



PVC
PIPES CATALOGUE
U.PVC & C.PVC



Al-Watania Plastics



بلاستيك الوطنية



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Al-Watania Plastics

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With the overall development of Saudi Arabia at all levels, it was necessary to find the effective forces that are working to push forward the progress for the better

Al-watania Plastics Factory is one of the companies of the National Group for Industry, a company specialized in the production of plastic pipes and their connections used in hot and cold water networks.

Since 1982, Al-watania Plastics has fed the Kingdom's market with the necessary products. Polyvinyl chloride plastic pipes have been given great attention as a key element in the formation of the nation's infrastructure, from urban water networks, farm irrigation networks, electrical and telephone installations , Household uses and sanitation.

Al-watania Plastics has adopted the highest technical and most advanced methods, which has made it a pioneer in its renewed and universal specifications and economical use.

Al-watania Plastics produces its pipes according to Saudi specifications 14 - 15 / 1996, which conforms to the German standard system DN 8061/ 8062

مع التطور الشامل الذي عرفته المملكة العربية السعودية على جميع المستويات ، كان لابد من ايجاد القوى الفعالة التي تعمل على دفع عجلة التقدم نحو الافضل ، وكان من هذه القوة

مصنع بلاستيك الوطنية ، هي إحدى شركات مجموعة الوطنية للصناعة وهي شركة متخصصة في إنتاج الأنابيب البلاستيكية والوصلات الخاصة بها والتي تستخدم في شبكات المياه الساخنة والباردة.

ومنذ عام ١٩٨٢ م ، عمدت بلاستيك الوطنية على تغذية سوق المملكة بالمنتجات اللازمة ، وقد أولت أنابيب البلاستيك المصنوعة من مادة « عديد كلوريد الفينيل » اهتماماً كبيراً باعتبارها عنصراً رئيسياً في تكوين البنية الأساسية للوطن ، من شبكات مياه المدن ، شبكات ري المزارع ، التمديدات الكهربائية والهاتفية ، الاستعمالات المنزلية والصرف الصحي .

اعتمد بلاستيك الوطنية اعلى اساليب التقنية واكثرها تطوراً مما جعلها رائدة في عطاها المتجدد والمتسم بعالمية المواصفات واقتصادية الاستعمال .

تنتج بلاستيك الوطنية انابيبها طبقاً للمواصفات السعودية ١٤ - ١٥ / ١٩٩٦ والتي تطابق نظام المواصفات الألماني دن ٨٠٦١ / ٨٠٦٢

The company provides technical and logistic services to customers to obtain their satisfaction and provides after-sales services for their products to avoid any problems in the future.

The use of advanced and advanced technology to serve the community and to find comprehensive technical solutions in the field of pipes and high quality links taking into account the protection of the environment and human health.

To continue to raise the level of quality and productivity, adhere to the ethical rules and distinguish the work sites in occupational safety and health, taking into account the surrounding environmental conditions and encourage our human resources to achieve personal goals and general goals.

The Department continues to raise awareness in these areas and hold several training courses necessary to ensure that a clear policy for employee health, safety and protection is established within the working environment by reducing the incidence of occupational accidents.

This also applies to products taking into account the lack of impact on the environment, and seeks to introduce less waste and the effective use of natural resources and advanced technology that reduce risks to public health and occupational safety.

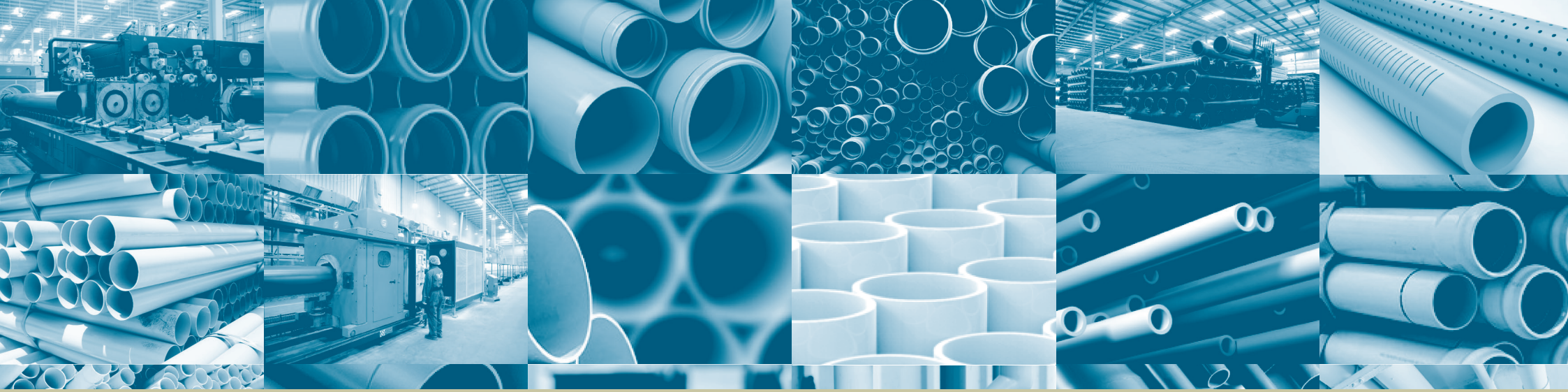
تقدم الشركة الخدمات الفنية واللوجستية المتميزة للعملاء كي تنال رضاهم كما تقدم خدمات ما بعد البيع لمنتجاتها لتفادي حدوث أي مشاكل مستقبلاً.

إستخدام التكنولوجيا المتقدمة والمتطورة لخدمة المجتمع وإيجاد حلول فنية شاملة في مجال الأنابيب والوصلات ذات الجودة العالية مع مراعاة حماية البيئة وصحة الإنسان.

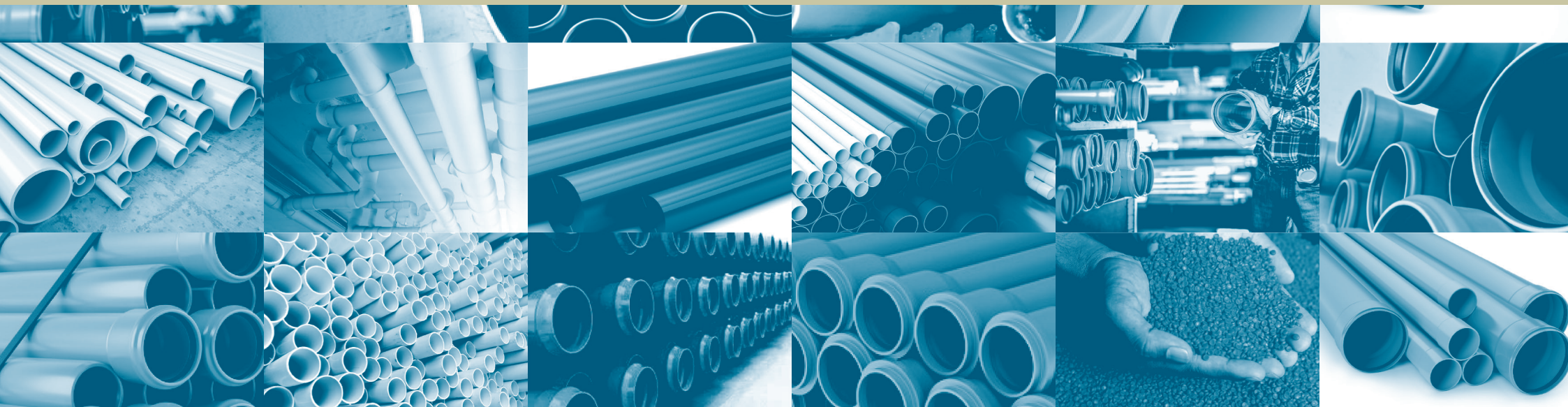
الإستمرار في رفع مستوى الجودة والإنتاجية ، والتمسك بالقواعد الأخلاقية وتميز مواقع العمل بالسلامة المهنية والصحية ، مع مراعاة الظروف البيئية المحيطة وتشجيع مواردنا البشرية على تحقيق الأهداف الشخصية والأهداف العامة.

وتستمر الإدارة في رفع الوعي في تلك المجالات وعقد العديد من الدورات التدريبية الضرورية لتضمن وضع سياسة واضحة لصحة الموظفين وسلامتهم وحمايتهم داخل بيئة العمل وذلك بخفض معدلات الحوادث المهنية.

ينطبق ذلك أيضاً على المنتجات واضعين في الإعتبار عدم التأثير على البيئة ، ونسعى لطرح نفايات أقل والإستخدام الفعال للموارد الطبيعية والتكنولوجيا المتطورة التي تقلل المخاطر على الصحة العامة والسلامة المهنية.



UPVC PIPES



General Advantages U-PVC Pipes

U-PVC PIPES resist corrosion by acids, alkalis, and weather, it also resists climatic and soil conditions.

U-PVC PIPES non toxic, not affect the taste, have smooth surface which resist and impede build up of deposits and corrosive scales.

U-PVC Pipes have great tensile strength. Yet they will not dent or flatien under pressure .

U-PVC PIPES are light, easy to transport, install, cut, repaired with a complete range of fittings, using solvent cement or rubber ring joints with an economic cost and easy maintenance.

U-PVC PIPES are not support combustion and it is self extinguishing.

U-PVC PIPES are ideal for electric conduits because of itself insulator.

U-PVC PIPES have been used for used for over 40 years, and and it has proved its supreme quality.

المواصفات العامة لأنابيب الـ يو بي في سي

تمتاز هذه الأنابيب بمقاومتها العالية للتفاعل مع الكيماويات وبخاصة الأحماض والقلويات و الأملاح كما تقاوم عوامل المناخ وتأثيرات التربة المختلفة .

لا توجد فيها أى مواد سامة بحيث لا تؤثر على طعم ولون ورائحة الماء أو السوائل الأخرى.

ذات سطوح ملساء تعمل على جعل انسيابية السائل عالية وتحول دون تراكم الرواسب .

ذات مقاومة كبيرة للشد تحول دون تجعد أو تسنن سطوح الأنابيب تحت تأثير أي ضغط .

خفيفة الوزن ، سهلة النقل والتكيب والقطع ، إقتصادية حتي مع جميع لوزامها، حيث تستعمل بوصلات عادية (غراء) أو بواسطة حلفات مطاطية كما أن صيانتها سهلة وسريعة .

تقاوم الأحتراق ، صعبة الاشتعال وذات قدرة على الإنطفاء الذاتي .

ذات عازلية جيدة للتلار الكهربائي مما يجعلها صالحة للاستعمال في القنوات الكهربائية وفي كل الظروف.

يضاف الى ما سبق أن هذه الأنابيب أثبتت كفاءتها من خلال استعمال منذ مدة تزيد عن اربعين سنة فى كل المجالات العلمية .

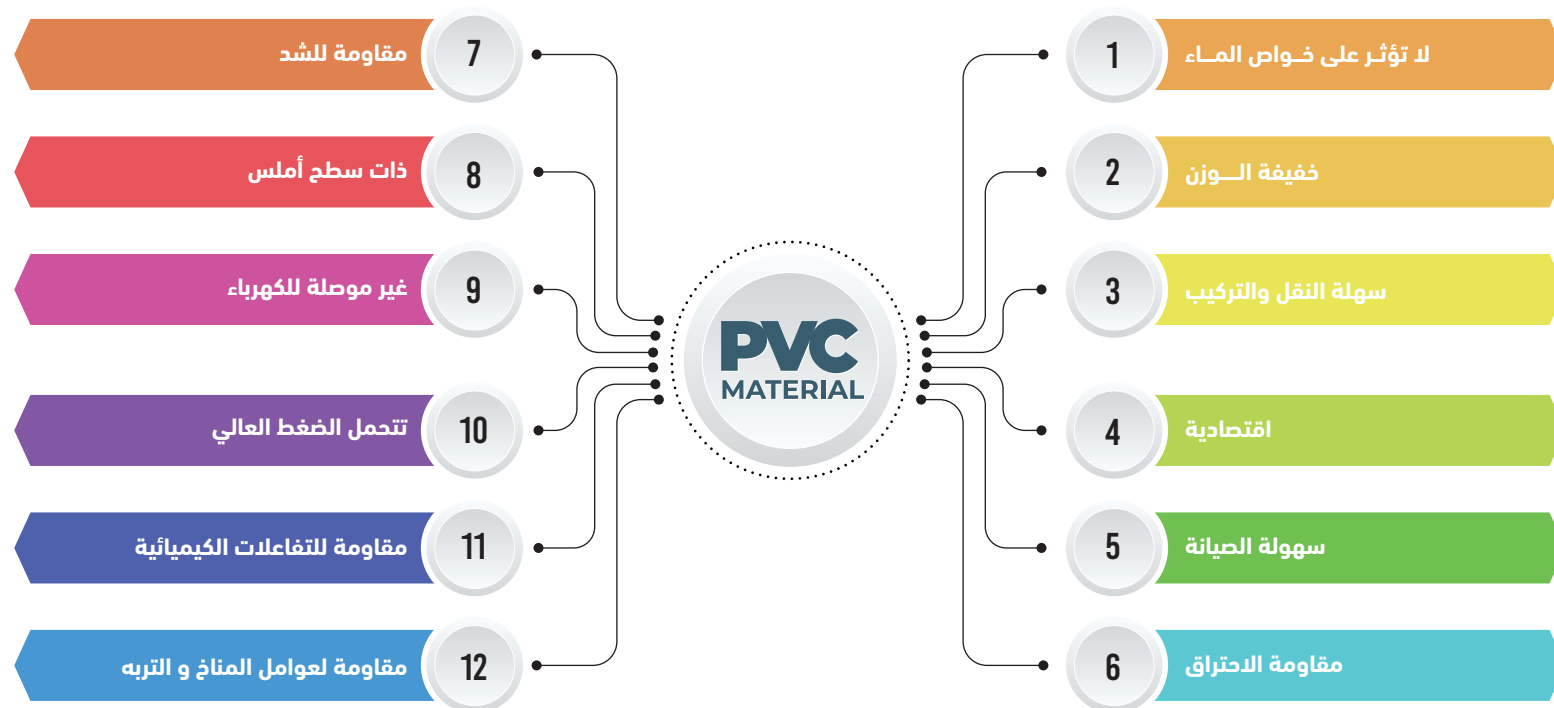


Material Properties Of U-PVC Pipes

• Material	Unplasticized Poly vinyl Chloride UPVC
• Color	Dark Grey
• General Properties	All values at 20 ⁰ C
• Specific Gravity	1.42 ± 0.02
• Flamability	will not supports combustion.

خواص مواد أنابيب ال يو بي في سي

• المواد	عديد كلوريد الفينيل القاسي (يو بي في سي)
• اللون	رمادي غامق
• شروط عامة	جميع القيم مقاسة عند 20 درجة مئوية .
• الثقل النوعي	0.02 ± 1.42
• قابلية الاشتعال	لا تساعد على الاشتعال .



Mechanical Properties - المواصفات الميكانيكية

Tensile Strength مقاومة الشد

BAR	LB FT / in ²	kg / CM ²
483 - 517	7500 - 7000	492 - 527

(IZOD)

Inch Notch Charpy Impact Strength

قوة الصدم (آيزود)

LB FT / in ²	Joule
3.5 - 4.0	4.75 - 4.52

Compressive Strength قوة التحمل

BAR	LB FT / in ²	kg / CM ²
665	9500	668 - 680

Water Absorption قابلية امتصاص الماء (النفوذية)

< 4 mg / cm ²

Flexural Strength قوة الالتواء (الثني)

BAR	LB FT / in ²	kg / CM ²
930	13500	950 - 960

Friction co- Efficient

عامل الاحتكاك

Colebrook	Friction co- Efficient
0.00001	135 - 150

Modulus Of Elasticity عامل المرونة

BAR	LB FT / in ²	kg / CM ²
3.1x 10 ⁴	45x 10 ⁴	3.2x 10 ⁴

Advantages Of U.PVC Pipes

Rigid PVC Offers many advantages over other materials

- u-PVC pipes resist corrosion by acids, alkalis, oils, salts, and weather, it also resists climatic and soil conditions.
- u-PVC pipes nontoxic, not affect the taste, smell or colour of water or liquid.
- u-PVC pipes have smooth surface which resist and impede buildup of deposits and corrosive scales.
- u-PVC pipes have great tensile strength. Yet they will not dent or flatten under pressure.
- u-PVC pipes are light, easy to transport, install, cut, repaired, with a complete or rubber ring joints with an economic cost and easy maintenance.
- u-PVC pipes are not support combustion and it is self-extinguishing.
- u-PVC pipes are ideal for electric conduits because of itself insulator.
- u-PVC pipes have been used for over - 40 years, and it has proved its supreme quality.

مزايا انابيب اليو بي في سي

لأنابيب ال بي في سي العديد من المزايا عن المواد الأخرى

- تمتاز هذه الانابيب بمقاومتها العالية للتفاعل مع الكيماويات وبخاصة الأحماض والقلويات والأملاح، كما تقاوم عوامل المناخ وتأثيرات التربة المختلفة.
- لا تحتوي على اي مواد سامة، بحيث لا تؤثر على طعم ولون ورائحة الماء أو السوائل الأخرى.
- ذات سطوح ملساء تعمل على جعل انسيابية السائل عالية وتحول دون تراكم الرواسب.
- خفيفة الوزن، سهولة النقل والتكيب والقطع، اقتصادية حتى مع جميع لوازمها، حيث تستعمل بوصلات عادية (غراء) أو بواسطة حلقات مطاطية، كما أن صيانتها سهلة وسريعة.
- تقاوم الاحتراق، فهي صعبة الاشتعال وذات قدرة على الإنطفاء الذاتي.
- ذات عازلية جيدة للتيار الكهربائي مما يجعلها صالحة للاستعمال في القنوات الكهربائية وفي كل الظروف.
- يضاف الى ما سبق أن هذه الانابيب أثبتت كفاءتها من خلال استعمالها منذ مدة تزيد عن أربعين سنة في كل المجالات العملية.

Physical and Chemical Properties of un Plasticized Polyvinyl Chloride Pipes

الخصائص الفيزيائية والكيميائية غير المطاطة أنابيب البولي فينيل كلورا

Property	Characteristics	Test meth	Value	Units
Physical	Specific Gravity	ASTM D 792	1.44	g / cc
	Hardness	ASTM D 785	120	Rockwell R
	Water Absorption	ASTM D 570	0.05	mg / cm ²
	Tensile Strength@20oC	ASTM D 638	500	kg / cm ²
	Ultimate Elongation.min.	ASTM D 638	80	%
	Copressive Strength	ASTM D 695	675	kg / cm ²
	Modulus Of Elasticity	ASTM D 5934	1400	MPa
	Modulus Of Rigidity	ASTM D 1043	11.250	kg / cm ²
	Charpy Impact Strength	ASTM D 256	4.75	Joule
Thermal	Specific Heat	-	0.25	Kcal./kg/ °C
	Thermal Conductivity	ASTM D 518	0.13	Kcal/C..m.h
	Vicat Softening Point	ASTM D 1525	80	°C
	Heat Distortion Temperature	ASTM D 648	75	°C
	Co-efficient of linear expansion	ASTM D 696	5 x 10 ⁻⁵	mm / °C
Chemical	Resistance to chemicals	ASTM D 543	Good	-
Electrical	Volume Resistivity	ASTM D 257	10 ¹⁵	Ohms / cm
	Di Electric Strength	ASTM D 149	>40	Kv / mm
Flammability				Self Extinguishing
	Limiting Oxygen Index	ASTM D 2893	47	-



Thermal Properties

Softening Point - نقطة الليونة
Coefficient Of Linear Expansaion - عامل التمدد الطولى On 3M.Length
Specific Heat - الحرارة النوعية

Electrical Properties

المقاومة الكهربائية النوعية Volume Resistivity
عامل التمدد الطولى Coefficient Of Linear Expansaion On 3M.Length
عامل العازلية Dielectric Strength

Chemical Resistance

Al-Watania Plastics U-PVC Pipe are manufactured according to SAS 14 - 15 / 1996 which conforms with DIN 8061 - 8062 - and it is unaffected by acids, alkails, aqueous, salt, water and demineralised water.
Also U-PVC Pipes are not affected by most chemicals.

المواصفات الحرارية

80°C or 176F
5x10 ⁻⁵ MM/ 1°C
0.25 Cal / Gr x 1°C

المواصفات الكهربائية

10 ¹⁶ OHM / cm
إن مادة عديد كلورايد الفينيل القاسية غير ناقلة للكهرباء
>40 KV / MM

الفاعلية الكيميائية

تنتج بلاستيك الوطنية أنابيبها القاسية من اليوم بي في سي وفقاً للمواصفات السعودية 14-15/1996 م المطابقة لنظام الألماني دين 8061/8062 ، وهذه الأنابيب لا تتأثر بمحاليل الأحماض و القلويات ، و الأملاح وبخاصة المياه المالحة و المعدنية علي اختلاف أنواع وبشكل عام ان أنابيب اليو بي فى سي عديمة التأثير بمعظم المحاليل الكيميائية .

Application of U-PVC Pipes

- Irrigation systems, water supply.
- Sanitary and any other under pressure System.
- Drainage, sewer system and ventilation.
- Industry and mining.
- Gasline Pipes.
- Conduits.

استخدامات أنابيب اليوبى فى سى

- أنظمة الري ، شبكات مياه الشرب ،
- التمديدات الصحية وجميع الاستخدامات التي تتطلب ضغوطاً مرتفعة نسبياً
- أعمال المجاري و الصرف الصحي ، و التهوية .
- فى المصانع و مناجم التعدين .
- نقل الغاز .
- القنوات الكهربائية .

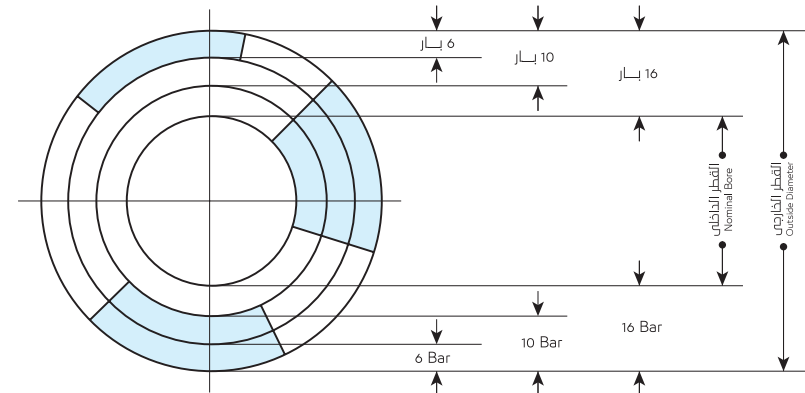


Table shows series what suit kind of application

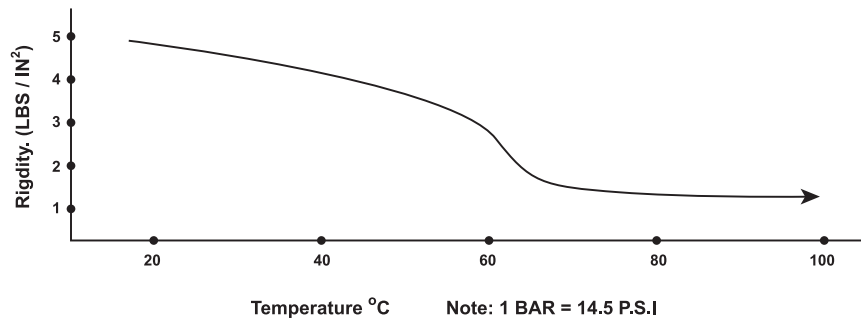
جدول يبين الاصناف المناسبة للاستعمالات المقابلة

الصف			الضغط التشغيلي في الدرجة 20 مئوية			الاستعمال
Series Or Class			Working Pressure At 20°C BAR			Application
5	4	3	16	10	6	الري Irrigation
5	4	-	16	10	-	شبكات المياه Water Supply
5	4	-	16	10	-	التمديدات المنزلية Sanitary
-	4	3	-	10	6	الصرف الصحي Drainage
-	-	3	-	-	6	المجاري و التهوية Sewer - Ventilation
5	4	3	16	10	6	المصانع ونقل الغاز Mining Gaslines
-	-	3	-	-	6	القنوات الكهربائية Conduits

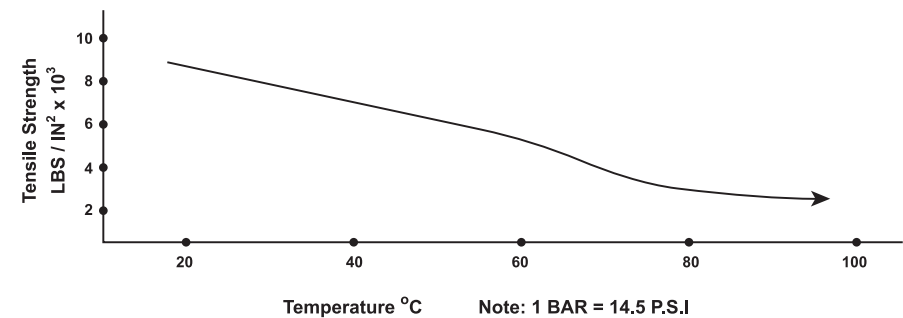
APPLICATIONS ACCORDING TO ITEMS



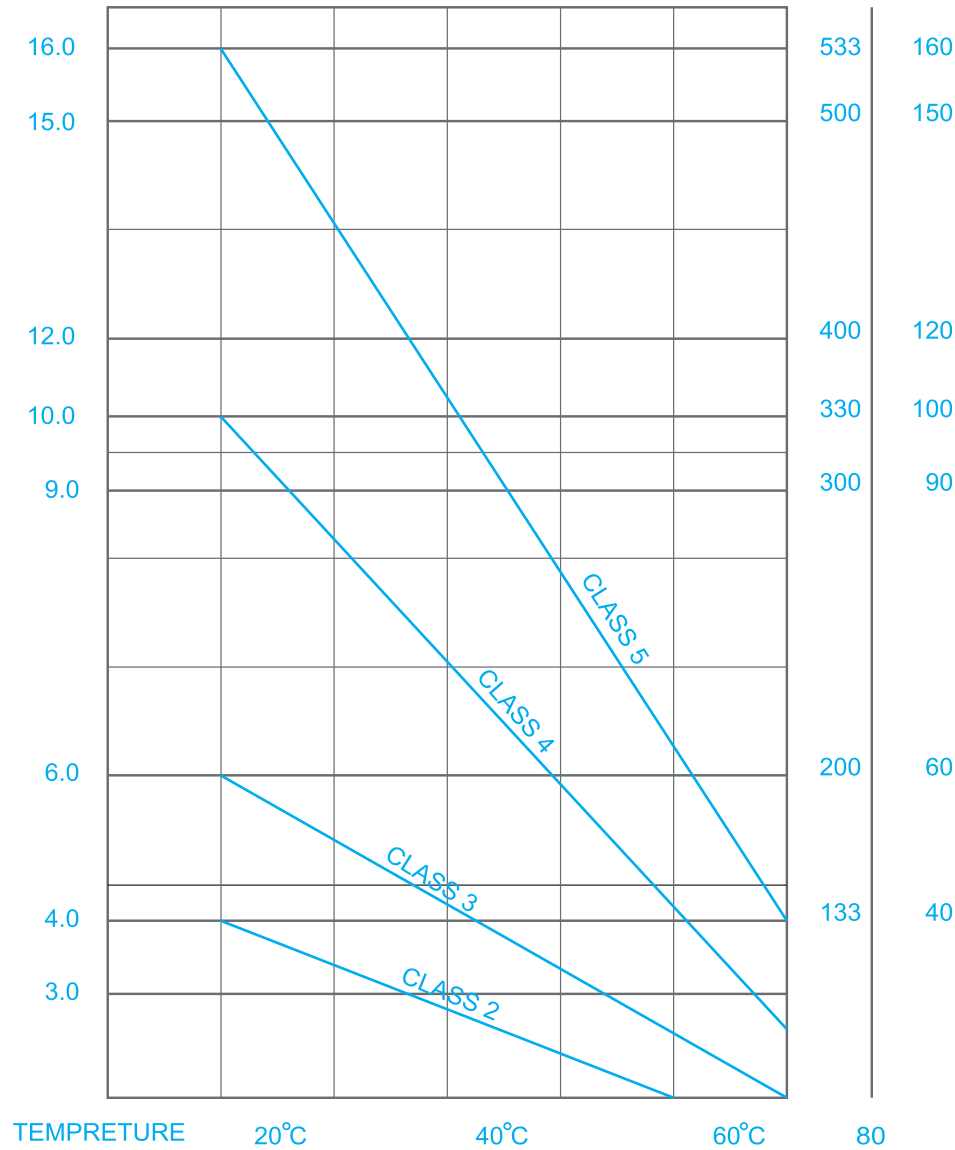
**Relation Between Thickness
And Pressure**



**Relation Between Rigidity
And Temperature**



**Relation Between Tensile Strength
And Temperature**



تأثير ارتفاع درجة الحرارة على أنابيب اليو بي في سي

الشكل البياني يبين العلاقة بين الضغط و درجة الحرارة المحيطة بالأنبوب حيث درجة الحرارة الداخلية 20^oم .

وبفرض أن درجة الحرارة المحيطة = 40^oم ، و الضغط التشغيلي = 6 بار ، فإن الشكل يبين ضرورة إستعمال أنابيب اليو بي في سي ، من ضغط 10 بار الصنف 4 عوضاً عن الصنف 3 .

UPVC Pipes and Elevated Temperatures

Pressure Temp Relationship ambient Variable , Internal temp 20^oC.

For ambient temperatue of 40^oC, a required working pressure of 6 BARS requires a10 BAR rated Pipe.

تأثير ارتفاع درجة الحرارة على أنابيب اليو بي في سي

- الشكل البياني يبين العلاقة بين الضغط و درجة حرارة السائل حيث درجة الحرارة المحيطة 20° م .
- وبفرض أن الضغط التشغيلي = 8 بار ، ودرجة حرارة السائل = 40 م فإن الأنابيب من الضغط 16 بار ، الصنف 5 عوضاً عن الصنف 4 هي الأكثر ملائمة .

UPVC Pipes and Elevated Temperatures

- Pressure Temp Relationship ambient temp. 20°C internal variable.
- For required working pressure 8 BARS with liquid temperature of 40°C. Therefore a 16 bar rated pipe is required

Since uPVC is thermoplastic material , pressure ratings must be reduced as higher temperatures are encountered.

The Drawn Below shows the relation ship between pressure, temperature and service life in years shows the percentage of the pressure rating recommended for various working temperatures over 20°C with a fluctuation not exceeding 5°C.

uPVC pipes should not be used for pressure duties if the operational temperature exceeds 60°C.

Temperature Pressure Relationship	
°C	Percentage of Working Pressure
20	100
30	90
35	80
40	70
45	60
50	45
55	30
60	15

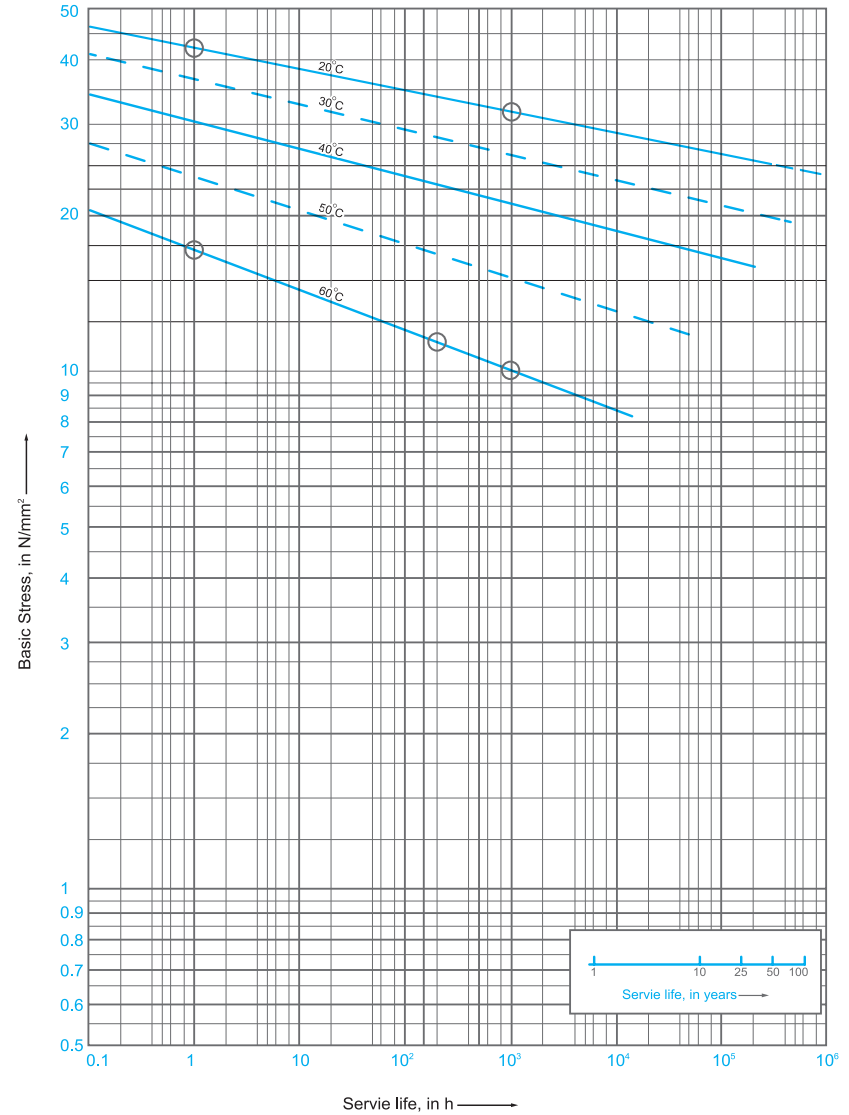
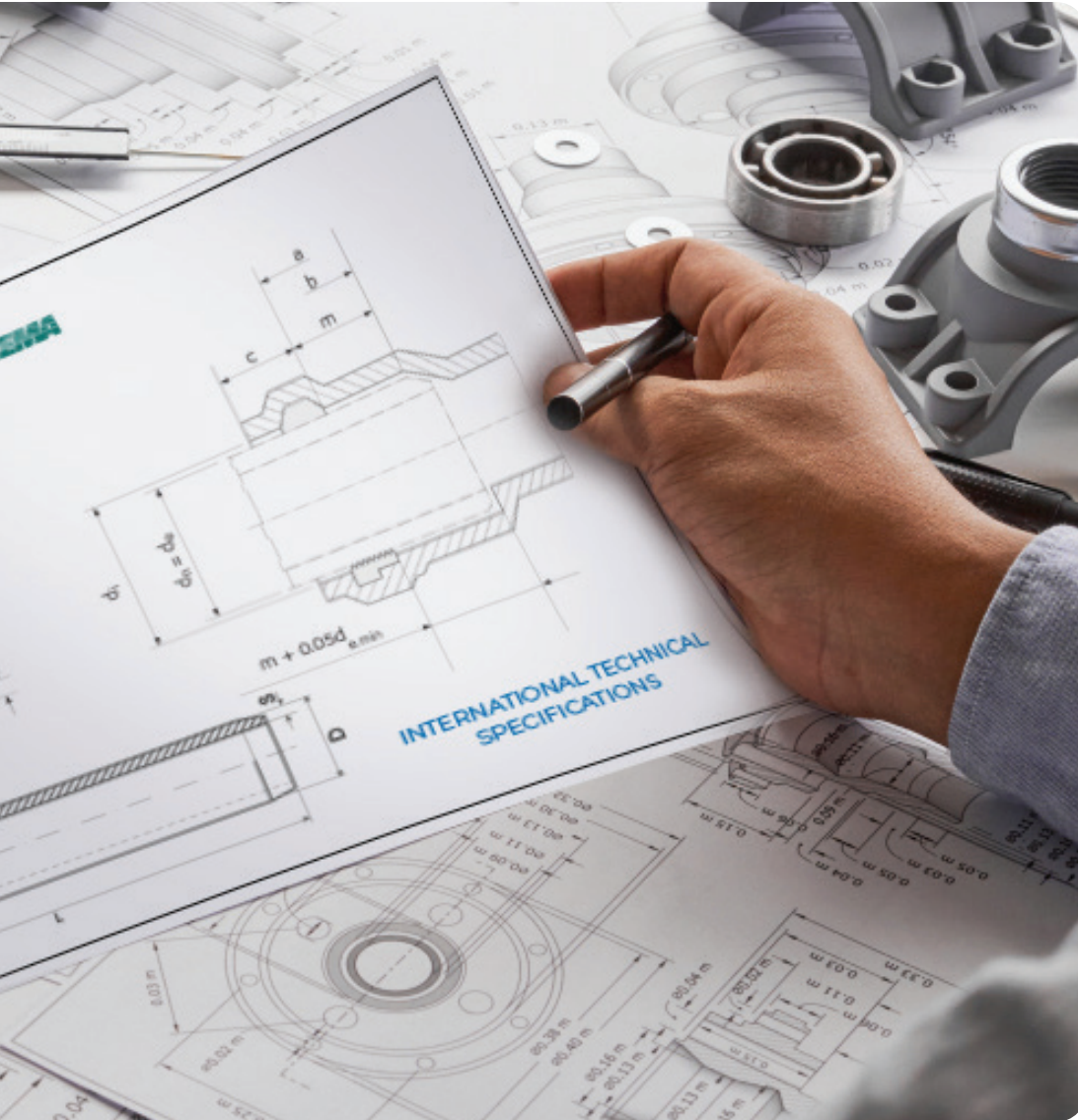


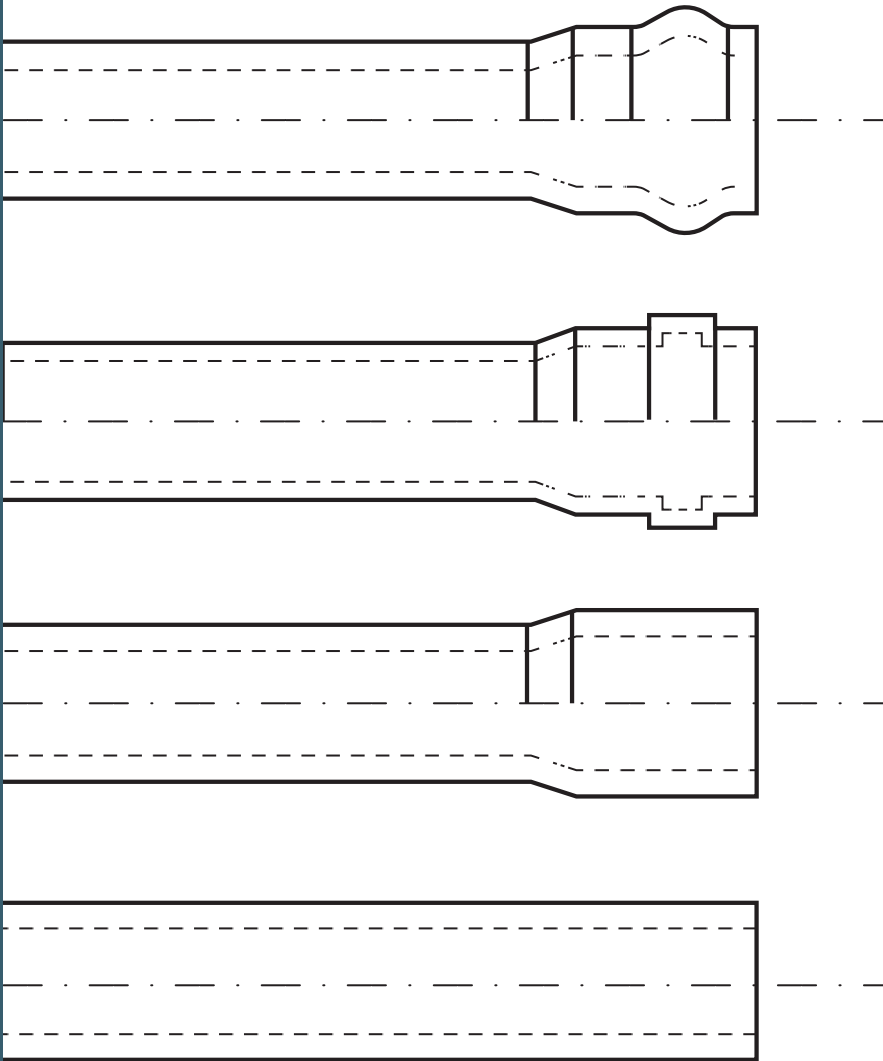
Figure 2 : Behaviour of PVC-U-K Pipes in long - term Hydrostatic pressure testing



INTERNATIONAL TECHNICAL SPECIFICATIONS - U PVC PIPE

المواصفات الفنية الدولية
لأنابيب (يو بيڤ فيڤ سي)

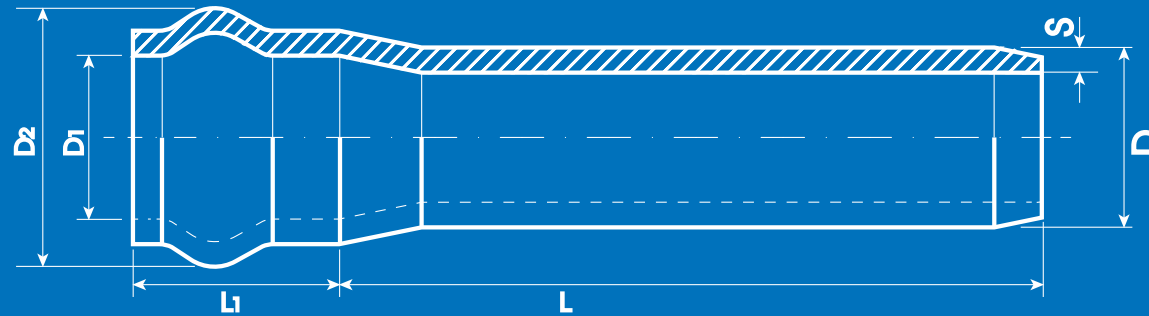




INTERNATIONAL ORGANIZATION FOR STANDARDIZATION



I



تنتج بلاستيك الوطنية أنابيب أبايب اليو بي في سي وفق المواصفات السعودية التالية :

Standard No.	SASO-ISO - 1452	رقم المواصفة
Reference No.	ISO 1452	مرجع المواصفة
Issue Year	2009	سنة الاصدار
Adoption Year	2014	سنة الاعتماد
Numeric Coding	922 - 1452	الترميز الرقمي

Table 1 - Nominal outside diameters and tolerances

Dimensions in millimetres			
Nominal outside diameter	Tolerance for mean outside diameter, d_{em}^a	Tolerance for out-of-roundness ^b	
		S 20 to S 16 ^c	S 12,5 to S 5 ^d
d_n	x	S 20 to S 16 ^c	S 12,5 to S 5 ^d
12	0,2	—	0,5
16	0,2	—	0,5
20	0,2	—	0,5
25	0,2	—	0,5
32	0,2	—	0,5
40	0,2	1,4	0,5
50	0,2	1,4	0,6
63	0,3	1,5	0,8
75	0,3	1,6	0,9
90	0,3	1,8	1,1
110	0,4	2,2	1,4
125	0,4	2,5	1,5
140	0,5	2,8	1,7
160	0,5	3,2	2,0
180	0,6	3,6	2,2
200	0,6	4,0	2,4
225	0,7	4,5	2,7
250	0,8	5,0	3,0
280	0,9	6,8	3,4

Dimensions in millimetres			
Nominal outside diameter	Tolerance for mean outside diameter, d_{em}^a	Tolerance for out-of-roundness ^b	
		S 20 to S 16 ^c	S 12,5 to S 5 ^d
d_n	x	S 20 to S 16 ^c	S 12,5 to S 5 ^d
315	1,0	7,6	3,8
355	1,1	8,6	4,3
400	1,2	9,6	4,8
450	1,4	10,8	5,4
500	1,5	12,0	6,0
560	1,7	13,5	6,8
630	1,9	15,2	7,6
710	2,0	17,1	8,6
800	2,0	19,2	9,6
900	2,0	21,6	--
1 000	2,0	24,0	--

a) The tolerance conforms to grade D of ISO 11922 - 1 [3] for $d_n \leq 50$ and to grade C for $d_n > 50$. The tolerance is expressed in the form $^{+x}_0$ mm, where x is the value of the tolerance.

b) The tolerance is expressed as the difference between the largest and the smallest outside diameter in a cross-section of the pipe (i.e. $d_{e, \max} - d_{e, \min}$).

c) For $d_n \leq 250$, the tolerance conforms to grade N of ISO 11922 - 1 [3]. For $d_n > 250$, the tolerance conforms to grade M of ISO 11922 - 1 [3]. The requirement for out-of-roundness is only applicable prior to storage.

Table 2 - Nominal (minimum) wall thicknesses

Nominal outside diameter, d_n	Nominal pressure PN based on design coefficient $C = 2,0^a$						
	PN 6	PN 8	PN 10	PN 12.5	PN 16	PN 20	PN 25
110	2,7	3,4	4,2	5,3	6,6	8,1	10,0
125	3,1	3,9	4,8	6,0	7,4	9,2	11,4
140	3,5	4,3	5,4	6,7	8,3	10,3	12,7
160	4,0	4,9	6,2	7,7	9,5	11,8	14,6
180	4,4	5,5	6,9	8,6	10,7	13,3	16,4
200	4,9	6,2	7,7	9,6	11,9	14,7	18,2
225	5,5	6,9	8,6	10,8	13,4	16,6	—
250	6,2	7,7	9,6	11,9	14,8	18,4	—
280	6,9	8,6	10,7	13,4	16,6	20,6	—
315	7,7	9,7	12,1	15,0	18,7	23,2	—
355	8,7	10,9	13,6	16,9	21,1	26,1	—
400	9,8	12,3	15,3	19,1	23,7	29,4	—
450	11,0	13,8	17,2	21,5	26,7	33,1	—
500	12,3	15,3	19,1	23,9	29,7	36,8	—
560	13,7	17,2	21,4	26,7	—	—	—
630	15,4	19,3	24,1	30,0	—	—	—
710	17,4	21,8	27,2	—	—	—	—
800	19,6	24,5	30,6	—	—	—	—
900	22,0	27,6	—	—	—	—	—
1000	24,5	30,6	—	—	—	—	—

Nominal outside diameter, d_n	Pipe series S						
	Nominal (minimum) wall thickness						
	S 20 (SDR 41)	S 16 (SDR 33)	S 12,5 (SDR 26)	S 10 (SDR 21)	S 8 (SDR 17)	S 6,3 (SDR 13,6)	S 5 (SDR 11)
	Nominal pressure PN based on design coefficient $C = 2,5$						
	PN 6	PN 8	PN 10	PN 12.5	PN 16	PN 20	
12	—	—	—	—	—	—	1,5
16	—	—	—	—	—	—	1,5
20	—	—	—	—	—	1,5	1,9
25	—	—	—	1,5	1,9	2,3	2,9
32	—	1,5	1,6	1,9	2,4	2,9	3,7
40	1,5	1,6	1,9	2,4	3,0	3,7	4,6
50	1,6	2,0	2,4	3,0	3,7	4,6	5,8
63	2,0	2,5	3,0	3,8	4,7	5,8	6,8
75	2,3	2,9	3,6	4,5	5,6	6,8	8,2
90	2,8	3,5	4,3	5,4	6,7	8,2	—

• a To apply a design coefficient of 2,5 (instead of 2,0) for pipes with nominal diameters above 90 mm, the next higher pressure rating, PN, shall be chosen.

• NOTE 1 The nominal wall thicknesses conform to ISO 4065^[4].

• NOTE 2 The PN 6 values for S 20 and S 16 are calculated with the preferred number 6,3.

Table 3 — Tolerance on wall thicknesses at any point

Dimensions in millimetres					
Nominal (minimum) wall thickness - e_n		Tolerance for wall thickness x	Nominal (minimum) wall thickness - e_n		Tolerance for wall thickness x
>	≤		>	≤	
1,0	2,0	0,4	21,0	22,0	2,4
2,0	3,0	0,5	22,0	23,0	2,5
3,0	4,0	0,6	23,0	24,0	2,6
4,0	5,0	0,7	24,0	25,0	2,7
5,0	6,0	0,8	25,0	26,0	2,8
6,0	7,0	0,9	26,0	27,0	2,9
7,0	8,0	1,0	27,0	28,0	3,0
8,0	9,0	1,1	28,0	29,0	3,1
9,0	10,0	1,2	29,0	30,0	3,2
10,0	11,0	1,3	30,0	31,0	3,3
11,0	12,0	1,4	31,0	32,0	3,4
12,0	13,0	1,5	32,0	33,0	3,5
13,0	14,0	1,6	33,0	34,0	3,6
14,0	15,0	1,7	34,0	35,0	3,7
15,0	16,0	1,8	35,0	36,0	3,8
16,0	17,0	1,9	36,0	37,0	3,9
17,0	18,0	2,0	37,0	38,0	4,0
18,0	19,0	2,1			
19,0	20,0	2,2			
20,0	21,0	2,3			

NOTE 1 The tolerance applies to the nominal (minimum) wall thickness and is expressed in the form $0 + x$ mm, where x is the value of tolerance for the mean wall thickness, e_m .

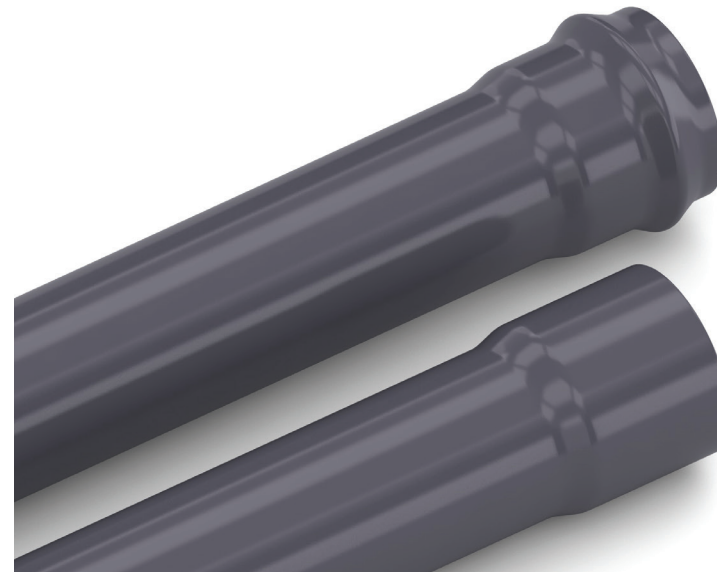
NOTE 2 The tolerance for wall thickness, e , at any point, conforms to grade W of ISO 119223 [1-].

6.5 Length of pipe

The nominal pipe length, l , shall be a minimum length which does not include the depth of the socketed portions, as shown in Figure 1.

NOTE

The preferred nominal length of pipe is 6 m. Other lengths are subject to agreement between the manufacturer and the purchaser.



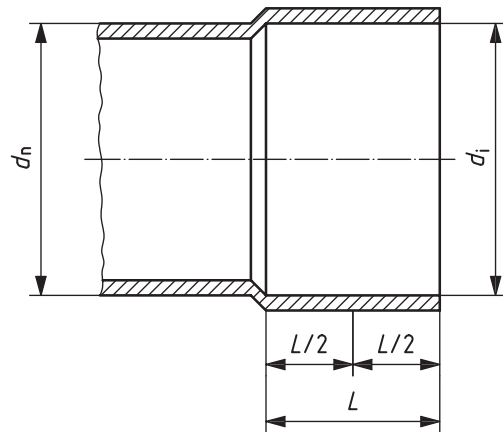


Figure 2 — Socket for solvent cementing

The nominal inside diameter of a socket shall be equal to the nominal outside diameter, d_n , of the pipe.
 The maximum included internal angle of the socketed portion shall not exceed 030) 30° min).
 The requirements for mean inside diameters, d_{im} , of sockets shall apply at the midpoint of the socket length.

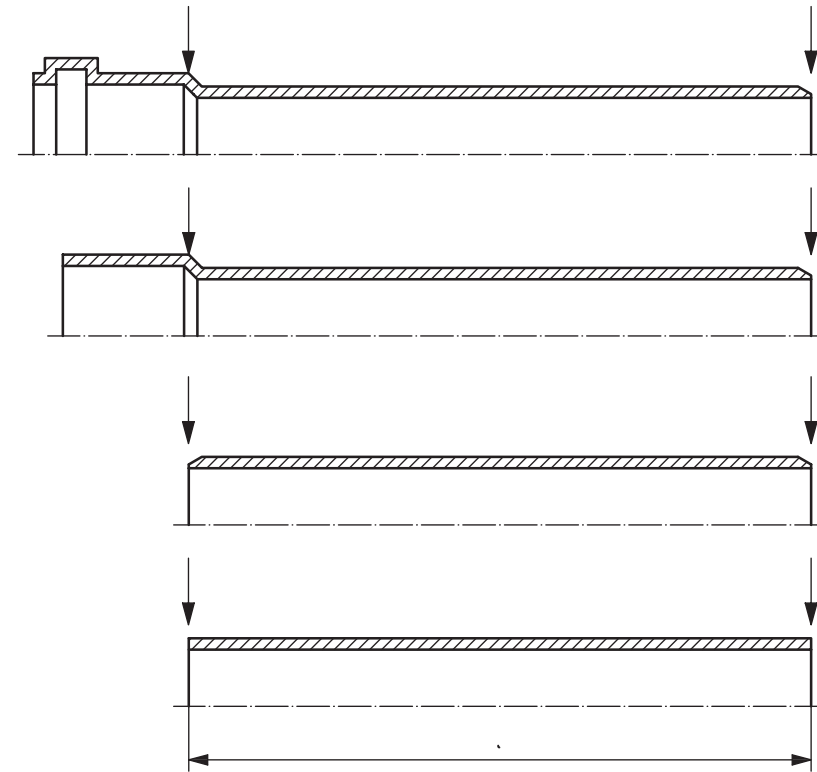


Figure 1 — Points of measurement for nominal pipe lengths

6.6 Pipes with sockets

6.6.1 Sockets for solvent cementing

The dimensions of sockets for solvent cementing are given in Figure 2. They shall conform to Table 4.

Table 4 — Dimensions of sockets for solvent cementing

Dimensions in millimetres				
Nominal inside diameter of socket	Mean inside diameter of socket		Maximum out-of roundness for d_i	Minimum socket length
	d_n	$d_{im, min}$		
			a	L_{min}^b
12	12,1	12,3	0,25	12,0
16	16,1	16,3	0,25	14,0
20	20,1	20,3	0,25	16,0
25	25,1	25,3	0,25	18,5
32	32,1	32,3	0,25	22,0
40	40,1	40,3	0,25	26,0
50	50,1	50,3	0,3	31,0
63	63,1	63,3	0,4	37,5
75	75,1	75,3	0,5	43,5
90	90,1	90,3	0,6	51,0
110	110,1	110,4	0,7	61,0
125	125,1	125,4	0,8	68,5
140	140,2	140,5	0,9	76,0
160	160,2	160,5	1,0	86,0
180	180,2	180,6	1,1	96,0
200	200,2	200,6	1,2	106,0
225	225,3	225,7	1,4	118,5
250	250,3	250,8	1,5	131,0
280	280,3	280,9	1,7	146,0
315	315,4	316,0	1,9	163,5
355	355,4	356,1	2,0	183,5
400	400,4	401,2	2,0	206,0

a The out-of-roundness tolerances are rounded values of 0,25 grade M to ISO 11922 - 1^[3].

b The minimum socket lengths are equal to $(0,5d_n + 6 \text{ mm})$ or 12 mm if $(0,5d_n + 6 \text{ mm}) \leq 12 \text{ mm}$.

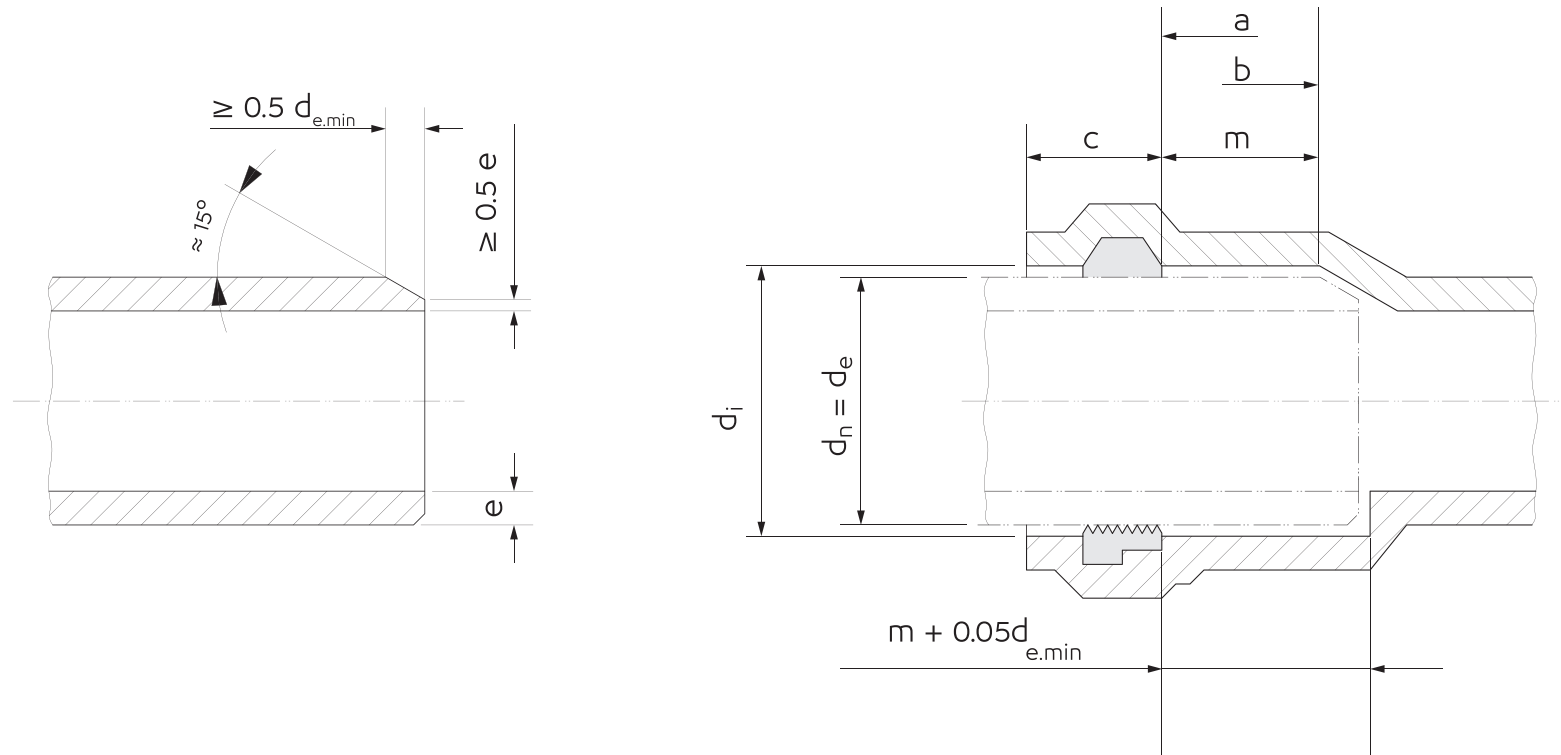
6.6.2 Sockets for elastomeric ring seal type joints

The minimum depth of engagement, m_{min} , of single sockets with elastomeric ring seal joints (see Figure 3) is based on pipe lengths up to 12 m and shall conform to Table 5.

The wall thickness of the sockets at any point, except the sealing ring groove, shall not be less than the minimum wall thickness of the connecting pipe. The wall thickness of the sealing ring groove shall not be less than 0,8 times the minimum wall thickness of the connecting pipe.

The requirements for mean inside diameters, d_{im} , of sockets shall apply at the midpoint of the depth of engagement, m .





Key

- a/ Start of sealing area.
- b/ End of cylindrical part of socket and pipe.

Figure 3 — Socket and spigot end for pipes with elastomeric sealing

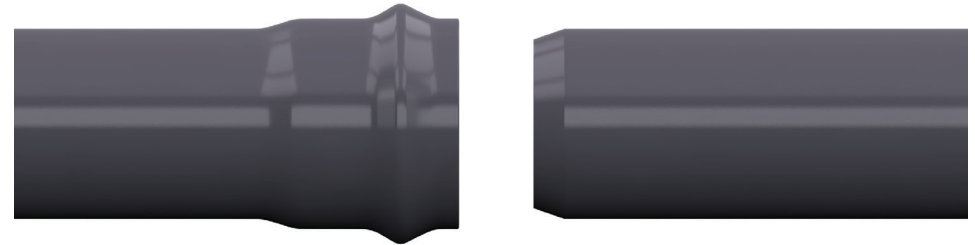
Figure 3 shows the engagement if the spigot end is pushed to the socket bottom.

NOTE For assembly instructions, see ISO/TR 4191[1].

Table 5 — Dimensions of sockets for elastomeric ring seal joints

Nominal inside diameter of Socket	Minimum mean inside diameter of Socket	Maximum permissible out-of-roundness for d_{ib}		Minimum depth of engagement	Length of socket Entrance and Sealing Area	Nominal inside diameter of Socket	Minimum mean inside diameter of Socket	Maximum permissible out-of-roundness for d_{ib}		Minimum depth of engagement	Length of socket Entrance and Sealing Area
		S 20 to S 16	S 12,5 to S 5					m_{min}^c	C^d		
20	20,3	—	0,3	55	27	250	250,9	3,8	2,3	81	62
25	25,3	—	0,3	55	27	280	281,0	5,1	2,6	85	67
32	32,3	0,6	0,3	55	27	315	316,1	5,7	2,9	88	72
40	40,3	0,8	0,4	55	28	355	356,2	6,5	3,3	90	79
50	50,3	0,9	0,5	56	30	400	401,3	7,2	3,6	92	86
63	63,4	1,2	0,6	58	32	450	451,5	8,1	4,1	95	94
75	75,4	1,2	0,7	60	34	500	501,6	9,0	4,5	97	102
90	90,4	1,4	0,9	61	36	560	561,8	10,2	5,1	101	112
110	110,5	1,7	1,1	64	40	630	632,0	11,4	5,7	105	123
125	125,5	1,9	1,2	66	42	710	712,3	12,9	6,5	109	136
140	140,6	2,1	1,3	68	44						
160	160,6	2,4	1,5	71	48						
180	180,7	2,7	1,7	73	51						
200	200,7	3,0	1,8	75	54						
225	225,8	3,4	2,1	78	58						

Dimensions in millimetres



a) $d_{im, min}$ is measured in the middle of the engagement, m , and is calculated using the applicable Equation (1), (2) or (3):

$$d_{im, min} = d_n + 0,3 \text{ mm} \quad (1)$$

when $d_n \leq 50$;

$$d_{im, min} = d_n + 0,4 \text{ mm} \quad (2)$$

when $63 \leq d_n \leq 90$;

$$d_{im, min} = 1,003 d_n + 0,1 \text{ mm} \quad (3)$$

when $d_n \geq 110$.

The values obtained shall be rounded to the next greater 0,1 mm.

b) The out-of-roundness tolerances are rounded values of 0,75 grade to ISO 11922 - 1 [3] for S 20 to S 16 as follows:

0,75 grade M for $32 \leq d_n \leq 50$;

0,75 grade N for $63 \leq d_n \leq 250$;

0,75 grade M for $280 \leq d_n \leq 710$.

For pipe series S 12,5 to S 5: 0,375 grade M, except 0,3 grade M for $d_n \leq 32$.

c) The value of m_{min} is calculated from the applicable Equation (4) or (5):

$$m_{min} = 50 \text{ mm} + 0,22d_n - 2e \quad (S 10), (4)$$

when $d_n \leq 280$;

$$m_{min} = 70 \text{ mm} + 0,15d_n - 2e \quad (S 10), (5)$$

when $d_n > 280$.

The values obtained shall be rounded to the next greater 1,0 mm.

d) The value of c is calculated using the following equation: $c = 22 + 0,16d_n$ and c is given only for guidance in calculating minimum spigot lengths.

The manufacturer shall state the c -values in his catalogue

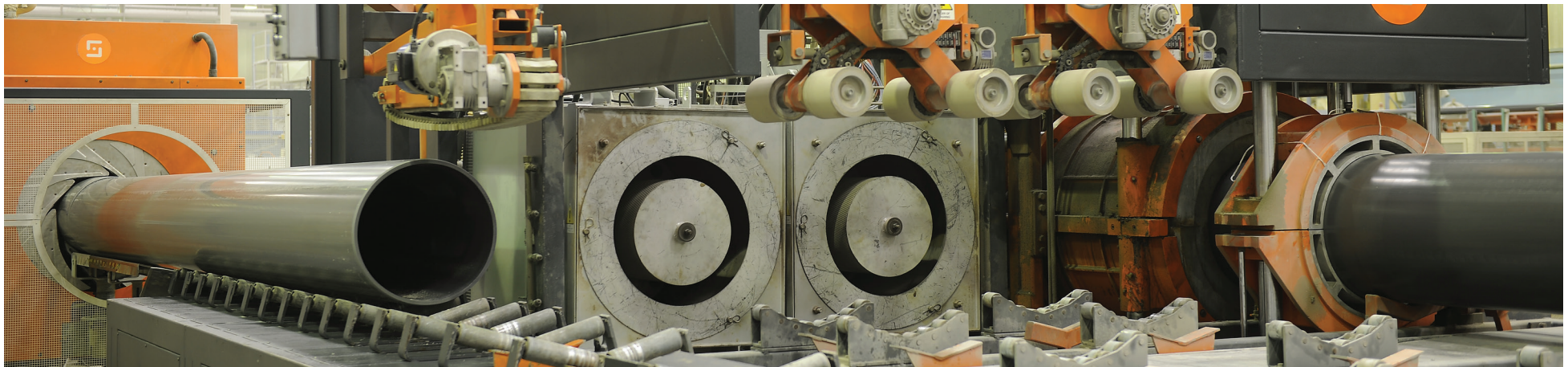


Table 6 — Requirements for the falling weight impact test

Nominal outside diameter dn mm	Medium level M			High level H		
	Mass of falling weight	Fall height	Impact energyab	Mass of falling weight	Fall height	Impact energyab
	kg	m	Nm	kg	m	Nm
20	0,5	0,4	2	0,5	0,4	2
25	0,5	0,5	2,5	0,5	0,5	2,5
32	0,5	0,6	3	0,5	0,6	3
40	0,5	0,8	4	0,5	0,8	4
50	0,5	1,0	5	0,5	1,0	5
63	0,8	1,0	8	0,8	1,0	8
75	0,8	1,0	8	0,8	1,2	9,5
90	0,8	1,2	9,5	1,0	2,0	20
110	1,0	1,6	16	1,6	2,0	31
125	1,25	2,0	25	2,5	2,0	49
140	1,6	1,8	28	3,2	1,8	57
160	1,6	2,0	31	3,2	2,0	63
180	2,0	1,8	35	4,0	1,8	71
200	2,0	2,0	39	4,0	2,0	78
225	2,5	1,8	44	5,0	1,8	88
250	2,5	2,0	49	5,0	2,0	98
280	3,2	1,8	57	6,3	1,8	111
≥ 315	3,2	2,0	63	6,3	2,0	124

a Based on $g = 9,81 \text{ m/s}^2$.

b For less than 10, rounded off to 0,5; for greater than 10, rounded off to integers.

8.2 Resistance to internal pressure

Pipes shall withstand, without bursting or leakage, the hydrostatic stress induced by internal hydrostatic pressure when tested in accordance with ISO 11671-, using the test conditions specified in Table 7.

For this test, end caps type A or B in accordance with ISO 11671- may be used. In case of dispute, end caps type A shall be used.



Table 7 — Pressure test requirements for pipes

Characteristic	Requirement	Test Parameters					Test method
		Temp.	Circumferential stress	Time	Type of test	Number of test pieces ^a	
		C	MPa	h			
Short- and longterm strength	No failure during the test	20	42,0	1	Water in water	3	ISO 11671- and ISO 1167 - 2
		60	12,5 ^b	100			

^a The number of test pieces given indicates the number required to establish a value for the characteristic described in the table. The number of test pieces required for factory production control and process control should be listed in the manufacturer's quality plan.

^b If tested with the circumferential stress of 12,5 MPa, due to statistical spread of the test results, test times less than 1 000 h can be achieved. In this case, a retest procedure with a circumferential stress of 12,5 MPa or 10,0 MPa shall be performed with pipes of the same production batch and double sampling. If the retest results are positive, the requirement of the minimum reference curve for PVCU 250, given in ISO 14524.4.2 ,1:2009-, is deemed to be verified.

Integral sockets shall be tested in accordance with ISO 11671-, using the test parameters given in Table 8. For this test, end caps type B in accordance with ISO 1167-1 may be used and the socket entrance may be externally reinforced to prevent a displacement of the sealing ring.

Table 8 — Pressure test requirements for all types of integral sockets on pipes

Characteristic	Requirement	Test Parameters					Test method	
		Nominal diameter	Temp	Pressure	Time	Type of test		Number of test pieces ^a
		d_n	°C	bar	h			
Short term strength	No failure during the test	≤ 90 mm	20	4,2 × PN	1	Water in water	3	ISO 1167- 1 and ISO 1167- 2
		> 90 mm	20	3,36 × PN	1		3	

^a The number of test pieces given indicates the number required to establish a value for the characteristic described in the table. The number of test pieces required for factory production control and process control should be listed in the manufacturer's quality plan.

Annex A

(normative) Allowable operating pressures

A.1 Nominal pressures of pipes

The nominal pressure, PN, of a pipe shall be designated in accordance with Table A.1, depending on the diameter of the pipe and the pipe series S.

Table A.1 — Nominal pressures of pipes

Nominal diameter d_n	Nominal pressures						
	Pipe series						
	S 20 (SDR 41)	S 16 (SDR 33)	S 12,5 (SDR 26)	S 10 (SDR 21)	S 8 (SDR 17)	S 6,3 (SDR 13,6)	S 5 (SDR 11)
≤ 90	—	PN 6	PN 8	PN 10	PN 12,5	PN 16	PN 20
> 90	PN 6	PN 8	PN 10	PN 12,5	PN 16	PN 20	PN 25

A.2 Nominal pressures of the system

All system components conforming to this part of ISO 1452 shall be classified and marked with PN and optionally with the pipe series S. Every component can be used at a temperature up to and including 25 °C for an operating pressure in bar equal to or less than the indicated PN.

This means that fittings and valves may be used in combination with pipes marked with the same or lower PN.

The whole system allows the operating pressure to be equal to or less than that of the component having the lowest pressure rating.

A.3 Derating factor for service temperatures between 25 °C and 45 °C

The derating factor, fT, for service temperatures between 25 °C up to 45 °C shall be taken from Figure A.1. The derating factor is based on long-term experience and test results.

EXAMPLE Consider a pipe with PN 12,5 to be applied for water at 40 °C. From Figure A.1 the derating factor at 40 °C is 0,71. Therefore the maximum allowable operating pressure at 40 °C in continuous use is: $0,71 \times 12,5 \text{ bar} = 8,88 \text{ bar}$.

Annex B

(normative) Imperial (inch)-sized pipes

B.1 General : All clauses of this part of ISO 1452 shall apply, together with the following clauses. The specifications given in this annex are for the requirements which differ from those given in Clauses 1 to 13.

B.2 Geometrical characteristics

B.2.1 Mean outside diameters and their tolerances : For the purposes of 6.3, Table B.1 shall apply in place of Table 1.

Table B.1 — Mean outside diameters and tolerances

Nominal size	Mean outside diameter		Tolerance for out-of-roundness	
	in	$d_{em, min}$		$d_{em, max}$
3/8		17,0	17,3	0,3
1/2		21,2	21,5	0,3
3/4		26,6	26,9	0,3
1		33,4	33,7	0,5
1 1/4		42,1	42,4	0,5
1 1/2		48,1	48,4	0,5
2		60,2	60,5	0,7
3		88,7	89,1	1,0
4		114,1	114,5	1,2
6		168,0	168,5	1,7
8		218,8	219,4	2,2
10		272,6	273,4	2,8
12		323,4	324,3	3,3
16		405,9	406,9	4,2
18		456,7	457,7	4,6
20		507,5	508,5	5,2
24		609,1	610,1	6,2

Dimensions in millimetres

B.2.2 Wall thicknesses and their tolerances

For the purposes of 6.4, the following shall apply.

The nominal wall thicknesses, e_n , shall be classified according to the PN rating of the pipe, as given in Table B.2.

The tolerances on the wall thickness at any point shall conform to Table B.3.



Table B.2 — Nominal wall thicknesses

Nominal Size	Nominal wall thickness e		
	PN 9	PN 12	PN 15
in			
3/8	—	—	1,5
1/2	—	—	1,7
3/4	—	—	1,9
1	—	—	2,2
1 1/4	—	2,2	2,7
1 1/2	—	2,5	3,1
2	2,5	3,1	3,9
3	3,5	4,6	5,7
4	4,5	6,0	7,3
6	6,6	8,8	10,8
8	7,8	10,3	12,6
10	9,7	12,8	15,7
12	11,5	15,2	18,7
16	14,5	19,0	23,4
18	16,3	21,4	—
20	18,1	—	—
24	21,7	—	—

Dimensions in millimetres

Table B.3 — Tolerance on wall thickness at any point

Nominal Size	Nominal wall thickness e		
	PN 9	PN 12	PN 15
in			
3/8	—	—	0,4
1/2	—	—	0,4
3/4	—	—	0,6
1	—	—	0,6
1 1/4	—	0,5	0,6
1 1/2	—	0,5	0,6
2	0,5	0,6	0,6
3	0,6	0,7	0,9
4	0,7	0,9	1,1
6	1,0	1,4	1,7
8	1,2	1,6	1,9
10	1,5	2,0	2,4
12	1,8	2,3	2,9
16	2,2	2,9	3,6
18	2,5	3,3	—
20	2,8	—	—
24	3,3	—	—

a The tolerance is expressed in the form of 0 + x mm, where x is the value of the tolerance on the minimum wall thickness.

B.2.3.1 Sockets for solvent cementing

For the purposes of 6.6.1, the following shall apply. The dimensions of sockets for solvent cementing are shown in Figure B.1. They shall conform to the values given in Table B.4.

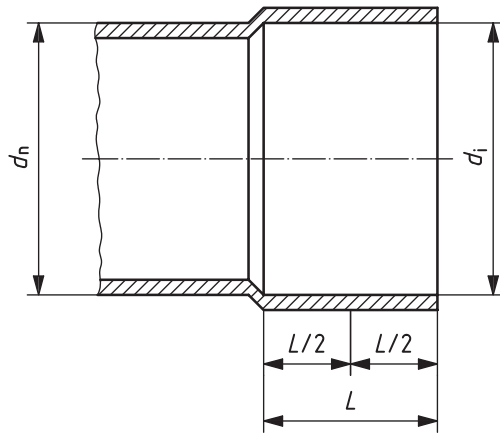


Figure B.1 — Socket on pipe end for solvent cementing

At no point shall the inside diameter of the socket be greater than the mouth inside diameter of the associated socket. The mean inside diameter of the socket may decrease from mouth to root by the following maximum total included angle of taper:

- 3/8" to 2" nominal size : 0° 40
- 3" nominal size and greater: 0° 30

An out-of-roundness tolerance of $\pm 0,2 \%$ is allowed on the mean inside diameter of the socket at the midpoint of the socket length.

Table B.4 — Dimensions of sockets for solvent cementing

Nominal size	Socket length	Mean inside diameter of socket at midpoint of socket length	
		$d_{im, min}$	$d_{im, max}$
in	L_{min}		
3/8	14,5	17,1	17,3
1/2	16,5	21,3	21,5
3/4	19,5	26,7	26,9
1	22,5	33,5	33,7
1 1/4	27,0	42,2	42,4
1 1/2	30,0	48,2	48,4
2	36,0	60,3	60,5
3	50,5	88,8	89,1
4	63,0	114,2	114,5
6	90,0	168,2	168,5
8	115,5	219,0	219,4
10	142,5	272,8	273,4
12	168,0	323,7	324,3

NOTE

The minimum socket lengths, L_{min} , are calculated using Equation (B.1):

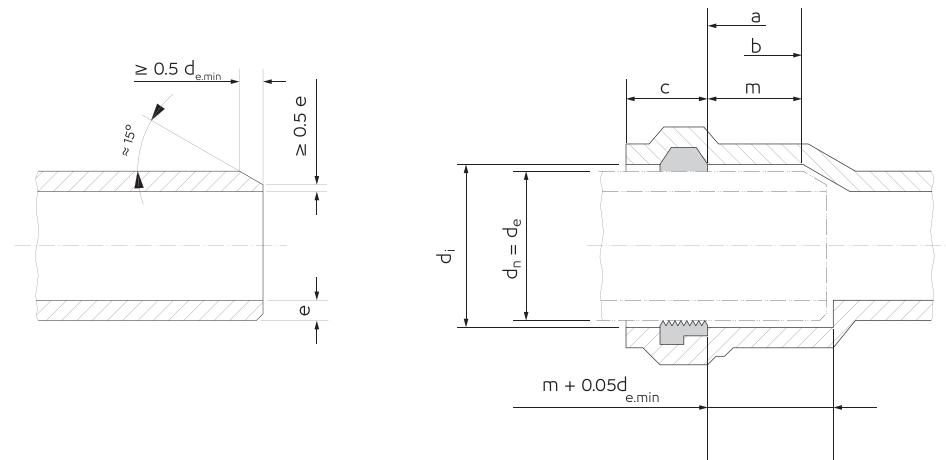
$$L_{min} = 0,5 d_{em, min} + 6 \text{ mm} \quad \dots\dots (B.1)$$

where $d_{em, min}$ is the minimum mean outside diameter of the Corresponding pipe (see ISO 1452- 1).

B.2.3.2 Sockets for elastomeric ring seal joints

For the purposes of 6.6.2, the following shall apply.

The depth of engagement, m , of single sockets with elastomeric sealing ring type joints are shown in Figure B.2. The minimum value for m shall conform to the applicable value given in Table B.5.



Key

- a Start of sealing area.
- b End of cylindrical part of socket and pipe.

Figure B.2 - Socket and spigot end for pipes with elastomeric sealing ring

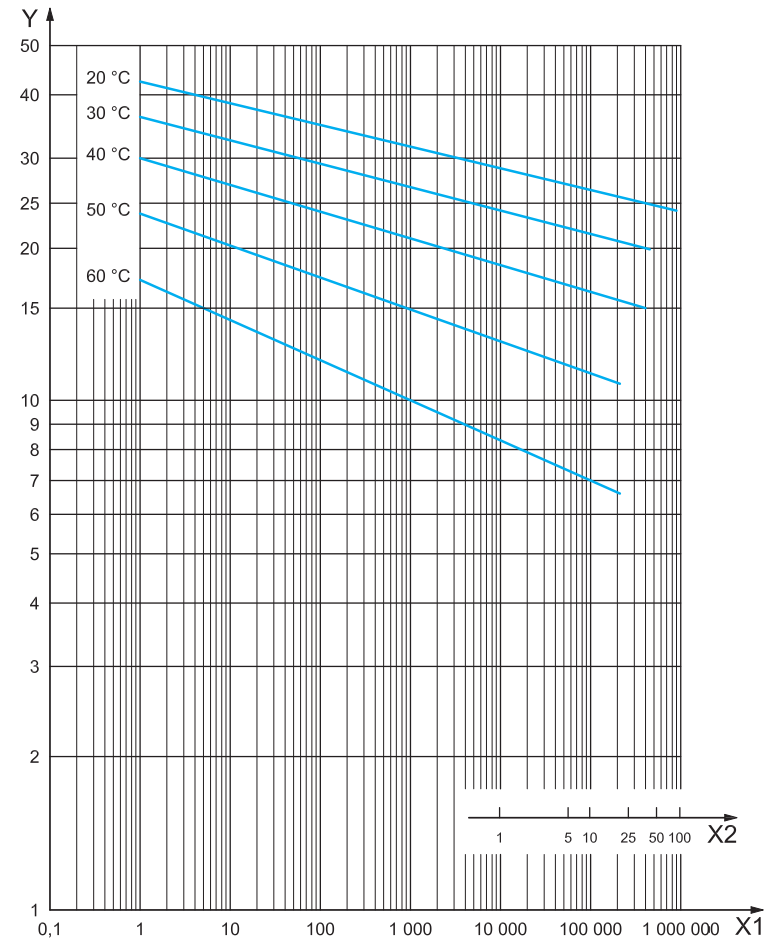
NOTE 1 : Figure B.2 shows the engagement if the spigot end is pushed to the socket bottom.

NOTE 2 : For assembly instructions, see ISO/TR 4191[1].

Table B.5 — Dimensions of sockets for elastomeric ring seal joints

Nominal size in	Minimum depth of engagement m_{min}	
	Single socket	Double socket
2	67	39
3	70	43
4	75	47
6	87	55
8	98	63
10	110	71
12	121	78
16	139	91
18	150	98
20	171	106
24	183	121

Dimensions in millimetres



Key : $X1$ time, t , to fracture, in hours | $X2$ time, in years
 Y hoop stress, σ , in megapascals

Figure 1 — Minimum reference curve for PVC-U 250

Wall thickness and their tolerances

- The nominal wall thickness, e_n , is classified with the pipe series S. The nominal wall thickness corresponds to the minimum allowable wall thickness.
- The nominal wall thickness shall conform to Table2, as appropriate to the pipe series.
- The tolerance for wall thickness, e , shall conform to Table3.

Table2 - Nominal (minimum) wall thicknesses

Pipe Series S							
Nominal (minimum) wall thickness							
Nominal outside diameter. dn	S 20 (SDR 41)	S 16 (SDR 33)	S 12.5 (SDR 26)	S 10 (SDR 21)	S 8 (SDR 17)	S 6.3 (SDR 13.6)	S 5 (SDR 11)
	Nominal Pressure PN based on design coefficient C=2.5						
	PN 6	PN 8	PN 10	PN 12.5	PN 16	PN 20	
12	-	-	-	-	-	-	1.5
16	-	-	-	-	-	-	1.5
20	-	-	-	-	-	1.5	1.9
25	-	-	-	1.5	1.9		2.3
32	-	1.5	1.6	1.9	2.4		2.9
40	1.5	1.6	1.9	2.4	3.0		3.7
50	1.6	2.0	2.4	3.0	3.7		4.6
63	2.0	2.5	3.0	3.8	4.7		5.8
75	2.3	2.9	3.6	4.5	5.6		6.8
90	2.8	3.5	4.3	5.4	6.7		8.2

Nominal Pressure PN based on design coefficient C=2.0a							
	PN 6	PN 8	PN 10	PN 12.5	PN 16	PN 20	PN 25
110	2.7	3.4	4.2	5.3	6.6	8.1	10.0
125	3.1	3.9	4.8	6.0	7.4	9.2	11.4
140	3.5	4.3	5.4	6.7	8.3	10.3	12.7
160	4.0	4.9	6.2	7.7	9.5	11.3	14.6
180	4.4	5.5	6.9	8.6	10.7	13.3	16.4
200	4.9	6.2	7.7	9.6	11.9	14.7	18.2
225	5.5	6.9	8.6	10.8	13.4	16.6	-
250	6.2	7.7	9.6	11.9	14.8	18.4	-
280	6.9	8.6	10.7	13.4	16.6	20.6	-
315	7.7	9.7	12.1	15.0	18.7	23.2	-
355	8.7	10.9	13.6	16.9	21.1	26.1	-
400	9.8	12.3	15.3	19.1	23.7	29.4	-
450	11.0	13.8	17.2	21.5	26.7	33.1	-
500	12.3	15.3	19.1	23.9	29.7	36.8	-
560	13.7	17.2	21.4	26.7	-	-	-
630	15.4	19.3	24.1	30.0	-	-	-
710	17.4	21.8	27.2	-	-	-	-
800	19.6	24.5	30.6	-	-	-	-

a To apply a design coefficient of 2.5 (instead of 2.0) for pipes with nominal diameters above 90 mm, the next higher pressure rating, PN, shall be chosen.

NOTTE 1 The nominal wall thicknesses conform to ISO 4065 (4).

NOTTE 2 The PN 6 values for S 20 and S 16 are calculated with the preferred number 6.3

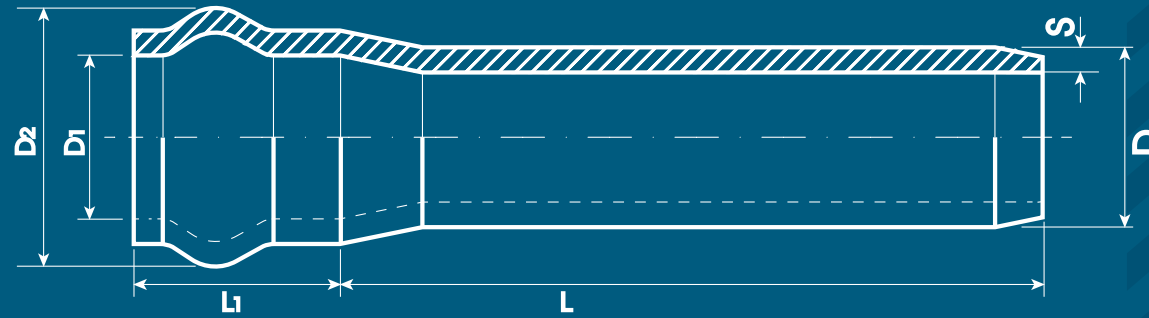
جميع الحقوق محفوظة للهيئة السعودية للمقياس و الجودة يسمح ل (هيئة المواصفات و المقاييس)
 باستخدام هذه المواصفة داخلياً فقط ولا يجوز منح الإذن للقبر باستخدام

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المواصفات القياسية الألمانية 8061 - 8062

DIN

II



Manufacturing Range

الأقطار المنتجة

تنتج بلاستيك الوطنية أنابيب اليوبي في سي وفق المواصفات السعودية وضمن الحدود التالية لأقطار والسماكات والأوزان وفق الأصناف المطابقة للمواصفات السعودية رقم 14 لسنة 1996 م - الألماني دين 8061 - 8062

Al-Watania Plastics U-PVC Pipes are manufactured as per (SASO) 14/ 1996 size range from 16 mm outside diameter upto 800mm. All details, sizes, thicknesses weights and classes are shown in this table according to (SASO)14 /1996 and DIN 8062





Working Pressure	Class 2 - 4 Bar		Class 3 - 6 Bar		Class 4 - 10 Bar		Class 5 - 16 Bar	
	Nominal Thickness mm	Weight Kg/m	Nomina Thickness mm	Weight Kg/m	Nominal Thickness mm	Weight Kg/m	Nominal Thickness mm	Weight Kg/m
16	-	-	-	-	-	-	1.2	0.090
20	-	-	-	-	-	-	1.5	0.137
25	-	-	-	-	1.5	0.174	1.9	0.212
32	-	-	-	-	1.8	0.264	2.4	0.342
40	-	-	1.8	0.334	1.9	0.350	3.0	0.525
50	-	-	1.8	0.442	2.4	0.552	3.7	0.809
63	-	-	1.9	0.562	3.0	0.854	4.7	1.289
75	1.8	0.642	2.2	0.782	3.6	1.22	5.6	1.82
90	1.8	0.774	2.7	1.13	4.3	1.75	6.7	2.61
110	2.2	1.16	3.2	1.64	5.3	2.61	8.2	3.90
125	2.5	1.48	3.7	2.13	-	-	-	-
160	3.2	2.41	4.7	3.44	7.7	5.47	11.9	8.17
200	4.0	3.7	5.9	5.37	9.6	8.51	14.9	12.8
225	4.5	4.7	6.6	6.76	10.8	10.8	16.7	16.1
250	4.9	5.65	7.3	8.31	11.9	13.2	18.6	19.9
280	-	-	8.2	10.4	13.4	16.6	20.8	24.9
315	6.2	9.02	9.2	13.1	15.0	20.9	23.8	31.5
400	7.9	14.5	11.7	21.1	19.1	33.7	29.7	50.8
500	9.8	22.4	14.6	32.9	23.9	52.6	0	0
630	12.4	35.7	18.4	52.2	30	83.2	0	0
710	14.0	45.3	20.7	66.10	-	-	-	-
800	15.70	57.2	23.3	83.90	-	-	-	-

Joints

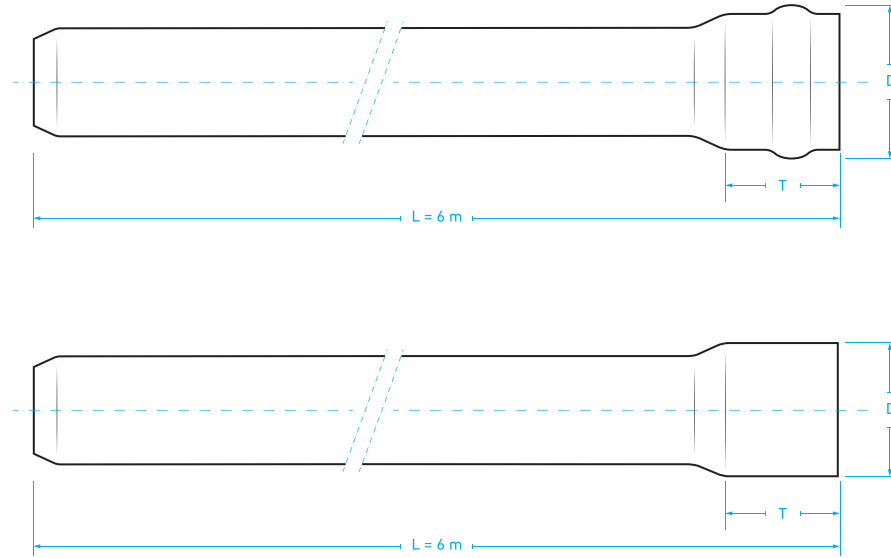
الوصلات

Al-Watania Plastics U-PVC Pipes are manufactured by tow types.

- 1 - Solvent Cement Joint.
- 2 - «A» Rubber Joint.

تنتج بلاستيك الوطنية أنابيب اليو بي في سي بنوعين من الوصلات :

- 1 - وصلة بالغراء (عادية)
- 2 - وصلة بالحلقة المطاطية (أ)



T	Socket Depth
D	O.D of Socket
L	Length of Pipe

ط	عمق الوصلة
ق	قطر الوصلة
ل	طول الماسورة

Al-Watania Plastics U-PVC Pipes are 6m standard length. Other length can be supplied by arrangement.

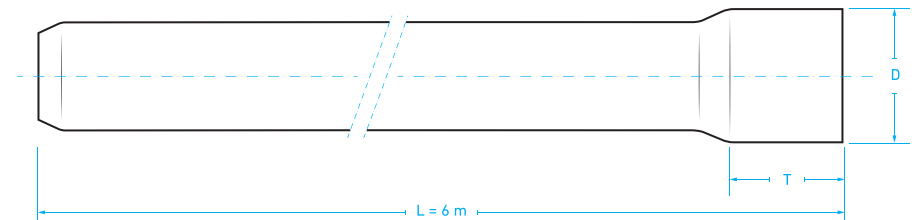
تنتج بلاستيك الوطنية أنابيب اليو بي في سي بطول 6 متر دوماً ، كما يمكن إنتاج أطول اخرى وفق طلب العميل .

Solvent Cement Joints Dimensions

Size (O.D)	Class	D : O.D of Socket	T: Socket Depth
16	5	19	30
20	5	24	32
25	4	28	33
	5	29	
32	4	36	35
	5	37	
40	3	44	38
	4	45	
	5	47	
50	3	54	48
	4	56	
	5	58	
63	3	67	65
	4	70	
	5	73	
75	3	80	72
	4	83	
	5	87	
90	3	96	85
	4	99	
	5	105	
110	3	117	93
	4	122	
	5	128	

ابعاد الوصلة العادية (الغراء)

Size (O.D)	Class	D : O.D of Socket	T: Socket Depth
125	3	131	102
160	2	167	120
	3	170	
	4	176	
	5	185	
200	2	210	145
	3	213	
	4	221	
	5	232	
225	2	235	160
	3	241	
	4	249	
	5	285	
250	2	261	175
	3	266	
	4	276	
	5	289	

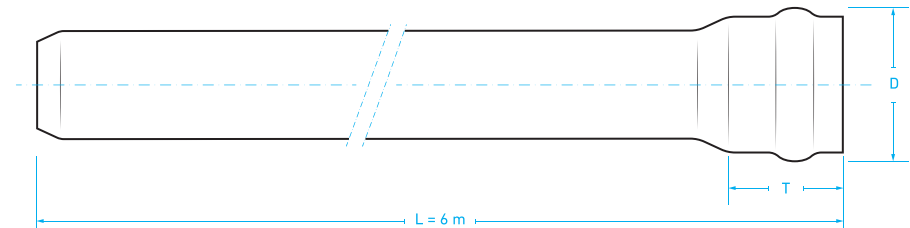


Rubber Joints Dimensions

Size (O.D)	Class	D : O.D of Socket	T: Socket Depth
63	3	84	105
	4	86	
	5	90	
75	3	99	108
	4	101	
	5	105	
90	3	116	112
	4	119	
	5	125	
110	3	139	118
	4	143	
	5	150	
160	3	195	135
	4	202	
	5	211	
200	3	242	150
	4	249	
	5	260	
225	3	268	155
	4	227	
	5	291	
250	3	296	166
	4	306	
	5	322	

أبعاد الوصلة ذات الحلقة المطاطية

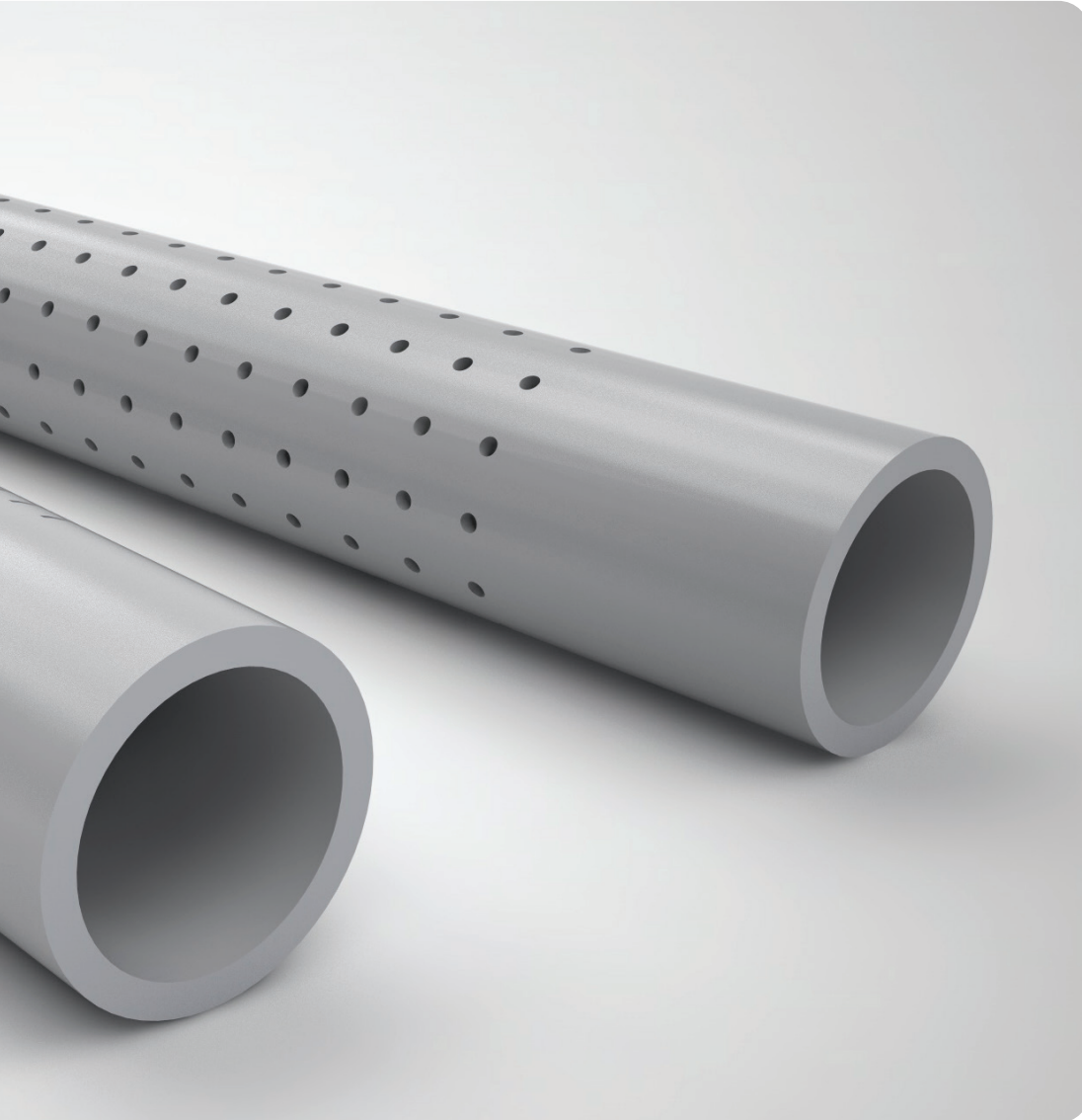
Size (O.D)	Class	D : O.D of Socket	T: Socket Depth
280	3	331	176
	4	342	
	5	361	
315	3	370	190
	4	383	
	5	403	
400	2	460	230
	3	470	
	4	481	
	5	515	



uPVC Sewer Pipes (Gravity) According to DIN 8061 / DIN 8062 Application : Sewer Pipe Gravity

Nominal Size (mm)	Outside Diameter mm		Wall Thickness mm		Weight Kg/m
	(D)	Tolerance	(S)	Tolerance	
110	110	0.3	3.2	+ 0.6	1.64
160	160	0.4	4.7	+ 0.7	3.440
200	200	0.4	5.9	+ 0.8	5.370
250	250	0.5	7.3	+ 1.0	8.310
315	315	0.6	9.2	+ 1.2	13.2
400	400	0.7	11.7	+ 1.4	21.1
500	500	0.9	14.6	+ 1.7	32.90
630	630	1.1	16.4	+ 2.2	52.2



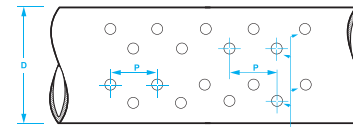


Perforated Pipes - الأنابيب المثقبة

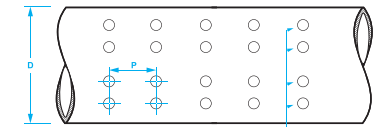
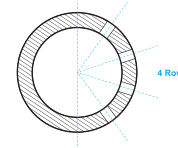
تستعمل أنابيب اليوبي في سي المثقبة لتخفيض منسوب المياه تحت التربة وهي على نوعين: 1 - أنابيب ذات صفوف متناظرة الثقوب . 2 - أنابيب ذات صفوف متناوبة الثقوب .

Perforated pipes used in sub soil drainage systems.

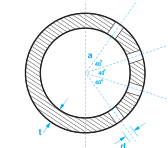
it is manufactured by tow types : 1 - Straight Rows. 2 - Staggered Rows.



Staggered Rows



Straight Rows



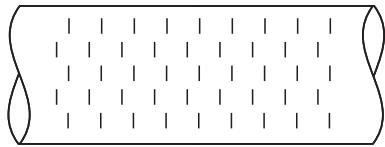
D	Outside Diameter 75mm - 400mm
P	Longitudinal Pitch of Holes 30mm - 200mm
N	Number of Rows 1 - 4
A	Angular Pitch of Holes. a = 40° for 3 or 4 Rows a = 80° or 120° for 2 Rows
R	Holes Diameter : 3mm - 13 mm

Depending on Pipe Diameter and As Per Customer Specifications .

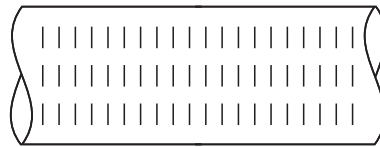
Slotted Pipes - الأنابيب المشققة

يتم إنتاج أنابيب الفسق المشقوق وفقا للمتطلبات وللاستخدام في خفض منسوب المياه الجوفية.

WP slotted pipes are produced according to requirements and for use in lowering the underground water table.



Staggered Slots



Straight Slots

Depend to the size

1 / 1.1 / 1.5 / 2 mm

4,6 & 8 (but according to the size)

To be recommended by consultant

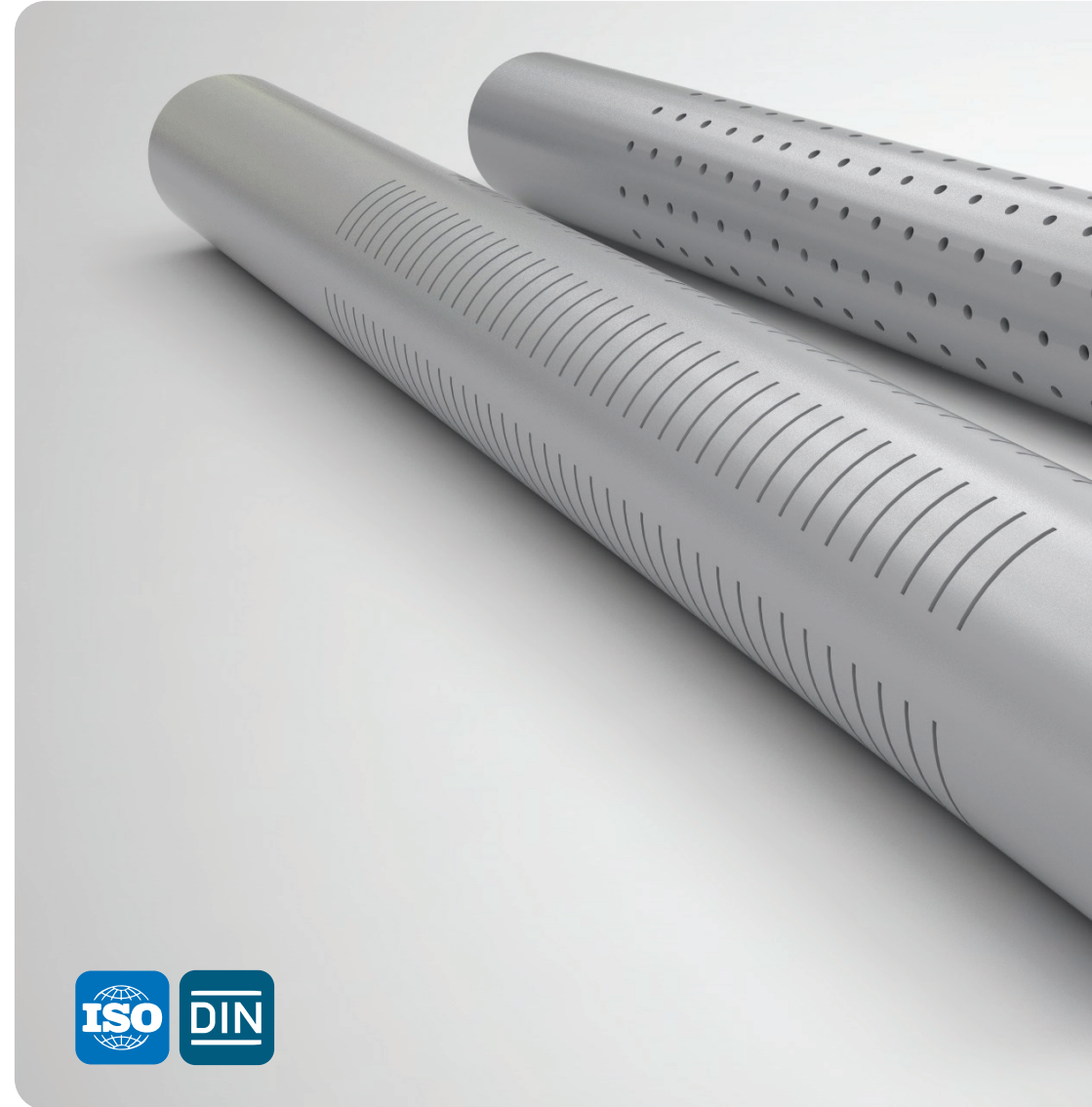
Slot Length

Slot Width

Number of Row

Angular Pitch

Depending on Pipe Diameter and As Per Customer Specifications .





PVC PIPE

POLYVINYL CHLORIDE

PVC Pipes - Electrical Conduits

PVC Conduits Rigid, Light Weight No Combustion, Excellent Electrical
According to SASO 254/ 1984

OUTSIDE DIAMETER (mm)	WALL THICKNESS	
	LIGHT GAUGE (mm)	HEAVY GAUGE (mm)
16	1.2	1.8
20	1.5	1.9
25	1.5	1.9
32	1.8	2.4
40	1.8	3.0
50	2.4	3.7

PVC Pipes - Electrical Conduits

PVC Electrical Conduits according to SASO 254/ 1984 Application : Electrical Installations.

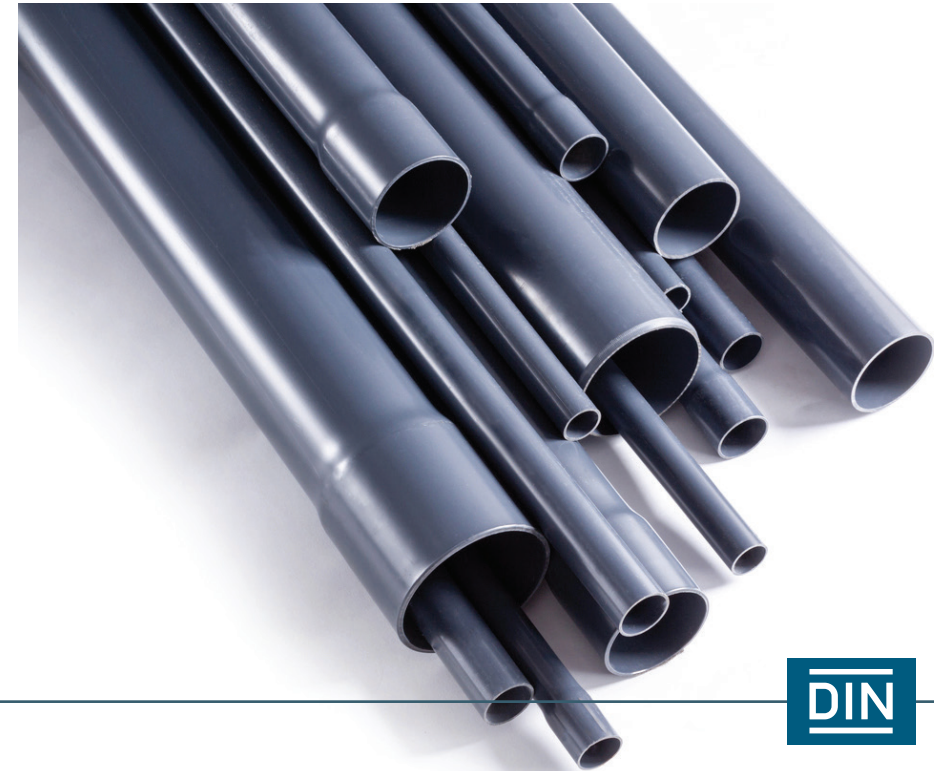
Nominal Size (mm)	Minimum Inside Diameter (mm)			Maximum Wall Thickness (mm)			Weight Kg/m		
	Light	Medium	Heavy	Light	Medium	Heavy	Light	Medium	Heavy
	Class 3	Class 4	Class 5	Class 3	Class 4	Class 5	Class 3	Class 4	Class 5
16	13.7	13.0	12.2	1.15	1.5	1.9	0.080	0.100	0.125
20	17.4	16.9	15.8	1.3	1.55	2.1	0.120	0.140	0.180
25	22.1	21.9	20.6	1.45	1.8	2.2	0.165	0.200	0.240
32	28.6	27.8	26.6	1.7	2.1	2.7	0.245	0.296	0.370
40	35.8	35.4	34.4	2.1	2.3	2.8	0.352	0.496	0.485
50	45.1	44.3	43.2	2.45	2.85	3.4	0.540	0.622	0.707
63	57.0	-	-	3.0	-	-	0.830	-	-

PVC Electrical Conduits according to SASO 14 & DIN 8061
 Applications : Electrical Installations.

مقاسات انابيب PVC لتمديد الكهرباء

Nominal OD mm	Class 2		Class 3	
	Wall Thickness (mm)	Weight Kg/m	Wall Thickness (mm)	Weight Kg/m
40	-	-	1.8	0.334
50	-	-	1.8	0.422
63	-	-	1.9	0.562
75	1.8	0.642	2.2	0.782
90	1.8	0.774	2.7	1.13
110	2.2	1.16	3.2	1.64
160	3.2	2.41	4.7	3.44
200	4.0	3.70	5.9	5.37
225	4.5	4.70	6.6	6.76
250	4.9	5.65	7.3	8.31
280	5.5	7.11	8.2	10.4
315	6.2	9.02	9.2	13.2
400	7.9	14.5	11.7	21.1

Nominal Size mm	Inside Diameter mm	Outer Diameter mm	
		Min.	Max
16	13.0	15.7	16
20	16.9	19.7	20
25	21.4	24.6	25
32	27.8	31.6	32



American standard specification

المواصفات القياسية الأمريكية



ASTM INTERNATIONAL

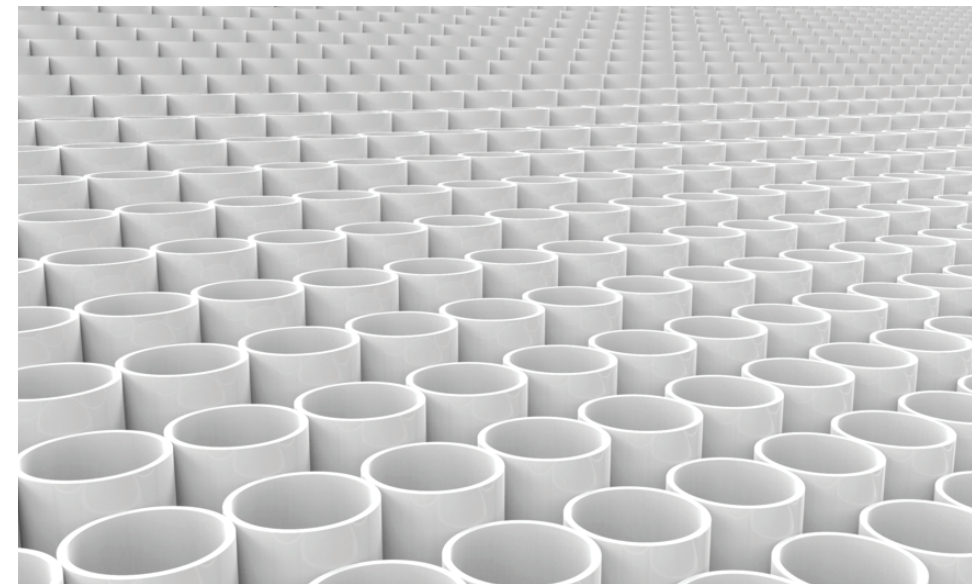


Dimensions of uPVC Pipes Manufactured to ASTM D1785 Specifications .

Nominal Pipe Size Inches	Outside Diameter mm	Schedule 40			Schedule 80		
		Wall Thickness mm	Working Pressure		Wall Thickness mm	Working Pressure	
			PSI	Bars		PSI	Bars
½	21.34 ± 0.10	2.77 + 0.51	600	41.3	3.73 + 0.51	850	58.6
¾	26.67 ± 0.10	2.87 + 0.51	480	33.1	3.91 + 0.51	690	47.5
1	33.40 ± 0.13	3.38 + 0.51	450	31.0	4.55 + 0.53	630	43.5
1¼	42.16 ± 0.13	3.56 + 0.51	370	25.5	4.85 + 0.58	520	35.8
1½	48.26 ± 0.15	3.68 + 0.51	330	22.8	5.08 + 0.61	470	32.4
2	60.32 ± 0.15	3.91 + 0.51	280	19.3	5.54 + 0.66	400	27.6
2½	73.02 ± 0.18	5.16 + 0.61	300	20.7	7.01 + 0.84	420	29.0
3	88.90 ± 0.20	5.49 + 0.66	260	17.9	7.62 + 0.91	370	25.5
3½	101.6 ± 0.20	5.74 + 0.68	240	16.5	8.08 + 0.96	350	24.1
4	114.30 ± 0.23	6.02 + 0.71	220	15.2	8.56 + 1.02	320	22.0
5	141.3 ± 0.25	6.55 + 0.79	190	13.1	9.52 + 1.14	290	20.0
6	168.28 ± 0.26	7.11 + 0.86	180	12.4	10.97 + 1.32	280	19.3

Dimensions of non-Pressure uPVC Pipes for Drain & Waste as per ASTM D2665

Nominal Size Inches	Outside Diameter mm	Wall Thickness mm
1¼	42.16 ± 0.13	3.56 + 0.51
1½	48.26 ± 0.15	3.68 + 0.51
2	60.33 ± 0.15	3.91 + 0.51
3	88.90 ± 0.20	5.49 + 0.66
4	114.30 ± 0.23	6.02 + 0.71
6	168.28 ± 0.28	7.11 + 0.86



Dimensions of uPVC Pipes Manufactured to ASTM D2241 Specifications .

Nominal Pipe Size	Out Side Diameter	Wall Thickness						
		mm						
Inches	mm	SDR 64	SDR 41	SDR 32.5	SDR 26	SDR 21	SDR 17	SDR 13.5
½	21.34 ± 0.10	-	-	-	-	-	-	1.57 + 0.51
¾	26.67 ± 0.10	-	-	-	-	1.52 + 0.51	1.57 + 0.51	1.98 + 0.51
1	33.40 ± 0.13	-	-	-	1.52 + 0.51	1.60 + 0.51	1.95 + 0.51	2.46 + 0.51
1¼	42.16 ± 0.13	-	-	1.52 + 0.51	1.62 + 0.51	2.00 + 0.51	2.49 + 0.51	3.12 + 0.51
1½	48.26 ± 0.15	-	-	1.52 + 0.51	1.85 + 0.51	2.28 + 0.51	2.84 + 0.51	3.58 + 0.51
2	60.32 ± 0.15	-	-	1.85 + 0.51	2.31 + 0.51	2.87 + 0.51	3.55 + 0.51	4.47 + 0.51
2½	73.02 ± 0.18	-	-	2.24 + 0.51	2.79 + 0.51	3.48 + 0.51	4.29 + 0.51	5.4 + 0.661
3	88.90 ± 0.20	-	2.16 + 0.51	2.74 + 0.51	3.43 + 0.51	4.24 + 0.51	5.23 + 0.63	6.58 + 0.78
3½	101.60 ± 0.20	-	2.49 + 0.51	3.12 + 0.51	3.91 + 0.51	4.83 + 0.58	5.97 + 0.71	7.5 + 0.91
4	114.30 ± 0.23	1.77 + 0.15	2.97 + 0.51	3.50 + 0.51	4.39 + 0.51	5.43 + 0.66	6.73 + 0.81	8.45 + 1.01

SDR - Standard Dimension Ratio. It is ratio of pipe Diameter to wall thickness



ASTM INTERNATIONAL



مقاسات أنابيب (uPVC) وفق المواصفات والمقاييس الأمريكية Dimensions of uPVC Pipes (Based on Astm D 1785 Schedule 40 & 80)

Nominal Size in Inch	O.D.MM		Schedule 40			Schedule 80		Weight Kg/m
			Thickness mm		Weight Kg/m	Thickness mm		
	Min.	Max	Min.	Max		Min.	Max	
½	21.2	21.44	2.8	3.3	0.24	3.7	4.2	0.31
¾	26.6	26.77	2.9	3.4	0.33	3.9	4.4	0.41
1	33.27	33.53	3.4	3.9	0.48	4.6	5.1	0.60
1¼	42.1	42.29	3.6	4.1	0.65	4.9	5.4	0.84
1½	48.1	48.4	3.7	4.2	0.77	5.1	5.7	1.03
2	60.2	60.5	3.9	4.4	1.04	5.5	6.2	1.41
3	88.7	89.1	5.5	6.2	2.14	7.6	8.5	2.88
4	114.1	114.5	6.0	6.7	3.05	8.6	9.6	4.22
6	168.0	168.6	7.1	8.0	5.37	11.0	12.3	8.05
8	218.7	219.4	8.2	9.2	8.11	12.7	12.9	-

PIPE - SDR	41	32.5	26	21	17	13.5
RATING P.S.I	100	125	160	200	250	315

Conforming to ASTM D2241
color white plain end or solvent socket standard length 6.0 meter.
PRESSURE RATING 23°C

Water Pressure ratings at 73°F (23°C) for Schedule 40 and 80 Plastic (psi) According to ASTM D1785

Nominal Pipe Size, Inch	Schedule 40	Schedule 80 Unthreaded
1/2	300	420
3/4	240	340
1	220	320
1 1/4	180	260
1 1/2	170	240
2	140	200
3	130	190
4	110	160
6	90	140
8	80	120



STANDARD DIMENSION RATIO PIPE (SDR) UPVC PIPES ACCORDING TO ASTM D 2241 - Application : Pressure pipes

Nominal Pipe Size Inch	Nominal Outside Diameter (mm)		Wall Thickness (mm) Standard Dimension Ratio (SDR)											
			41 W.P: 6.9 Bar		32.6 W.P: 8.6 Bar		26W.P: 11 Bar		21 W.P: 13.8 Bar		17 W.P: 17.2 Bar		13.5 W.P: 21.7 Bar	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
½	21.24	21.44	-	-	-	-	-	-	-	-	-	-	1.57	2.08
¾	26.57	26.77	-	-	-	-	-	-	1.52	2.03	1.57	2.08	1.98	2.49
1	33.27	33.53	-	-	-	-	1.52	2.03	1.60	2.11	1.96	2.46	2.46	2.97
1¼	42.03	42.29	-	-	1.52	2.03	1.63	2.13	2.01	2.52	2.49	3.00	3.12	3.63
1½	48.11	48.41	-	-	1.52	2.03	1.85	2.36	2.29	2.80	2.84	3.35	3.58	4.09
2	60.17	60.47	-	-	1.85	2.36	2.31	2.82	2.87	3.38	3.56	4.06	4.47	4.98
3	88.70	89.10	2.16	2.67	2.74	3.25	3.43	3.94	4.24	4.75	5.23	5.87	6.58	7.37
4	114.07	114.53	2.80	3.30	3.51	4.01	4.39	4.90	5.44	6.10	6.73	7.54	8.46	9.49
6	168.0	168.56	4.11	4.62	5.18	5.79	6.48	7.26	8.03	9.00	9.91	11.10	12.47	13.97
8	218.7	219.46	5.33	5.97	6.73	7.54	8.43	9.45	10.41	11.66	12.90	14.45	-	-

CPVC PIPE

CHLORINATED POLYVINYL CHLORIDE HOT WATER PIPES

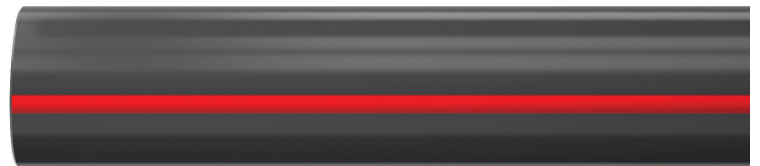
أنابيب (cPVC) للمياه الساخنة

ان أنابيب (سي بي في سي) المصنعة من مركب عديد كلورايد الفينيل (cPVC) تستخدم لتوصيل المياه الساخنة التي تصل درجة حرارتها إلى درجة الغليان كما أنه يمكن استخدامها في توصيلات للمياه الباردة وتلائم الظروف البيئية والجوية لمنطقتنا الجغرافية بكفاءة تفوق كافة أنواع الأنابيب الأخرى بتكلفة منخفضة بالإضافة الى زيادة الأمان .

C-PVC PIPES for Hot Water

cPVC pipes (Chlorinated Polyvinyl Chloride) are used in hot systems, where temperature degree could reach boiling levels as well as cold water distribution systems.

It combine performance, durability and cost savings in addition to safety.



Dimension of cPVC Pipes Based on ASTM F 441 Pressure Rating
Applies for Water at 23°C and for Unthreaded Pipes SASO 1517 / 1999

Nominal Size In Inch	Outside Diameter		Schedule 80 Minimum Wall Thickness		Nominal Weight Kg / m	Water Pressure Rating	
	Inch	mm	Inch	mm		Psi	Bar
¼	0.540	13.7	0.119	3.02	0.230	1130	77.8
½	0.840	21.34	0.147	3.73	0.337	850	58.6
¾	1.050	26.67	0.154	3.91	0.457	690	47.6
1	1.315	33.40	0.179	4.55	0.671	630	43.4
1¼	1.660	42.20	0.191	4.85	0.928	520	35.9
1½	1.900	48.30	0.200	5.08	1.13	470	32.4
2	2.375	60.33	0.218	5.54	1.56	400	27.6
3	3.500	88.9	0.300	7.62	2.9	370	25.5
4	4.500	114.3	0.337	9.52	4.3	320	22.1
6	6.625	168.3	0.432	10.97	8.1	280	19.3

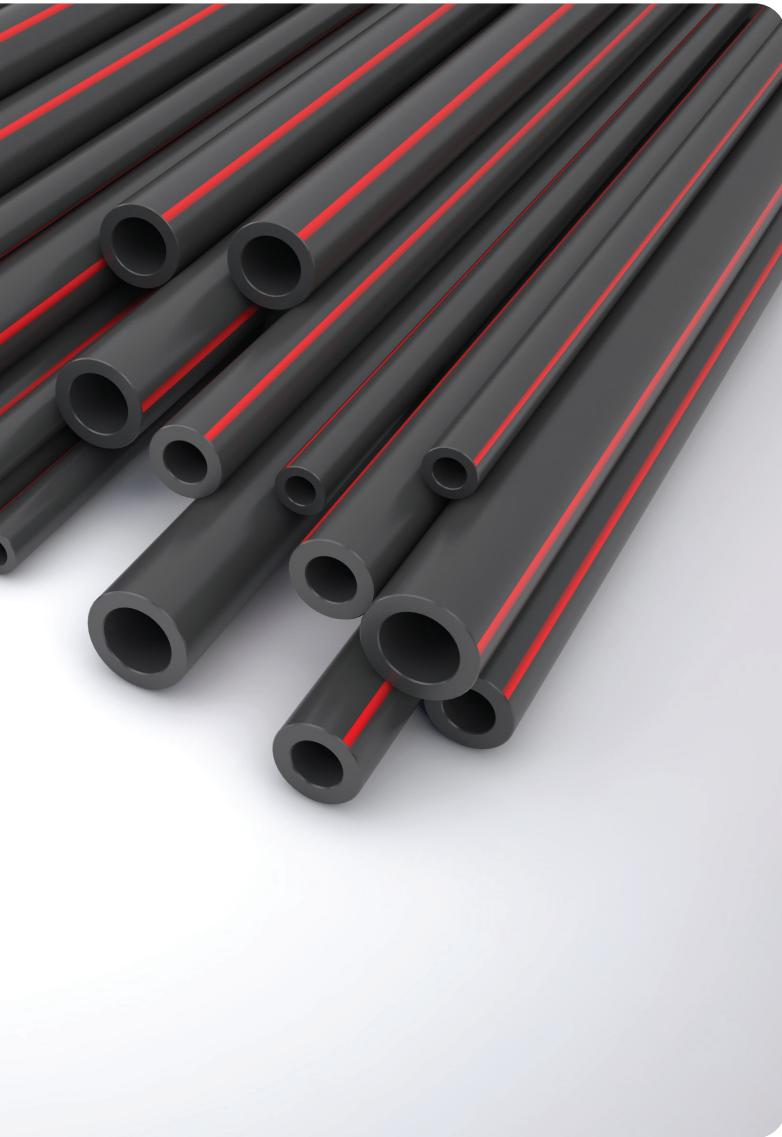
(جدول تقييم ضغط الماء دخل مواسير ال (سى بي فى سى

Water Pressure Ratings for cPVC Pipes According to standard Blow in the table

 Water Pressure Ratings at 180°F (82°C) for cPVC Pipe
 Schedule 40 and 80 (psi) According to ASTM F 441 SASO 1517 / 1999

Nominal Diameter in Inch	Schedule 40	Schedule 80 Unthreaded
¼	195 - 1340	280 - 1930
½	150 - 1030	210 - 1450
¾	120 - 830	170 - 1170
1	110 - 760	155 - 1070
1¼	90 - 650	130 - 960
1½	80 - 550	115 - 790
2	70 - 480	100- 690
3	65 - 450	90 - 620
4	55 - 380	80 - 530
6	45- 310	70 - 480





Chlorinated Polyvinyl Chloride HOT WATER PIPES

Dimension of cPVC Pipes Based on ASTM F 441 Pressure Rating Applies for Water at 23°C and for Unthreaded Pipes SASO 1517 / 1999

Nominal Size In Inch	Outside Diameter		Schedule 80 Minimum Wall Thickness		Nominal Weight Kg / m	Water Pressure Rating	
	Inch	mm	Inch	mm		Psi	Bar
½	0.840	21.34	0.147	3.73	0.337	850	58.6
¾	1.050	26.67	0.154	3.91	0.457	690	47.6
1	1.315	33.40	0.179	4.55	0.671	630	43.4
1¼	1.660	42.20	0.191	4.85	0.928	520	35.9
1½	1.900	48.30	0.200	5.08	1.13	470	32.4
2	2.375	60.33	0.218	5.54	1.56	400	27.6
3	3.500	88.9	0.300	7.62	2.9	370	25.5
4	4.500	114.3	0.337	9.52	4.3	320	22.1

مقاسات أنابيب (cPVC) وفق المواصفات والمقاييس الامريكية

Dimensions of cPVC Pipes (Based on Astm F 441 Schedule 40 & 80) SASO 1517 / 1999

Nominal Size in Inch	O.D.MM		Schedule 40			Schedule 80		
			Thickness mm		Weight Kg/m	Thickness mm		Weight Kg/m
	Min.	Max	Min.	Max		Min.	Max	
½	21.2	21.4	2.8	3.3	0.269	3.7	4.2	0.336
¾	26.6	26.8	2.9	3.4	0.359	3.9	4.4	0.457
1	33.4	33.5	3.4	3.9	0.527	4.6	5.1	0.671
1¼	42.1	42.3	3.6	4.1	0.713	4.9	5.4	0.928
1½	48.1	48.4	3.7	4.2	0.851	5.1	5.7	1.13
2	60.2	60.5	3.9	4.4	1.14	5.5	6.2	1.56
3	88.7	89.1	5.5	6.2	2.36	7.6	8.5	3.18
4	114.1	114.5	6.0	6.7	3.35	8.6	9.6	4.65
6	168.0	168.6	7.1	8.0	5.91	11.0	12.3	8.88



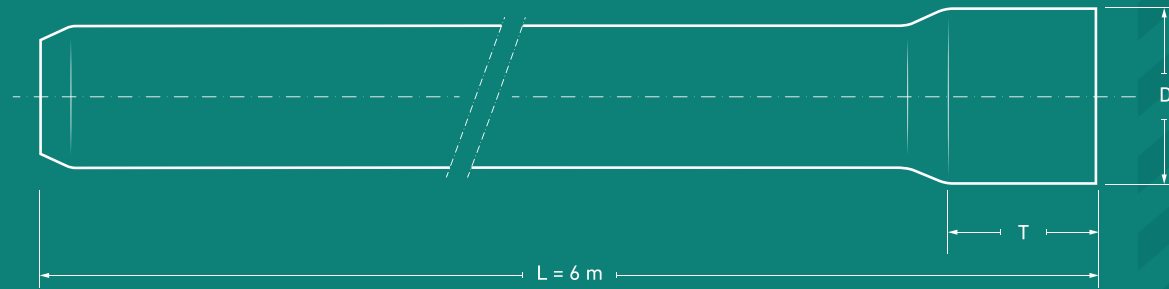
CPVC PIPES

Electrical Plastic Tubing (EPT) and Conduit (EPC - 40 and EPD - 80) NEMA STANDARD

المواصفات القياسية الأمريكية (نيمما)



V





Electrical Plastic Tubing (EPT) and Conduit (EPC - 40 and EPD - 80) NEMA STANDARD

Introduction

Al-Watania Plastic Industries One of the major manufactures of plastic products in the Kingdom of Saudi Arabia established in 1984 to produce various kinds of Plastic products. One of plasco main product is rigid PVC conduits according to American NEMA standard.

Material

Material of Electrical Plastic Conduit Pipe According to (NEMA) standard from rigid Polyvinyl Chloride (PVC) .

The plastic compound used in manufacturing is according to ASTM D1784.and the color shall be gray color.

Dimensions & Sizes

NEMA TC2 Eletrical plastic Tube (EPT) and conduit EPC-40 and EPC-80 sizes and Dimensions enclosed, according to specifications TC21983- is shown in Table #11.

NEMA TC-6 plastic duct for under ground installations. Sizes and dimensions is shown in Table # 12 .

NEMA TC-8 Extra strength plastic duct for under ground installations. Sizes and dimensions is shown in Table # 13

To assure and maintain high Quality of products, Al-Watania Plastic have a well-experienced quality control team and strict production control system in the

quality control laboratories using high technology tools to ensure the best and high quality products. Al-Watania Plastic meets ARAMCO standards, ISO 9002 quality certification achieved on 1998, and achieved SASO (Saudi Arabian Standards Organization) cerification and achieve NSF 61 Certifecat 2014 .

Chemical Resistance

Unlike Metallic conduits, **Al-Watania Plastic** PVC conduits are totally resistant to corrosive fluids , wide range of acids , alkalin, soil and all kinds of water.

Usages

Rigid PVC conduits being a non-conductor of electricity is an ideal media designed to suit for concrete encasement as well as for direct burial applications of power supply, telecommunications, street lighting and network distribution.

Technical Properties For NEMA

Material Properties	
Material	Polyvinyl Chlorid (PVC)

Material Properties	
Specific Gravity	1.42 gm/ cm ³
Flammability	Self Extinguishing
Water Absorption	< 4mg /Cm ²

Material Properties	
ZOD Impact Strength	4.0 ft lb/In Notch
Tensile Strength	7500 p.s.i.
Flexural Strength	13500 p.s.i.
Modulus of Elasticity	5.0 X 10 ⁵ p.s.i.
Flattening	No Splitting

Material Properties	
Vicat Softening Point 5KG	> 80 C
Thermal Conductivity	0.13 k Cal / m.h. C
CO-Efficient of linear	5.0 X 10 ⁻⁵ / C
Expansion	-
Specifi Heat	0.25 Cal / C

Material Properties	
Dielectric Strength	> 40 kv /mm
Surface Resistivity	> 10 chm
Volume Resistivity	> 10 chm.cm

DIMENSION of PVC TUBING AND CONDUIT for above and below ground use
Dimensions Based on NEMA TC2

Nominal Size " Inch	Average outside diameter mm	EPT - A - PVC		EPC - 40 - PVC		EPC - 80 - PVC	
		Wall Thickness (Min) mm	wall thickness (Max) mm	Wall Thickness (Min) mm	wall thickness (Max) mm	Wall Thickness (Min) mm	wall thickness (Max) mm
½	21.34	1.52	2.03	2.77	3.28	3.73	4.24
¾	26.67	1.52	2.03	2.87	3.38	3.91	4.42
1	33.40	1.52	2.03	3.38	3.89	4.55	5.08
1¼	42.16	1.78	2.29	3.56	4.06	4.85	5.43
1½	48.26	2.03	2.54	3.68	4.19	5.08	5.69
2	60.32	2.54	3.05	3.91	4.42	5.54	6.20
3	88.90	3.18	3.68	5.49	6.15	7.62	8.53
4	114.30	3.81	4.32	6.02	6.73	8.56	9.58
6	168.28	-	-	7.11	7.98	10.97	12.29

EPT - A Electrical Plastic Tubing - Designed to be encased in concrete.
 EPT - 40 Electrical Plastic Conduit - Designed for normal duty application.
 EPT - 80 Electrical Plastic Conduit - Designed for heavy duty application.
 All EPC - A - PVC and EPC - 40 - PVC and EPC - 80 - PVC shall be gray color.



U-PVC PIPES - NEMA

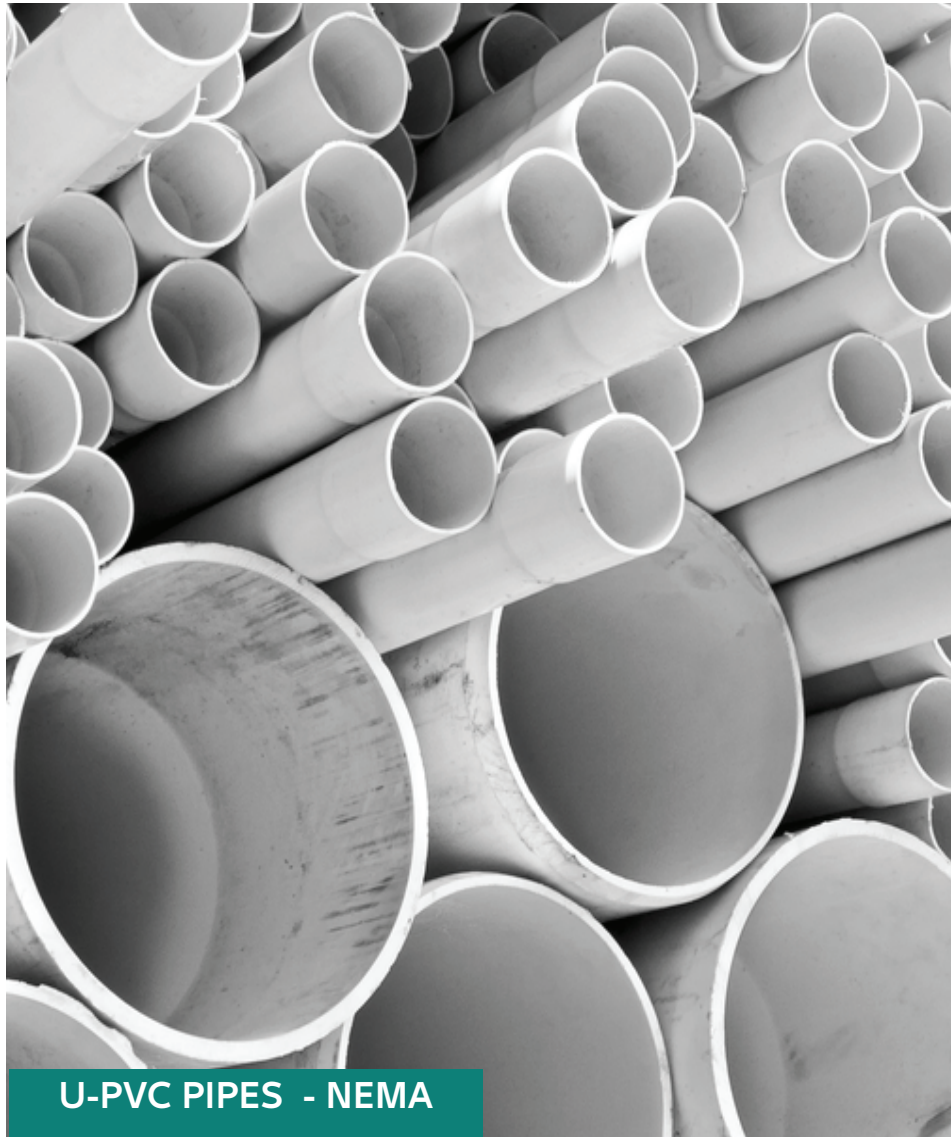
Rigid PVC Utilites Duct for Underground Installation Dimensions Based on NEMA TC6

Nominal Size Inch	Average Outside Diameter mm	PVC - Type EB		PVC - Type DB	
		Wall Thickness (Min)	Nominal Weight kg / m	Wall Thickness (Min)	Nominal Weight kg / m
2	60.32	1.52	0.463	1.52	0.465
3	88.90	1.55	0.702	2.34	1.00
4	114.30	2.08	1.17	3.07	1.65
6	168.28	3.18	2.53	4.62	3.57

Rigid PVC Extra Strength Utilites Duct for Underground Installation Dimensions Based on NEMA TC8

Nominal Size Inch	Average Outside Diameter mm	PVC - Type EB		PVC - Type DB	
		Wall Thickness (Min)	Nominal Weight kg / m	Wall Thickness (Min)	Nominal Weight kg / m
1	33.40	-	-	1.52	0.251
1½	48.26	-	-	1.52	0.369
2	60.32	1.52	0.485	1.96	0.576
3	88.90	1.93	0.847	3.00	1.25
4	114.30	2.54	1.30	3.91	2.06
6	168.28	3.86	3.02	5.77	4.42





U-PVC PIPES - NEMA

Al-Watania Plastics PVC Utilities Duct for Underground Installation.

NEMA TC- 6 and ASTM F512 Dimension PVC Type EB 20					
Nom Pipe Size Inch	Outside Die	Wall Thick (Minimum)	Net Weight	Wall Thick	Net Weight
Inch	mm	mm	Kgs / M	Min. mm	Kgs / M
2	60.32	1.52	0.463	1.52	0.465
3	88.90	1.55	0.702	2.34	1.000
4	114.30	2.08	1.170	3.07	1.650
5	141.30	2.62	1.710	3.86	2.500
6	168.28	3.18	2.530	4.62	3.570

- Type EB for Encased Burial in Concrete.
- Type DB for Direct Burial without Concrete.

Al-Watania Plastics PVC Extra Strength for Underground Installation.

NEMA TC- 8 and ASTM F512 Dimension					
Nom Pipe Size Inch	Outside Die	Wall Thick (Minimum)	Net Weight	Wall Thick	Net Weight
Inch	mm	mm	Kgs / M	Min. mm	Kgs / M
1	33.40	-	-	1.52	0.251
1½	48.26	-	-	1.52	0.369
2	60.32	1.52	0.465	1.96	0.576
3	88.90	1.93	0.847	3.00	1.250
4	114.30	2.54	1.390	3.91	2.050
5	141.30	3.20	2.090	4.85	3.120
6	168.28	3.86	3.020	5.77	4.420

Al-Watania Plastics Rigid PVC Electrical Plastic Tubing (EPT) & Conduit (EPC - 40 and EPC - 80)
NEMA TC- 6 and ASTM F512 Dimension PVC Type EB 20

Nominal	Outside		EPT - A - PVC		EPC - 40 - PVC		EPC - 80 - PVC	
Pipe Size	Dia		W/Thick	N.Weight	W/T	N.Weight	W/T	N.Weight
Inch	Inch	mm	mm	Kgs/M	mm	Kgs/M	mm	Kgs/M
½	0.840	21.340	1.52	0.155	2.77	0.248	3.73	0.309
¾	1.050	26.670	1.52	0.197	2.87	0.329	3.91	0.418
1	1.315	33.400	1.52	0.250	3.38	0.483	4.55	0.614
1¼	1.660	42.160	1.78	0.365	3.56	0.652	4.85	0.850
1½	1.900	48.260	2.03	0.468	3.68	0.779	5.08	1.030
2	2.376	60.320	2.54	0.717	3.91	1.040	5.54	1.430
2½	2.876	73.020	2.79	0.952	5.16	1.650	7.01	2.180
3	3.502	88.900	3.18	1.310	5.49	2.160	7.62	2.900
4	4.503	114.30	3.81	2.000	6.02	3.070	8.56	4.260
5	5.567	141.30	-	-	6.55	4.170	9.52	5.910
6	6.629	168.28	-	-	7.11	5.410	10.97	8.130
8	8.631	219.08	-	-	8.18	8.143	12.70	12.40



- EPT - A - PVC Electrical Plastic Tubing for encasement in concrete.
- EPC 40 (Sch 80) Electrical Plastic Conduit for normal duty.
- EPC 80 (Sch 80) Electrical Plastic Conduit for heavy duty.

British standard specification

المواصفات القياسية البريطانية



IV



Class	B	C	D	E	O
Bar	6	9	12	15	Non Pressure

Note : 2% of rated pressure should be reduced for each 1°C rise above 20°C

Size - Inch	Pressure Rating Bar	
	Class 6	Class 7
½	28	40
¾	22	32
1	24	32
1¼	20	28
1½	18	25
2	-	22

Manufactured to : BS 3505 / Classes B, C, D & E, BS 3506, Classes 0, 6 & 7

Standard Length : 5.8 and 6 meters

Color : Grey (except Class 0 which is white & Class B in black)

Soket : Solvent weld

: Plain - end

1 - A wide range of compatible fittings manufactured to BS 4346 part 1 by Durapipe (U.K) are available.

2 - Class D pipes are non - stock items, can be produced on request.





Quality Control Testing

Al-Watania PVC Factory is equipped with a testing laboratory having a fully trained staff for evaluation of raw materials and finished pipes.

In order to maintain uniform quality level, all our routine control tests are carried out as per SAS, and DIN Standards.



إختبارات الجودة

لقد زود مصنع بلاستيك الوطنية بمختبرات على أعلى المستويات الفنية تحت إشراف مجموعة من المختصين من ذوي الخبرة ليؤكدوا أفضل مستويات الجودة بدءاً من المواد الأولية وانتهاءً بالأنابيب الجاهزة للاستعمال .

إن هذه المجموعة تعمل وبكل كفاءة لتبقى أنابيب الوطنية بجودتها المميزة و المطابقة بمواصفاتها لنظام المواصفات السعودية المتفق مع نظام المواصفات الألماني .



APPENDIX TO CERTIFICATE OF REGISTRATION

Al Watania Plastics

This appendix identifies the locations covered by the management system of:

Al Watania Plastics

This appendix is linked to the Main Certificate # QMS 180125-01 and cannot be shown nor reproduced without it.

Al Watania Plastics

Block No. 2016, M. 41, 2nd Industrial City, Riyadh, Kingdom of Saudi Arabia

Manufacture of Disposable Plastic Products by Thermo Forming and Injection Molding Methods

CERTIFICATE OF REGISTRATION

Al Watania Plastics

This is to certify that the management system of:

Al Watania Plastics

Main Site: New Strategy Industrial Zone, Street 202, Post Box- 10164, Riyadh - 11483, Kingdom of Saudi Arabia

See appendix for additional sites and additional site types.

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

ISO 9001:2015

The management system is applicable to:

Manufacture of Plastic Products including PVC Pipes, PPR Pipes, Flexible Packaging, Blow Film, Cap Irrigation Tape for Extension, Injection Molding, Blow Molding, and Thermo Forming Methods

Cafin Middle East
Product: Business Assurance
Intertek Certificate issued: 04 February 2020
Valid until: 04 February 2023

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Main Site: New Strategy Industrial Zone, Street 202, Post Box- 10164, Riyadh - 11483, Kingdom of Saudi Arabia

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

ISO 14001:2015

The management system is applicable to:

Manufacture of Plastic Products including PVC Pipes, PPR Pipes, Flexible Packaging, Blow Film, Cap Irrigation Tape for Extension, Injection Molding, Blow Molding and Thermo Forming Methods

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Product: Business Assurance
Intertek Certificate issued: 04 February 2020
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See appendix for additional sites and additional site types.

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

OHSAS 18001:2007

The management system is applicable to:

Manufacture of Plastic Products including PVC Pipes, PPR Pipes, Flexible Packaging, Blow Film, Cap Irrigation Tape for Extension, Injection Molding, Blow Molding, and Thermo Forming Methods

Cafin Middle East
Product: Business Assurance
Intertek Certificate issued: 04 February 2020
Valid until: 04 February 2023

AL WATANIA CERTIFICATES

CERTIFICATE
No. 9660262

This is to certify the Food Safety Management System of:

AL WATANIA PLASTICS

Block No. 2016, M. 41, 2nd Industrial City, Riyadh, Kingdom of Saudi Arabia

has been assessed and found to be in compliance with the Standard:

ISO 22000:2005

applicable to:

Manufacture of Plastic products for food packaging applications including Flexible Packaging, Blow Film, Injection Molding & Thermo-forming Methods.

The certificate has been issued under no. **9660262** for the registration period from 15 November 2019 to 14 November 2021

CERTIFICATE
No. 9660262

This is to certify the Food Safety Management System of:

AL WATANIA PLASTICS

Block No. 2016, M. 41, 2nd Industrial City, Riyadh, Kingdom of Saudi Arabia

has been assessed and found to be in compliance with the Standard:

ISO 22000:2005

applicable to:

Manufacture of Plastic products for food packaging applications including Flexible Packaging, Blow Film, Injection Molding & Thermo-forming Methods.

The certificate has been issued under no. **9660262** for the registration period from 15 November 2019 to 14 November 2021

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ISO 22000:2005

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Manufacture of Plastic products for food packaging applications including Flexible Packaging, Blow Film, Injection Molding & Thermo-forming Methods.

The certificate has been issued under no. **9660262** for the registration period from 15 November 2019 to 14 November 2021

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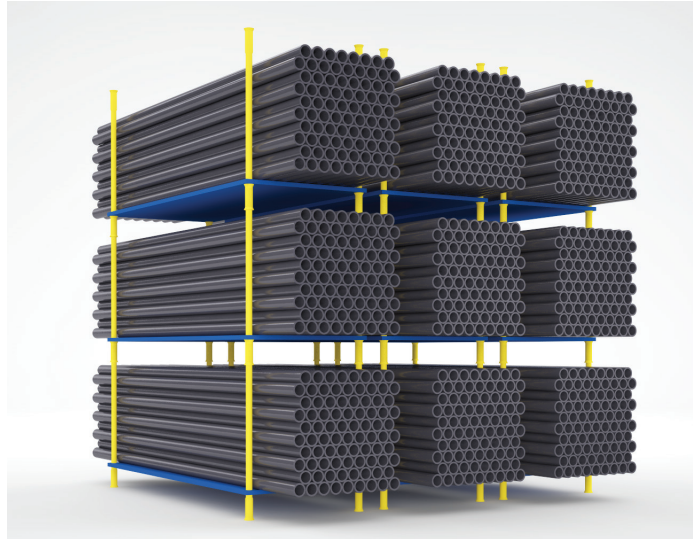
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التحميل و التخزين

مواسير الوطنية بي في سي ، يجب نقلها وتحميلها وتنزيلها بكل عناية وإهتمام لتجنب حدوث أية أضرار ميكانيكية أثناء ذلك ، ويجب تكديسها على شكل طبقات وبحيث تكون المواسير بعكس بعضها وكما هو موضح بالصور ولا يجب رصها بكميات كبيرة خاصة عند درجات حرارة مرتفعة حتى لا يؤدي ذلك الى اية إنبعاجات أو تلف في الوصلات .
وفي حال تخزينها في مستودعات ولمدة طويلة يجب وضعها على أرضية مستقيمة أو عوارض أو دعائم مستقيمة لا يقل عرضها عن 75 ملم وأن لا يزيد المسافات بين الدعائم عن متر واحد ويجب أيضاً أن لا يزيد ارتفاع الرصة عن 7 طبقات أو 1,75 متر أيها أقل ، وفي حال رص أصناف مختلفة يجب أن تكون الاصناف من النوع الواحد في نفس الصف و الأصناف ذات السماكة الأعلى في الأسفل .

Handling & Storage

U-PVC Shold be handled with care to avoid mechanical damage before installation. pipes should not be stacked in large pipes especially as under warm temperature condition the bottom pipes may distort, thus giving rise to difficulty in pipe alignment and joining at sites.

Socketed pipes should be stacked in layers with sockets placed at alternate ends of the stack and with sockets protuding so as to avoid lop - sided stacks and the imparting of a permanent set to the pipes.

For long term storage, the pipes should be stored either on flat level floors or pipe racks which provide continous support. If this is not possible supports of at least 75mm bearing width at spacing not greater than 1 meter centres should be placed beneath the pipes.

In such racks the pipes may be stored not more than seven layers high or max 1.75 meters whichever is lower if different classes of pipes are kept in the same rack then the thickest classes must always be at the bottom.

التخزين في الموقع

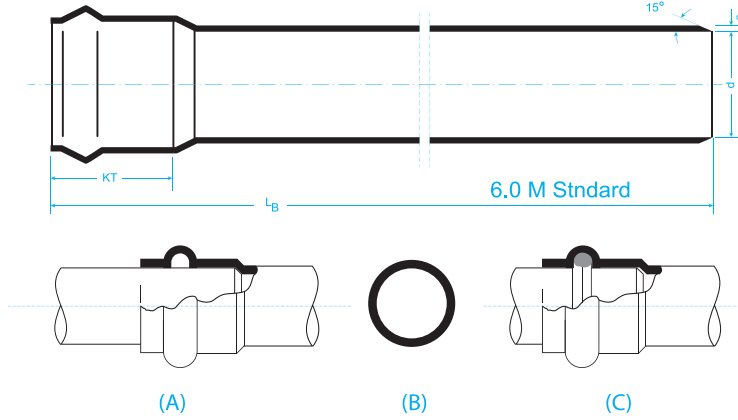
يجب الاهتمام في تخزين المواسير في مواقع العمل والتنفيذ بحيث يتم وضع المواسير على أرضية مستقيمة خالية من الأحجار ولا يجب أن يزيد تكديسها عن ثلاث طبقات ويجب ان تكون المواسير في جميع الأحوال محمية من أشعة الشمس المباشرة ومن درجات الحرارة العالية خاصة في فصل الصيف .

Field Storage

For temporary storage in the field / site where racks are not provided, care should be taken that the ground is level and free from loose stones.

Pipes stored in the field should not exceed three layers and should be either stored in the shade or covered to prevent excess heating under direct sunlight when the temperature of dark colored UPVC pipes can reach 60oC to 70oC in summer.

uPVC Pipe with wallthickened socket joint (Rubber Joint)
of unplasticized Poly vinyl chloride (uPVC) .



- يجب تأكد من أن نهاية الانبوبة والوصله خاليان من الغبار ، وجافة .
- دخل الأنبوبة في الوصله بدون الحلقة المطاطية ثم ضع علامة على الأنبوب عند إدخاله بالكامل.
- ثم ضع الحلقة المطاطية في فتحة التجويف
- يجب ان تكون نهاية الماسورة مشطوفة بحيث يمكنها الدخول في نهاية الماسورة الاخرى بسهولة
- ادخل الأنبوب في الجلبة إلى العلامة التي تم إجراؤها مسبقًا.

- Ensure that the spigot and socket are free from dust, and as dry as possible .
- Insert pipe into the socket without seal ring place and mark pipe when it fully inserted.
- Place seal in groove of socket ensuring that seal is correct way round .
- Must be the end of the pipe chamfered , so be viable to enter into the other end of the pipe easily.
- Push the pipe firmly into the socket up to the insertion mark previously made .

طرق التركيب

تتوفر أنابيب الوطنية بأطوال قياسية بطول 6 أمتار. ويمكن توفيرها بأطوال أخرى حسب طلب العميل .

توصيل الأنابيب :

يتم توصيل أنابيب الوطنية بطرق عديدة:

- 1 - انبواب ذات نهاية عادية (PE) مع وصلات منفصلة.
- 2 - انبوبة ذات الحلقة المطاطية (RR)
- 3 - انبواب ذات وصلة غراء (SC)

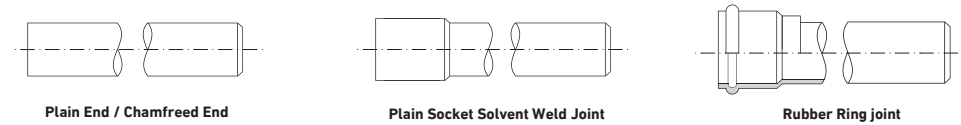
يمكن توفير الأنابيب مع طرفي النهايات مشنفرة (DC) بأطوال 6 أمتار أو أطول مختلفة ، حسب الطلب .

Installation

Al-Watania pipes are available in nominal standard lengths of 6 meters. Other lengths can be supplied by arrangement customer requiremnt.

Pipe Joint- Al-Watania pipes are supplied with various joint system.

Plain Ended (PE) pipe for use with separate Couplings, Rubber Ring, Solvent (Adhesive) Weld or Special Fittings. Pipe can also be supplied with both ends chamfered (DC) if requested, in lengths of 6 metres ather lengths can be supplied.



توصيل الحلقات المطاطية (RRJ) :

يتم تصنيع الانابيب بنهاية ذات تجويف داخلي لوضع حلقة مطاطية مانعة للتسرب.

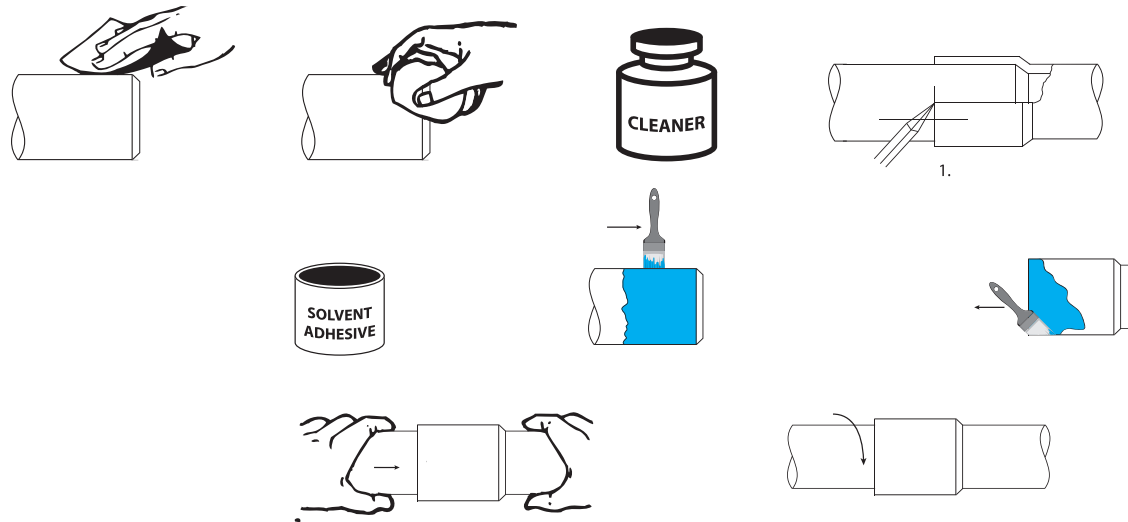
Rubber ring joints (R/J).

Pipes are supplied with integral grooved socket at one end incorporating elastomeric sealing ring.

Pipes up to 110 mm may be jointed easily with solvent adhesives.

Larger sizes require more special techniques and require tow men to make such joints.

- 1- Jointing Procedure. Mark depth of entry of the pipe into the socket and alignment mark.
- 2- Make small chamfer on the edge of the pipe and with medium file.
- 3- Roughen the outside of the pipe and the inside of the socket using sand paper or emery cloth upto the entry mark.
- 4- Clean both surfaces and remove all dust, grease and swaerf using a dry clean cloth and cleaner.
- 5- Stir adhesive thoroughly.
- 6- Apply adhesive without delay after cleaning , using a flat clean brush .



- 7- Immediately insert the pipe into the socket up to the entry mark, align pipe and socket. Hold in position for a few seconds, then wipe off excess cement (DO NOT TWIST).

يمكن توصيل المواسير حتى 110 مم بسهولة باستخدام المواد اللاصقة المذيبة.

تتطلب الأحجام الأكبر تقنيات أكثر خصوصية وتتطلب من الفنيين سحب هذه الوصلات .

- 1 - إجراءات الربط: ضع علامة على دخول الأنبوب في الجلبة وعلامة المحاذاة.
- 2 - جعل الشطب الصغير على حافة الأنبوب وفي الوسط تماماً .
- 3- قم بتخشين الجزء الخارجي من الأنبوب والجزء الداخلي من المقبس باستخدام ورق الصنفرة حتى علامة الإدخال.
- 4- نظف السطح الخارجي ، و قم بإزالة جميع الأتربة والشحوم باستخدام قطعة قماش نظيفة.
5. تحرك المادة اللاصقة جيداً.
- 6- ضع المادة اللاصقة دون تأخير بعد التنظيف باستخدام فرشاة نظيفة.

- 7 - قم بإدخال نهاية الأنبوب على الفور حتى يصل إلى علامة الإدخال ، قم بمحاذاة الأنبوب والمقبس.
- قم بتثبيتها على هذا الوضع لبضع ثوان ، ثم امسح الغراء الفائض مع مراعاة عدم لف الأنبوب في أي اتجاه .

