666 NO TOWN HOUSES	DUBAI	ARIF & BINTOAK	TROJAN GENERAL CONTRACTING
HEADQUARTERS OFFICE COMPLEX @ DUBAI BIOTECHNOLOGY & RESEARCH PARK	DUBAI	KLING CONSULT / CRACKNELL	AL BAYADER
G+2P+10 TYP+GYM+ROOF	DUBAI	AL KHAWAJAH ENGINEERING CONSULTANCY	BECON CONSTRUCTION
ONE JLT - G + 27 TOWER, TEECOM	DUBAI	ARIF & BINTOAK	JAMES L WILLIAMS ELECTROMECHANICAL
PEARL DIVING POOL	DUBAI	HALCROW INTERNATIONAL / RTA	JAMES L WILLIAMS ELECTROMECHANICAL
247 VILLA - JUMEIRAH PARK	DUBAI	DAR / SHAIR & PARTNERS	CONVERSION ELECTROMECHANICAL
IBN BATTUTA HOTEL	DUBAI	ARCH GROUP	CONVERSION ELECTROMECHANICAL
G + 27 - OPUS TOWERS	DUBAI	CLARKE SAMADIN	HAYDON MEP
G + 20 BLDG. SPORTS CITY	DUBAI	ARCH GROUP	SOBHA CONTRACTING
G + 15 - 8 BUILDINGS - TANMIYAT GLOBAL	DUBAI	AL AJMI CONSULTANTS	DELTA EMIRATES

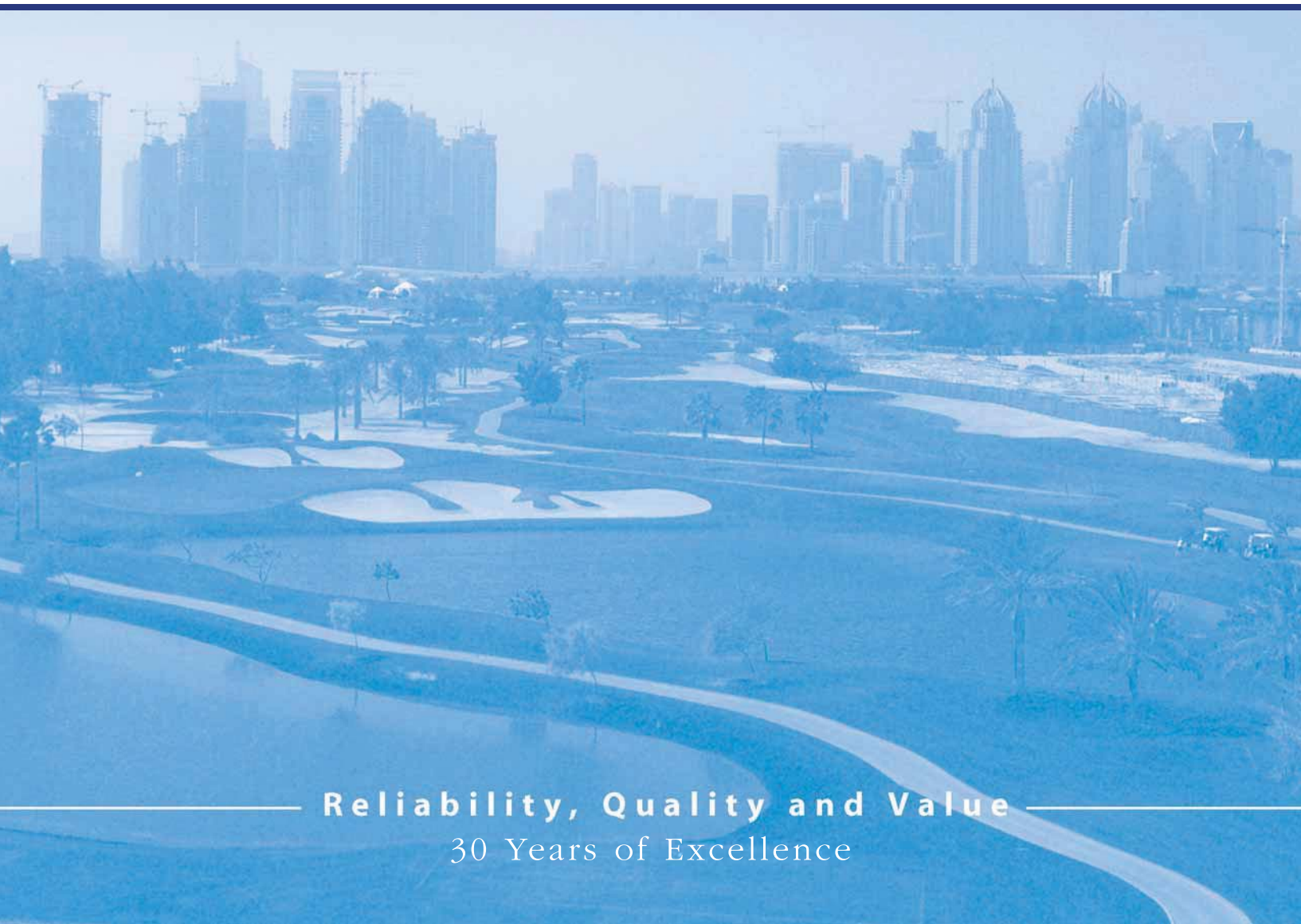
PRODUCT CATALOGUE



MODERN PLASTIC INDUSTRY L.L.C.



UPVC PRESSURE PIPES & FITTINGS



Reliability, Quality and Value

30 Years of Excellence



P R O F I L E

Introduction

Modern Plastic Industry is a part of AL SHIRAWI GROUP OF COMPANIES which is one of the largest and most diversified business conglomerates in the Arabian Gulf. From its inception in 1971 as a trading and contracting company, the Group has broadened its scope to encompass a cross section of products, services and industries ranging from printing, heavy fabrication, engineering, electromechanical, electronics, trucks and logistics.

Established in 1987, Modern Plastic Industry (MPI) has pioneered the manufacturing of UPVC pressure pipe fittings in the UAE. Today Modern Plastic has a wide range of SWR drainage, high pressure UPVC, CPVC, PP Compression Fittings and Pipes.

MPI products have been used extensively in the irrigation, construction, plumbing and landscaping industry and are playing a significant role in the development of the Gulf region and Middle East.

Subsequently the company started manufacturing Pressure Pipes and Fittings under the “Atlas” brands.

State-of-the-art facility

MPI UPVC Pressure Pipes and Fittings systems are manufactured in a state-of-the-art facility at Dubai Investment Park with state-of-the-art Microprocessor based Injection Moulding Machines and High Quality Precision Moulds for Fittings and High Quality Extrusion Machines for Pipes.

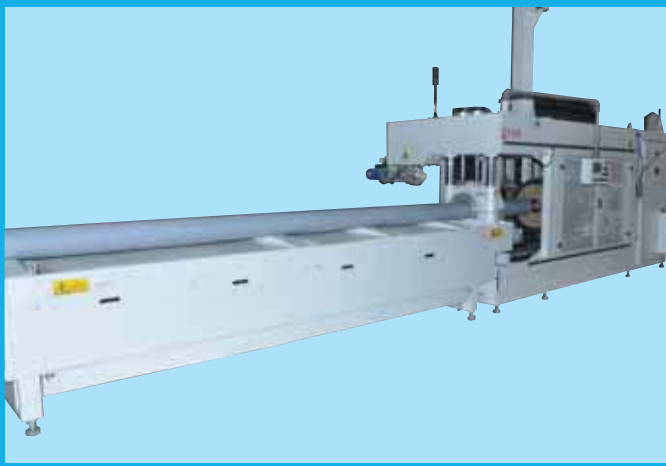
Technology is the backbone of ongoing development and the right design selection headed by a team of experienced and well-trained professionals complements the development process.

MPI has established an in-house tool room with the latest CNC machines and EDM machines, which are used to manufacture moulds as per the needs of the market.

Quality Control

As the UPVC High Pressure Pipe Fitting systems are specially designed to meet the harsh climate conditions of the Gulf region, MPI places emphasis on Quality, Reliability and Economy. Strict in-house Quality Control is backed by testing through independent laboratories of international repute to certify the quality of pipes and fittings.

MPI places great emphasis on customer satisfaction through quality products. The company's operational excellence is evident through its established Quality Management System, which complies with the ISO 9001-2008 standard, certified by British Standard Institute (BSI) UK. Also the company's product have been awarded the prestigious Kitemark certification of BSI, UK.



Kitemark

Modern Plastic is one of the largest companies in the Middle East to manufacture a wide range of UPVC High Pressure Pipes and Fittings Kitemark certified by BSI, UK.

WRAS

Modern Plastic manufactures wide range of UPVC high pressure pipes & fittings from material approved by WRAS.

In-House Quality Control

MPI's Products are tested to maintain the quality level in the permissible standard tolerances. We perform the tests as per relevant international standards (BS, DIN, ISO) and acceptance sampling procedures for production quality control and lot testing are done during all production operations.

The following quality control tests are performed in our in-house lab.

- Physical Test
- Dimensional Check
- Pressure Test
- Impact Test
- Heat Reversion test / Effect on Heating Test
- Dichloromethane test
- Vicat Softening Temperature Test
- Opacity Test

Apart from this, our products are being tested / assessed by BSI / other certification bodies on a regular basis.

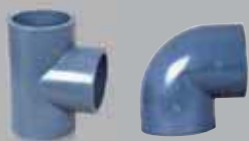
A Complete Solution

With the growing demand to cater to the construction industry MPI has now introduced a complete range of UPVC Pressure Pipe sizes from 1/2" to 12" conforming to British Standards BS EN ISO 1452-2 which supercedes BS 3505 and sizes 20mm to 400mm conforming to DIN Standards DIN 8061 / 8062.

MPI's products are manufactured par excellence to the international standards and ensure a complete solution of "Piping System" for plumbing applications.

Global Presence

MPI has been the leader in the Gulf market mainly because it can offer the widest range of UPVC Pressure Pipes and Fittings which are specially designed to meet the harsh climatic conditions with more emphasis of Quality, Reliability and Economy. MPI is managed by a team of experienced and well trained professionals, and markets its range of products in the AGCC region, the Middle East, Africa, Europe and the Asian subcontinent.



TECHNICAL SPECIFICATION

UPVC PRESSURE PIPES AND FITTINGS

Description

"Atlas" Pipe Fittings are the "UPVC (Unplasticized Polyvinyl Chloride) Pressure Pipes and Fittings system" for cold water distribution, precisely designed for cold solvent welding as well as rubber ring jointing. The complete range can also be offered in CPVC (Chlorinated Polyvinyl Chloride) material for hot water distribution on special demand.

Brand & Marking

"Atlas" is a registered brand name of "Modern Plastic Industry LLC" within United Arab Emirates for all UPVC Fittings manufactured by MPI. All fittings are marked with the brand name, size, category and standard.

Standards

UPVC Pressure Pipes & Fittings are manufactured as per the following standards.

(i) Inch series (Imperial) :

- Pressure Pipes : BS EN ISO 1452-2 : 2000
This standard supercedes BS 3505 : 1986
- Pressure Fittings : BS EN ISO 1452-3 : 2000
This standard supercedes BS 4346-3 : 1982

(ii) Millimeter series (mm) :

- Pressure Pipes : DIN 8061 / 8062
- Pressure Fittings : DIN 8063
- Threaded joints are as per BS 21 & ISO 7 – 1 standards

Working Pressure

All Pipe Fittings depending upon the sizes are made for permissible continuous working pressure at 20°C (Based on water quality) as below :

Inch system Pipe Fittings : Maximum upto 15 Bar

Millimeter system Pipe Fittings : Maximum upto 16 Bar

Types & Ranges

Pressure Fittings :

Size : (i) Inch Series (Imperial) = 1/2" to 8"
(ii) Milimeter (mm) = 20mm to 200mm

- Elbow 90°, Female Elbow 90°, Elbow 45°, Reducing Female Elbow 90°, Tee, Female Tee & "Y"
- Reducing Tee, Reducing Female Tee, End Cap Plain, Threaded Cap, Male Thread Adaptor
Female Socket Adaptor, Female Slip Adaptor, Socket, Reducer Bushes, Female Reducer Bushes
Hex Nipples, Flanges, Unions, Repair Socket, Converter Socket, Reducing Socket.

Pressure Pipes :

Size : (i) Inch Series (Imperial) = 1/2" to 12"
(ii) Milimeter Series (mm) = 20mm to 160mm

Raw Material

The raw material used is 100 % UPVC virgin material with necessary additives / chemicals needed to facilitate the manufacturing process.

Appearance

The internal and external surface of the pipes are smooth, clean and free from surface defects.

Colour

The colour of the Pipe Fittings are Grey throughout the wall.

Effective Length of Pressure Pipes

All pipes are manufactured in 4m and 6 / 5.8m lengths.

Pressure Pipe Sockets

The Pipes are supplied as follows.

The inch size pipes from 1/2" to 2" and "mm" size pipes from 20mm to 63mm are supplied with plain ends.

The inch size pipes from 3" to 12" and "mm" size pipes from 75mm to 400mm are supplied with
Solvent cement socket or rubber ring socket.

General Physical Properties of UPVC

Sr. No	Characteristics	Value
1	Specific Gravity	1.41
2	Thermal Conductivity	160 w/m° C
3	Specific Heat	1040 J / Kg/°C
4	Flammability	UPVC is self – extinguishing and will not support combustion
5	Tensile Strength	> 45 MN/sq cm at 20° C
6	Vicat Softening Temperature	>80°C
7	Poissons Ratio	1:3
8	Thermal Expansion Co efficient	0.07...0.08 Mm/mK
9	Heat Conductivity at 23 c	0.15 W/mk
10	Water absorption at 23 c	<0.1%



Mechanical and Physical Properties : UPVC Pipes

Sr. No	Characteristics	Value	Value
1	Impact Strength	TIR <10% at 0° C	EN 744
2	Vicat Softening Temperature	>80°C	EN 727
3	Longitudinal Reversion	<5 % at 150° C	EN 743 (Method B ; Air)
4	Resistance to Dichloromethane Test	No attack at any part of the surface of pipe at 15°C	EN 580
5	Opacity	Shall not transmit >0.2% of visible light	EN 578
6	Resistance to Internal Pressure	No failure during the test period of 1 hr at 20°C ; 42 Mpa	EN 921

Mechanical and Physical Properties : UPVC Fittings

Sr. No	Characteristics	Value	Value
1	Vicat Softening Temperature	>74°C	EN 727
2	Effects on Heating	Depth of crack / delamination, blisters or signs of weld line splitting < 30% of wall thickness around injection point	EN 743 (Method B ; Air)
3	Opacity	Shall not transmit >0.2% of visible light	EN 578
4	Resistance to Internal Pressure of 1 hr at 20°C ; 3.36 x PN	No failure during the test period	ISO / DIS 12092

Chemical Resistance

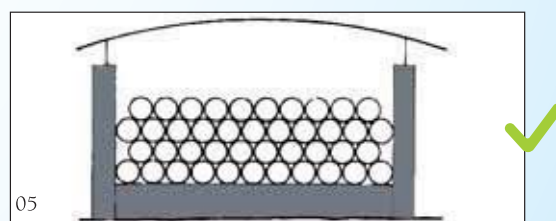
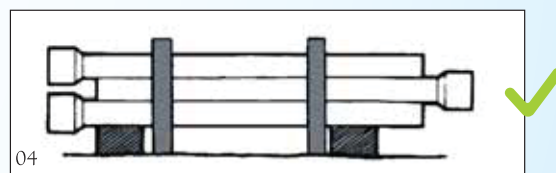
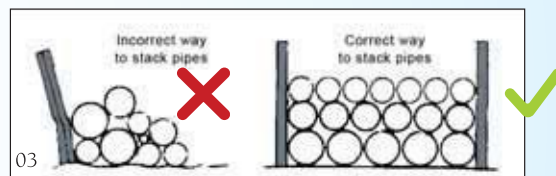
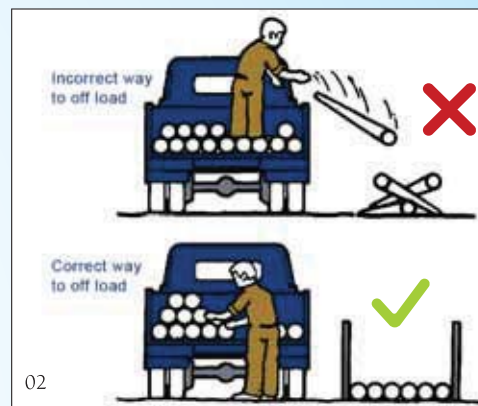
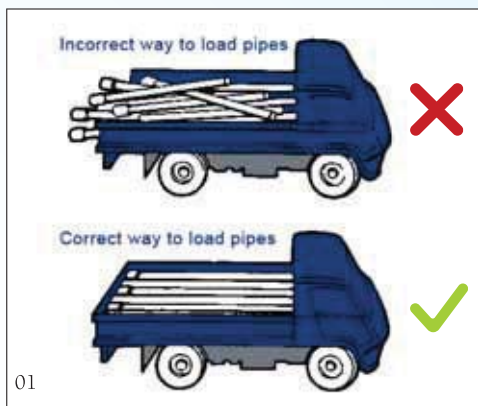
UPVC Pressure Pipe systems are suitable to be used with a number of acids, alkalies, salts and solvents that can be mixed with water.

UPVC Pressure Pipe systems are not resistant to aromatic and chlorinated hydrocarbons.

More detailed and specific information is available on pages 32 - 35 & in the British Standard code of practice for plastic pipe work CP 312-3 : 1973

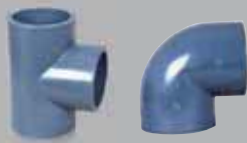


ON SITE STORAGE AND HANDLING



Storage

- The pipes should be kept on a flat surface or on level ground free from stones and sharp objects.
- The maximum stack should be 7 layers high under normal conditions and 6 layers high in hot conditions.
- Ideally a stack should contain pipes of the same diameter. If this is not possible nesting of the smaller pipes inside the larger pipes may be done. The larger diameter pipes should always be kept at the bottom of the stack.
- Direct exposure to sunlight (UV rays) can affect the pipes and fittings, causing decolouration and deterioration in the seal rings.
- It is recommended that the pipes should not be exposed to direct sunlight and if kept in open for longer periods of direct sunlight, it should be covered by opaque sheets.
- While storing socketed pipes, it is recommended that alternate layers should have the sockets in the opposite direction.



Handling

- Reasonable care should be taken while handling of pipes. During unloading from vehicles, pipes should not be dropped/mishandled from the vehicle.
- Pipes should never be dragged along hard surfaces. In case of mechanical lifting, avoid using metal chains and hooks in direct contact with the pipes. It is recommended to provide protected slings and padded supports.

Transportation

- Generally UPVC pipes are supplied in prepacked bundles of standard quantity.
- In case loose pipes being transported, the larger diameter and heavier pipes should be placed at the bottom of the load and smaller diameter pipes on top.
- The pipes should be loaded in such a way that the overhang should be less than a meter.



PVC PIPING SYSTEM: Brief Technical Overview

Temperature / Pressure Relationship

The service life of a pipe system is influenced by the relationship between the working temperature and the working pressure. Illustration 'A' below plots, the recommended maximum pressures in relation to working temperatures, based upon a service life expectancy of 50 years for 15 bar fittings.

It is appreciated, in the context of modern industrial pipe system, reference to service life of 50 years, or even 20 years may be largely irrelevant. Such a time scale is, however, used only as a basis of material provided maximum combinations of pressure and temperature are not exceeded.

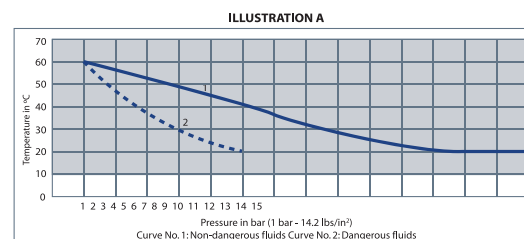
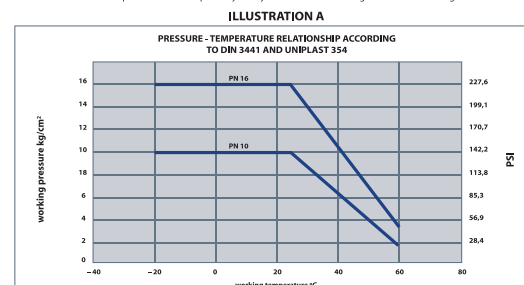


Illustration 'B' below plot, the recommended maximum working pressures in relation to working temperatures, based upon a service life expectancy of 50 years for metric size fittings for 16 & 10 bar fittings.



THE ABOVE DATA HAS BEEN TAKEN FROM BURST & AGEING TESTS ON A RANDOM SAMPLING BASIS CARRIED OUT UNDER RELEVANT TEST CRITERIONS

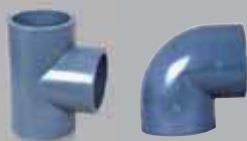
Determining the Pressure Rating of a System

In determining the maximum working pressure of system as whole, it is essential to take into consideration those components in the system which have the lowest pressure rating. PVC pipe, for example, is available with pressure ratings ranging from 6 bar (Class B) up to 15 bar (Class E), and it is frequently the pressure class of the pipe that will determine the performance capability of the whole system.

Pressure ratings of pipe fittings and values are always quoted with and subjected to a given temperature, usually 20° C. They can be used at higher pressures, but it is a fundamental principle in plastics pipe work that if either the temperature or the pressure is increased then the other must be reduced.

The table below shows the percentage of system's overall pressure rating recommended for various working temperature over 20° C with a fluctuation not exceeding 5° C. Where pipe work is conveying highly corrosive or dangerous liquids, or is liable to mechanical abuse, it is recommended that the pressure rating be regarded as that applicable to the next lower pressure class.

Temperature		Percentage of Pressure Rating	W.P. (BAR)	
deg. C	deg. F		inch Size	MM Size
20	68	100	15	16
30	86	90	13.50	14.40
35	95	80	12	12.80
40	104	70	10.50	11.20
45	113	60	9	9.60
50	122	45	6.75	7.20
55	131	30	4.50	4.80
60	140	15	2.25	2.40

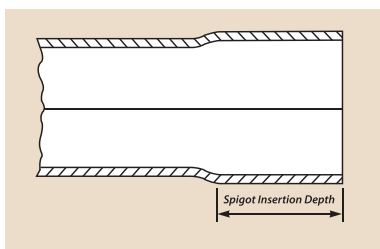


PIPE JOINTING TECHNIQUES

Solvent cement Jointing



- 1** The socket and spigot to be jointed shall be thoroughly seen for any damage. Proper attention shall be given to spigot chamfer and socket.



- 2** The spigot insertion depth shall be measured as the depth from the mouth to the shoulder of the socket. The spigot shall be marked accordingly with marker. (REFER FIG 1 & 3)



- 3** The mating area of spigot and socket shall be thoroughly cleaned. (REFER FIG 2 & 3)



- 4** Lightly roughen the mating surface of the spigot and socket using clean emery cloth or medium glass paper. (REFER FIG 3)



- 5** Thoroughly clean again the mating surface and ensure that all mating surfaces are clean and completely dry. (REFER FIG 4)



- 6** Apply uniform coat of solvent cement to the spigot and socket mating surfaces. The cement shall be applied in a lengthwise direction and not with a circular motion. (REFER FIG 5)



- 7** Immediately following cement application ensure that the pipe is slowly anchored and push the spigot fully in the socket without turning the pipe. The spigot shall be inserted with a steady, continuous motion and held in place for 20 seconds. Remove the excess cement from around the mouth of the socket. (REFER FIG 6 & 7)



- 8** Leave the joint undisturbed for five minutes then handle with reasonable care. (REFER FIG 8)

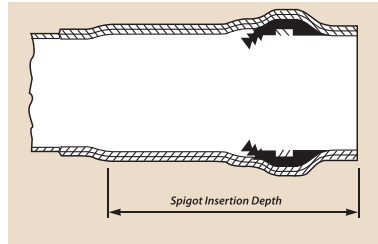
Notes for Solvent Cement :

- 1) Solvent cement is flammable and shall be used in well ventilated conditions.
- 2) The solvent in the cement evaporates quickly, so it is recommended to close the tin/container immediately after use.
- 3) Avoid cleaning fluid be mixed with solvent cement.
- 4) Don't use brush on which solvent cement has previously hardened.
- 5) Solvent cement spilled on the pipe surface should be removed immediately.

Rubber Ring Jointing



1 The socket and spigot to be joined shall be thoroughly seen for any damage. Proper attention shall be given to spigot chamfer and the sealing ring. The chamfered spigot shall be clean and free from burrs. The sealing ring shall be correctly seated in the socket groove.



2 The spigot insertion depth shall be measured as the depth from the mouth to the shoulder of the socket. The spigot shall be marked accordingly with marker. If an allowance for expansion is required, this should be deducted from the spigot insertion depth. (REFER FIG 2)



3 The spigot and socket should be thoroughly cleaned. Any grease, dirt and other foreign matter shall be removed from the sealing areas. (REFER FIG 3)



4 The spigot end and sealing ring shall be thoroughly lubricated with the suitable lubricant. The spigot shall be lubricated to the full insertion depth and around its complete circumference including chamfer area. (REFER FIG 4)

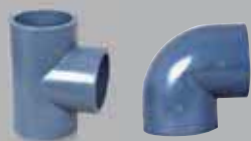


5 Immediately after lubrication, the spigot shall be brought into contact with the socket. The spigot shall be inserted into the socket until resistance from the inner sealing section is felt. Correct alignment at this stage is essential to ensure that the rubber sealing ring is not torn or pinched. (REFER FIG 5)



- 1) All the threaded fittings must have insulated with Teflon tape for better water tightness.
- 2) The threaded fittings must have installed directly without any lubricant or solvent cement.
- 3) Before final assembly / Installation, the threads shall be tested manually for compatibility with male / female adaptor. The amount of Teflon tape to be judged based on the fitment.
- 4) The threads should be tightened by hand initially and then further one or two turns shall be sufficient to create seal.

Note: High pressure thread fittings (both male and female) are most compatible to use with similar plastic fittings. However, while connecting plastic thread it is not recommended to connect UPVC female threads with metal adaptors where overtightening is expected by the installer. Overtightening can cause stress and failure in UPVC fittings.



UPVC INCH SIZE PRESSURE PIPES AND FITTINGS

UPVC Pressure Pipes are manufactured as per the following dimensions :

Inch size Pressure Pipes : BS EN ISO 1452-2

Size	Mean Outside Dia		Wall thickness		Wall thickness		Wall thickness	
			PN - 15 (CLASS-E)		PN - 12 (CLASS-D)		PN - 9 (CLASS-C)	
	Min	Max	Min	Max	Min	Max	Min	Max
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	2.7	3.3	2.2	2.7	-	-
1 1/2"	48.1	48.4	3.1	3.7	2.5	3.0	-	-
2"	60.2	60.5	3.9	4.5	3.1	3.7	2.5	3.0
3"	88.7	89.1	5.7	6.6	4.6	5.3	3.5	4.1
4"	114.1	114.5	7.3	8.4	6.0	6.9	4.5	5.2
6"	168	168.5	10.8	12.5	8.8	10.2	6.6	7.6
8"	218.8	219.4	12.6	14.5	10.3	11.9	7.8	9.0
10"	272.6	273.4	15.7	18.1	12.8	14.8	9.7	11.2
12"	323.4	324.3	18.7	21.6	15.2	17.5	11.5	13.3

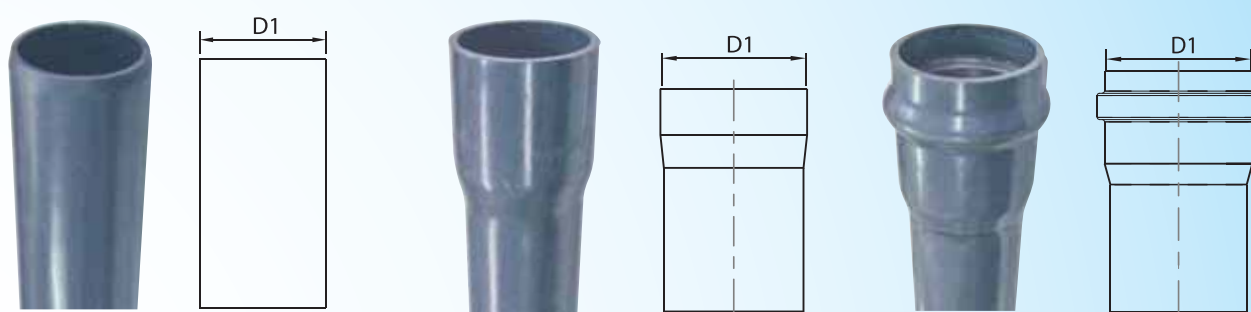
UPVC High Pressure Pipes to BS EN ISO 1452-2 Metric series

Size	Mean Outside Dia		Wall thickness		Wall thickness		Wall thickness	
			PN-16		PN-10		PN-6	
	Min	Max	Min	Max	Min	Max	Min	Max
20 mm	20.0	20.2	1.5	1.9	-	-	-	-
25 mm	25.0	25.2	1.9	2.3	-	-	-	-
32 mm	32.0	32.2	2.4	2.9	1.6	2.0	-	-
40 mm	40.0	40.2	3.0	3.5	1.9	2.3	1.5	1.9
50 mm	50.0	50.2	3.7	4.3	2.4	2.9	1.6	2.0
63 mm	63.0	63.2	4.7	5.4	3.0	3.5	2.0	2.4
75 mm	75.0	75.3	5.6	6.4	3.6	4.2	2.3	2.8
90 mm	90.0	90.3	6.7	7.6	4.3	5.0	2.8	3.3
110 mm	110.0	110.3	6.6	7.5	4.2	4.9	2.7	3.2
160 mm	160.0	160.4	9.5	10.7	6.2	7.1	4.0	4.6

For Water Supply, Irrigation, Drainage mains & Duct Cabling

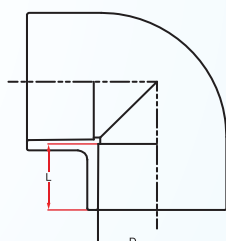
Available in standard length of 5.8 / 6 meters with plain ends, pushfit rubber ring (for dia > 2") or solvent socket ends.

Working pressure given are based on a temperature of 20°C. UPVC Pipes derate at higher temperature.



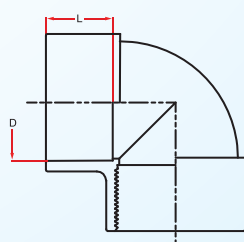
UPVC INCH SIZE PRESSURE PIPES AND FITTINGS

(BS EN ISO 1452-3; CLASS-E; PN-15)



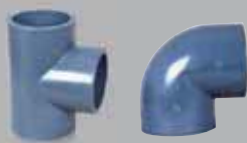
Elbow 90° Plain

Code	Size	D	L	PN
E900.5	1/2"	21.3	16.5	15
E900.75	3/4"	26.7	19.5	15
E901	1"	33.5	22.5	15
E901.25	1 1/4"	42.2	27.0	15
E901.5	1 1/2"	48.2	30.0	15
E902	2"	60.3	36.0	15
E9075X2.5	2 1/2"	75.1	44.0	15
E903	3"	88.8	50.5	15
E904	4"	114.2	63.0	15
E906	6"	168.2	90.0	15
E908	8"	219	101.6	SCH80



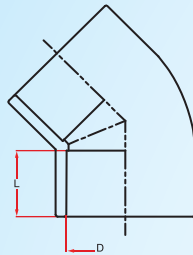
Female Elbow 90° One end plain/other end BSP female thread

Code	Size	D	L	PN
FE0.5	1/2"	21.3	16.5	15
FE0.75	3/4"	26.7	19.5	15
FE1	1"	33.5	22.5	15
FE1.25	1 1/4"	42.2	27.0	15
FE1.5	1 1/2"	48.2	30.0	15
FE2	2"	60.3	36.0	15
FE75X2.5	2 1/2"	75.1	44.0	15
FE3WOC	3"	88.8	50.5	15



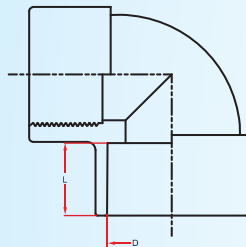
UPVC INCH SIZE PRESSURE PIPES AND FITTINGS

(BS EN ISO 1452-3; CLASS-E; PN-15)



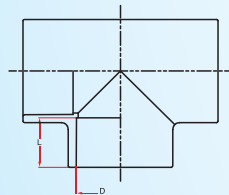
Elbow 45 °Plain

Code	Size	D	L	PN
E450.5	1/2"	21.3	16.5	15
E450.75	3/4"	26.7	19.5	15
E451	1"	33.5	22.5	15
E451.25	1 1/4"	42.2	27.0	15
E451.5	1 1/2"	48.2	30.0	15
E452	2"	60.3	36.0	15
E4575	2 1/2"	75.1	44.0	15
E453	3"	88.8	50.5	15
E454	4"	114.2	63.0	15
E456	6"	168.2	90.0	15
E458	8"	219	101.6	SCH 80



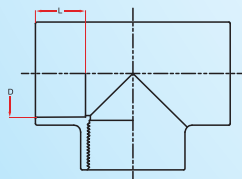
Reducing Female Elbow 90° One end plain/other end BSP female thread

Code	Size	D	L	PN
RFE 1X0.5	1 x 1/2"	33.5	22.5	15



Tee 90° Plain

Code	Size	D	L	PN
T0.5	1/2"	21.3	16.5	15
T0.75	3/4"	26.7	19.5	15
T1	1"	33.5	22.5	15
T1.25	1 1/4"	42.2	27.0	15
T1.5	1 1/2"	48.2	30.0	15
T2	2"	60.3	36.0	15
T75X2.5	2 1/2"	75.1	44.0	15
T3	3"	88.8	50.5	15
T4	4"	114.2	63.0	15
T6	6"	168.2	90.0	15
T8	8"	219	101.6	SCH 80

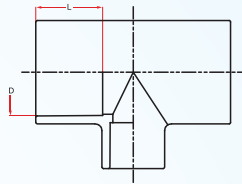


Female Tee : Two end plain/Center end BSP female thread

Code	Size	D	L	PN
FT0.5	1/2"	21.3	16.5	15
FT0.75	3/4"	26.7	19.5	15
FT1	1"	33.5	22.5	15
FT1.5	1 1/2"	48.2	30.0	15
FT2	2"	60.3	36.0	15
FT75X2.5	2 1/2"	75.1	44.0	15

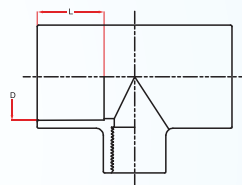
UPVC INCH SIZE PRESSURE PIPES AND FITTINGS

(BS EN ISO 1452-3; CLASS-E; PN-15)



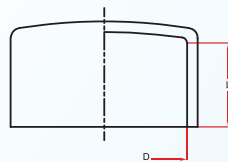
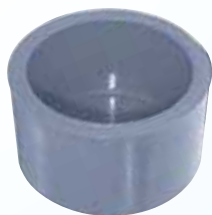
Reducing Tee

Code	Size	D	L	PN
RT0.75X0.5	3/4 x 1/2"	21.3	19.5	15
RT1X0.5	1 x 1/2"	33.5	22.5	15
RT1X0.75	1 x 3/4"	33.5	22.5	15
RT1.5X0.5	1 1/2 x 1/2"	48.2	30.0	15
RT1.5X0.75	1 1/2 x 3/4"	48.2	30.0	15
RT1.5X1	1 1/2 x 1"	48.2	30.0	15
RT2X0.5	2 x 1/2"	60.3	36.0	15
RT2X0.75	2 x 3/4"	60.3	36.0	15
RT2X1	2 x 1"	60.3	36.0	15
RT2X1.5	2 x 1 1/2"	60.3	36.0	15
RT3X2	3 x 2"	88.8	50.5	15
RT4X3	4 x 3"	114.2	63.0	15



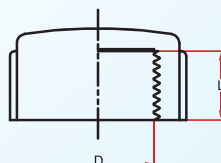
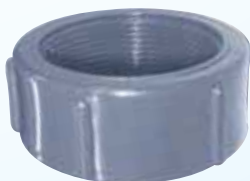
Reducing Female Tee: Two end plain/Center end BSP female thread

Code	Size	D	L	PN
RFT0.75X0.5	3/4 x 1/2"	21.3	19.5	15
RFT1X0.5	1 x 1/2"	33.5	22.5	15
RFT1X0.75	1 x 3/4"	33.5	22.5	15
RFT1.5X0.5	1 1/2 x 1/2"	48.2	30.0	15
RFT1.5X0.75	1 1/2 x 3/4"	48.2	30.0	15
RFT1.5X1	1 1/2 x 1"	48.2	30.0	15
RFT2X0.5	2 x 1/2"	60.3	36.0	15
RFT2X0.75	2 x 3/4"	60.3	36.0	15
RFT2X1	2 x 1"	60.3	36.0	15



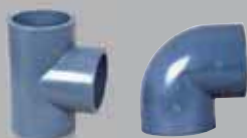
End Cap Plain

Code	Size	D	L	PN
C0.5	1/2"	21.3	16.5	15
C0.75	3/4"	26.7	19.5	15
C1	1"	33.5	22.5	15
C1.25	1 1/4"	42.2	27.0	15
C1.5	1 1/2"	48.2	30.0	15
C2	2"	60.3	36.0	15
C75X2.5	2 1/2"	75.1	44.0	15
C3	3"	88.8	50.5	15
C4	4"	114.2	63.0	15
C6	6"	168.2	90.0	15
C8	8"	219	101.6	SCH 80



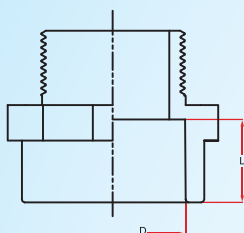
Thread Cap ; BSP female thread

Code	Size	D	PN
TC0.5	1/2"	21.3	15
TC0.75	3/4"	26.7	15
TC1	1"	33.5	15
TC1.25	1 1/4"	42.2	15
TC1.5	1 1/2"	48.2	15
TC2	2"	60.3	15
TC2.5	2 1/2"	75.1	15
TC3	3"	88.8	15
TC4	4"	114.2	15



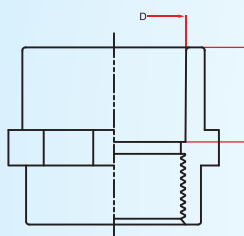
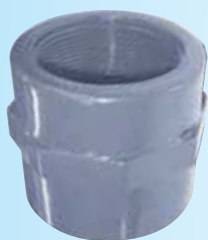
UPVC INCH SIZE PRESSURE PIPES AND FITTINGS

(BS EN ISO 1452-3; CLASS-E; PN-15)



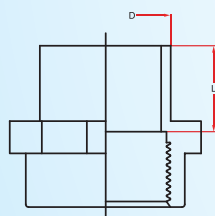
Male Thread Adaptor/Nipple Socket; BSP male thread/plain socket

Code	Size	D	L	PN
MA0.5	1/2"	21.3	16.5	15
MA0.75	3/4"	26.7	19.5	15
MA1	1"	33.5	22.5	15
MA1.25	1 1/4"	42.2	27.0	15
MA1.5	1 1/2"	48.2	30.0	15
MA2	2"	60.3	36.0	15
MA75X2.5	2 1/2"	75.1	44.0	15
MA3	3"	88.8	50.5	15
MA4	4"	114.2	63.0	15



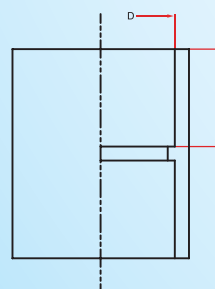
Female Socket Adaptor ; BSP female thread/plain socket

Code	Size	D	L	PN
FS0.5	1/2"	21.3	16.5	15
FS0.75	3/4"	26.7	19.5	15
FS1	1"	33.5	22.5	15
FS1.25	1 1/4"	42.2	27.0	15
FS1.5	1 1/2"	48.2	30.0	15
FS2	2"	60.3	36.0	15
FS75x2.5	2 1/2"	75.1	44.0	15
FS3	3"	88.8	50.5	15
FS4	4"	114.2	63.0	15



Female Slip Adaptor ; BSP female thread/male plain socket

Code	Size	D	L	PN
FSL0.5	1/2"	21.3	16.5	15
FSL0.75	3/4"	26.7	19.5	15
FSL1	1"	33.5	22.5	15
FSL1.25	1 1/4"	42.2	27.0	15
FSL1.5	1 1/2"	48.2	30.0	15
FSL2	2"	60.3	36.0	15

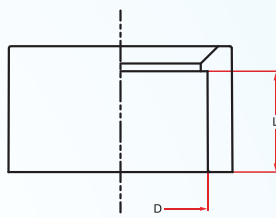


Socket

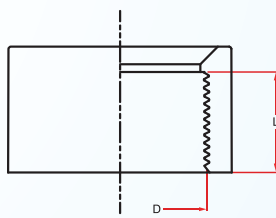
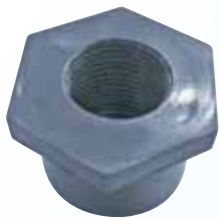
Code	Size	D	L	PN
S0.5	1/2"	21.3	16.5	15
S0.75	3/4"	26.7	19.5	15
S1	1"	33.5	22.5	15
S1.25	1 1/4"	42.2	27.0	15
S1.5	1 1/2"	48.2	30.0	15
S2	2"	60.3	36.0	15
S75X2.5	2 1/2"	75.1	44.0	15
S3	3"	88.8	50.5	15
S4	4"	114.2	63.0	15
S6	6"	168.2	90.0	15
S8	8"	219	101.6	SCH 80

UPVC INCH SIZE PRESSURE PIPES AND FITTINGS

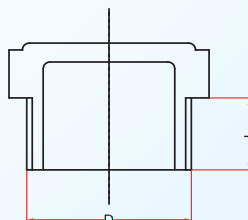
(BS EN ISO 1452-3; CLASS-E; PN-15)



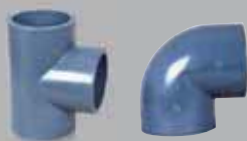
Reducer Bush				
Code	Size	D	L	PN
RB0.75X0.5	3/4 x 1/2"	21.3	19.5	15
RB1X0.5	1 x 1/2"	33.5	22.5	15
RB1X0.75	1 x 3/4"	33.5	22.5	15
RB1.25X0.5	1 1/4 x 1/2"	42.2	27.0	15
RB1.25X0.75	1 1/4 x 3/4"	42.2	27.0	15
RB1.25X1	1 1/4 x 1"	42.2	27.0	15
RB1.5X0.5	1 1/2 x 1/2"	48.2	30.0	15
RB1.5X0.75	1 1/2 x 3/4"	48.2	30.0	15
RB1.5X1	1 1/2 x 1"	48.2	30.0	15
RB2X0.5	2 x 1/2"	60.3	36.0	15
RB2X0.75	2 x 3/4"	60.3	36.0	15
RB2X1	2 x 1"	60.3	36.0	15
RB2X1.5	2 x 1 1/2"	60.3	36.0	15
RB2.5X1.5	2 1/2 x 1 1/2"	75.1	44.0	15
RB2.5X2	2 1/2 x 2"	75.1	44.0	15
RB3X1.5	3 x 1 1/2"	88.8	50.5	15
RB3X2	3 x 2"	88.8	50.5	15
RB3X2.5	3 x 2 1/2"	88.8	50.5	15
RB4X3	4 x 3"	114.2	63.0	15
RB4X2	4 x 2"	114.2	63.0	15
RB6X3	6 x 3"	168.2	90.0	15
RB6X4	6 x 4"	168.2	90.0	15
RB8X6	8 x 6"	219	101.6	SCH 80



Female Reducer Bush ; BSP female thread				
Code	Size	D	L	PN
FTRRB0.75X0.5	3/4 x 1/2"	21.3	19.5	15
FTRRB1X0.5	1 x 1/2"	33.5	22.5	15
FTRRB1X0.75	1 x 3/4"	33.5	22.5	15
FTRRB1.5X0.5	1 1/2 x 1/2"	48.2	30.5	15
FTRRB2X0.5	2 x 1/2"	60.3	36.0	15

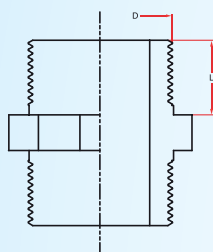


Male Plug			
Code	Size	L (mm)	PN
MTP0.5	1/2"	11.4	15
MTP0.75	3/4"	12.7	15
MTP1	1"	14.5	15
MTP1.25	1 1/4"	16.8	15
MTP1.5	1 1/2"	16.8	15



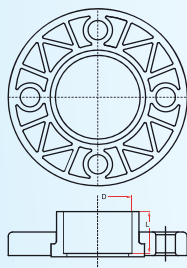
UPVC INCH SIZE PRESSURE PIPES AND FITTINGS

(BS EN ISO 1452-3; CLASS-E; PN-15)



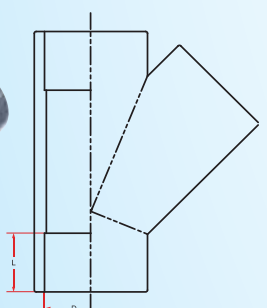
Hex Nipple

Code	Size	L (mm)	PN
HN0.5	1/2"	11.4	15
HN0.75	3/4"	12.7	15
HN1	1"	14.5	15
HN1.5	1 1/2"	16.8	15



Flanges with stub

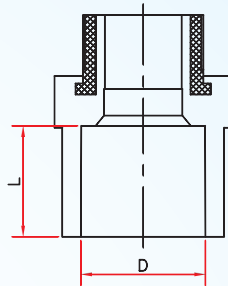
Code	Size	D	L	PN
FL2S	2"	60.3	36.0	15
FL75.2.5S	2 1/2"	75.1	44.0	15
FL3S	3"	88.8	50.5	15
FL4S	4"	114.2	63.0	15
FL6S	6"	168.2	40.0	15
FL8S	8"	168.2	90	SCH80



WYE 45°

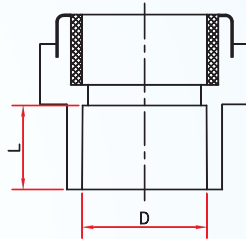
Code	Size	D	L	PN
Y0.75	3/4"	26.7	19.5	15
Y1	1"	33.5	22.5	15
Y1.25	1 1/4"	42.2	27.0	15
Y1.5	1 1/2"	48.2	30.0	15
Y2	2"	60.3	36.0	15

UPVC INCH SIZE PRESSURE BRASS THREADED FITTINGS



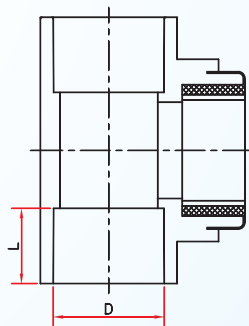
Brass Threaded Male Adaptor, BSP Threaded /Plain Socket

Code	Size	D	L	PN
MA0.5X0.5BI	1/2"	21.3	16.5	15
MA0.75X0.75BI	3/4"	26.7	19.5	15
MA1X1BI	1"	33.5	22.5	15



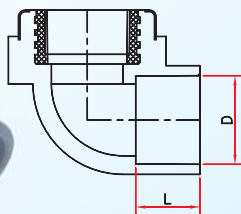
Brass Threaded Female Socket Adaptor, BSP Threaded /Plain Socket

Code	Size	D	L	PN
FS0.5X0.5BI	1/2"	21.3	16.5	15
FS0.75X0.75BI	3/4"	26.7	19.5	15
FS1X1BI	1"	33.5	22.5	15



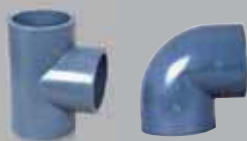
Brass Threaded Female Tee, BSP Threaded /Plain Socket

Code	Size	D	L	PN
FT0.5X0.5BI	1/2"	21.3	16.5	15
FT0.75X0.75BI	3/4"	26.7	19.5	15
FT1X1BI	1"	33.5	22.5	15

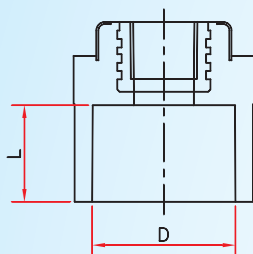


Brass Threaded Female Elbow 90°, BSP Threaded /Plain Socket

Code	Size	D	L	PN
FE0.5X0.5BI	1/2"	21.3	16.5	15
FE0.75X0.75BI	3/4"	26.7	19.5	15
FE1X1BI	1"	33.5	22.5	15

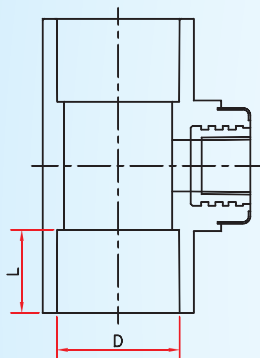


UPVC INCH SIZE PRESSURE BRASS THREADED FITTINGS



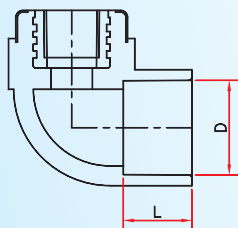
Brass Threaded Female Reducer Socket Adaptor, BSP Threaded

Code	Size	D	L	PN
FS0.75X0.5BI	3/4 x 1/2"	27.7	19.5	15



Brass Threaded Female Reducer Tee, BSP Threaded /Plain Socket

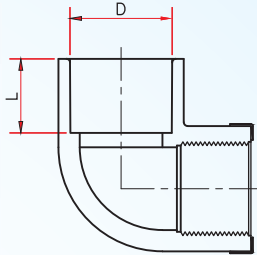
Code	Size	D	L	PN
FT0.75X0.5BI	3/4 x 1/2"	26.7	19.5	15



Brass Threaded Female Reducer Elbow 90°, BSP Threaded

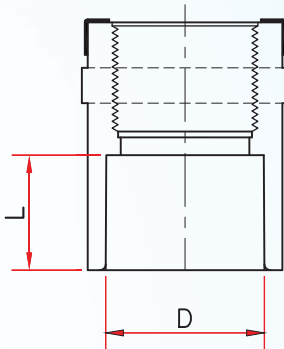
Code	Size	D	L	PN
FE0.75X0.5BI	3/4 x 1/2"	26.7	19.5	15

UPVC INCH SIZE PRESSURE BRASS THREADED FITTINGS



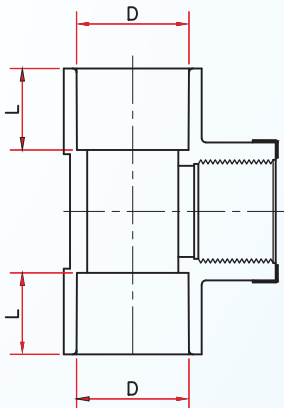
Female Socket Adaptor with Steel Reinforcing Ring, (BSP Thread / Plain Socket)

Code	Size	D	L	PN
FS0.5SR	1/2"	21.3	16.5	15
FS0.75SR	3/4"	26.7	19.5	15
FS1SR	1"	33.5	22.5	15



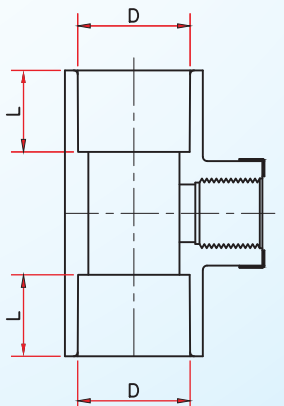
Female Tee with Steel Reinforcing Ring, (BSP Thread / Plain Socket)

Code	Size	D	L	PN
FT0.5SR	1/2"	21.3	16.5	15
FT0.75SR	3/4"	26.7	19.5	15



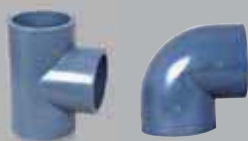
Female Elbow 90° with Steel Reinforcing Ring, (BSP Thread / Plain Socket)

Code	Size	D	L	PN
FE0.5SR	1/2"	21.3	16.5	15
FE0.75SR	3/4"	26.7	19.5	15



Female Reducer Tee with Steel Reinforcing Ring, (BSP Thread / Plain Socket)

Code	Size	D	L	PN
RFT0.75X0.5SR	3/4" x 1/2"	26.7	19.5	15
RFT1X0.5SR	1" x 1/2"	26.7	19.5	15
RFT1.5X0.5SR	1 1/2" x 1/2"	48.2	30	15



UPVC MILLIMETER SIZE PRESSURE PIPES FITTINGS

Millimeter size Pressure Pipes : DIN 8061 / 8062

Size	Mean Outside Dia		Wall thickness		Wall thickness		Wall thickness	
			PN - 16		PN - 10		PN - 6	
	Min	Max	Min	Max	Min	Max	Min	Max
20 mm	20.0	20.2	1.5	1.9	-	-	-	-
25 mm	25.0	25.2	1.9	2.3	1.5	1.9	-	-
32 mm	32.0	32.2	2.4	2.9	1.8	2.2	-	-
40 mm	40.0	40.2	3.0	3.5	1.9	2.3	1.8	2.2
50 mm	50.0	50.2	3.7	4.3	2.4	2.9	1.8	2.2
63 mm	63.0	63.2	4.7	5.4	3.0	3.5	1.9	2.3
75 mm	75.0	75.3	5.6	6.4	3.6	4.2	2.2	2.7
90 mm	90.0	90.3	6.7	7.6	4.3	5.0	2.7	3.2
110 mm	110.0	110.30	8.2	9.3	5.3	6.1	3.2	3.8
160 mm	160.0	160.40	11.9	13.3	7.7	8.7	4.7	5.4

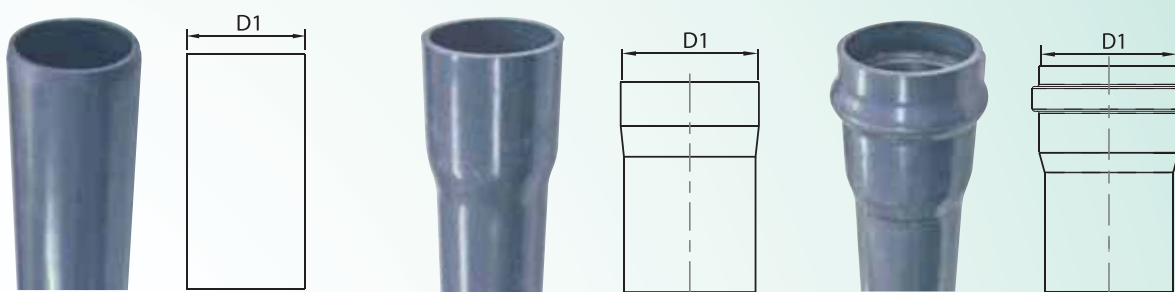
Pressure Pipes to ISO 161-1 Metric series

Size	Mean Outside Dia		Wall thickness		Wall thickness		Wall thickness	
			PN - 16		PN - 10		PN - 6	
	Min	Max	Min	Max	Min	Max	Min	Max
20 mm	20.0	20.2	1.2	1.6	-	-	-	-
25 mm	25.0	25.2	1.5	1.9	-	-	-	-
32 mm	32.0	32.2	1.9	2.3	-	-	-	-
40 mm	40.0	40.2	2.4	2.9	1.6	2.0	-	-
50 mm	50.0	50.2	3.0	3.6	2.0	2.5	1.3	1.7
63 mm	63.0	63.2	3.8	4.4	2.5	3.0	1.6	2.0
75 mm	75.0	75.3	4.5	5.2	2.9	3.4	1.9	2.3
90 mm	90.0	90.3	5.4	6.2	3.5	4.1	2.2	2.7
110 mm	110.0	110.3	6.6	7.5	4.2	4.9	2.7	3.2
160 mm	160.0	160.4	9.5	10.7	6.2	7.1	4.0	4.7

For Water Supply, Irrigation, Drainage mains & Duct Cabling

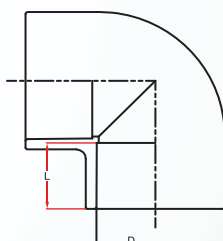
Available in standard length of 5.8 / 6 meters with plain ends, pushfit rubber ring (for dia > / 75mm) or solvent socket ends.

Working pressure given are based on a temperature of 20°C. UPVC Pipes derate at higher temperature.



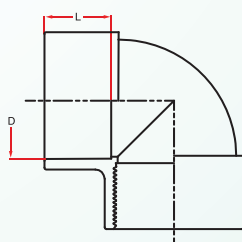
UPVC MILLIMETER SIZE PRESSURE PIPES AND FITTINGS

(DIN 8063 ; PN-16)



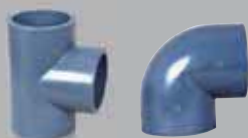
Elbow 90° Plain

Code	Size	D	L	PN
E9020	20 mm	20.1	16.0	16
E9025	25 mm	25.1	19.0	16
E9032	32 mm	32.1	22.0	16
E9040	40 mm	40.1	26.0	16
E9050	50 mm	50.1	31.0	16
E9063	63 mm	63.1	38.0	16
E9075x2.5	75 mm	75.1	44.0	16
E9090	90 mm	90.1	51.0	16
E90110(N)	110 mm	110.1	61.0	16
E90160	160 mm	160.2	86.0	16
E90200	200 mm	200.2	106.0	10



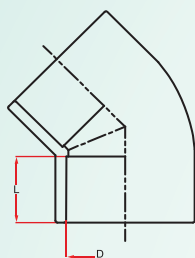
Female Elbow 90° One end plain/other end BSP female thread

Code	Size	D	L	PN
FE20X0.5	20 x 1/2"	20.1	16.0	16
FE25X0.75	25 x 3/4"	25.1	19.0	16
FE32X1	32 x 1"	32.1	22.0	16
FE40X1.25	40 x 1 1/4"	40.1	26.0	16
FE50X1.5	50 x 1 1/2"	50.1	31.0	16
FE63X2	63 x 2"	63.1	38.0	16
FE75X2.5WOC	75 x 2 1/2"	75.1	44.0	16
FE90X3WOC	90 x 3"	90.1	51.0	16



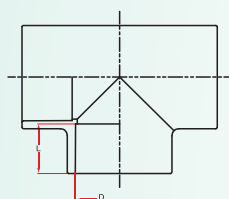
UPVC MILLIMETER SIZE PRESSURE PIPES AND FITTINGS

(DIN 8063 ; PN-16)



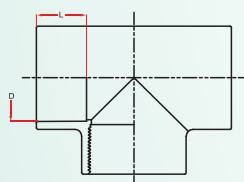
Elbow 45° Plain

Code	Size	D	L	PN
E4520	20 mm	20.1	16.0	16
E4525	25 mm	25.1	19.0	16
E4532	32 mm	32.1	22.0	16
E4540	40 mm	40.1	26.0	16
E4550	50 mm	50.1	31.0	16
E4563	63 mm	63.1	38.0	16
E4575	75 mm	75.1	44.0	16
E4590	90 mm	90.1	51.0	16
E45110	110 mm	110.1	61.0	16
E45160	160 mm	160.2	86.0	16
E45200	200 mm	200.2	106.0	10



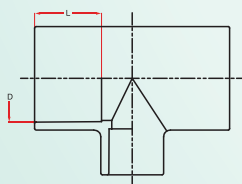
Tee 90° Plain

Code	Size	D	L	PN
T20	20 mm	20.1	16.0	16
T25	25 mm	25.1	19.0	16
T32	32 mm	32.1	22.0	16
T40	40 mm	40.1	26.0	16
T50	50 mm	50.1	31.0	16
T63	63 mm	63.1	38.0	16
T75x2.5	75 mm	75.1	44.0	16
T90	90 mm	90.1	51.0	16
T110(N)	110 mm	110.1	61.0	16
T160	160 mm	160.2	86.0	16
T200	200 mm	200.2	106.0	10



Female Tee : Two end plain/Center end BSP female thread

Code	Size	D	L	PN
FT20X0.5	20 x 1/2"	20.1	16.0	16
FT25X0.25	25 x 3/4"	25.1	19.0	16
FT32X1	32 x 1"	32.1	22.0	16
FT40X1.25	40 x 1 1/4"	40.1	26.0	16
FT50X1.5	50 x 1 1/2"	50.1	31.0	16
FT63X2	63 x 2"	63.1	38.0	16
FT75X2.5	75 x 2 1/2"	75.1	44.0	16
FT90X3	90 x 3"	90.1	51.0	16

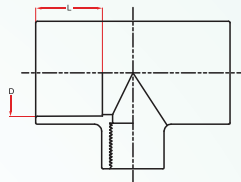


Reducing Tee

Code	Size	D	L	PN
RT25X20	25 x 20mm	25.1	19.0	16
RT32X20	32 x 20mm	32.1	22.0	16
RT32X25	32 x 25mm	32.1	22.0	16
RT50X20	50 x 20mm	50.1	31.0	16
RT50X25	50 x 25mm	50.1	31.0	16
RT50X32	50 x 32mm	50.1	31.0	16
RT63X20	63 x 20mm	63.1	38.0	16
RT63X25	63 x 25mm	63.1	38.0	16
RT63X32	63 x 32mm	63.1	38.0	16
RT63X50	63 x 50mm	63.1	38.0	16
RT90X63	90x 63mm	90.1	51.0	16
RT110X90	110 x 90mm	110.1	61.0	16
RT160X90	160 x 90mm	160.2	86.0	16
RT160X110	160 x 110mm	160.2	86.0	16

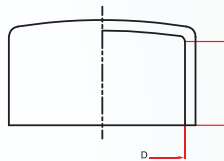
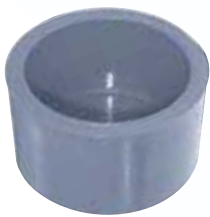
UPVC MILLIMETER SIZE PRESSURE PIPES AND FITTINGS

(DIN 8063 ; PN-16)



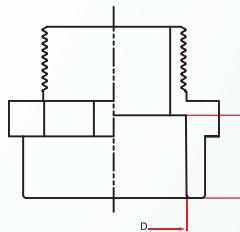
Reducing Female Tee: Two end plain/Center end BSP female thread

Code	Size	D	L	PN
	20 x 1/2"	20.1	16.0	16
RFT25X0.5	25 x 1/2"	25.1	19.0	16
RFT32X0.5	32 x 1/2"	32.1	22.0	16
RFT32X0.75	32 x 3/4"	32.1	22.0	16
RFT50X0.5	50 x 1/2"	50.1	31.0	16
RFT50X0.75	50 x 3/4"	50.1	31.0	16
RFT63X0.5	63 x 1/2"	63.1	38.0	16
RFT63X0.75	63 x 3/4"	63.1	38.0	16
RFT90X0.75	90 x 3/4"	90	51.0	16



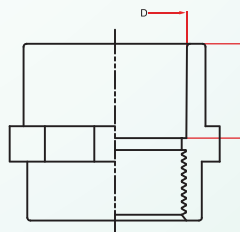
End Cap Plain

Code	Size	D	L	PN
C20	20 mm	20.1	16.0	16
C25	25 mm	25.1	19.0	16
C32	32 mm	32.1	22.0	16
C40	40 mm	40.1	26.0	16
C50	50 mm	50.1	31.0	16
C63	63 mm	63.1	38.0	16
C75x2.5	75 mm	75.1	44.0	16
C90	90 mm	90.1	51.0	16
C110	110 mm	110.1	61.0	16
C160	160 mm	160.2	86.0	16
C200	200 mm	200.2	106.0	10



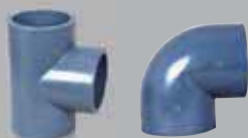
Male Thread Adaptor/Nipple Socket; BSP male thread/plain socket

Code	Size	D	L	PN
MA20X0.5	20 x 1/2"	20.1	16.0	16
MA25X0.75	25 x 3/4"	25.1	19.0	16
MA32X1	32 x 1"	32.1	22.0	16
MA40X1.25	40 x 1 1/4"	40.1	26.0	16
MA50X1.5	50 x 1 1/2"	50.1	31.0	16
MA63X2	63 x 2"	63.1	38.0	16
MA75X2.5	75 x 2 1/2"	75.1	44.0	16
MA90X3	90 x 3"	90.1	51.0	16
MA110X4	110 x 4"	110.1	61.0	16



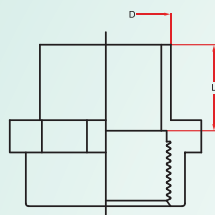
Female Socket Adaptor ; BSP female thread/plain socket

Code	Size	D	L	PN
FS20X0.5	20 x 1/2"	20.1	16.0	16
FS25X0.75	25 x 3/4"	25.1	19.0	16
FS32X1	32 x 1"	32.1	22.0	16
FS40X1.25	40 x 1 1/4"	40.1	26.0	16
FS50X1.5	50 x 1 1/2"	50.1	31.0	16
FS63X2	63 x 2"	63.1	38.0	16
FS75X2.5	75 x 2 1/2"	75.1	44.0	16
FS90X3	90 x 3"	90.1	51.0	16
FS110X4	110 x 4"	110.1	61.0	16



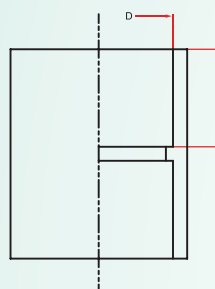
UPVC MILLIMETER SIZE PRESSURE PIPES AND FITTINGS

(DIN 8063 ; PN-16)



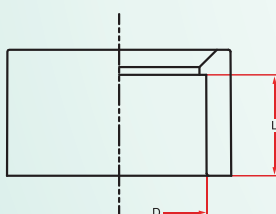
Female Slip Adaptor ; BSP female thread/male plain socket

Code	Size	D	L	PN
FSL20X0.5	20 x 1/2"	20.1	16.0	16
FSL25X0.75	25 x 3/4"	25.1	19.0	16
FSL32X1	32 x 1"	32.1	22.0	16
FSL40X1.25	40 x 1 1/4"	40.1	26.0	16
FSL50X1.5	50 x 1 1/2"	50.1	31.0	16
FSL63X2	63 x 2"	63.1	38.0	16



Socket

Code	Size	D	L	PN
S20	20 mm	20.1	16.0	16
S25	25 mm	25.1	19.0	16
S32	32 mm	32.1	22.0	16
S40	40 mm	40.1	26.0	16
S50	50 mm	50.1	31.0	16
S63	63 mm	63.1	38.0	16
S75x2.5	75 mm	75.1	44.0	16
S90	90 mm	90.1	51.0	16
S110	110 mm	110.1	61.0	16
S160	160 mm	160.2	86.0	16
S200	200 mm	200.2	106.0	10

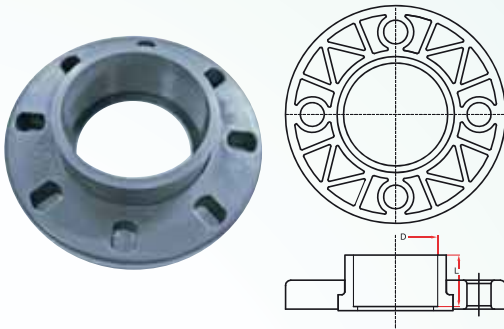


Reducer Bush

Code	Size	D	L	PN
RB25X20	25 x 20mm	25.1	19.0	16
RB32X20	32 x 20mm	32.1	22.0	16
RB32X25	32 x 25mm	32.1	22.0	16
RB40X20	40 x 20mm	40.1	26.0	16
RB40X25	40 x 25mm	40.1	26.0	16
RB40X32	40 x 32mm	40.1	26.0	16
RB50X20	50 x 20mm	50.1	31.0	16
RB50X25	50 x 25mm	50.1	31.0	16
RB50X32	50 x 32mm	50.1	31.0	16
RB63X20	63 x 20mm	63.1	38.0	16
RB63X25	63 x 25mm	63.1	38.0	16
RB63X32	63 x 32mm	63.1	38.0	16
RB63X50	63 x 50mm	63.1	38.0	16
RB75X50	75 x 50mm	75.1	44.0	16
RB75X63	75 x 63mm	75.1	44.0	16
RB90X50	90 x 50mm	90.1	51.0	16
RB90X63	90 x 63mm	90.1	51.0	16
RB90X75	90 x 75mm	90.1	51.0	16
RB90X75	110 x 90mm	110.1	61.0	16
RB110X63	110 x 63mm	110.1	61.0	16
RB160X90	160 x 90mm	160.2	86.0	16
RB160X110	160 x 110mm	160.2	86.0	16
RB200X160	200 x 160mm	200.2	106.0	10
RB225X160	225 x 160mm	225.3	119.0	16

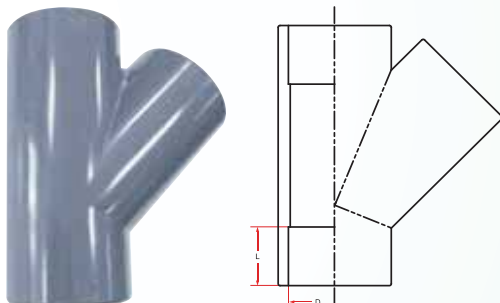
UPVC MILLIMETER SIZE PRESSURE PIPES AND FITTINGS

(DIN 8063 ; PN-16)



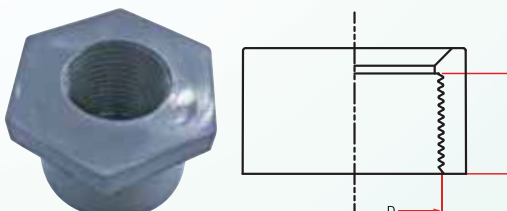
Flanges with stub

Code	Size	D	L	PN
FL63S	63 mm	63.10	38.0	16
FL75.2.5S	75 mm	75.10	44.0	16
FL90S	90 mm	90.10	51.0	16
FL4.110S	110 mm	110.10	61.0	16
FL160S	160 mm	160.20	86.0	16
FL200S	200 mm	200.2	106.0	10



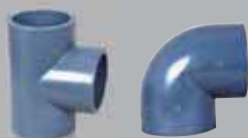
WYE 45°

Code	Size	D	L	PN
Y25	25 mm	25.1	19.0	16
Y32	32 mm	32.1	22.0	16
Y40	40 mm	40.1	26.0	16
Y50	50 mm	50.1	31.0	16
Y63	63 mm	63.1	38.0	16



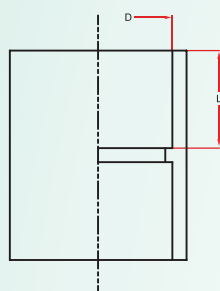
Female Reducer Bush ; BSP female thread

Code	Size	D	L	PN
FTRRB25X0.5	25 x 1/2"	25.1	19.0	16
FTRRB32X0.5	32 x 1/2"	32.1	22.0	16
FTRRB32X0.75	32 x 3/4"	32.1	22.0	16



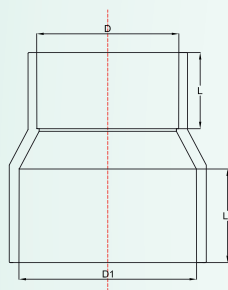
UPVC MILLIMETER SIZE PRESSURE PIPES AND FITTINGS

(DIN 8063 ; PN-16)



Converter Socket

Code	Size	D	L	PN
S20X0.5	20 x 1/2"	20.1 / 21.3	16.0 / 16.5	16
S25X0.75	25 x 3/4"	25.1 / 26.7	19.0 / 19.5	16
S32X1	32 x 1"	32.1 / 33.5	22.0 / 22.5	16
S50X1.5	50 x 1 1/2"	50.1 / 48.2	31.0 / 30.0	16
S63X2	63 x 2"	63.1 / 60.3	38.0 / 36.0	16
S90X3	90 x 3"	90.1 / 88.8	51.0 / 50.5	16
S110X4	110 x 4"	110.1 / 114.2	61.0 / 63.0	16



Reducing Socket

Code	Size	D1 / D	L1 / L	PN
RS200X160	200 x 160mm	200.2 / 160.2	106.0 / 86.0	10



FLOW DATA

Flow Chart for uPVC PIPES NOMINAL DIAMETER ½" TO 12"

The accompanying flow chart has been calculated on the mean bore of UPVC pipes manufactured in different classes according to PN Rating BS EN ISO1452:2:2000 These standards are based on pipes made to inch diameters and the diagram has been prepared on the basis of imperial units; metric equivalents of velocity and a separate scale for rate of flow in litres per second are incorporated.

The smooth bore of UPVC pipes, which are not subject to modulation, together with long pipe lengths, enables them to be treated as hydraulically smooth where they are used for the conveyance of potable water supply. Sewage pumping mains are in certain circumstances, liable to acquire coatings of limes which may reduce their flow capacity.

To use the chart it is only necessary to visually locate the appropriate intersection points to ascertain the relationship between pipe dimension, flow and loss of head and if required, the mean velocity of flow.

The charts has been prepared using the
Colebrook = white Flow equation.

$$V = \frac{1.49}{K} \sqrt{\frac{2g}{D}} \left(\frac{Ks}{3.7D} + \frac{2.51 \nu}{D \sqrt{2gD}} \right)^{-0.25}$$

Where

- V = Velocity in metres per second
- g = gravitational acceleration (a value of 9.807 M/s has been assumed)
- i = Hydraulic gradient
- ν = Kinetic Viscosity (a value of 1.141×10^{-6}
- Ks = linear measure of roughness in mm. = 0.003 mm
- D = mean internal diameter of pipe (manufactured to B.S.EN ISO 1452-2:2000)

K. VALUE

The frictional losses occasioned by flow through fittings are approximately proportional to the square of the liquid velocity.

The losses can be determined by the use of the following formula.

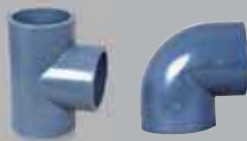
$$H = \frac{Kv^2}{2g}$$

Where

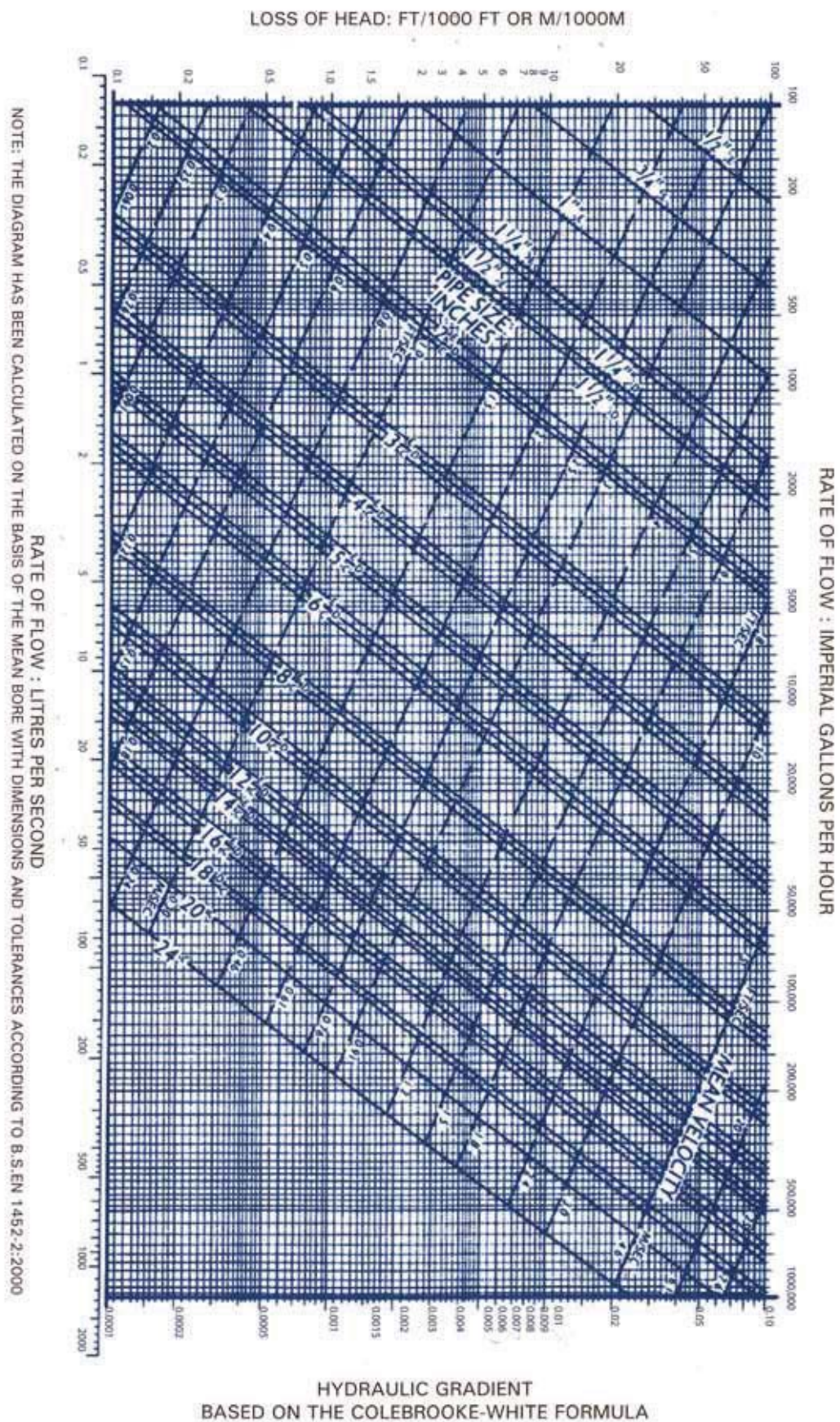
- H = loss of head
- V = liquid velocity
- g = acceleration due to gravity
- K = coefficient dependent on type of fitting

various Values for K are:-

90° Elbow	K = 1.00
45° Elbow	K = 0.4
22 1/2° Elbow	K = 0.2
90° Bend	K = 0.2
45° Bend	K = 0.1
22 1/2° Bend	K = 0.05
90° Tee flow in line	K = 0.35
90° Tee flow in to or from ranch	K = 1.20
Gate valve: Open	K = 0.12
¼ closed	K = 1.0
½ closed	K = 6.0
¾ closed	K = 24.0
Globe valve: open	K = 10.0
Butterfly valve: open	K = 0.3



FLOW CHART FOR PVC - U PIPES



TRENCH WORK

The line and level of the pipe and hence buried depth of the pipeline, will have been predetermined at the design stage. The trench should not be excavated too far in advance of pipe laying and should be backfilled as soon as possible, **however joints should be left exposed until testing has been successfully completed.**

The width of the trench at ground level will depend on the type of subsoil and buried depth of the pipeline. The minimum width of the trench at the pipe springing line should be as narrow as practicable but not less than the pipe diameter plus 300mm. The maximum width of the trench at the crown of the pipe must not exceed the pipe diameter plus 600mm.

TRENCH FORMATION

a) DIRECT LAYING

If the pipe is to be laid directly onto the trench bottom make sure that the trench formation is composed of:-

Stable, uniform, fine-grained soil, with no large flints or stones, or other protuberances which might cause point-loading on the pipe.

When laying the pipe directly the trench formation should be trimmed to an even finish which will provide continuous support to the pipe. Additional excavation will be required at the position of the pipe sockets to ensure proper joint assembly and pipe support.

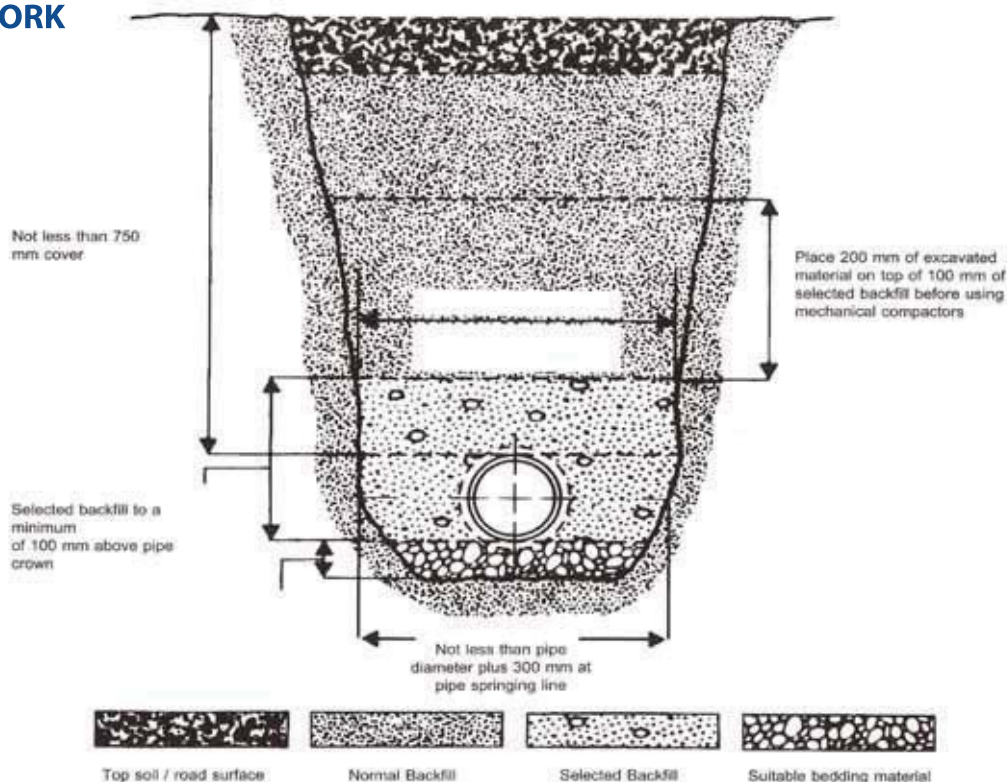
b) PIPE LAYING ON BEDDING

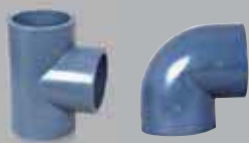
If the formation is unsuitable for direct laying the trench will need to be excavated to a further depth of minimum of 100 mm below the underside of the pipe

This should be made up with a suitable bedding material as below. In extreme conditions such as waterlogged or unstable ground it may be necessary to increase the thickness of the bedding material.

If guidance is required please consult our technical department. Pipelines laid through rock should always be laid on a minimum of 100mm bed of suitable bedding materials.

TRENCH WORK





BEDDING MATERIAL

The bedding material selected may be available from excavated trench material or may need to be imported from another source. The material should be granular in nature, free from large stones, debris or frozen matter, and preferably fine grained in nature. Materials such as clay or hard chalk will break up when wetted should not be used. Suitable materials are free draining coarse sand and nominal single size gravel with rounded or angular particles. Gravels should be normal single size 10mm or 5 to 10 mm graded, preferably with angular particles which have good self compacting properties.

BACKFILL

Following satisfactory bedding and pipe laying, selected material should be placed in the trench in layers not exceeding 100 mm, each layer being thoroughly compacted by hand. The selected material should have a maximum particle size of 75mm and be free from topsoil, stones, tree roots and other debris which may be harmful to the pipe. The initial backfilling of selected material should continue to a minimum height of 100 mm above the crown of the pipe.

The bedding material should be placed carefully in the trench and properly compacted by hand to ensure a sound continuous bed for the pipes. Particular attention should be paid to the socket holes to ensure correct placement and compaction of bedding material in this area. **Bricks or other forms of temporary pipe support should never be left in the trench.**

Above this level normal backfilling procedures should be adopted including compaction to prevent subsequent settlement of the trench infill. Heavy mechanical compactors should not be used until there is a minimum 300 mm layer of material above the crown of the pipe. Any trench sheeting should be carefully withdrawn during the backfilling and infill process, to allow proper compaction to occur.



AVERAGE QUANTITIES OF SOLVENT CEMENT, CLEANER AND LUBRICANT REQUIRED FOR uPVC PIPE JOINTS USING 500ML CONTAINERS

SOLVENT CEMENT		SOLVENT CLEANER		LUBRICANT FOR UPVC PIPES WITH RING JOINTS	
Size of pipe	Qty(500ML)	Size of pipe	Qty(500ML)	Size of pipe	Qty(500ML)
1/2"	212	1/2"	141.35	0	0
3/4"	168	3/4"	112	0	0
1"	134	1"	89.35	0	0
1-1/4"	86	1-1/4"	57.35	0	0
1-1/2"	62	1-1/2"	41.35	0	0
2"	38	2"	25.35	2"	50
2-1/2"	24	2-1/2"	16	2-1/2"	0
3"	17	3"	11.35	3"	44
4"	10	4"	6.7	4"	39
5"	6.5	5"	4.35	5"	26
6"	4.5	6"	3	6"	22
7"	3.4	7"	2.3	7"	20
8"	2.6	8"	1.75	8"	16
9"	2	9"	1.35	9"	13
10"	1.7	10"	1.15	10"	11
12"	1.2	12"	0.8	12"	9

DEFLECTION

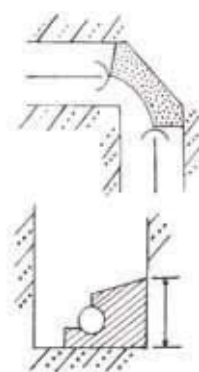
The Loc-Ring Internal Socket permits an angular deflection at the joint 2/3. The introduction of joint deflection is, however, generally unnecessary in an inherently flexible UPVC pipeline. Sufficient flexibility is provided by individual pipe lengths to enable gentle curves to be negotiated without imparting deflection at the joints. As a general guide the cold bending radius (R) of UPVC pipe length can be calculated as follows:

$$R = 250 \times \text{External Diameter}$$

Where a shorter radius of curvature is required, then uPVC formed bends must be introduced.

THERMAL MOVEMENT

Research has shown that in buried High Pressure installation, below ground temperatures remain constant and little attention need be given to the accommodation of thermal movement. It is only necessary to consider the effect of ambient temperatures during laying operations. Where solvents welded joints are being used the pipe line should be allowed to assume thermal stability after laying before final connections are made and anchor block positioned. No precautions are necessary using push-fit joints which are self connecting.

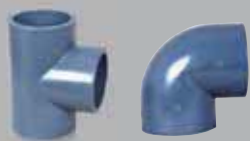


PVC BEND THRUST FORCES

When a pipeline is constructed using push-fit joint separation due to internal pressure and resulting thrust forces must be prevented. This is achieved using concrete thrust blocks at directional changes, branches, end caps, valves, etc. The design of UPVC pipes provides a safety factor of 2:1 after a life of 50 years at maximum working pressure. In designing thrust blocks it is logical to apply a similar factor of safety after calculating thrust forces on the

maximum foreseeable pressure.

In view of the flexible nature of UPVC it is desirable in thrust block design to permit the largest possible area of contact between fitting concerned and the concrete blocks so that a restraint against excessive flexing as well as a thrust is provided (Fig.1). This feature, in certain soil conditions, may also be applied to solvent welded pipelines which need support against thrust but which can benefit by flexing restraint at abrupt directional changes. Thrust blocks concrete should not be allowed to encase the fitting as the external diameter of a UPVC pipe must be left free to distend due to pressure fluctuation. The block may be designed as shown in fig.1 or if total encasement is preferred the fitting should first be wrapped in several layers of heavy gauge polythene film prior to concreting to provide freedom of movement and a barrier against abrasion.



BACK-FILLING AND CONSOLIDATION

It is good practice to arrange back-filling can progress to follow closely behind main laying. UPVC pipe can be laid with such speed that backfilling can progress simultaneously with pipe-laying.

The initial pipe back-filling should be of reasonably compatible material (compaction factor 0.3 or less) and free from sharp stones or other debris, which, on compaction can cause detrimental point loading on the pipeline. This initial backfilling should be thoroughly compacted by hand ramming.

Mechanical ramming of subsequent backfill should not commence until least 30cms. Of hand consolidated cover is attained. Where pipes have less than 76cms Of cover, consideration should always be given to the likelihood of heavy vehicular traffic loadings.

The encasement of UPVC pipe in concrete is both wasteful and destructive. It converts a tough flexible pipeline into a grid beam of limited flexural strength. At cover depths of 60cm and more, protection by normal, well compacted granular surround is generally adequate. At shallower cover depths under roads, protection is best afforded by use of concrete slabs upon a cushion of granular fill or by passing the pipeline through a protective pipe duct of greater diameter.

INSTALLATION – ABOVE GROUND

Where u PVC High Pressure mains or services are specified for above ground situations the following notes should be considered where applicable.

FROST PROTECTION

Like most materials u PVC becomes prone to impact damage as the temperature drops below zero. Pipe-runs should therefore be sited or protected in such manner as will prevent accidental damage in conditions of extreme cold.

Due to the extremely low thermal conductivity of the material it is unlikely that the contents of a u PVC pipeline will freeze in normal UK winter temperatures. However abnormal climatic conditions and periods of “no-flow” should be considered and exposed pipe work lagged accordingly.

WORKING PRESSURE

The maximum pressure ratings of u PVC pipes have been calculated on the basis that the pipeline temperature is no greater than 20° C. where the pipe temperature is likely to be exceeded then the maximum pressure rating must be reduced if the full operational life-expectancy of the pipeline is to be maintained.

It is unlikely that such modification will be necessary due to mains water temperatures, but where a watermain is in an exposed location it will be necessary to reduce the pipe pressure rating by 2% for each C by which the ambient temperature exceeds 20°C.

THERMAL MOVEMENT

Where the temperature of a u PVC pipeline is likely to vary due to atmospheric temperature it is important to plan the variations in pipeline length which may variations in pipeline length which may arise as a result of temperature differences.

Expansion and contraction can be calculated using the formula:

$$dL = \alpha \times L \times dt$$

Where dL = Change in the length in millimeters.
 α = 0.8 mm/m/°C - (PVC)
 L = Original length of pipe in meters.
 dt = Total temperature range in °C

Calculated of expansion and contraction should take account of the minimum and maximum foreseeable temperature conditions.

When the total length variation of the pipeline has been established, the positioning of both support and anchor brackets can be determined.

Anchor brackets can be so arranged to sub-divide the total length variation and to control movement in a specific direction. Support brackets must allow the pipeline to move freely. It is normally possible like correct bracket arrangements to direct movement in such a manner that this is accommodated by directional changes in the line.

Expansion bellows may be used to accommodate excessive movement but in such instance the pipes so connected must be restrained against possible separation.

Any lines valves must be firmly anchored and independently supported so that no stresses are transmitted to the pipeline.

Pipe bracket spacing for PVC-U for liquids with a density of 1 g/cm³

d	DN	Pipe brackets intervals L for SDR21 / S 10 / PN10 pipes in mm at pipe wall temperature:				
mm	inch	≤20 °C	30 °C	40 °C	50 °C	60 °C
20	½	1100	1050	1000	900	700
25	¾	1200	1150	1050	950	750
32	1	1350	1300	1250	1100	900
40	1 ¼	1450	1400	1350	1250	1000
50	1 ½	1600	1550	1500	1400	1150
63	2	1800	1750	1700	1550	1300
75	2 ½	2000	1900	1850	1700	1450
90	3	2200	2100	2000	1850	1550
110	4	2400	2300	2250	2050	1750
125	-	2550	2450	2400	2200	1850
140	5	2700	2600	2500	2300	1950
160	6	2900	2800	2700	2500	2100
180	-	3100	2950	2850	2650	2200
200	-	3250	3150	3000	2800	2350
225	8	3450	3300	3200	2950	2500
250	-	3650	3500	3350	3100	2600
280	10	3750	3700	3550	3300	2750
315	12	4100	3900	3750	3500	2950
400	16	4600	4450	4250	3950	3300

For other SDR multiply the values given in the table with the following factor:
SDR 13.6/S 6.3/PN 16 with 1.08

SDR11 /s 5/pn20 with 1.15

The pipe bracket spacing given in the table may be increased by 30% in the case of vertical pipe runs, i.e. multiply the values given by 1.3

USEFUL EQUIVALENTS

BRITISH TO METRIC			METRIC TO BRITISH		
1 inch	=	25.4 millimetres	1 millimetre	=	0.0394 inch
1 foot	=	0.3048 metre	1 metre	=	3.28 feet
1 mile	=	1.609 kilometres	1 kilometre	=	0.6214 mile
1 square mile	=	2.59 km ²	1 square kilometre	=	0.386sq.mile
1 acre	=	0.4047 hectare	1 hectare=10,000m ²	=	2.471 acre
1 cubic foot	=	28.32 litres	1 cubic metre=1000litres	=	35.31 cubic feet
1 cubic yard	=	0.76 cubic metre		=	1.31 cubic yards
1 gallon	=	4.546 litres		=	219.97 gallons
1 pound	=	0.4536 killograme	1 kilogram	=	2.205 pounds
1 m.g.d	=	0.05261m ³ /s	1 cubic metre per second	=	19.01 million gallons per day(m.g.d)
1 lbf/per square inch	=	0.07031 kgf/cm ²	1 killograme force per cm ²	=	14.223 lbf per sq.inch
1 pound force (lbf)	=	4.448 newton(N)	1 kilo newton per m ²	=	0.145lbf/in ²
1 lbf/in ²	=	6.895kN/m ²	1 tonne=1000kg=		0.984 U.K.tons
Acceleration due to gravity	=	9.807m/s ²	1 newton	=	0.2248 pound force
			1 bar=29.530 in Hg	=	14.5038lbf/in ²

INSPECTION AND TESTING

When the system has been fully installed all pipe work and fittings should be visually inspected and hydraulically tested. Joints should be exposed until hydraulic testing has been successfully completed.

VISUAL INSPECTION

The system should be visually inspected to ensure that the correct installation procedures have been followed and that the pipes and fittings are adequately supported and restrained in the prescribed manner.

HYDRAULIC TESTING

The length of the section under test will be determined by practical considerations such as availability of water 1000 metres of nominal diameter 12 pipe has a capacity of approximately 15,400 galls) and the number of joints or fittings to be tested.

a) Trust forces

During installation the pipe line should have been suitably anchored to resist thrust at changes of direction and fixed points such as branches and hydrant connections. Testing should not take place until any in-situ concrete used as anchorage has matured and attained its required strength (normally a minimum of 7 days after placing).

Similarly solvent weld joints should be allowed to stand for a minimum of 24 hours before testing at 1 ½ times working pressure is carried out. For lower test pressures allow one hour per 15 psi test pressure.

b) Charging the Mains

The test section should be isolated, where necessary, from the rest of the system. A blank end connection drilled and tapped for test equipment. Will be required and should be installed on a suitable flange face. If no flange face is not available, the blank flange can be incorporated by means of a Viking Johnson Flange Adaptor or similar fitting.

Alternatively a suitable expanding stopper may be used. The blank flange or stopper and all the other blank ends on the system should be adequately strutted to resist the thrust developed as result of the internal pressure (a normal diameter 12 pipe with an internal pressure of 9 bar/ 130.5 psi will exert a thrust of 6.3 tons).

Testing should not be carried out against closed waves.

The system should be filled from its lowest point with all air valves and control valves in the open position. Care should be taken to avoid pressure surges and to ensure that all air is expelled from the pipeline (the presence of air can seriously affect the results of pressure test operations). Air valves should be closed as filling proceeds when the air valves are seen to be discharging water free from aeration.

When fully charged, the system should be allowed to stand for a period of 24 hours with the air valves closed to allow any residual air to prolate to the pipe soffit. During this period the system can be visually examined for leakage. The system should then be revented and any water deficiency made up.

c) Pressurising

When Charging is complete the pressure test equipment should be connected to the system via the blank flange or stopper. The equipment should consist of a single or double cylinder hand pump, a pressure gauge suitably graduated and preferably calibrated before use and press hoses to connect to a water supply and the blank flange or stopper.

The system should be pressurized slowly using the hand pump until the pressure gauge indicates the required value. The test pressure will be determined by the engineer responsible but should not exceed 1 ½ times the nominal working pressure of lowest rated component of the pipe system.

The duration of the test should be not less than one hour and not greater than 24 hours during which time the system should be isolated from the test pump.

ASSESSMENT OF TEST

The test is assessed on the basis of the amount of water required to maintain the test pressure during the prescribed period. This amount of water should not exceed that calculated by the following formula:

2 Litres per kilometer of pipe, per metre of nominal bore per metre head of test pressure per 24 hours.

As specified in W.A.A. "Civil Engineering Specifications for the Water Industry"

For example, the permissible water loss for 1 kilometre to 6 diameter PN 12 pipe when tested at PN 18 (180 metres head) pressure would be $2 \times 0.16 \times 1.0 \times 180 = 57.6$ litres per 24 hours or 2.4 litres per hour.

Any defects revealed during testing and any case of failure to meet the prescribed requirements should be rectified and the system retested until a satisfactory result is obtained. It may be helpful to retest the mains in sections to assist in fault location.

GENERAL GUIDANCE NOTES

RESISTANCE TO BIOLOGICAL ATTACK/GROWTH

uPVC pipes and fittings will not deteriorate under attack from bacteria or other microorganisms and will not provide a food source to micro-organisms, macro-organisms and fungi.

Recent research has shown that certain elastomeric sealing rubbers can be susceptible to the support of microbiological growth. The water industry has specified that elastomers for use as sealing rings in potable water pipes should not be capable of supporting microbiological growth.

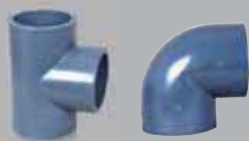
RESISTANCE TO WEATHERING

It is well known that thermoplastic materials may be affected by prolonged exposure to high levels of solar radiation. Exposure to sunlight for prolonged periods has two effects on uPVC pipes and fittings.

a) Surface Degradation: caused by high levels of ultra violet radiation, which manifests itself as discolouration and crazing of the surface of the uPVC.

b) Solar Gain: surface temperature of the uPVC pipes and fittings can reach as high as 16°C above the ambient temperatures in areas such as the Middle East.

Surface degradation of uPVC pipes and fittings causes a slight deterioration in the impact properties in addition to the colour changes. To protect the uPVC pipes from UV degradation, two coats of Emulsion type paint (water based), preferably white colour applied to the pipe work. All pipes and fittings must be cleaned



hand de-greased with pipe cleaner and the surface should be toughened slightly with fine emery paper, to allow paint to adhere.

However, research has shown that this and other properties such as hydrostatic burst strength, tensile strength and resistance to negative pressure are still above the British Standard requirements even after prolonged periods of exposure.

Solar gain due to exposure to direct or indirect sunlight can raise the surface temperature of pipes and fittings and this can lead to problems of ovalisation and longitudinal bending during storage.

However these effects can be avoided if the pipes and fittings are properly stored. Please refer to page no. 7 for recommendations on storage and handling.

RESISTANCE TO ABRASION & TUBERCULATION

uPVC pipes have excellent abrasion resistance properties. The nature of uPVC is such that the material gradually erodes over a large area, localized pitting does not occur.

Comparisons are difficult because of the variations occurring according to the abrasive fluid and number of cycles. However, in tests using the same percentage concentration and duration time, uPVC pipes exhibited an abrasive resistance some 2.5 times greater than mild steel.

uPVC pipe is not subject to the effects of tuberculation caused by corrosion by-products. Soluble encrustants, such as calcium carbonate, do not precipitate onto the walls of uPVC pipes.

INSITU BENDING

GENERAL

One of the practical features of uPVC pipes is their ability to bend when cold. The benefits of this cold bending property can be utilized during installation and when the pipe is in service. During installation pipes can be cold bent as a means of overcoming certain topographical or man-made obstructions without recourse to the use of purpose made bends.

During service the pipe has an inbuilt ability to take up ground movements caused by subsidence or differential settlement without undue stresses being incurred in the pipe wall.

PRACTICAL CONSIDERATIONS

It can be shown that as the pipe diameter increases the force required to affect the bending radius quoted increases.

The force required can place practical limitations on the maximum pipe diameter considered suitable for bending during installation. CP312: part 2: 1973 refers to a limiting size of nominal diameter 6.

For larger diameters the decision to attempt cold bending will depend upon available resources, site conditions and ambient temperatures. The following points must be considered in all cases:

- (a) Cold bending should not be attempted at ambient temperatures less than 5°C
- (b) The trailing socket must be securely fixed in position before the pipe is bent.
- (c) On no account must the trailing socket be subject to angular deflection and hence additional stresses.

(d) Bending should be carried out manually wherever possible.

(e) If mechanical pulling devices are used the pipe must be adequately protected from damage. Metal chains, stings, hooks or straps must not come into direct contact with the pipe.

(f) The pipe must be securely fixed in its, radiused position before laying proceeds. uPVC pipe has a "memory" and will re-straighten itself if it is not secured.

(g) Every precaution shall be taken during the drawing operation to ensure the safety of site personnel.

EXPANSION AND CONTRACTION

In common with a number of engineering materials, unplasticized PVC will expand and/or contract under the influence of various in pipe and ambient temperatures. The Coefficient of Thermal Expansion Contraction of uPVC pipes which is equal to 6.0 x 10⁻⁵ per °C is relatively high compared with another materials. Due count should be taken of possible expansion or contraction when installing uPVC pipes which will be subjected to variations in temperature either immediately following installation or in their service life time.

EXPANSION AND CONTRACTION ALLOWANCE

The length by which a particular length of uPVC pipe will expand or contract under a given variation in temperature is given by:

If the installation is made up of pipes with Loc Ring Integral Sockets the expansion/contraction can normally be accommodated within the socket without recourse to special fittings or pipe arrangements.

In above ground installations the solvent weld, jointing system is normally adopted and in this case special provisions will need to be made to accommodate movement resulting "from" expansion or contraction.

Please consult our Technical Department in these cases.

EXTERNAL COMPRESSIVE LOADS

SOIL AND TRAFFIC LOADS

Under normal operating conditions it is not necessary to confirm the performance of a uPVC pressure pipe for resistance to soil and traffic loadings.

In these conditions the stress resulting from the internal pressure greatly outweighs the soil and traffic load stresses.

However, in certain circumstances where mains are expected to stand empty for long periods of time, engineers may wish to confirm the structural capabilities of the pipe system under soil and traffic load conditions.

Please consult the MPI Technical Department for further information.

THRUST RESTRAINT

A uPVC pipeline operating under internal pressure will generate thrust forces at any change of direction, reduction in diameter, blank end or closed valve.

Allowance should be made to accommodate the thrust forces developed which would otherwise cause deflection, extension or joint separation in the pipeline.

It is most important that the thrust forces are calculated using the maximum internal pressure to which the pipeline is likely to be subjected.

This in the majority of cases, is the site inspection test pressure (usually $1\frac{1}{2}$ times the working pressure).

In above ground installations purpose made struts or fixed brackets will be required to design resist the developed thrust modified by an appropriate factor of safety.

In below ground installation the normal method used for thrust resistance is to construct an anchor block at the point at which the thrust is developed.

The purpose of the anchor block is to transfer the thrust load to the surrounding ground and the decision on load bearing capabilities of the ground must be made at the design stage.

This will depend on the nature of the surrounding ground and will determine the dimensions of the thrust block required to resist the calculated thrust force.

When partially or completely surrounding uPVC pipes or fittings in concrete the pipe or fitting should be wrapped in heavy gauge polyethylene sheet which allow the pipe to decent slightly under the action of internal pressure and avoid stress concentration at the rigid/ flexible interface.

PIPE SUPPORT

In many non-buried situations the need arise to provide pipe supports to ensure that the weight of the pipe and its contents are adequately supported.

The recommended maximum support spacing given are for uPVC pressure pipes operating under the following conditions:-

1. Contents density 1 g/cc
2. Operating pressure PN 9
3. Horizontal pipe runs.

Change in length and flexible sections

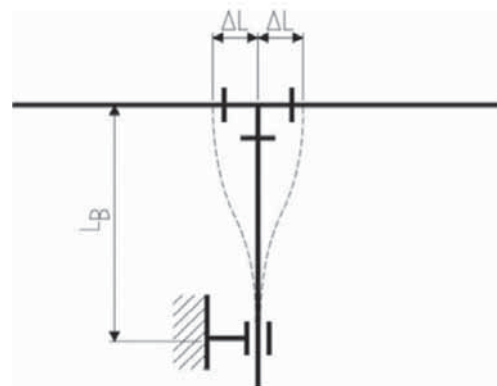
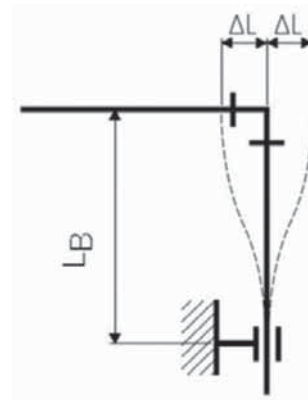
Introduction

General

Thermoplastics are subject to greater thermal expansion and contraction than metals. Pipes installed above ground, against walls or in ducts, especially those exposed to temperature variations, require changes in length to be taken up in order to prevent extra strain on the pipes. Length changes can be taken up by:

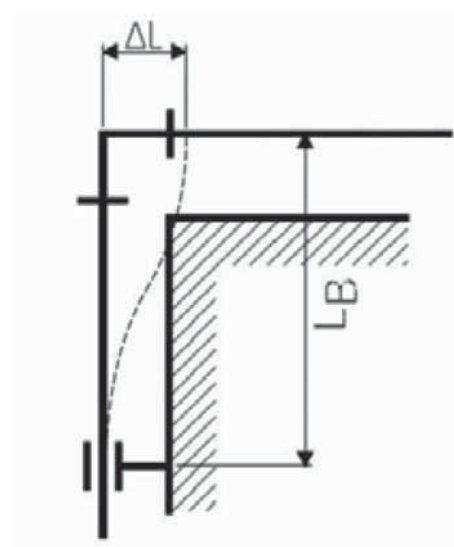
- a) Flexible sections
- b) Compensators

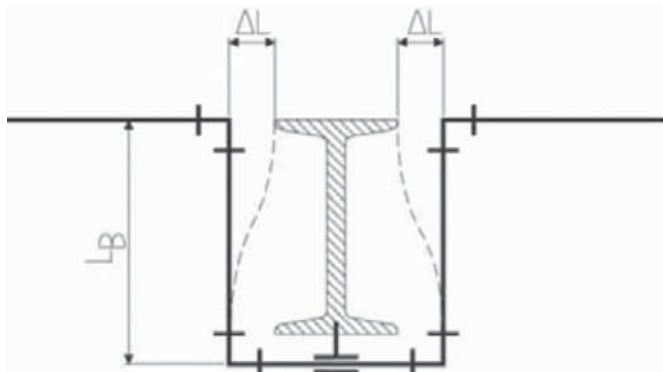
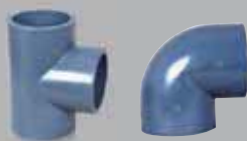
Flexible sections are the most common solution, being the simplest and the most economical. The calculations for and the positioning of flexible sections are therefore described in detail.



Fundamentals

The low modulus of elasticity of thermoplastics allows changes in length to be taken up by special pipe sections, where pipe supports are positioned so that they can take advantage of the natural flexibility of the material. The length of such sections is determined by the diameter of the pipeline and the extent of the thermal expansion to be compensated. Flexible sections arise naturally at any branching or change in direction of the pipeline. The movement LB of the flexible section as a result of a change L in the length must not be restrained by fixed pipe brackets, protrusions wall, girders or the like.





Calculation of change in length

The change in length caused by temperature can be calculated using the following formula:

$$\Delta L = L \Delta T \alpha$$

with:

- ΔL = temperature-related change in length (mm)
- L = length of the pipe section (m)
- ΔT = difference of temperature (K)
- α = coefficient of linear expansion (mm / m K)

Installation of metric industrial piping systems
Change in length and flexible sections

Coefficients of linear expansion of polymers:

Material	α in mm/m K
PVC-U	0.08 – 0.07

Tip : If the operating temperature is higher than the installation temperature, then the pipe expands. If, on the other hand, the operating temperature is lower than the installation temperature, then the pipe contracts in length.

The installation temperature must therefore be incorporated into the calculations as well as the maximum and minimum operating temperatures.

It is preferable to use "+" to indicate expansion of the pipe and "-" to indicate contraction.

The larger change in length is the one to be used for determining the required length of the flexible section.



Calculating of length of the flexible section

The required length of the flexible section can be calculated using the following formula:

$$L_B = \sqrt{\frac{3 d_a \Delta L E_{cm}}{\sigma_b}}$$

with:

- d_a = pipe outside diameter (mm)
- ΔL = change in length (mm)
- E_{cm} = average bending creep modulus for $t = 25$ a (N/mm²)
- σ_b = permitted bending stress for $t = 25$ a (N/mm²)

Remark : Because E_{cm} and σ_b are depending on time, temperature and stress, the calculation of L_B is very difficult. Therefore the following diagrams should be used instead of the formula.

Boundary conditions for using the diagram

For easy determination of the required length of flexible section please use the following diagrams. Please take into account the given boundary conditions.

- Assembly temperature $T_M = 20^\circ\text{C}$
- T_B Operating temperature
- $\Delta T = T_B - T_M$
- allowable bending stress 15 % of σ_b
- PN 16..6
- Coefficient of friction of the pipe in the loose brackets 0.5

Information:

The following diagrams show the required flexible sections for straight pipe lengths of 10 m or 70 m. Exceeding the maximally permissible straight pipe distance would lead to buckling of the pipe due to the too large friction in the pipe clamps. Therefore the maximally possible pipe length is to consider depending on the pipe diameter => above the hatched range.

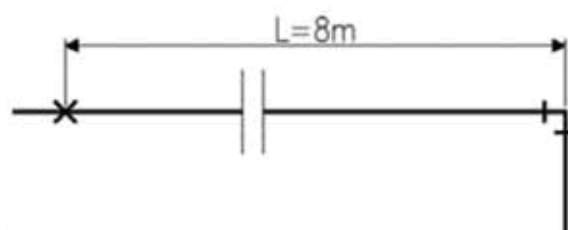
Example: Determining the required flexible section

Calculating the relevant change in length

The example of an ABS process pipe serves to illustrate the procedure:

Length of piping from the fixed point to the branch point where the change in length is to be taken up:

- $L = 8$ m.
- Installation temperature: $T_M = 20^\circ\text{C}$
- Max. working temperature: $T_{35} = 1^\circ\text{C}$
- Min. working temperature: $T_{20} = -2^\circ\text{C}$



PRESSURE EQUIVALENTS TABLE

BAR	ibf/in ²	FEET HEAD	Kg/cm ²	METRES HEAD
0.1	1.45	3.35	0.1	1.02
0.2	2.9	6.69	0.2	2.04
0.3	4.35	10.04	0.31	3.06
0.4	5.8	13.38	0.41	4.08
0.5	7.25	16.73	0.51	5.10
0.6	8.7	20.07	0.61	6.12
0.7	10.15	23.42	0.71	7.22
0.8	11.6	26.76	0.82	8.16
0.9	13.05	30.11	0.92	9.18
1.0	14.5	33.46	1.02	10.2
1.1	15.95	36.8	1.12	11.22
1.2	17.4	40.15	1.22	12.24
1.3	18.86	43.49	1.33	13.26
1.4	20.31	46.84	1.43	14.82
1.5	21.76	50.18	1.53	15.3
1.6	23.21	53.53	1.63	16.35
1.7	24.66	56.87	1.73	17.34
1.8	26.11	60.22	1.84	18.36
1.9	27.56	63.57	1.94	19.37
2.0	29.01	66.91	2.04	20.39
2.1	30.46	70.26	2.14	21.41
2.2	31.91	73.60	2.24	22.43
2.3	33.36	76.95	2.35	23.45
2.4	34.81	80.29	2.45	24.47
2.5	36.26	83.64	2.55	25.49
2.6	37.71	86.98	2.65	26.51
2.7	39.16	90.33	2.75	27.53
2.8	40.61	93.68	2.86	28.55
2.9	42.06	97.02	2.96	29.57
3.0	43.51	100.37	3.06	30.59
3.1	44.96	103.71	3.16	31.61
3.2	46.41	107.06	3.26	32.63
3.3	47.86	110.40	3.37	33.65
3.4	49.31	113.75	3.47	34.67
3.5	50.76	117.09	3.57	35.69
3.6	52.21	120.44	3.67	36.71
3.7	53.66	123.79	3.77	37.73
3.8	55.11	127.13	3.88	38.75
3.9	56.56	130.48	3.98	39.77
4.0	58.02	133.82	4.08	40.79
4.1	59.47	137.17	4.18	41.81
4.2	60.92	140.51	4.28	42.83
4.3	62.37	143.86	4.38	43.85
4.4	63.82	147.2	4.49	44.87
4.5	65.27	150.55	4.59	45.89
4.6	66.72	153.90	4.69	46.91
4.7	68.17	157.24	4.79	47.93
4.8	69.62	160.59	4.89	48.95
4.9	71.07	163.93	5.00	49.97
5.0	72.52	167.28	5.10	50.99
5.1	73.97	170.62	5.20	52.01
5.2	75.42	173.97	5.30	53.03
5.3	76.87	177.31	5.40	54.05
5.4	78.32	180.66	5.51	55.07
5.5	79.77	184.01	5.61	56.08
5.6	81.22	187.35	5.71	57.10
5.7	82.67	190.70	5.81	58.12
5.8	84.12	194.04	5.91	59.14
5.9	85.57	197.39	6.02	60.16
6.0	87.02	200.73	6.12	61.18
6.1	88.47	204.08	6.22	62.20
6.2	89.92	207.42	6.32	63.22
6.3	91.37	210.77	6.42	64.24
6.4	92.82	214.12	6.53	65.26
6.5	94.27	217.46	6.63	66.28
6.6	95.73	220.81	6.73	67.30
6.7	97.18	224.15	6.83	68.32
6.8	98.63	227.50	6.93	69.34
6.9	100.08	230.84	7.04	70.36
7.0	101.53	234.19	7.14	71.38
7.1	102.98	237.53	7.24	72.40
7.2	104.43	240.88	7.34	73.42
7.3	105.88	244.23	7.44	74.44
7.4	107.33	247.57	7.55	75.46
7.5	108.78	250.92	7.65	76.48

BAR	ibf/in	FEET HEAD	Kg/cm	METRES HEAD
7.6	110.23	254.26	7.75	77.50
7.7	111.68	257.61	7.85	78.52
7.8	113.13	260.95	7.95	79.54
7.9	114.58	264.3	8.06	80.56
8	116.03	267.64	8.16	81.58
8.1	117.48	270.99	8.26	82.60
8.2	118.93	274.33	8.36	83.62
8.3	120.38	277.68	8.46	84.64
8.4	121.83	281.03	8.57	85.66
8.5	123.28	284.37	8.67	86.68
8.6	124.73	287.72	8.77	87.70
8.7	126.18	291.06	8.87	88.72
8.8	127.63	294.41	8.97	89.74
8.9	129.08	297.75	9.08	90.76
9.0	130.53	301.1	9.18	91.78
9.1	131.98	304.44	9.28	92.79
9.2	133.43	307.79	9.38	93.81
9.3	134.89	311.14	9.48	94.83
9.4	136.34	314.48	9.59	95.85
9.5	137.79	317.83	9.69	96.87
9.6	139.24	321.17	9.79	97.89
9.7	140.69	324.52	9.89	98.91
9.8	142.14	327.86	9.99	99.93
9.9	143.59	331.21	10.10	100.95
10.0	145.04	334.55	10.20	101.97
10.1	146.49	337.9	10.30	102.99
10.2	147.94	341.25	10.40	104.01
10.3	149.39	344.59	10.50	105.03
10.4	150.84	347.94	10.61	106.05
10.5	152.29	351.28	10.71	107.07
10.6	153.74	354.63	10.81	108.09
10.7	155.19	357.97	10.91	109.11
10.8	156.64	361.32	11.01	110.13
10.9	158.09	364.66	11.12	111.15
11.0	159.54	368.01	11.22	112.17
11.1	160.99	371.36	11.32	113.19
11.2	162.44	374.7	11.42	114.21
11.3	163.89	378.05	11.52	115.23
11.4	165.34	381.39	11.63	116.25
11.5	166.79	384.74	11.73	117.27
11.6	168.24	388.08	11.83	118.29
11.7	169.69	391.43	11.93	119.31
11.8	174.14	394.77	12.03	120.33
11.9	172.6	398.12	12.14	121.35
12.0	174.05	401.47	12.24	122.37
12.1	175.5	404.81	12.34	123.39
12.2	176.95	408.16	12.44	124.41
12.3	178.4	411.5	12.54	125.43
12.4	179.85	414.85	12.65	126.45
12.5	181.3	417.91	12.75	127.47
12.6	182.75	421.54	12.85	128.49
12.7	184.2	424.88	12.95	129.50
12.8	185.65	428.23	13.05	130.52
12.9	187.1	431.58	13.15	131.54
13.0	188.55	434.92	13.26	132.56
13.1	190.00	438.27	13.36	133.58
13.2	191.45	441.61	13.46	134.60
13.3	192.9	444.96	13.56	135.62
13.4	194.35	448.3	13.66	136.64
13.5	195.8	451.65	13.77	137.66
13.6	197.25	455.00	13.87	138.68
13.7	198.70	458.34	13.97	139.70
13.8	200.15	461.69	14.07	140.72
13.9	201.60	465.03	14.17	141.74
14.0	203.05	468.38	14.28	142.76
14.1	204.50	471.72	14.38	143.78
14.2	205.95	475.07	14.48	144.80
14.3	207.40	478.41	14.58	145.82
14.4	208.85	481.76	14.68	146.84
14.5	210.31	485.10	14.79	147.86
14.6	211.76	488.45	14.89	148.88
14.7	213.21	491.80	15.00	149.90
14.8	214.66	495.14	15.09	150.92
14.9	216.11	498.49	15.19	151.94
15.0	217.56	501.83	15.30	152.96

MATERIAL PROPERTIES OF UPVC

PVC pipes and fittings exhibit excellent resistance to aggressive environments, both naturally occurring and as a result of industrial activity.

RESISTANCE TO CORROSION

uPVC pipes and fittings are resistant to almost all type of corrosion, whether chemical or electrochemical in nature. Since uPVC is a non conductor, galvanic and electro chemical effects do not occur in uPVC pipe systems.

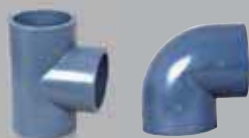
Because it is non metallic, the material is totally resistant to all forms of metallic corrosion. Aggressive waters resulting from both high sulphate soils and low hardness waters will not attach u PVC in any way.

uPVC pipes and fittings can also be considered resistant to a wide range of industrial waters and chemicals and can offer advantages in long term system life and maintenance costs.

CHEMICAL RESISTANCE

The resistance uPVC pipes and fittings to the chemical agents listed below has been drawn from CP312: Part 1: 1973 'General Principles and Choice of Materials'.

Ratings for the EPDM seals used in the High Pressure System have been Included, where the uPVC rating differs from the EPDM rating or where further information on chemicals not listed here is required, refer to the MPI Technical Department.



CHEMICAL RESISTANCE TABLE

Medium Name	CONCENTRATION	rating u PVC	@20°C EPDM
Acetaldehyde	Technically pure 40% Aqueous solution	- o	+ o
Acetic Acid	Technically Pure Glacial 40% Aqueous 10% Aqueous	o o +	+ o +
Acetic Acid Anhydride	Technically pure	-	+
Acetone	Technically pure Up To 10% Aqueous	- -	+ o
Acrylic Ester	Technically pure	-	o
Acrylonitrile	Technically pure	-	o
ADIPIC Acid	Technically Aqueous	+	+
Alcoholic Spirits (Gin, Whisky Etc.)	(approx 40 % Ethyl Alcohol)	+	o
Aluminium Chloride	10% Acqueous Saturates Acqueous	+ +	+ +
Aluminium Sulphate	10% Acqueous Cold Saturates Acqueous	+ +	+ +
Ammonia	Gaseous Technically pure	+	+
Ammonium Acetate	Aqueous all	+	c
Ammonium Carbonate	50% Aqueous	+	+
Ammonium Chloride	Aqueous 10% Acqueous Cold Saturated	+ +	+ +
Ammonium Hydrogen Fluoride	50 % Aqueous	+	+
Ammonium Hydroxide	Acqueous Cold Saturated	+	+
Ammonium Nitrate	Technically pure 40% Aqueous solution	+ +	+ +
Ammonium Phosphate	Aqueous all	+	+
Ammonium Sulphate	10% Aqueous Acqueous Saturated	+ +	+ +
Ammonium Sulphide	Aqueous All	+	+
Amyl Acetate	Technically pure	-	+
Amyl Alcohol	Technically pure	+	+
Aniline	Technically pure	-	o
Aniline Hydrochloride	Acqueous Saturated	+	o
Antimony Trichloride	90% Aqueous	+	+
Aqua Regia		+	c
Arsenic Acid	80% Aqueous	+	+
Barium Hydroxide	Acqueous Saturated	+	+
Barium Salts	Aqueous All	+	c
Beef Tallow Emulsion Sulphonated	Usual Commercial	+	c
Beer	Usual Commercial	+	+
Benzaldehyde	Saturated Acqueous	-	+
Benzene	Technically pure	+	c
Benzine	Free of lead and aromatic compounds	+	c
Benzoic Acid	All Aqueous	+	+
Benzyl Alcohol	Technically pure	o	o
Bleaching Dye	12.5% active chlorine Aqueous	+	+
Borax	All Aqueous	+	+
Boric Acid	All Aqueous	+	+
Brandy	Usual Commercial	+	+
Brine, Sea Water		+	+
Bromine Liquid	Technically pure	-	c

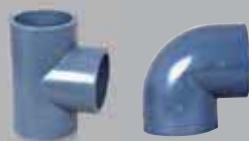
KEY + Recommended o Conditionally Recommended
- Not Recommended c Consult MPI Tech Service Dept.

Medium Name	CONCENTRATION	rating u PVC	@20°C EPDM
Bromine Vapours	High	-	c
Bromine Water	Saturated Aqueous	+	c
Butadiene		+	c
Butane	Technically pure	+	c
Butanol	Technically pure	+	
Butyl Acetate	Technically pure	-	
Butyl Phenol	Technically pure	o	c
Butylene Glycol	Technically pure	+	
Butylene Liquid	Technically pure	+	c
Butynediol	Aqueous 10%	+	c
Butyric Acid	Technically pure	+	c
Calcium Chloride	Saturated Aqueous all	+	+
Calcium Hydroxide	Aqueous Saturated	+	+
Calcium Hypochloride	Cold Saturated Aqueous	+	+
Calcium Nitrate	50% Aqueous	+	+
Carbon Dioxide (Carbonic acid)	Technically pure anhydrous technically pure moist	+ +	+ +
Carbon Disulphide	Technically pure	-	c
Carbon Tetrachloride	Technically pure	-	-
Caustic Potash Solution	50% Aqueous	+	+
Caustic Soda Solution	upto 10% Aqueous upto 40% Aqueous 50% Aqueous	+ + +	+ + +
Caustrial Hydrate	Technically pure	-	c
Chorethanol	Technically pure	-	c
Chloric Acid	10% Aqueous 20% Aqueous	+ +	c c
Chlorine	Moist 90% gaseous unhydrous tech. pure Liquid, tech.pure	o o -	+ + o
Chlorine Water	Saturated	o	o
Chloroacetic Acid Mono	Technically pure 50% Aqueous	+ +	+ +
Chlorobenzene	Technically pure	-	c
Chloroform	Technically pure	-	-
Chloro Methane (Methyl Chloride)	Technically pure	-	-
Chlorosulphonic Acid	Technically pure	o	c
Chrome Alum	Cold Saturated Aqueous	+	+
Chromic Acid	up to 50% Aqueous All Aqueous	+ +	c c
Chromic Acid + Sulphuric Acid + Water	50 g 15 g 35 g	+	c
Cider		+	+
Citric Acid	10% Aqueous	+	+
Clophenes	Technically pure	-	c
Coal Gas (Benzene Free)		+	c
Coconut Fat Alcohol	Technically pure	+	c
Coconut Oil	Technically pure	+	+
Compressed Air Containing Oil		o	o
Copper Salts	All Aqueous	+	+
Corn Oil	Technically pure	o	c

Medium Name	CONCENTRATION	rating u PVC	@20°C EPDM
Cresol	up to 90% aqueous	o	c
Crotonic Aldehyde	Technically pure	-	c
Cyclohexane	Technically pure	-	-
Cyclohexanol	Technically pure	+	+
Cyclohexanone	Technically pure	-	o
Densodrine W		+	c
Detergents	for usual washing lathers	+	+
Dextrine (Strach Gum)	usual commercial	+	c
Dibutyl Ether	Technically pure	-	-
Dibutyl Phthalate	Technically pure	-	+
Dibutyl Sebacate	Technically pure	-	-
Dichloroacetic Acid	Technically pure 50% Aqueous	+	+
Dichlorobenzene	Technically pure	-	-
Dichlorethylene	Technically pure	-	-
Diesel Oil		+	+
Diethylamine	Technically pure	o	c
Diglycolic Acid	30% aqueous	+	+
Di-Isobutyl Ketone	Technically pure	-	c
Dimethyl Formamide	Technically pure	-	o
Dimethylamine	Technically pure	o	-
Dinonyl Phthalate	Technically pure	-	-
Dioctyl Phthalate	Technically pure	-	
Dioxone	Technically pure	-	+
Ethyl Acetate	Technically pure	-	+
Ethyl Alcohol	Technically pure 96%	+	+
Ethyl Alcohol + Acetic Acid		+	+
Ethyl Benzene	Technically pure	-	-
Ethyl Chloride	Technically pure	-	+
Ethyl Ether	Technically pure	-	o
Ethylene Chloride	Technically pure	-	c
Ethylene Diamine	Technically pure	o	c
Ethylene Glycol	Technically pure	+	+
Ethylene Oxide	Technically pure Liquid	-	c
Fatty Acids	Technically pure	+	+
Fatty Alcohol Sulphonate	aquaous	+	+
Fertilizers Salts	aquaous	+	+
Flourine	Technically pure	o	o
Floussilic Acid	32% aqueous	+	+
Formaldehyde	40% aqueous	+	+
Formamide	Technically pure	-	c
Formic Acid	upto 50% aqueous techically pure	+	+
Frigen 12 (Freon 12)	Technically pure	+	+
Fruit Juices		+	+
Fruit Pulp		+	+
Fuel Oil		+	c
Furfury Alcohol	Technically pure		
Gelatine	all aqueous	+	+
Glucose	all aqueous	+	+

KEY + Recommended o Conditionally Recommended
- Not Recommended c Consult MPI Tech Service Dept.

Medium Name	CONCENTRATION	rating u PVC	@20°C EPDM
Glycerine	Technically pure all aqueous	+	+
Glycoll (Glycin)	10% aqueous	+	c
Glycolic Acid	37% aqueous	+	o
Heptane	Technically pure	+	c
Hexane	Technically pure	+	c
Hydrazine Hydrate	aqueous	+	c
Hydrobromic Acid	aqueous 50%		
Hydrochloric Acid	5% aqueous 10% aqueous upto 30 % aqueous 36% aqueous	+	+
Hydrocyanic Acid	Technically pure	+	+
Hydrofluric Acid	70% aqueous 50% aqueous, upto 40 % aqueous,	+	o
Hydrogen	Technically pure	+	+
Hydrogen Chloride	Technically pure, gaseous	+	c
Hydrogen Peroxide	10% aqueous 30% aqueous	+	+
Hydrogen Sulphide	technincally pure saturated aqueous	+	+
Hydroxilamine Sulphate	all aqueous	+	c
Iodine Solution	65% iodine in ethonol	-	o
Iron Salts	all aqueous	+	+
Iso-Octane	Technically pure	+	+
Isoprophyl Alcohol	Technically pure	+	+
Isoprophyl Ether	Technically pure	-	c
Lactic Acid	10% aqueous	+	+
Lanolin	Technically pure	+	c
Lead Acetate	aqueous saturated	+	+
Linseed Oil	Technically pure	+	c
Liquers		+	c
Lubricating Oil		+	c
Lubricating Oil Free Of Aromatic Compounds		+	c
Magnesium Salts	all aqueous	+	+
Maleic Acid	cold saturated aqueous	+	c
Malic Acid	1% aqueous	+	c
Marmalade		+	+
Mercury	pure	+	+
Mercury Salts	cold saturated aqueous	+	+
Methane	Technically pure	+	c
Methanol	all	+	+
Methyl Acetate	Technically pure	-	c
Methyl Amine	32% acqueous	o	c
Methyl Bromide	Technically pure	-	c
Methyl Chloride	Technically pure	-	c
Methyl Ethyl Ketone	Technically pure	-	+
Methyl Chloride	Technically pure	-	c
Milk		+	+
Mineral Water		+	+



Medium Name	CONCENTRATION	rating u PVC	@20°C EPDM
Mixed Acid (I) Sulphuric Nitric Water	48% 49% 3%	+	+
	50% 31% 19%	+	+
	10% 20% 70%	+	+
Mixed Acid (I) Sulphuric Nitric Water	3 parts 1 part 2 parts	o	o
Mixed Acid (I) Sulphuric Nitric Water	30% 60% 10%	+	+
Molasses		+	+
Molasses Wort		+	+
Monochloroacetic Acid Ethyl Ester	technically pure	o	c
Monochloroacetic Acid Methyl Ester	technically pure	o	c
Morphalin	technically pure	-	c
Mowilith D	usual commercial	+	c
Naphthalene	technically pure	-	c
Nickel Salts	cold saturated aqueous	+	+
Nitric Acid	6.3% aqueous upto 40% aqueous 65% aqueous 100%	+	+
		o	o
		-	c
Nitrobenzene	technically pure	-	c
Nitrotoluene	technically pure	o	c
Nitrous Gases	low, wet & dry	+	c
Oleic Acid	technically pure	+	o
Oleum	10% SO ₃	+	c
Oleum Vapours	traces	+	c
Olive Oil		+	c
Oxalic Acid	cold saturated aqueous	+	+
Oxygen	all	+	+
Ozone	up to 2% in air cold saturated aqueous	+	+
		+	+
Palm Oil, Palm Net Oil		+	c
Paraffin Emulsions	usual commercial aqueous	+	c
Paraffin Oil		+	c
Perchloric Acid	10% aqueous 70% aqueous	+	c
		o	c
Perchloroethylene	technically pure	-	c
Petroleum	technically pure	+	c
Petroleum Ether	technically pure	+	c
Petroleum Jelly	technically pure	o	c
Phenol (Carbolic Acid)	up to 10% aqueous up to 90% aqueous	+	c
		o	c
Phenylhydrazine	technically pure	-	c
Phenylhydrazine Hydrochloride	aqueous	o	c
Phosgene	liquid technically pure gaseous technically pure	-	c
		+	c

Medium Name	CONCENTRATION	rating u PVC	@20°C EPDM
Phosphoric Acid	up to 30% aqueous 50% aqueous 85% aqueous	+	c
		+	c
		+	c
Phosphorous Chlorides		-	-
Phosphorous Trichlorides		c	c
Phosphorous Pentachloride		c	
Phosphorous Oxychloride	technically pure	-	+
Phosphorous Pentoxide	technically pure	+	c
Photographic Developer	usual commercial	+	c
Photographic Emulsion		+	c
Photographic Fixer	usual commercial	+	c
Phthalic Acid	saturated aqueous	+	c
Picric Acid	1% aqueous	+	c
Potash(Potassium Carbonate)	cold saturated aqueous	+	+
Potassium / Aluminium Sulphates (Alum)	50% aqueous	+	+
Potassium Bichromate	saturated aqueous	+	+
Potassium Borate	10% aqueous	+	+
Potassium Bromate	cold saturated aqueous	+	+
Potassium Bromide	all aqueous	+	+
Potassium Chloride	cold saturated aqueous	+	+
Potassium Chloride	all aqueous	+	+
Potassium Chromate	cold saturated aqueous	+	+
Potassium Cyanide	cold saturated aqueous	+	+
Potassium Iodide	cold saturated aqueous	+	+
Potassium Nitrate (Saltpetre)	50% aqueous	+	+
Potassium Perchlorate	cold saturated aqueous		c
Potassium Permanganate	cold saturated aqueous	+	c
Potassium Persulphate	all aqueous	+	+
Potassium Phosphates	all aqueous	+	+
Potassium Sulphate	all aqueous	+	+
Propane	technically pure liquid technically pure, gaseous	+	c
		+	c
Propanol	technically pure	+	+
Propargyl Alcohol	7% aqueous	+	c
Propionic Acid	50% aqueous technically pure	+	c
		+	c
Propylene Glycol	technically pure	+	+
Propylene Oxide	technically pure	o	c
Pyridine	technically pure	-	c
Ramasil Fabric Water Proofing Agents	usual commercial	+	+
Silicon Oil		+	c
silver Salts	Cold saturated aqueous	+	+
soap Solution	All aqueous	+	+
sodium acetate	All aqueous	+	+
sodium Bicarbonate	Cold saturated aqueous	+	+

KEY + Recommended o Conditionally Recommended
- Not Recommended c Consult MPI Tech Service Dept.

Medium Name	CONCENTRATION	rating pvc-u	@20°C epdm
sodium Bisulphate	10% aqueous	+	+
sodium Bisulphate	All aqueous	+	+
sodium Bromate	All aqueous	+	c
sodium Bromide	All aqueous	+	+
sodium Carbonate (Soda)	Cold saturated aqueous	+	+
sodium Chlorate	All aqueous	+	+
sodium Chloride	All aqueous	+	+
sodium Chloride	Up to 10%aqueous	o	+
sodium Chromate	Up to 10%aqueous	+	c
sodium Disulphite	All aqueous	+	c
sodium Dithionite (Hydrosulphite)	Up to 10%aqueous	+	c
sodium Fluoride	Cold saturated aqueous	+	+
sodium Hypochloride	12.5% aactive chlorine aqueous	+	c
sodium Iodine	All aqueous	+	c
sodium Nitrate	Cold saturated aqueous	+	+
sodium Nitrate	Cold saturated aqueous	+	+
sodium Oxalate	Cold saturated aqueous	+	c
sodium Persulphate	Cold saturated aqueous	+	c
sodium Phosphate	Cold saturated aqueous	+	+
sodium Silicate	Cold saturated aqueous	+	+
sodium Sulphate	Cold saturated aqueous	+	+
sodium Sulphide	Cold saturated aqueous	+	+
sodium Thiosulphate	Cold saturated aqueous	+	+
spindle Oil		o	c
spinning Bath Acids Containing Carbon Disulphide	100mg CS 2/1	+	c
stannous Chloride	Cold saturated aqueous	+	c
starch Solution	All aqueous	+	+
starch Syrup	Usual commercial	+	c
stearic Acid	Technically pure	+	c
succinic Acid	All aqueous	+	c
sugar Syrup	Usual commercial	+	c
sulphur	Technically pure	o	+
sulphur Dioxide	Technically pure anhydrous	+	+
	all moist	+	+
	technically pure liquid	-	+
sulphur Trioxide		-	c
sulphuric Acid	Up to 40%aqueous	+	+
	up to 60%aqueous	+	+
	up to 80%aqueous	+	+
	90%aqueous	+	+
	96%aqueous	+	+
sulphurous Acid	Saturated aqueous	+	c
sulphuric Chloride	Technically pure	-	c
tallow	Technically pure	+	c
Tannic Acid	All Aqueous	+	+
Tanning Extracts From Plant	Usual	+	c

Medium Name	CONCENTRATION	rating pvc-u	@20°C epdm
Tartaric Aid	All Aqueous	+	c
Tetrachloroethane	Technically pure	-	c
Tetreathyl Lead	Technically pure	+	c
Tetrahydrofurane	Technically pure	-	o
Tetrahydronaphtalene	Technically pure	-	c
Thionyl Chloride	Technically pure	-	c
Toluene	Technically pure	-	c
Thionylphosphate	Technically pure	-	+
Trichloroethane	Technically pure	-	c
Trichloroacetic Acid	Technically pure	o	o
	50% aqueous	+	o
Trichloro Ethane	Technically pure	-	c
Tricresyl Phosphate	Technically pure	-	+
Triethanolamine	Technically pure	o	c
Troctyl Phosphate	Technically pure	-	c
Turpentine Oil	Technically pure	+	c
Urea	up to 30% aqueous	+	c
Urine	Technically pure	+	+
Vegetables Oils & Fats	Technically pure	+	+
Vinegar	Technically pure	+	+
Vinyl Acetate	Technically pure	-	+
Viny Chloride	Technically pure	-	+
Viscose Spinning Solution		+	c
Waste Gasese	all	+	c
Containing Carbon Dioxide			
Carbon Mono Xide	all	+	+
Hydrochloric Acid	all	+	+
Hydrogen Flouride	Traces	+	+
Nitrous Gases	Traces	+	+
Sulphur Dioxide	Traces	+	+
Sulphur Trioxide	Traces	+	+
Sulphuric Acid	all	+	+
Water	Condensed	+	+
Water	distilled deionised	+	+
Water	drinking	+	+
Water	waste without organic solvent	+	+
Wax Alcohol	Technically pure	+	+
Wetting Agents	up to 5% aqueous	+	+
Wines (Red& White)	Usual Commercial	+	+
Wine Vinegar	Usual Commercial	+	+
Yeast	All Aqueous	+	+
Yeast Wort	Working Concentration	+	+
Xylene	Technically pure	-	c
Zinc Salts	All Aqueous	+	+

KEY + Recommended o Conditionally Recommended
- Not Recommended c Consult MPI Tech Service Dept.

			
Kitemark™ Certificate			
This is to certify that		Modern Plastics Industries LLC Dubai Investment Park PO Box 11550 Jebel Ali Dubai United Arab Emirates	
Holds Certificate Number		KIM 107116	
In respect of		BS EN 1462 PVC piping systems for water supply - underground/poly-buried standards (Part 1) - Part 1 (Single)	
This is to state the evidence to use the Kitemark in accordance with the European Technical and Conformity governing use of the Kitemark, as may be updated from time to time by BS Assurance (UK Ltd) ("BS Assurance"). All information on this Certificate shall be true and correct, missing and in the Conformity. The use of the Kitemark is authorised (subject to the Product(s) detailed on this Certificate) provided or as from the above address.			
By and on behalf of ISO		 Peter Francis - Managing Director	
First issued: 2007/01/05		Valid until: 2015/06/10	
			
This certificate has been issued by and under the authority of the British Standards Institution (BSI), 389, Market Road, Tisbury, Wiltshire, SP4 6DF, United Kingdom. It is subject to the conditions of issue set out in the BSI Rules of the Kitemark Scheme, which may be updated from time to time by BSI Assurance (UK Ltd) ("BSI Assurance"). All information on this Certificate shall be true and correct, missing and in the Conformity. The use of the Kitemark is authorised (subject to the Product(s) detailed on this Certificate) provided or as from the above address.			
BSI Assurance (UK Ltd) is a registered company in England under number 2635201 at 100 Brook Hill Drive, Suite 400, PMB 100, San Jose, CA 95128, USA.			

			
Certificate of Registration			
QUALITY MANAGEMENT SYSTEM - ISO 9001:2008			
This is to certify that:		Mastson Plastics Industry LLC Dulles Investment Park 1 Arlington PO Box 31550 Dulles United Arab Emirates	
Holds Certificate No:		TSA 51158	
and operates a Quality Management System which complies with the requirements of ISO 9001:2008 for the following scope:			
The manufacture of PVC/PVC Pipe and Fittings, PP Compression Fittings, Injection Moulded Products to company and customer request specifications.			
			
For and on behalf of ISO:		United Kingdom, DMS Compliance & Risk Director	
Original Registration Date: 1999/07/07		Expiry Date: 2015/10/30	
Latest Revision Date: 2015/08/11		Efficacy Date: 2016/10/29	
			
			
This certificate is issued under conditions and subject to the provisions of the BSI Rules of Accreditation and Registration. For further information on the BSI Rules of Accreditation and Registration, please visit www.bsi.org.uk Information on accreditation: BS, Michael Clark, Data Manager, Accredited Body ISO 9001 - 0008 000 0000			

			
Kitemark™ Certificate			
This is to certify that		(Product Name, End-Use etc.) (Date presented for testing) (Date tested) (Product Name)	
(UK Certificate Number)		(UK PSN)	
is/are:			
(UK Standard) (Manufacturer Name for UK Marking) (Manufacturer Name, UK Marking) (Manufacturer Name, UK Marking, Address, and e-mail)			
This/These test item/s have been examined in accordance with the relevant British Standard(s) governing the use of the product(s) and the product has/have been found to conform to the requirements of the standard/s and the product has/have been awarded a Kitemark.			
The use of this statement in evidence of compliance of the product(s) covered by this certificate is limited to the product/s stated.			
			
(Name and position of authorised signatory)		(Name and position of authorised signatory)	
(Date and place of issue)		(Date and place of issue)	
(Signature of authorised signatory)		(Signature of authorised signatory)	
			
(Signature of authorised signatory)		(Signature of authorised signatory)	
(Date and place of issue)		(Date and place of issue)	
(Signature of authorised signatory)		(Signature of authorised signatory)	

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Approval Number: 1071540 Project Name: WSRAS		Water Regulatory Authority Licence No: 1071540 Licence No: 1071540 Part 1 for Industrial Estate District: South MTD: 402
2 nd March 2017 Modern Plastics Industry LLC 1071540 PO Box No. 31395, Dubai United Arab Emirates	Water Regulations Abstraction Scheme (1071540) NOTICE OF INTENTION The material intended to be treated is suitable for contact and exposure water for domestic purposes having and the environmental equivalent (1000 mg/l) of 1071540 (limitation of non-hazardous products for use in treated and water not intended for human consumption) in order to ensure the safety of the water. The maximum release volume may be affected or be equally or more significant if it may impact into contact and should not imply the effect of its material and if pre-treatment for effluents.	
POLY(VINYLCHLORIDE), PVC, AND PVC-CLAY COMPOSITES 0081		
Refer to Part 1 of the application (CPC) plan, for use with water at or 23°C.		
APPROVAL HOLDER: MODERN PLASTIC INDUSTRY LLC		
APPROVAL HOLDER: MODERN PLASTIC INDUSTRY LLC		
The licensee is required to sign the notice approval (1071540) and acknowledge January 2017 and January 2020.		
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DELTA
AIR LINES

FLIGHT TICKET

FLIGHT INFORMATION

Origin: NEW YORK
Destination: LOS ANGELES
Class: Y
Fare: \$1,200.00
Tax: \$100.00
Total: \$1,300.00

BAGGAGE CLAIM

1. Description of baggage: 1 piece, 23" x 15" x 10", 15 lbs.
2. Date of check-in: 10/10/10
3. Date of arrival: 10/11/10
4. Date of departure: 10/12/10
5. Date of return: 10/13/10
6. Date of arrival: 10/14/10
7. Date of departure: 10/15/10
8. Date of return: 10/16/10
9. Date of arrival: 10/17/10
10. Date of departure: 10/18/10
11. Date of return: 10/19/10
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33. Date of arrival: 11/10/10
34. Date of departure: 11/11/10
35. Date of return: 11/12/10
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110. Date of return: 01/26/11
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112. Date of departure: 01/28/11
113. Date of return: 01/29/11
114. Date of arrival: 01/30/11
115. Date of departure: 01/31/11
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205. Date of departure: 04/30/11
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209. Date of return: 05/04/11
210. Date of arrival: 05/05/11
211. Date of departure: 05/06/11
212. Date of return: 05/0

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 REQUEST FOR MATRICES APPROVAL										 DELTA	
CLIENT		M/s. ARVIND REAL ESTATE DEVELOPMENTS				PROJECT		DELTA TOWER			
DESIGN		M/s. ALTAIR ENGINEERING CONSULTANTS				NO.		AA/ST/10/15			
CONTRACTOR		M/s. DELTA REAL ESTATE BUILDING CONSTRUCTION PVT. LTD.				REVISION		01			
NO. OF FLOORS		Storey No.		Drawing No.		Sheet No.		REV.			
Area	Code	Structure	Disc.	Part	Mod.						
Main Activity		High Pressure Piping & Flanges in P.V.I. with Sump				EXHAUST & VENT					
Manufacture		Mumbai, Punjab, India				Country of origin					
Sub-Contract						India					
Inspected Material		Per phase & during high pressure				Inspected by		J.C.			
Reason for alteration						Material		EPG-201			
Date of alteration (month)						Date of issue					
Signature by Sub-Contractor		Signature by Client				Date		Signature			
Signature by M/s. Contractor		Signature by Consultant				Date		Signature			
Contractor's Comments    		Inspector's Comments    				Client's Comments    					
Approved by () Approved by () Reviewed by () Approved by ()											
Signed by Sub-Contractor 		Signed by Client 		Signed by Consultant 		Signature 					
Received by Main Contractor											
This document and its copies are for the use of the client only. (Not to be distributed)											

Kontrollbogen

Kontrollfahrt

1. Personendaten:

Name: Michael Müller

Geburtsdatum: 19.05.2014

Geburtsort: 10000

Adressen: 10000

Telefon: 10000

E-Mail: 10000

2. Fahrzeugdaten:

Modell: 10000

Farbe: 10000

Motorleistung: 10000

Motorart: 10000

Motorbauart: 10000

Motorbaujahr: 10000

Motorbauort: 10000

Motorbauart: 10000

Motorbaujahr: 10000

Motorbauort: 10000

3. Fahrzeugzustand:

1. Motor: 10000

2. Ölwanne: 10000

3. Ölwanne: 10000

4. Ölwanne: 10000

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7. Ölwanne: 10000

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9. Ölwanne: 10000

10. Ölwanne: 10000

4. Fahrerdaten:

Name: 10000

Adressen: 10000

Telefon: 10000

E-Mail: 10000

5. Fahrerzustand:

1. Fahrer: 10000

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16. Fahrerzustand:

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- Pipes & fittings at a competitive price.
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- One stop facility - wide range of pipes & fittings in UPVC (SWR Drainage), UPVC high pressure, CPVC & PP Compression.
- Prompt deliveries in-house manufacturing facilities for all the pipes and fittings in UAE.
- Quality and reliability - according to international standards, Quality management system (ISO 9001 & kite-mark).
- Operational excellence - precision manufacturing according to the standards using state of the art machinery.
- Duty exemption in GCC countries.
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