# Saudi Hepco LLC

## Into the New Age with PVC

PVC Pipes

Technical & Product Guide


ج
علامة الجودة
SASO
QUALITY MARK

# Content

# Introduction

Saudi Hepco LLC was established in 2002 to manufacture a wide range of plastic pipes and pipe fittings.

Saudi Hepco's uPVC pipes and fittings are resistant to almost all types of corrosion, whether chemical or electro-chemical in nature. Since uPVC is a non-conductor, galvanitic and electrochemical 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 attack uPVC in any way.

Saudi Hepco's 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.

Saudi Hepco water main Loc-Ring integral socket manufactured to the highest standards incorporate a double compression seal which is resistant to both positive and negative pressures.

# المقدمـة

هيبـكـو السعودية شركة ذات مسئولية محدودة تمّ تأسيسهـا في عام ٢٠٠٢ م وذلك لتصنيع مجموعة واسعة من الأنابيب البلاستيكية والأنابيب وتجهيزاتهـا .

إنّ منتجات شركة هيبـكـو السعودية من الأنابيب وتجهيزاتهـا تتميز بأنها مقاومة لجميع أنواع التآكل سواء أكان كيميائي أو التي بطبيعتها كهر وكيميائية . حيث أن أنابيب عديد كلوريد الفينيل عازلة للكهرباء، فإن تأثيرات الجلفنة والكهروكيمياء لاتحدث في أنظمة أنابيب عديد كلوريد الفينيل.

ولأن هذه الأنابيب غير معدنية ، فإن المواد مقاومة تماماً لجميع أشكال التآكل المعدني . وكذلك المياه المسببة للتآكل الناتجة من الأتربة الغنية بالكبريت والمياه القليله الكالسيوم والبوتاسيوم لن تؤثر على هذه الأنابيب بأي حال.

ويمكن أيضاً اعتبار الأنابيب والتجهيزات التي يتم تصنيعها بواسطة هيبـكـو السعودية مقاومة لمجموعة كبيرة من المياه والمواد الكيميائية الصناعية ، ويمكن أن توفر مزايا على المدى الطويل لنظام الحياة وتكاليف الصيانة.

إن نظام توصيل أنابيب مياه الشرب الذي تم تصنيعه بواسطة شركة هيبكو السعودية هو نظام إغلاق متكامل تم تصنيعه لمطابقة أعلى المعايير ويحتوي على سداد محكم بضغط مزدوج لمقاومة الضغوطات الإيجابية والسلبية .

# About Us

SAUDI HEPCO is one of the leadings Company in Kingdom of Saudi Arabia to start manufacturing of PVC / uPVC Pipes and Fittings.

HEPCO has a professional management team and an experienced and competent workforce. Competition is intense in pipe business demanding high standards, thus we apply stringent quality control programs to ensure that all our pipes meet Saudi and International classification requirements, and are fit for the purpose.

HEPCO's policy is to provide quality pipes and associated pipeline products at time and at competitive prices. At the same time, the HEPCO undertakes to provide professional support to its customers on all technical and other matters relating to pipelines and networks, including potable water, sewage, gas, industrial and petrochemical.

# مـاذا عــنا

إن شركة هيبكو السعودية هي شركة رائدة في مجال تصنيع أنابيب الألياف الزجاجية المقواة بالبوليستر وتوصيلاتها في المملكة العربية السعودية.

هيبكــو لديها فريق عمــل إداري ومهني من ذوي الخبرة الكبيرة والاختصاص . حيث أن المنافسة الشديدة في مجال الأعمال التجارية التي تتعلق بالأنابيب تتطلب معايير عالية ، ونتيجة لذلك فقد قمنا بتطبيق برامج ذات تقنية عالية في مجال مراقبة وضمان الجودة ولكي نتأكد من أن جميع الأنابيب التي نقوم بتصنيعها تقابل معايير متطلبات التصنيف الدولــي ، وتكون مناسبة لهذا الغـرض .

إنّ سياسة شركتنا هو تصنيع وتقديم أنابيب ذات جودة عالية وكذلك المنتجات المرتبطة بالأنابيب في الوقت المطلوب وبأسعــار تنافسيــة. وفي نفس الوقت، تتعهد الشركة بتوفيــر الدعــم الفني لعملائها في جميع المسائل الفنية والتقنية وكذلك الدعم الآخـر المتعلق بشبكات خطوط الأنابيب، ويشمل ذلك مياه الشرب والصرف الصحي والغاز والصناعات البتروكيماوية .

## Vision

To manufacture quality products and provide excellent service at all times. We will earn our customer's loyalty through continuous improvement driven by innovation.

A great place to work where people are inspired to be the best.

## الرؤية

إنّ رؤيتنا هي تصنيع منتجات ذات جودة عالية وتوفير خدمة ممتازة في جميع الأوقات. ونحن سوف نعمل على كسب ولاء العملاء لدينا من خلال التطوير والتحسينات المستمرة والتي يقودها الابتكار.

إنه مكان عظيم لتقديم أفضل ما يرضي تطلعات وآمال الناس .

## Mission

To be the leading manufacturer in and out of the Kingdom while innovating to meet or surpass specifications and standards.

Our goal is to provide superior value products while our employees and business partners will share in our success and our shareholders will receive a sustained better return on their investment.

## المهمة

المهمة هي أن نكون ضمن المصانع الرائدة والقيادية للتصنيع داخل وخارج المملكة العربية السعودية التي تقوم بتصنيع منتجات مطابقة للمقاييس والمواصفات العالمية .

إنّ هدفنا هو توفير منتجات ذات قيمة عالية في حين أن موظفينا وشركائنا في الأعمال يشاركوننا ويساهمون في نجاحنا وبالتالي سوف تتلقى عائدا أفضل على الاستثمار .

## Values

Excellent customer service

Superiority in performance

Harmonious relationship with the team

Innovation in products and technology

Perfection in doing the "right" thing

Respect for all people

## القيم

خدمة العملاء بصورة ممتازة

التفوق في الأداء

العلاقة متناغمة وانسجام مع فريق العمل

الابتكار في المنتجات والتكنولوجيا

الكمال في القيام "الشيء الصحيح".

احترام جميع الناس .



# Plant

Our plant is located in the Western Region of Saudi Arabia at Yanbu Light Industrial Park Area, Royal Commission Yanbu, which was established in 2002 to manufacture:

- **uPVC Pipes and Fittings**
- **GRP Pipes and Fittings**
- **FRP Customized Products**

Our plant's area is 40,000 square meters, and has the most advanced machineries and technologies with highly qualified engineers, technicians and operators to meet customer's demands and expectations.

In a yearly basis, we manufacture and supply over 5,000 tons of Glass Reinforced Plastic (GRP), 100 tons of Fiber Reinforced Plastic (FRP), and 5,000 tons of Polyvinyl Chloride (PVC) in and out of the Kingdom.

# المصنـــع

لدينا مصنع يقع في المنطقة الغربية من المملكة العربية السعودية في مدينة ينبع منطقة الصناعات الخفيفة ، الهيئة الملكية للجبيل وينبع ، والذي تمّ تأسيسه في عام ٢٠٠٢ م وذلك لتصنيع ما يلي :

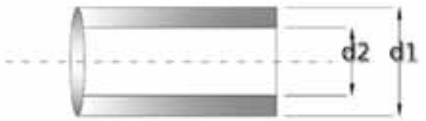
- أنابيب عديد كلوريد الفينيل وتوصيلاتها.
- أنابيب الألياف الزجاجية المقواة بالبوليستر وتوصيلاتها.
- منتجات بتصميم خاص من الفيبرجلاس.

مساحة المصنع ٤٠,٠٠٠ متر مربع ، ومزوّد بأكثر المكائن والآلات والتقنيات الحديثة بإشراف مهندسين أكفاء في هذا المجال ، وكذلك فنيي على درجة عالية من الكفاءة وذلك لمقابلة متطلبات العملاء وتوقعاتهـــم .

وعلى أساس سنوي ، نقوم بتصنيع وتوريد ما يزيد عن ٥,٠٠٠ طن من الألياف الزجاجية المقواة بالبوليستر بالاضافة إلى ١٠٠ طن من منتجات الفيبرجلاس و ٥,٠٠٠ طن من البولي فينيل كلورايد للاستعمال داخل وخارج المملكة العربية السعودية .

# uPVC DUCT PIPES

## Manufactured to Saudi Standard SAS 254 / 255




**Dimensions in Millimeters**

| Nominal Sizeof Conduit | OutsideDiameter d1 | | Minimum Inside Diameter |
|---|---|---|---|
| | Dimension | Tolerance % | |
| 20 | 20 | +0.0 / -0.3 | 14.1 |
| 25 | 25 | +0.0 / -0.4 | 18.4 |
| 32 | 32 | +0.0 / -0.4 | 24.4 |
| 40 | 40 | +0.0 / -0.4 | 31.2 |
| 50 | 50 | +0.0 / -0.5 | 39.7 |
| 63 | 63 | +0.0 / -0.5 | 49.6 |

**Specifications:**

Standard Lengths : 6m with socket (non-standard lengths or diameters to special order)

Standard Colour : Dark Grey or to customer specification

Bends : Long and short radius 22.5°, 45°, 90°

Cluster Bends : To customer requirements

Junctions : Square and swept tees, crosses and fittings, double sockets, bellmouths, end caps, clayware adapters

Jointing : Spigot and socket– dry fit or solvent cement for situations demanding sealed joints

**Properties:**

Specific Gravity : 1.42
Vicat Softening Point : 82 °C (BS 2782)
Inflammability : Will not support combustion
Specific Heat : 1.00 Kj / Kg / °C
Thermal Conductivity: $1.9 \times 10^{-3}$ W / (mk)
Tensile Strength : 46.5 $Nmm^{-2}$ (6750 PSI) at 20 °C
Impact Strength : 4.75 – 6.10 Joules (3.5 – 4.5 ft lb)
Compressive Strength: 65.50 $Nmm^{-2}$ (9500 PSI)
Flexural Strength : 93.08 $Nmm^{-2}$ (13500 PSI)

**Applications:**

- Telephone Cables
- High, Medium & Low Voltage Underground Power Cables
- Street and Housing Power Supplies
- Piped T.V. and Radio
- Factory and Industrial Applications
- Sheathing of Water and Gas Services

# uPVC SEWER & DRAIN PIPES

## Manufactured to Saudi Standard SAS 1395 / 1396

| Nominal Size (mm) | Nominal Outside Diameter (mm) | | Wall Thickness (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Class 2 | | Class 3 | | Class4 | |
| | mm | Tolerance | Min. | Tol. | Min. | Tol. | Min. | Tol. |
| 110 | 110 | +0.3 | 2.2 | +0.5 | 3.2 | +0.6 | 5.3 | +0.8 |
| 160 | 160 | +0.4 | 3.2 | 0.6 | 4.7 | +0.7 | 7.7 | +1.0 |
| 200 | 200 | +4.0 | 4.0 | +0.6 | 5.9 | +0.8 | 9.6 | +1.2 |
| 250 | 250 | +0.5 | 4.9 | +0.7 | 7.3 | +1.0 | 11.9 | +1.4 |
| 315 | 315 | +0.6 | 6.2 | +0.9 | 9.2 | +1.2 | 15.0 | +1.7 |
| 400 | 400 | +0.7 | 7.9 | +1.0 | 11.7 | +1.4 | 19.1 | +2.2 |
| 500 | 500 | +0.9 | 9.8 | +1.2 | 14.6 | +1.7 | 23.9 | +2.6 |
| 630 | 630 | +1.1 | 12.4 | +1.5 | 18.4 | +2.1 | 30 | +3.2 |
| 710 | 710 | +1.2 | 14.0 | +1.6 | 20.7 | +2.3 | - | - |

**Specifications:**

Pipes are normally available and supplied with integral joints in 6m or 9m lengths, but lengths of 3m can be produced if required. The metric Sewer Drain system is terracotta coloured. Imperial pipe to BS 3505 / BS 3506 is grey.

For the Colebrook White Formula the following coefficients of friction should be used:

- 0.003mm when new
- 0.6mm when mature (the normal accepted value for mature sewers)

Note: Whilst it is difficult to claim the use of the lower value for a mature uPVC sewer, it should be noted that because of the long lengths and precision joints, it is difficult to induce roughness by misalignment of joints. Steppingdoes not occur.

| | | |
|---|---|---|
| Specific Gravity | : | 1.42 |
| Flammability | : | Will not support Combustion |
| Specific Heat | : | 1.00 kJ/kg/°C |
| Thermal Conductivity | : | 0.180 J/m²/s/°C/m |
| Coefficient of Linear Expansion | : | 0.06 mm/m/°C |
| Vicat Softening Point (5kg) | : | 79°C |
| Impact Strength | : | Complies with BS 5481/4660/3505 |
| Modulus of Elasticity | : | 3000 MN/m² at 20°C |
| Poisson's Ratio | : | 1 : 3 |
| Tensile Strength | : | In excess of 45MN/m² at 20°C |
| Elongationat Break | : | In excess of 80% |

# uPVC SEWER & DRAIN PIPES

## Manufactured to Saudi Standard SAS 1395 / 1396

**Application**
To provide an efficient means of drainage of waste water and foul discharge from appliances in single and multi-storey buildings

**Maintenance**
Designers should provide adequate access for periodic cleaning Access pipes and bosses are available with the range.

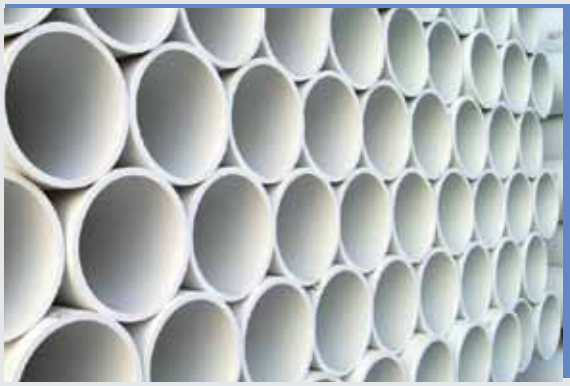
**Reactionwith other Materials**
uPVC has not been found to react adversely with any traditional buildingmaterials.

**Flammability**
uPVC is self-extinguishing a defined by BS 2782; method 508A.

**Effect of Chemicals**
uPVC is resistant to most acids, alkalis and oils but liable to attack by concentrated sulphuric, nitric and chromic acids and organic solvents. For specialized applications, consult the Technical Services Departmentfor advice.

**Effect of Solar Radiation**
Prolonged exposure to sunlight will cause the colour to fade. It may also result in slight loss of impact strength. We would not expect this to seriously affect the performance of the system.

**Thermal Movement**
Coefficient of linear expansion 0.5 x $10^{-4}$/°C temperature rise, i.e. 1mm per 2m length for a temperature rise of 10°C. An allowance is made for expansion of pipes and pipe fittings in each socket.



# uPVC WATERMAIN

## Pressure Pipes and Fittings

### Description

Manufactured to DIN 8061 / 8062 & SAS 14/15, the uPVC Watermain System is available in Metric sizes within the range of 20 to 315 in both Classes 4 and 5. For Ease of identification, Metric size Watermain pipes are colored blue (or as per customer's request) and are supplied in standard 6m lengths.

### Flow Characteristics

The flow characteristics of uPVC Watermain can be assessed using the Colebrook White Formula. The recommended value for the roughness coefficient (ks) for use with this formula is 0.003mm.

### Jointing System

uPVC Watermain uses the integral Loc-Ring joint. This simple and effective push-fit compression joint assures quality jointing even in difficult site conditions.

### Abrasion Resistance and Tuberculation

Abrasion of uPVC pipes can generally be ignored in potable water systems. uPVC pipe is not subject to the effects of tuberculation as soluble encrustants such as calcium carbonate do not precipitate on to the walls of uPVC pipes.

### Chemical Resistance

Both uPVC and EPDM have good resistance to a wide range of chemicals. However, if the pipeline is to be laid through contaminated ground, detailed guidance can be obtained from the Technical Advisory Service.

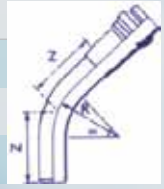
**Formed Bends- Available in 90°, 45°, 22.5 and 11.25**

| Description | Working Pressure / Class | Nominal Diameter(mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 50 | 75 | 110 | 140 | 160 | 200 | 250 | 315 |
| Loc Ring Socket | 6 Bar | | | | | | | | |
| | 10 Bar | | | | | | | | |
| | 16 Bar | | | | | | | | |
| Solvent Weld Socket | 10 Bar | | | | | | | | |
| | 16 Bar | | | | | | | | |
| Plain End | 6 Bar | | | | | | | | |
| | 10 Bar | | | | | | | | |
| | 16 Bar | | | | | | | | |

**Legends:** Available from stock  Available to order

**PVC Fittings**

| Nom. Dia. (mm) | a = R mm | 90° Z mm | 45° Z mm | 22.5° Z mm | 11.25° Z mm |
|---|---|---|---|---|---|
| 50 | 229 | 457 | 318 | 257 | 216 |
| 75 | 343 | 572 | 368 | 292 | 267 |
| 110 | 457 | 586 | 406 | 305 | 279 |
| 140 | 572 | 813 | 470 | 381 | 305 |



| Nom. Dia. (mm) | a = R mm | 90° Z mm | 45° Z mm | 22.5° Z mm | 11.25° Z mm |
|---|---|---|---|---|---|
| 160 | 686 | 953 | 546 | 406 | 343 |
| 200 | 914 | 1219 | 775 | 559 | 521 |
| 250 | 1143 | 1473 | 889 | 648 | 597 |
| 315 | 1372 | 1994 | 1105 | 913 | 635 |

# DIMENSION OF SAUDI HEPCO uPVC PIPES

## According to SAS 14 / 1998

## Equivalent to DIN 8062 and 8061

Saudi Hepco offer a range of uPVC water main pipes in metric sizes designed to meet the requirements of water construction & industry.

| Nominal Outside Diameter (mm) | Class 1 2 Bar | | Class 2 4 Bar | | Class 3 6 Bar | | Class 4 10 Bar | | Class 5 16 Bar | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nom. Wt. kg/m | No. Thick of wall mm | Nom. Wt. kg/m | No. Thick of wall mm | Nom. Wt. kg/m | No. Thick of wall mm | Nom. Wt. kg/m | No. Thick of wall mm | Nom. Wt. kg/m | No. Thick of wall mm |
| **10** | | | | | | | | | 0.045 | 1.0 |
| **12** | | | | | | | | | 0.056 | 1.0 |
| **16** | | | | | | | | | 0.090 | 1.2 |
| **20** | | | | | | | | | 0.137 | 1.5 |
| **25** | | | | | | | 0.174 | 1.5 | 0.212 | 1.9 |
| **32** | | | | | | | 0.264 | 1.8 | 0.342 | 2.4 |
| **40** | | | | | 0.334 | 1.8 | 0.350 | 1.9 | 0.525 | 3.0 |
| **50** | | | | | 0.422 | 1.8 | 0.552 | 2.4 | 0.809 | 3.7 |
| **63** | | | | | 0.562 | 1.9 | 0.854 | 3.0 | 1.289 | 4.7 |
| **75** | | | 0.642 | 1.8 | 0.782 | 2.2 | 1.22 | 3.6 | 1.82 | 5.8 |
| **90** | | | 0.774 | 1.8 | 1.13 | 2.7 | 1.75 | 4.3 | 2.61 | 6.7 |
| **110** | 0.950 | 1.8 | 1.16 | 2.2 | 1.64 | 3.2 | 2.61 | 5.3 | 3.90 | 8.2 |
| **125** | 1.08 | 1.8 | 1.48 | 2.5 | 2.13 | 3.7 | 3.34 | 6.0 | 5.01 | 9.8 |
| **140** | 1.21 | 1.8 | 1.84 | 2.8 | 2.65 | 4.1 | 4.18 | 6.7 | 6.27 | 10.4 |
| **160** | 1.39 | 1.8 | 2.41 | 3.2 | 3.44 | 4.7 | 5.47 | 7.7 | 8.17 | 11.9 |
| **180** | 1.57 | 1.8 | 3.02 | 3.6 | 4.37 | 5.3 | 6.88 | 8.7 | 10.4 | 13.4 |
| **200** | 1.74 | 1.8 | 3.70 | 4.0 | 5.37 | 5.9 | 8.51 | 9.6 | 12.8 | 14.9 |
| **225** | 1.96 | 1.8 | 4.70 | 4.5 | 6.76 | 6.6 | 10.8 | 10.8 | 16.1 | 16.7 |
| **250** | 2.40 | 2.0 | 5.65 | 4.9 | 8.31 | 7.3 | 13.2 | 11.9 | 19.9 | 18.6 |
| **280** | 3.11 | 2.3 | 7.11 | 5.5 | 10.4 | 8.2 | 16.6 | 13.4 | 24.9 | 20.8 |
| **315** | 3.78 | 2.5 | 9.02 | 6.2 | 13.8 | 9.2 | 20.9 | 15.0 | 31.5 | 23.4 |
| **355** | 4.87 | 2.9 | 11.4 | 7.0 | 16.7 | 10.4 | 26.5 | 16.9 | 39.9 | 26.3 |
| **400** | 6.10 | 3.2 | 14.5 | 7.9 | 21.1 | 11.7 | 33.7 | 19.1 | 50.8 | 29.7 |

# PVC PIPES

# ASTM STANDARDS

## ASTM D 1785 SCH - 40

| SR. NO. | NOMINAL PIPE DIAMETER INCH | OUTSIDE DIAMETER MIN (MM) | WALL THICKNESS MIN (MM) | AVERAGE WEIGHT (KG)/MTR | PRESSURE AT 23C (SHORTTERM TESTS) | |
|---|---|---|---|---|---|---|
| | | | | | BAR | PSI |
| 1 | ½" | 21.24 | 2.77 | 0.248 | 41.38 | 600 |
| 2 | ¾" | 26.57 | 2.87 | 0.329 | 33.10 | 480 |
| 3 | 1" | 33.27 | 3.38 | 0.483 | 31.03 | 450 |
| 4 | 1 ¼" | 42.03 | 3.56 | 0.652 | 25.52 | 370 |
| 5 | 1 ½" | 48.11 | 3.68 | 0.779 | 22.76 | 330 |
| 6 | 2" | 60.17 | 3.91 | 1.040 | 19.31 | 280 |
| 7 | 2 ½" | 72.84 | 5.16 | 1.650 | 20.69 | 300 |
| 8 | 3" | 88.70 | 5.49 | 2.160 | 17.90 | 260 |
| 9 | 4" | 114.07 | 6.02 | 3.070 | 15.17 | 220 |
| 10 | 6" | 168.00 | 7.11 | 5.410 | 12.41 | 180 |
| 11 | 8" | 218.70 | 8.17 | 8.143 | 11.03 | 160 |

Pipes are standardized at 6m length. Other lengths are available on request. Socket type: standardized as solvent cement jointed (SCJ). Plain end available on request. Color: white, grey, blue and black (Other colors offered on request).

# PVC PIPES

# ASTM STANDARDS

## ASTM D 1785 SCH-80

| SR. NO. | NOMINAL PIPE DIAMETER INCH | OUTSIDE DIAMETER MIN (MM) | WALL THICKNESS MIN (MM) | AVERAGE WEIGHT (KG)/MTR | PRESSURE AT 23°C (SHORTTERM TESTS) | |
|---|---|---|---|---|---|---|
| | | | | | BAR | PSI |
| 1 | ½" | 21.24 | 3.73 | 0.309 | 58.62 | 850 |
| 2 | ¾" | 26.57 | 3.91 | 0.418 | 47.59 | 690 |
| 3 | 1" | 33.27 | 4.55 | 0.614 | 43.45 | 630 |
| 4 | 1 ¼" | 42.03 | 4.85 | 0.850 | 35.86 | 520 |
| 5 | 1 ½" | 48.11 | 5.08 | 1.030 | 32.41 | 470 |
| 6 | 2" | 60.17 | 5.54 | 1.430 | 27.59 | 400 |
| 7 | 2 ½" | 72.84 | 7.01 | 2.180 | 28.97 | 420 |
| 8 | 3" | 88.70 | 7.62 | 2.910 | 25.52 | 370 |
| 9 | 4" | 114.07 | 8.56 | 4.360 | 22.07 | 320 |
| 10 | 6" | 168.00 | 10.97 | 8.130 | 19.31 | 280 |
| 11 | 8" | 218.70 | 12.70 | 12.400 | 17.24 | 250 |

Pipes are standardized at 6m length. Other lengths are available on request. Socket type: sizes 2 ½" and above are available with solvent cement joints (SCJ type). All sizes are available with plain ends. Color: white, grey, blue and black (Other colors offered on request).

## ASTM D 1785 SCH-120

| SR. NO. | NOMINAL PIPE DIAMETER INCH | OUTSIDE DIAMETER MIN (MM) | WALL THICKNESS MIN (MM) | AVERAGE WEIGHT (KG)/MTR | PRESSURE AT 23°C (SHORTTERM TESTS) | |
|---|---|---|---|---|---|---|
| | | | | | BAR | PSI |
| 1 | ½" | 21.34 | 4.32 | 0.35 | 69.66 | 1010 |
| 2 | ¾" | 26.67 | 4.32 | 0.46 | 53.1 | 770 |
| 3 | 1" | 33.40 | 5.08 | 0.69 | 49.66 | 720 |
| 4 | 1 ¼" | 42.16 | 5.46 | 0.97 | 41.38 | 600 |
| 5 | 1 ½" | 48.25 | 5.72 | 1.17 | 37.24 | 540 |
| 6 | 2" | 60.33 | 6.35 | 1.66 | 32.41 | 470 |
| 7 | 2 ½" | 73.03 | 7.62 | 2.41 | 32.41 | 470 |
| 8 | 3" | 88.90 | 8.89 | 3.44 | 30.39 | 440 |
| 9 | 4" | 114.30 | 11.1 | 5.53 | 29.66 | 430 |
| 10 | 6" | 168.28 | 14.27 | 10.63 | 25.52 | 370 |
| 11 | 8" | 219.08 | 18.24 | 16.8 | 26.21 | 380 |

# PVC PIPES

# ASTM STANDARDS

## ASTM D 2241 SDR

| SR. NO. | NOMINAL PIPE DIAMETER INCH | OUTSIDE DIAMETER MIN (MM) | WALL THICKNESS MIN (MM) | AVERAGE WEIGHT (KG)/MTR | PRESSURE AT 23C (SHORTTERM TESTS) | |
|---|---|---|---|---|---|---|
| | | | | | BAR | PSI |
| 1 | ½" SDR 13.5 | 21.24 | 1.57 | 0.193 | 21.7 | 315 |
| 2 | ¾" SDR 21.0 | 26.57 | 1.52 | 0.238 | 13.8 | 200 |
| 3 | ¾" SDR 17.0 | 26.57 | 1.57 | 0.245 | 17.2 | 250 |
| 4 | ¾" SDR 13.5 | 26.57 | 1.98 | 0.900 | 21.7 | 315 |
| 5 | 1" SDR 26.0 | 33.27 | 1.52 | 0.292 | 11.0 | 160 |
| 6 | 1" SDR 21.0 | 33.27 | 1.60 | 0.320 | 13.8 | 200 |
| 7 | 1" SDR 17.0 | 33.27 | 1.96 | 0.360 | 17.2 | 250 |
| 8 | 1" SDR 13.5 | 33.27 | 2.46 | 0.428 | 21.7 | 315 |
| 9 | 1 ¼" SDR 32.5 | 42.03 | 1.52 | 0.357 | 8.6 | 125 |
| 10 | 1 ¼" SDR 26.0 | 42.03 | 1.63 | 0.366 | 11.0 | 160 |
| 11 | 1 ¼" SDR 21.0 | 42.03 | 2.01 | 0.451 | 13.8 | 200 |
| 12 | 1 ¼" SDR 17.0 | 42.03 | 2.49 | 0.543 | 17.2 | 250 |
| 13 | 1 ¼" SDR 13.5 | 42.03 | 3.12 | 0.764 | 21.7 | 315 |
| 14 | 1 ½" SDR 32.5 | 48.11 | 1.52 | 0.407 | 8.6 | 125 |
| 15 | 1 ½" SDR 26.0 | 48.11 | 1.85 | 0.325 | 1.0 | 160 |
| 16 | 1 ½" SDR 21.0 | 48.11 | 2.29 | 0.520 | 13.8 | 200 |
| 17 | 1 ½" SDR 17.0 | 48.11 | 2.84 | 0.697 | 17.2 | 250 |
| 18 | 1 ½" SDR 13.5 | 48.11 | 3.58 | 0.860 | 21.7 | 315 |
| 19 | 2" SDR 32.5 | 60.17 | 1.85 | 0.490 | 8.6 | 125 |
| 20 | 2" SDR 26.0 | 60.17 | 2.31 | 0.680 | 11.0 | 160 |
| 21 | 2" SDR 21.0 | 60.17 | 2.87 | 0.876 | 13.8 | 200 |
| 22 | 2" SDR 17.0 | 60.17 | 3.56 | 1.070 | 17.2 | 250 |
| 23 | 2" SDR 13.5 | 60.17 | 4.47 | 1.313 | 21.7 | 315 |
| 24 | 3" SDR 41.0 | 88.70 | 2.16 | 0.678 | 6.9 | 100 |
| 25 | 3" SDR 32.5 | 88.70 | 2.74 | 1.130 | 8.6 | 125 |
| 26 | 3" SDR 26.0 | 88.70 | 3.43 | 1.506 | 11.0 | 160 |
| 27 | 3" SDR 21.0 | 88.70 | 4.24 | 1.836 | 13.8 | 200 |

# PVC PIPES

# ASTM STANDARDS

## ASTM D 2241 SDR

| SR. NO. | NOMINAL PIPESIZE INCH | OUTSIDE DIAMETER MIN (MM) | WALL THICKNESS MIN (MM) | AVERAGE WEIGHT (KG)/MTR | PRESSURE AT 23C (SHORTTERM TESTS) | |
|---|---|---|---|---|---|---|
| | | | | | BAR | PSI |
| 28 | 3" SDR 17.0 | 88.70 | 5.23 | 2.233 | 17.2 | 250 |
| 29 | 3" SDR 13.5 | 88.70 | 6.58 | 2.780 | 21.7 | 315 |
| 30 | 4" SDR 41.0 | 114.07 | 2.80 | 1.250 | 6.9 | 100 |
| 31 | 4" SDR 32.5 | 114.07 | 3.51 | 1.850 | 8.6 | 125 |
| 32 | 4" SDR 26.0 | 114.07 | 4.39 | 2.430 | 11.0 | 160 |
| 33 | 4" SDR 21.0 | 114.07 | 5.44 | 2.790 | 13.8 | 200 |
| 34 | 4" SDR 17.0 | 114.07 | 6.73 | 3.790 | 17.2 | 250 |
| 35 | 4" SDR 13.5 | 114.07 | 8.46 | 4.678 | 21.7 | 315 |
| 36 | 6" SDR 41.0 | 168.00 | 4.11 | 3.355 | 6.9 | 100 |
| 37 | 6" SDR 32.5 | 168.00 | 5.18 | 3.990 | 8.6 | 125 |
| 38 | 6" SDR 26.0 | 168.00 | 6.48 | 4.970 | 11.0 | 160 |
| 39 | 6" SDR 21.0 | 168.00 | 8.03 | 6.550 | 13.8 | 200 |
| 40 | 6" SDR 17.0 | 168.00 | 9.91 | 7.855 | 17.2 | 250 |
| 41 | 6" SDR 13.5 | 168.00 | 12.47 | 9.418 | 21.7 | 315 |
| 42 | 8" SDR 41.0 | 218.70 | 5.33 | 5.505 | 6.9 | 100 |
| 43 | 8" SDR 32.5 | 218.70 | 6.73 | 6.895 | 8.6 | 125 |
| 44 | 8" SDR 26.0 | 218.70 | 8.43 | 8.705 | 11.0 | 160 |
| 45 | 8" SDR 21.0 | 218.70 | 10.41 | 11.000 | 13.8 | 200 |
| 46 | 8" SDR 17.0 | 218.70 | 12.90 | 12.800 | 17.2 | 250 |

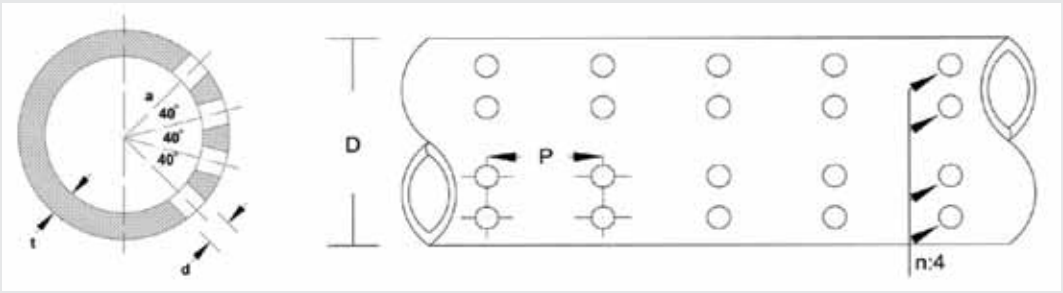
The maximum pressure rating given above is based on water at 73°F / 23°C and for unthreaded pipes. SDR-Standard Dimension Ratio = Outside Diameter / Wall Thickness (Note: wall thickness maintained is minimum or more than required). Pipes are standardized at 6m length (Other lengths are available on request). Socket type: Standardized as solvent cement jointed (SCJ). Plain end available on request. Color: white, grey, blue and black (Other colors offered on request).

# PERFORATED

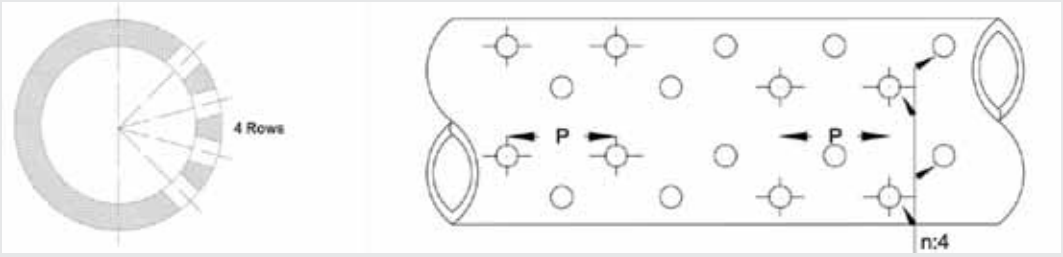
# uPVC PIPES

Saudi Hepco perforated uPVC pipes are manufactured upon request depending on the size and class of the pipes, below figures given a general configuration which may vary for each client's requirements.

**Straight Rows:**




**Staggered Rows:**




| | | |
|---|---|---|
| Range of sizes | : | 75mm to 50mm |
| LongitudePitch of wholes (LP) | : | 30mm to 200mm |
| Hole Diameter | : | 5mm to 13 mm |
| Number of Rows | : | 1 to 6 |
| AngularPitch of Holes | : | 40, 80 or 120 degrees for 2 rows |

# SLOTTED PVC PIPES

Saudi Hepco slotted pipes are produced according to RDA requirements and for use in lowering the undergroundwater table.

**Straight Slots**

**Staggered Slots**

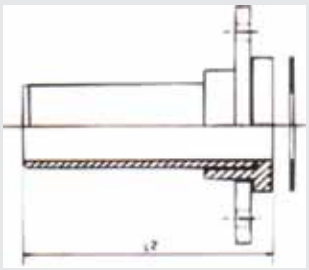
| | | |
|---|---|---|
| Slot Length | : | Dependto the size |
| Slot width | : | 1 / 1.1 / 1.5 / 2mm |
| Number of Row | : | 4, 6 & 8 (but accordingto the size) |
| AngularPitch | : | To be recommendedby Saudi Hepco |

# CUSTOMIZED FITTINGS

## Watermain Assembled Fittings and Specials

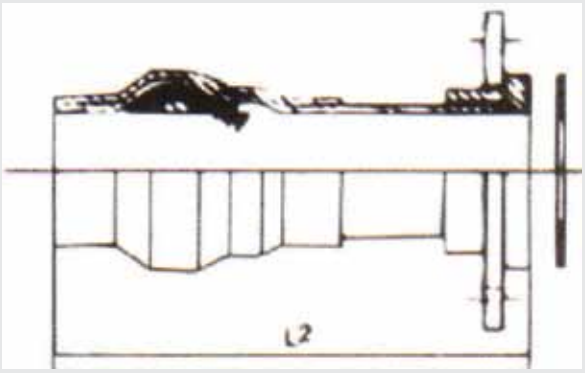
**Flanged Socket:**

| Nominal Size | L² mm | Maximum Working Pressure Bar |
|---|---|---|
| 2 | 305 | 12 |
| 3 | 305 | 12 |
| 4 | 305 | 12 |
| 5 | 305 | 12 |
| 6 | 305 | 12 |
| 8 | 458 | 9 |



**Flanged Spigot:**

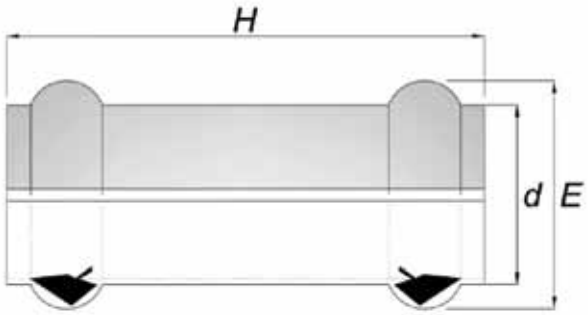
| Nominal Size | L² mm | Maximum Working Pressure Bar |
|---|---|---|
| 2 | 305 | 12 |
| 2.5 | 305 | 12 |
| 3 | 305 | 12 |
| 4 | 305 | 12 |
| 5 | 305 | 12 |
| 6 | 305 | 12 |
| 8 | 458 | 9 |




# PVC FABRICATED PRODUCTS

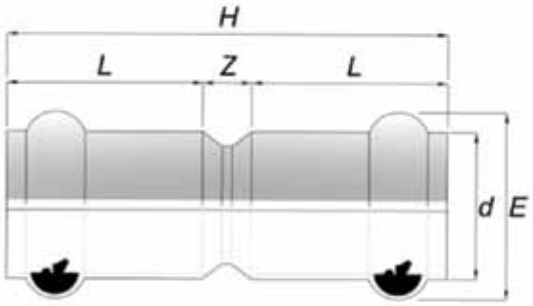
*Saudi Hepco is manufacturing all kinds of long bend and repair coupling fittings which are required in the project during installation. All these fittings are combined with Saudi Hepco Pipe under Standards DIN 8062/8061 and it is available with single and double rubber joint at the end. Also available for all kind of pressure rating 6-10 and 16 bar.*

**Repair Coupling:**




| d mm | E mm | H mm |
|---|---|---|
| 63 | 86 | 280 |
| 75 | 102 | 280 |
| 90 | 120 | 290 |
| 110 | 144 | 290 |
| 160 | 202 | 350 |
| 200 | 248 | 440 |
| 225 | 277 | 400 |
| 250 | 304 | 440 |
| 280 | 342 | 440 |
| 315 | 382 | 440 |

**Register Coupling:**




| d mm | E mm | H mm | L mm | Z mm |
|---|---|---|---|---|
| 63 | 86 | 280 | 128 | 30 |
| 75 | 102 | 280 | 123 | 30 |
| 90 | 120 | 290 | 133 | 30 |
| 110 | 144 | 310 | 135 | 35 |
| 125 | 161 | 330 | 143 | 35 |
| 140 | 178 | 350 | 158 | 40 |
| 160 | 202 | 350 | 155 | 40 |
| 180 | 224 | 380 | 173 | 50 |
| 200 | 248 | 410 | 185 | 50 |
| 225 | 277 | 460 | 195 | 55 |
| 250 | 304 | 460 | 223 | 55 |
| 280 | 342 | 490 | 220 | 60 |
| 315 | 382 | 500 | 220 | 60 |

# PVC CONDUIT & DUCT

## AS PER NEMA TC 2 EPC 80-PVC (ELECTRICAL USE)

| SR NO | NOMINAL PIPE SIZE INCH | OUTSIDE DIAMETER MIN (MM) | WALL THICKNESS MIN (MM) | WEIGHT (KG)/MTR | PRESSURE (SHORT TERM TESTS) | |
|---|---|---|---|---|---|---|
| | | | | | BAR | PSI |
| 1 | 1/2" | 21.24 | 2.770 | 0.248 | 41 | 600 |
| 2 | 3/4" | 26.57 | 2.870 | 0.329 | 33 | 480 |
| 3 | 1" | 33.27 | 3.380 | 0.483 | 31 | 450 |
| 4 | 11/4" | 42.03 | 3.560 | 0.652 | 25 | 370 |
| 5 | 11/2" | 48.11 | 3.680 | 0.779 | 23 | 330 |
| 6 | 2" | 60.17 | 3.910 | 1.040 | 19 | 280 |
| 7 | 21/2" | 72.84 | 5.160 | 1.650 | 18 | 260 |
| 8 | 3" | 88.70 | 5.490 | 2.160 | 15 | 220 |
| 9 | 4" | 114.07 | 6.020 | 3.070 | 12 | 180 |
| 10 | 6" | 168.00 | 7.110 | 5.410 | 11 | 160 |

Pipes are standardized at 3, 5.8 & 6 m length. Socket type: standardized as solvent cement jointed (SCJ) for 2" & above. All sizes available with plain ends. Color: white, grey, blue and black (Other colors offered on request)

## PVC Utilities Duct

As Per Nema TC 6 PVC Type EB-20 & Astm F 512
(Electrical Use)-encased Burial-to Be Encased In Concrete

| SR NO | NOMINAL PIPE SIZE INCH | OUTSIDE DIAMETER MIN (MM) | WALL THICKNESS MIN (MM) | WEIGHT (KG)/MTR | PRESSURE (SHORT TERM TESTS) | |
|---|---|---|---|---|---|---|
| | | | | | BAR | PSI |
| 1 | 1/2" | 21.24 | 1.520 | 0.155 | 16 | 232 |
| 2 | 3/4" | 26.57 | 1.520 | 0.198 | 12 | 1174 |
| 3 | 1" | 33.27 | 1.520 | 0.251 | 10 | 145 |
| 4 | 11/4" | 42.03 | 1.780 | 0.365 | 8 | 116 |
| 5 | 11/2" | 48.11 | 2.030 | 0.470 | 8 | 116 |
| 6 | 2" | 60.17 | 2.540 | 0.719 | 8 | 116 |
| 7 | 21/2" | 72.84 | 2.790 | 0.952 | 8 | 116 |
| 8 | 3" | 88.70 | 3.180 | 1.310 | 6 | 87 |
| 9 | 4" | 114.07 | 3.810 | 2.000 | 6 | 87 |

Pipes are standardized at 5.8 & 6 m length. Socket type: standardized as solvent cement jointed (scj) for 2" & above. All sizes available with plain ends. Color: white, grey, blue and black (Other colors offered on request)

# PVC CONDUIT & DUCT

## AS PER NEMA TC 2 EPC 80-PVC (ELECTRICAL USE)

| SR NO | NOMINAL PIPE SIZE INCH | OUTSIDE DIAMETER MIN (MM) | THICKNESS MIN (MM) | PRESSURE (SHORT TERM TESTS) | | WEIGHT (KG)/MTR |
|---|---|---|---|---|---|---|
| | | | | BAR | PSI | |
| 1 | 1/2" | 21.24 | 3.730 | 59 | 850 | 0.309 |
| 2 | 3/4" | 26.57 | 3.910 | 48 | 690 | 0.418 |
| 3 | 1" | 33.27 | 4.550 | 43 | 630 | 0.614 |
| 4 | 11/4" | 42.03 | 4.850 | 36 | 520 | 0.850 |
| 5 | 11/2" | 48.11 | 5.080 | 32 | 470 | 1.030 |
| 6 | 2" | 60.17 | 5.540 | 28 | 400 | 1.430 |
| 7 | 21/2" | 72.84 | 7.010 | 25 | 370 | 2.180 |
| 8 | 3" | 88.70 | 7.620 | 22 | 320 | 2.910 |
| 9 | 4" | 114.07 | 8.560 | 19 | 280 | 4.260 |
| 10 | 6" | 168.00 | 10.970 | 17 | 250 | 8.130 |

Pipes are standardized at 3, 5.8 & 6 m length. Socket type: standardized as solvent cement jointed (SCJ) for 2" & above. All sizes available with plain ends. Color: white, grey, blue and black (Other colors offered on request)

## PVC Utilities Duct

As Per Nema TC 6 PVC Type EB-20 & Astm F 512
(Electrical Use)-encased Burial-to Be Encased In Concrete

| SR NO | NOMINAL PIPE SIZE INCH | OUTSIDE DIAMETER MIN (MM) | WALL THICKNESS MIN (MM) | PRESSURE | | WEIGHT (KG)/MTR |
|---|---|---|---|---|---|---|
| | | | | BAR | PSI | |
| 1 | 2" | 60.17 | 1.520 | 4 | 58 | 0.465 |
| 2 | 3" | 88.70 | 1.550 | 4 | 58 | 0.703 |
| 3 | 4" | 114.07 | 2.080 | 4 | 58 | 1.170 |
| 4 | 6" | 168.00 | 3.180 | 4 | 58 | 2.530 |

Pipes are standardized at 3, 5.8 & 6 m length. Socket type: standardized as solvent cement jointed (SCJ). Plain end available on request. Color: white, grey, blue and black (Other colors offered on request)

# PVC UTILITIES & DUCT

## AS PER NEMA TC 6 PVC TYPE DB-60 & ASTM F 512 (ELECTRICAL USE) DIRECT BURIAL- FOR DIRECT BURIAL UNDERGROUND

| SR NO | NOMINAL PIPE SIZE INCH | OUTSIDE DIAMETER MIN (MM) | THICKNESS MIN (MM) | PRESSURE (LONGTERM TESTS) | | WEIGHT (KG)/MTR |
|---|---|---|---|---|---|---|
| | | | | BAR | PSI | |
| 1 | 2″ | 60.17 | 1.52 | 5 | 72.5 | 0.465 |
| 2 | 3″ | 88.70 | 2.34 | 5 | 72.5 | 1.000 |
| 3 | 4″ | 114.07 | 3.07 | 5 | 72.5 | 1.650 |
| 4 | 6″ | 168.00 | 4.62 | 5 | 72.5 | 3.570 |

Pipes are standardized at 5.8 & 6 m length. Socket type: standardized as solvent cement jointed (SCJ). Plain end available on request. Color: white, grey, blue and black (Other colors offered on request)

## PVC PIPES AS PER NEMA TC 8 PVC TYPE EB - 35 & ASTM F 512 (ELECTRICAL USE) ENCASED BURIAL- TO BE ENCASED IN CONCRETE

| SR NO | NOMINAL PIPE SIZE INCH | OUTSIDE DIAMETER MIN (MM) | WALL THICKNESS MIN (MM) | PRESSURE | | WEIGHT (KG)/MTR |
|---|---|---|---|---|---|---|
| | | | | BAR | PSI | |
| 1 | 2″ | 60.17 | 1.52 | 5 | 72.5 | 0.465 |
| 2 | 3″ | 88.70 | 1.93 | 4 | 58.0 | 0.847 |
| 3 | 4″ | 114.07 | 2.54 | 4 | 58.0 | 1.390 |
| 4 | 6″ | 168.00 | 3.86 | 4 | 58.0 | 3.020 |

Pipes are standardized at 5.8 & 6 m length. Socket type: standardized as solvent cement jointed (SCJ). Plain end available on request. Color: white, grey, blue and black (Other colors offered on request)

## PVC PIPES AS PER NEMA TC 8 PVC TYPE DB - 120 & ASTM F 512

| SR NO | NOMINAL PIPE SIZE INCH | OUTSIDE DIAMETER MIN (MM) | WALL THICKNESS MIN (MM) | PRESSURE (LONGTERM TESTS) | | WEIGHT (KG)/MTR |
|---|---|---|---|---|---|---|
| | | | | BAR | PSI | |
| 1 | 1″ | 33.270 | 1.520 | 10 | 145 | 0.251 |
| 2 | 11/2″ | 48.110 | 1.520 | 8 | 116 | 0.369 |
| 3 | 2″ | 60.170 | 1.960 | 8 | 116 | 0.576 |
| 4 | 3″ | 88.700 | 3.000 | 8 | 116 | 1.250 |
| 5 | 4″ | 114.070 | 3.910 | 8 | 116 | 2.050 |
| 6 | 6″ | 168.000 | 5.770 | 8 | 116 | 4.420 |

Pipes are standardized at 5.8 & 6 m length. Socket type: standardized as solvent cement jointed (scj) for 2″ & above. All sizes available with plain ends. Color: white, grey, blue and black (Other colors offered on request)

# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE

## Introduction

Saudi Hepco offer a range of uPVC Watermain imperial pressure pipes designed to meet the requirements of the Water Industry.
Qualities such as lightness, ease of transport, simplicity of jointing, speed of laying and cost effective installation have enabled uPVC pipe systems to make a dynamic contribution to water engineering around the world.

## Description

Manufactured to ASTM D 1785, the uPVC Watermain System is available in imperial sizes within the range 3/8" in both Schedules 40 and 80.

For ease of identification imperial size Watermain pipes are colored dark grey and are supplied in standard 6m lengths.

Pipes can be supplied plain ended but the normal joint for the size range 2" to 12" is the Loc-Ring joint and pipes in the size range 3/8" to 12" can be supplied with solvent weld sockets.
For size range 2" to 24" formed bends are available at 90°, 45°, 22.5° and 11.25°, with joints matching pipe joints.

## Specification

uPVC Watermain pipes are manufactured in accordance with ASTM D 1785 specification for uPVC pressure pipes for cold potable water and industrial uses.

The Loc-Ring joints include EPDM sealing rings in accordance with BS 2494: 1991 specification for elastomeric joint sealing rings for pipework and pipelines, type W.

## Material Testing

Testing required by ASTM D 1785 includes both burst tests and impact tests. In addition some tests are also repeated at elevated temperatures.

We conduct a series of tests to ensure water quality is not affected by the pipe and that guidelines from the World Health Organization are adhered to.

## Fracture Toughness Test

The resistance of a plastic pipe to developing cracks and bursting is one of the major considerations when selecting pipeline materials. uPVC is a very strong material, but has been characterized by brittle behavior in certain circumstances. The theory of Fracture Toughness is used to ensure that uPVC pipes are not susceptible to failure brought about through brittle behavior. uPVC pipes made by manufacturers that have not adopted this theory are unlikely to provide adequate service life. Only uPVC pipes tested for resistance to crack growth can be sure to have a measureable resistance to failure resulting from flaws and defects arising during manufacture, and damage caused during the normal installation operations.

# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE

The fracture toughness test is based on the application of fracture mechanics to the behavior of plastic pipes. It provides a means of initially examining the pipe structure for consistency and testing the performance of a section whilst it is being subjected to a combination of stress and defect – such as would be the case in a typical site installation.

## C Ring Test

To evaluate performance under long term loading, rings are cut from Watermain pipe and notches are machined on to the surface. These rings are then loaded for many hours in bending.

It is not usual to encounter pipes which are subjected to point loading, bending or damage whilst undergoing pressure or cyclic loading.

## Quality Assurance

Saudi Hepco have an unparalleled commitment to quality through the innovation of new products. All products are manufactured under the approval of BS EN ISO 9002 of the British Standards Institutions.

The uPVC Watermain range is manufactured at the Yanbu site in Saudi Arabia which is listed in the BSI register of firms of assessed capability and hold certificates of registration FM 31040 to BS EN ISO 9002.

## Changes in Direction

It is recommended that, wherever possible, changes of direction should be accommodated using purpose made bends.

Pipes up to 6" may be cold bent in situ to minimum radius of a curvature of 200 pipe diameters. Further details are available from the Technical Advisory Service.

## Flow characteristics

The flow characteristics of uPVC Watermain can be assessed using Colebrook White formula. The recommended value for the roughness coefficient (ks) for use with this formula is 0.003mm.

Abrasion Resistance and Tuberculation

Abrasion of uPVC pipes can generally be ignored in potable water systems. uPVC pipe is not subject to the effects of tuberculation as soluble encrustants such as calcium carbonate do not precipitate on to the walls of uPVC pipes.

## Chemical Resistance

Both uPVC and EPDM have good resistance to a wide range of chemicals. However, if the pipeline is to be laid through contaminated ground, detailed guidance can be obtained from the Technical Advisory Service.

## 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.

# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE

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 Technical Advisory Service 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.

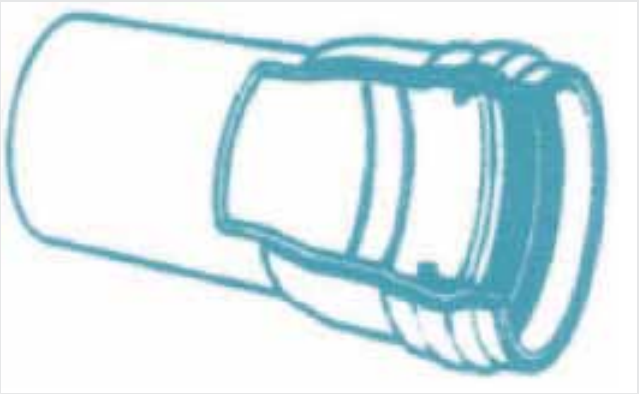
## Pipe Support

In non-buried situations the need arises to provide pipe supports to ensure that the weight of the pipe and its contents are adequately supported. Recommended maximum support spacing for the Watermain range at operating temperatures 20°C to 60°C are available from the Technical Advisory Service.

# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE

## Expansion and Contraction

In common with a number of engineering materials uPVC will expand and/or contract under the influence of variations 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 other materials. Due account should be taken of possible contraction of expansion when installing uPVC pipes which will be subject to variations in temperature either immediately following installation or in their service lifetime.



## Sitework (Handling)

uPVC Watermain pipes are lightweight and easy to handle. In order to avoid damage to the pipes on site, good site practice should be followed. Pipes should not be dropped onto hard surfaces or dragged along the ground as this can result in scoring. Under no circumstances should metallic slings be used in direct contact with the pipe wall. Nylon webbing or other similar material should be used.

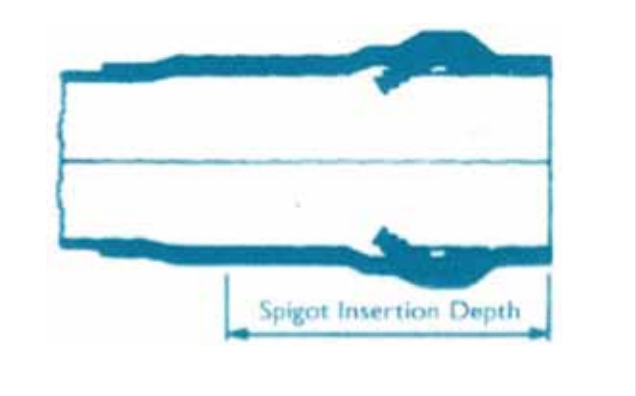
Standard bundles of packs of 6m lengths can be handled using a forklift truck or a crane. The packs should remain intact until pipe laying takes place. Single pipes should be offloaded individually. A 10" pipe can be carried by two men in normal site conditions (subject to HSC regulations for manual handling of loads).

Pipes should be free from sharp projections. Stacks of individual pipes should not exceed 7 layers or 1.5m high and 3.0, wide.

Strong ultraviolet light can discolor the pipes, and for prolonged storage outdoors a protective opaque cover should be used. Discoloration has a minimal effect on the mechanical performance of uPVC, however if there is any doubt please contact the Technical Advisory Service.

## Jointing System

uPVC Watermain uses the integral Loc-Ring joint. This simple and effective push-fit compression joint assures quality jointing even in difficult site conditions.

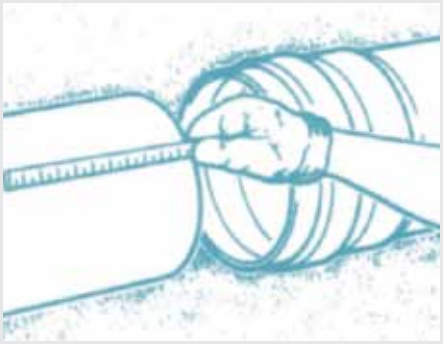


# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE

## Jointing

a- The spigot and socket to be joined should be carefully examined for any damage which would impair the jointing procedure. Particular attention should be paid to the spigot chamfer and the sealing ring. The pipe should be chamfered to a depth of half the wall thickness and at an inclination angle of 15° to the pipe axis. If pipes are cut on site they should be cut square to the pipe axis with a fine toothed saw and chamfered to half the pipe wall thickness with a coarse file or surform tool. The chamfered spigot should be clean and free from swarf and burrs. The sealing ring should be correctly seated in the socket groove, complete with the insert ring the sealing portion of the ring must be free from damage of any sort. Joints containing damaged or incorrectly fitted rings but not be used.

b- The spigot insertion depth should be measured as the depth from the mouth to the shoulder of the socket. Pipes are supplied with the spigot insertion depth marked on the spigot end. The spigots of cut pipes should be marked similarly using an indelible crayon. In an allowance for expansion is required (e.g. where changes in operating temperatures are anticipated), this should be deducted from the spigot insertion depth.



# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE

c- The spigot and socket should be thoroughly cleaned. All grease, dirt, swarf and other foreign matter should be removed from the sealing areas.

d- The spigot end and triple seal portion of the sealing ring should be thoroughly lubricated with the pipe supplied free-of-charge.

The spigot should be lubricated to the full insertion depth and around its complete circumference, paying particular attention to the chamfer area. The triple seal should be lubricated around its complete circumference. The guiding principle should be to apply a liberal quantity of lubricant and avoid 'dry' areas on the sealing surfaces.

e- Immediately after lubrication, the spigot should be brought into contact with the socket. The spigot pipe and parent joint should be accurately aligned so that the axis of the pipes are precisely in line. The spigot should be and fed 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 pinched or torn.

f- The joint can now be completed by one of the methods described below.

# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE

### i- Leverage Method

Sizes up to 8" can normally be jointed by applying leverage with a crow bar at the following socket end. A stout timber should be inserted between the crow bar and the pipe socket to prevent damage to the latter.
The leverage should be applied in a steady, continuous manner until the spigot insertion depth mark coincides with the mouth of the socket being jointed. No further leverage should be applied. If any undue resistance is felt and the spigot cannot be disassembled and examined to determine possible causes (e.g. lack of lubrication and pinched or trapped sealing ring). The procedure should then be repeated as described previously.

### ii- Jointing Clamps

These are available for sizes above 8" and are specially designed for use with Watermain uPVC Pressure Pipes. These are particularly useful where bends are to be installed in the pipeline. The clamps should be positioned so that one clamp is adjacent to the socket shoulder and the other close to, but not overlapping the depth insertion mark.

Once assembled with the steel tie wires in place, a simple ratchet action will draw the spigot into the socket mouth. The spigot should be correctly aligned as described above the drawn into the socket until the spigot insertion depth mark coincides with the mouth of the socket being jointed. No further pulling should take place. The camps incorporate protective pads to prevent gouging and scratching of the piTpe surface. The clamps must not be used without the protective pads.

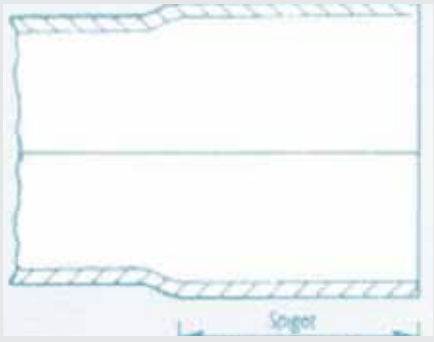
### Watermain Solvent Weld Socket

1- The spigot and socket to be jointed should be carefully examined for any damage which ii- would impair the jointing procedure. Particular attention should be paid to the spigot chamfer as for Loc-Ring jointing procedure.

2- The spigot insertion depth should be measure as the depth from the mouth to the shoulder of the socket (see below). The insertion depth should then be marked on the spigot using an indelible crayon.

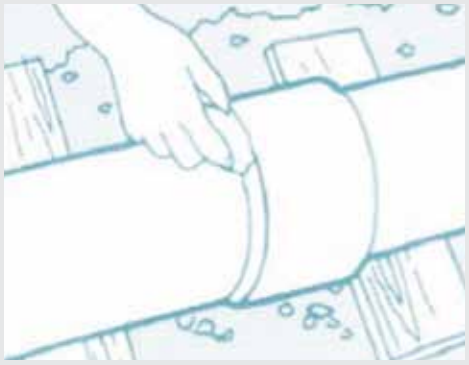
3- The mating areas of the spigot and socket should be thoroughly cleaned using the Watermain Cleaning Fluid provided and a clean rag or absorbent paper.
N.B. Man-made fibers must not be used to clean joints which are to be solvent welded.

4- Lightly roughen the mating surfaces of the spigot and socket, using clean emery cloth or medium glass paper.



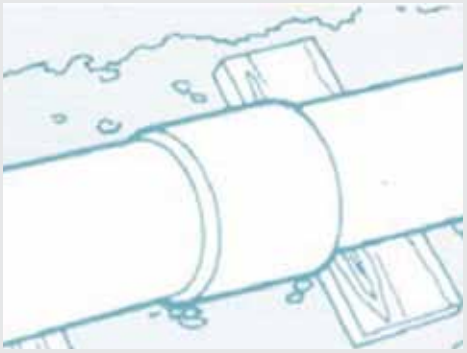

# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE

5- Thoroughly clean again the mating surfaces using the Watermain Cleaning Fluid provided and a clean rag or absorbent paper. Ensure that all mating surfaces are clean and completely dry.

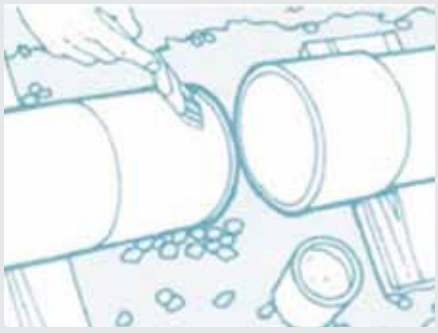


6- Using a brush of the size recommended (see table) apply an even layer of Watermain Solvent Cement to the spigot and socket mating surfaces. The cement should be applied in a lengthways direction and NOT with a circular motion. For joints of nominal diameter 3 and above, the cement should be applied simultaneously to the spigot and socket by two people.

7- Immediately following cement application ensure that the parent pipe is suitably anchored, and push the spigot fully home in the socket without turning the pipe. The spigot should be inserted with a steady, continuous motion and held in place for 20 seconds. Remove the surplus cement from around the mouth of the socket.



8- Leave the joint undisturbed for five minutes, then handle with reasonable care.



# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE

## IMPORTANT

## SOLVENT WELD NOTES

1- Solvent cement is flammable. Do not work near a naked flame or smoke in the work area.

2- Solvent cement should be used in well ventilated conditions.

3- The instructions on the tin, especially those relating to first aid should be strictly adhered to.

4- On no account must cleaning fluid be mixed with solvent cement.

5- The solvent in the cement evaporates quickly, so the tin should be closed immediately after use.

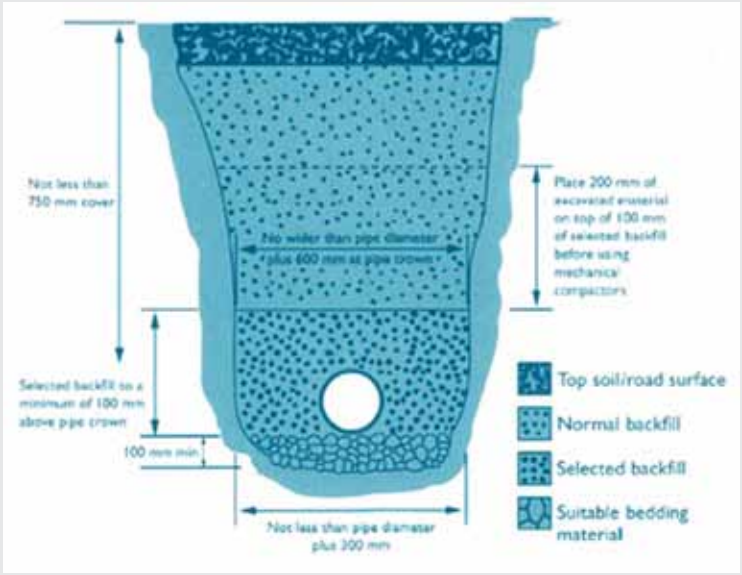
6- Do not use a brush on solvent cement which has previously hardened.

7- Solvent cement spilled on the pipe surface should be removed immediately.

8- If solvent cement is spilled in the trench on the backfill material, the contaminated material must be removed from the working area.

| Nominal Diameter | Joints from 500ml Tin | Type & Size (inches) of Brush | Number of Persons |
|---|---|---|---|
| 3/8 | 160 | 3/16 Round | 1 |
| ½ | 140 | 3/16 Round | 1 |
| ¾ | 110 | 3/8 Round | 1 |
| 1 | 75 | 3/8 Round | 1 |
| 1 ¼ | 55 | 1 Flat | 1 |
| 1 ½ | 48 | 1 Flat | 1 |
| 2 | 33 | 2 Flat | 1 |
| 2 ½ | 22 | 2 Flat | 1 |
| 3 | 18 | 2 Flat | 2 |
| 4 | 10 | 2 Flat | 2 |
| 5 | 5 | 2 Flat | 2 |
| 6 | 3 | 2 Flat | 2 |
| 7 | 2 | 2 Flat | 2 |
| >7Please consult our Technical Department | | | |

# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE




## Trench Work

The line and level of the pipe and 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 Information

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 boulders, bricks or rocks 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.

## Pipe Laying on Bedding

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

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

Pipelines laid through rock should always be laid on a minimum of 100mm bed of suitable bedding materials

# INSTALLATION, JOINTING, HANDLING and QUALITY ASSURANCE

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 the 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.***

## 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 or debris and preferably fine grained. Materials such as clay or hard chalk which 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 nominal single size 10mm or 5mm to 10mm, which have good self-compacting properties.

*Safety Starts here*

# ASSOCIATES AND CUSTOMERS

# Summary of Experience ( Major Projects)

- Project A4 - Area of Bohairat, Zahid & Faiha in Makkah
- Step 1 of development of Industrials City in Sudair
- Amana `Madinah Al-Munawarah Project
- Site Development - Jubail 2, Stage 2
- Sabic Housing Yanbu
- Royal Commission University College Dormitories
- Royal Commission Nurses Housing Project
- Royal Commission - Construction of Primary and Secondary
- Roads and Utilities for Hail Al-Azizia and Hail Al-Jaar
- Royal Commission0 Hail Al - Fahd City Center
- Royal Commission General Utilities for RC Investment and other Sites
- Royal Commission Waterfront Development - MODA
- Royal Commission Construction Infrastructure at Hail Al-Nakheel 2 and 6 Oyoun 2
- Royal Commission Construction of Utilities Network and Development of Al-Bathana Area
- Royal Commission Yanbu Technical Institute
- Royal Commission Construction of 2 Boys School, 1 Girl Primary School and 1 Girls Secondary School
- Royal Commission - Minor Utility work and Conversation of Portable Water Irrigation to TSE to MYAS
- Royal Commission Construction and Site Development for the Waterfront - Phase 3 at Madinat Yanbu Al-Sinayah
- Marafic STG Unit 5 & 6 Project HVAC & FF 0 In Heavy Industrial Area - Yanbu Al Sinaiyah
- Royal Commission Construction of Roads and Utilities in Expansion (LIPE) Area
- Royal Commission Yanbu Refinery - Tanks Farm Package, Yanby Al-Sinaiyah
- Royal Commission Yanbu University Men's Housing Phase 1
- Royal Commission - Construction of 380KV Substation 10J & 5KV Satelite S/ST, Contract
- Luberef Saudi Oil Aramco Company, Yanbu
- Natpetk Yanbu
- Ministry of Water - Hassa Water O. & M. Project
- Saudi Electric Corporation Riyadh SCECO vendor no available

# Customer List

- Al-Harbi Riyadh
- Civil Work Company, Alhasa
- Wanyah Establishment Riyadh
- DEEM Company Riyadh
- Al-Bilad Company Riyadh
- Abdullah-Lazmi Riyadh
- Saudi Oger Ltd Riyadh
- Alfanar Company Riyadh
- Energy Company Limited (TAACA)
- Amec Riyadh
- Al Muhaidib Jeddah
- Al Angari Riyadh
- SBG-KAFD Riyadh
- Mashariq Riyadh
- Bahra Cable Riyadh
- KAU Project both Riyadh/Jeddah
- UCEMS, an electromechanical company associated with Harmain
- Railway project Jeddah
- King Abdullah Financial District (KAFD), 30 parcels - Riyadh - CRP Water Tanks
- Al-Mailabi & Sons Co.
- Bejing Construction Engineering Group Fo. Ltd. KSA
- Peaks Construction & Maintenance Co. Ltd
- Arabtec Saudi Arabia Ltd
- Star Cole Est, Water & Environmental Engineering
- A.R. NAMLA Contracting Co. Ltd.
- JAWDAT Construction
- Sinohydro Corporation
- Project Build Company
- China Harbour Engineering Company Limited
- Qaisar Raza Yousaf construction Co.
- Luberef Saudi Oil Aramco Company, Yanbu
- Natped, Yanbu

# Certificates

المملكة العربية السعودية
وزارة التجارة والصناعة

ترخيص صناعي

رقم ( ١٥٠ / ص ) وتاريخ ١٤٢٨/١/١٩هـ

رقم الصادر: ١٠١٧

نوع الترخيص: ☐ جديد ☑ تعديل الترخيص ( منشأة متوسطة )

اسم المنشأة: شركة هيكو السعودية المحدودة

| اسم صاحب /أصحاب الترخيص | الجنسية | الحصة من رأس المال |
|---|---|---|
| شركة الطريس السعودية للتجارة والصناعة والبناء | سعودية | ٥٥ ٪ |
| رقم السجل التجاري ١٠١٠١٢٦٤٠٥ | | |
| حسن بن حمدي بن أحمد الحربي | سعودي | ٢٠ ٪ |
| رقم السجل المدني ١٠٢٢٤٤٧٦٦٢ | | |

عنوان المنشأة: ص.ب: ٢٤٨ المدينة: جدة

المنتجات: ١٢٠٠٠ ( إثنا عشر الف ) طن
٢٠٠٠ ( الفان ) طن
٤٠٠٠ ( تسعة الاف ) طن
٨٠٠٠ ( ثمانيه الاف ) طن
٤٠٠٠ ( أربعه آلاف ) طن

إجمالي التمويل: ( ١٠٤ ) ( مائه وأربعه )
القوى العاملة: ( ١٧٨ ) ( مائة وثمانيه وسبعون )

ملحوظة: التعليمات الموجودة خلف هذا القرار ملزمة له.

اسم صاحب /أصحاب الترخيص | الجنسية | الحصة من رأس المال

شركة هيكو السعودية للتجارة والصناعة والبناء | سعودية | ٥٥ ٪
رقم السجل التجاري: ١٠١٠٠٩٠٦١٥

الرمز البريدي: هاتف: ٢٢١١٢٤٤ فاكس: ٢٢١٤٨٤٤

أنابيب وتوصيلات الياف زجاجية مقواة بالراتنجات
أنابيب الياف زجاجية مقواة بالكلوكس
أنابيب من فيبر جلاس
أنابيب بولي إيثلين
أنابيب فايبر جلاس

وزارة التجارة والصناعة

المملكة العربية السعودية
وزارة التجارة والصناعة

شهادة تسجيل شركة

رقم: ٤٢٠٠٠٠٧١٣٧
التاريخ: ١٤٣٢/١٠/٢٤

الاسم التجاري للشركة: شركة هيكو السعودية المحدودة
نوعها: ذات مسئولية محدودة

مدة الشركة: ٢٥ سنة
مركزها الرئيسي: جميع الصناعية - منطقة الصناعات الخفيفة
ص.ب: ٢٤٨ الرمز البريدي: هاتف: ٢٢١١٢٤٤ فاكس: ٢٢١١٢٤٢
النشاط: انتاج انابيب من فيبر جلاس و انابيب بولي ايثلين وانابيب وتوصيلات فيبرجلاس

بموجب الترخيص الصناعي رقم ١٥٠/ص وتاريخ ١٤٢٨/١/١٩هـ
((( تم تعديل في الشركاء ومدراء الشركة و رقم الترخيص الصناعي )))

رأس المال: ٨٠٥٠٠٠٠٠٠ ريال سعودي
المديرون:
١ - حسن حمدي احمد السعيدي الحربي
٢ - سلمان سليم طريس الصامدي
٣ - لديم اختر تريخ
٤ - سليمان سليم الصامدي الحربي

سلطات المدير / المديرون: حسب ما نص عليه عقد الشركة

يشهد مكتب السجل التجاري بمدينة جدة بتسجيل الشركة المذكر بسجل مدينة جدة
وتنتهي صلاحية الشهادة في ١٤٣٣/١٠/٢٤ بموجب السجل رقم ٠٠١٩١٩٨٢٢ وتاريخ ١٤٢٧/١١/٠٥ هـ

مدير السجل التجاري الأستاذ: عبدالله حمد الصقاعي
التوقيع:

# Certificates



ج
علامة الجودة
SASO
QUALITY MARK


**Head Office & Factory**
**Saudi Hepco LLC**
P.O.Box 102 -Yanbu
6th Street, Light Industrial Zone
Yanbu Al Sinaiyah -K S A
Tel. +966 14 3211744 / 3211746
3254881 / 3254882
Fax +966 14 3211742

**مكتب الرئيسي**
**هيبكو السعودية**
ص.ب. ١٠٢ ينبع
شارع السادس - منطقة الصناعات الخفيفة
الهيئة الملكية - ينبع الصناعية
المملكة العربية السعودية
تلفون ٣٢١١٧٤٦ / ٣٢١١٧٤٤ ١٤ ٩٦٦+
٣٢٥٤٨٨١ / ٣٢٥٤٨٨٢
فاكس ٣٢١١٧٤٢ ١٤ ٩٦٦+

**Riyadh Branch**
**Saudi Hepco LLC**
P.O.Box 245802
Riyadh 11312
Kingdom of Saudi Arabia
Tel. +966 11 4153011
Fax +966 11 4789881

**فرع الرياض**
**هيبكو السعودية**
ص.ب. ٢٤٥٨٠٢
الرياض ١١٣١٢
المملكة العربية السعودية
تلفون ٢٩١٩٤٠٩ ١١ ٩٦٦+
فاكس ٤٧٨٩٨٨١ ١١ ٩٦٦+

**Jeddah Branch**
**Saudi Hepco LLC**
P.O.Box 114918
Jeddah 21831
Kingdom of Saudi Arabia
Tel. +966 12 6425834
Fax +966 12 6426871

**فرع الجدة**
**هيبكو السعودية**
ص.ب ١١٤٩١٨
الرياض ٢١٨٣١
المملكة العربية السعودية
تلفون ٦٤٢٥٨٣٤ ١٢ ٩٦٦+
فاكس ٦٤٢٦٨٧١ ١٢ ٩٦٦+

Website: www.saudihepco.com.sa
E m a i l : info@saudihepco.com.sa