National Plastic
SHARJAH

uPVC & HDPE Casing and Screen Plain & Ribbed

DIN 4925
ISO 9002

For Deep,
Medium &
Shallow Wells

National Plastic
SHARJAH

Water is Life.

Water is one of the most amazing of all substances.
Without fresh water, living beings nor the
environment that sustains them, can survive.

Each country, geographic region and continent have a limited supply of fresh water. In fact only 3% of the earth's water is fresh. The pressure on water resources is escalating at an ominous pace to feed the ever growing population.

Clearly the immediate and future well being of people in all countries depends on their abilities to manage fresh water more effectively.

Dr. Antoun Kronfli the founder of National Plastic, a man of extraordinary vision, truly understood and recognized the value of water, the role it plays in economic development and in the creation of a better world. His initiative and dedication resulted in establishing the company in 1975 using the latest technology to manufacture products and systems that handle and conserve water with utmost respect and care as well as keeping in view the present and future concerns for water.

National Plastic products have been used worldwide in the greening of the deserts, providing rural water & sanitation network, enriching the life of poor people with affordable and effective means of tapping groundwater, modernisation of urban water supply & drainage networks, and in efficient utilisation of water for agriculture and irrigation.

National Plastic always strives to maintain close and frequent interaction with its worldwide clients, understanding their needs and meeting their requirements on a project to project basis.

National Plastic offers a comprehensive and integrated pipe network system to distribute water from the point of source to the point of use and from the point of use to point of disposal serving all points and every connection in between, in every conceivable corner of the globe.

Ground Water

Underground water found in the pore spaces of rocks and sediments in a fully saturated zone is called groundwater.

Water Table

Water table is the level in the ground below which the pore spaces in the soil or rock are saturated with water.

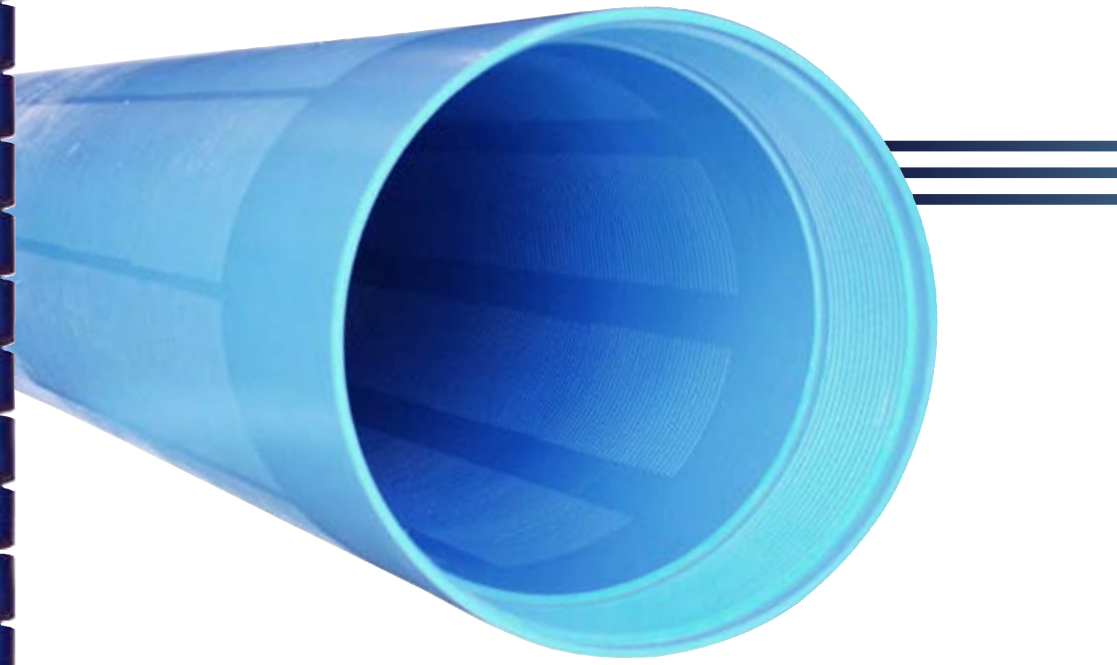
Aquifer

An aquifer is a fully water saturated zone from which water can be extracted in useful amounts by means of well.

If the rate of extraction exceeds the rate of recharge then the water table level dramatically lowers. Over extraction and contamination of waterwells poses a major threat to the precious ground water resources.

National Plastic is dedicated to provide safe water and protection of the ground water with its wide range of products. National Plastic waterwell casings & screens facilitate correct & economic utilization of ground water resources, incorporating the concept of water conservation, elimination of wastage without negative effect on the quality of water and ground water resources.

Water is the basis for survival and development. National Plastic casing & screen has brought about transformation and enhancement in the quality of life of millions of people in developing countries as well as safeguarding groundwater resources for future generations to come.



National Plastic produces a high quality range of uPVC well casings and screens strictly in accordance with the Metric Standard DIN 4925, Part I, II and III and standard DIN 8061 for materials and workmanship of pipes used in the manufacture of the casing and screen.

National Plastic produces two basic ranges - a standard range for shallow and medium well depths and a heavy duty, thick walled range for greater well depths.

Casing and screens are made from 100% virgin unplasticized poly vinyl chloride compound and are coloured blue. They are supplied with a male pipe thread at the spigot end and a female pipe thread at the socket end.

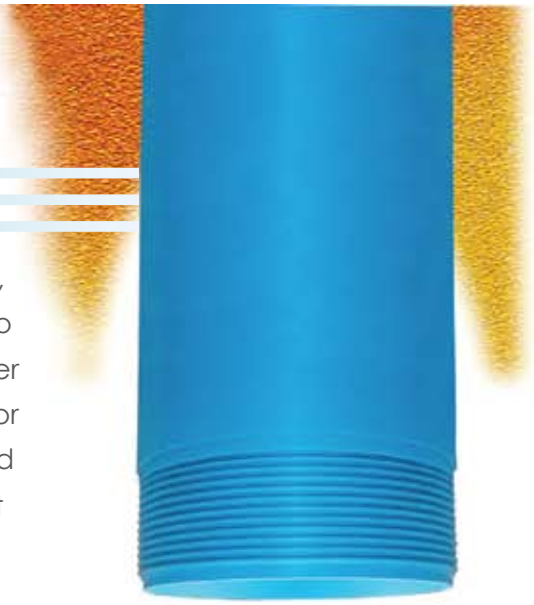
Screens can be supplied with either a plain or ribbed surface. Ribbed surfaces increase water permeability and help prevent clogging of intake openings.

Slots on screens are designed to give open areas ranging from 6 % to 12% depending on the size and slot width.

(Above)
Rolla, Sharjah

(Right)
Buheira Corniche,
Sharjah

A Case for Borewells



T o meet the growing demand and need for water in recent times, more and more developing countries are turning to groundwater to supplement their surface water resources. Traditionally, groundwater drawn through open water wells had been utilized predominantly for human consumption, irrigation and domestic purposes. Now ground water is practically used in every sphere of human activity to meet the need for water in both rural and urban areas.

With the advent of appropriate technology in the form of drilling rigs, submersible pumps and motors as well as casings and screens, open water wells even in developing countries are rapidly becoming a thing of the past. Evaporation of water and the environmental hazards posed by open waterwells through contamination and the use of dry wells as dumping sites of various pollutants have been significantly minimized with the development of closed borewells.

Steel casings and screens were commonly accepted during the early years of borewells, but after prolonged use of steel casing and screen in borewells, several doubts relating to quality of water, performance, efficiency and restricted life span of the wells began to surface.

In the meantime the waterwell industry witnessed the development of uPVC Casing and Screen as a suitable alternative to steel. Casing and Screen made of uPVC material because of its superior tangible advantages over steel casing and screen in terms of cost, quality of water, corrosion resistance, operating efficiency and life expectancy of the water well, has now attained tremendous popularity in most parts of the world. uPVC Casing and Screen are economical, providing a linear metre saving in material cost of around 50% in comparison to steel. It is also lighter in weight than steel and hence much easier and economical to transport, handle and install. The quality of water extracted from a well is vital, especially if it is for direct human consumption. uPVC is a thermoplastic material and therefore chemically inert to groundwater. It is hygienic, rust free, non toxic and does not in any way contaminate nor affect the quality of extracted well water. Steel casing and screen are vulnerable to aggressive water, consequently the yield of the well progressively declines because of the buildup of carbonate scales and rust deposits that clog the well screen slots. uPVC Casing and Screen by comparison are chemically resistant to aggressive ground water and acids, thereby eliminating the problem of clogged screen slots, thus maintaining maximum flow capacities and ensuring operating efficiency. Subsequent buildup of carbonate scales and rust corrosion in the steel will further deteriorate the water well yield and after a certain point will render the well useless.

uPVC Casings and Screens are immune to such deterioration and hence the life expectancy of the well is increased manifold.

National Plastic's uPVC Casings and Screens for water wells have gained reputation in over 45 countries in Africa, Asia, Middle East and Europe. It is a popular and trusted choice of Water Authorities, Waterwell Consultants and Contractors, Professional International Organizations, Development Banks and Aid Agencies.

National Plastic also manufactures uPVC Casing and Screen plain and ribbed types to other international specifications which are standard requirement for international projects.

In addition to the supply of our products we are closely involved with clients worldwide in providing reliable service and on-site technical assistance.

Mechanical & Thermal Properties

Unplasticized polyvinylchloride (uPVC), without plasticizers and fillers

Properties	Units	Testing Method	Specification	Specified Value
Long term Creep Pressure For 1000 hours	N/mm^2	DIN 53795	DIN 8061	10
Impact Resistance (Confidence Limit) at 23±2)˚C	%	DIN 53453	DIN 8061	Min 90
Water Absorption	mg/cm^2	DIN 8061	DIN 8061	max 4
Heat Reversion	%	DIN 8061	DIN 8061	Max 5
Density	gm/cc	DIN 53479	DIN 8061	1.4-1.45
Mean Coefficient of linear thermal expansion in the temperature range 0 to 70˚C	k^{-1}	DIN 53752	DIN 8061	0.8×10^{-4}
Thermal Conductivity	w/km	DIN52612 Part 1	DIN 8061	0.15
Vicat Softening Temp.	˚C Part 1	ISO 2507 Part 2	ISO 2507	≥79
Surface Resistance	Ω Part2	DIN VDE 0303	DIN 8061	$>10^{12}$
Yield Point	N/mm^2	DIN EN ISO 527 Part2	DIN 4925	45 to 55

* **uPVC is generally resistant to :**
- All types of ground water
- Sea water and brines
- Diluted acids
- Diluted alkalines

Range of uPVC Screens with Ribbed Surface.

Nom Diam (mm/inch)	Outside Diam (mm) d	Wall Thickness (mm) s	Outside Diam of Ribs (mm) d_2	Outside Diam of Socket (mm) d_5 (max)
40/1.5"	48	3.5	52	57
50/2"	60	4.0	64	70
80/3"	88	4.0	94	98
100/4"	113	5.0	117	125
125/5"	140	6.5	144	153
150/6"	165	7.5	169	181
200/8"	225	10.0	229	245

Range of uPVC Well Casing and Screens to DIN 4925

Nom Diam (mm/inch) OD	Outside Diam (mm) d	Wall Thickness (mm) s	Outside Diam of Socket (mm) d_5 (max)	Inside Diam of Pipe (mm) d_1
Standard Wall				
35/1.25"	42	3.5	46	35
40/1.5"	48	3.5	53	41
50/2"	60	4.0	66	52
80/3"	88	4.0	94	80
100/4"	113	5.0	121	103
115/4.5"	125	5.0	132	115
125/5"	140	6.5	149	127
150/6"	165	7.5	176	150
175/7"	195	8.5	205	178
200/8"	225	10.0	241	205
250/10"	280	12.5	297	255
300/12"	330	14.5	350	301
350/14"	400	17.5	425	365
400/16"	450	19.5	475	411
Thick Walled				
100/4"	113	7.0	125	96.6
115/4.5"	125	7.5	137	110
125/5"	140	8.0	152	124
150/6"	165	9.5	180	146
175/7"	195	11.5	211	172
200/8"	225	13.0	247	199
250/10"	280	16.0	304	248
300/12"	330	19.0	359	292
350/14"	400	21.5	433	358
400/16"	450	23.5	490	403

Note: Other sizes confirming to BS and ASTM standards can be supplied on request.

The use of non-corroding uPVC for well casing and screen offers significant advantages over steel and other materials. The excellent properties of uPVC guarantee the maximum possible operating life of the well in many applications.

Dimensions and Mass

Nom size DN	Check plug dia[1]	d	d_5 Max	s	l_3[2]	Casings and filter pipes Effective length, l_2(±10)				l_5 +30 0	l_4 (±50) For a reference length, l_2, of			
						1000	2000	3000	4000		1000	2000	3000	4000
						Mass, incl. threaded portion, in kg[3]								
35	33	$42^{+0.2}$	46	$3.5^{+0.6}$		0.7	1.4	2.0	2.6	60	820	1820		
40	39	$48^{+0.2}$	53	$3.5^{+0.6}$		0.8	1.5	2.1	2.9	60	820	1820		
50	50	$60^{+0.2}$	66	$4.0^{+0.6}$		1.1	2.1	3.1	4.1	70	810	1810		
80	77	$88^{+0.3}$	94	$4.0^{+0.6}$		1.7	3.3	4.9	6.5	80	800	1800		
100	98	$113^{+0.3}$	121	$5.0^{+0.7}$		2.7	5.1	7.6	10.1	90	790	1790		
1) The value apply for a check plug length of 100mm. 2) Only filter pipes with effective lengths of 1000mm and 2000mm.														
100[4]	98	$113^{+0.3}$	121	$5.0^{+0.7}$	47	2.7	5.1	7.6	10.1	95	775	1775	2775	3775
	94	$113^{+0.3}$	125	$7.0^{+0.9}$	47	3.6	7.1	10.5	14.0	95	775	1775	2775	3775
115	110	$125^{+0.3}$	132	$5.0^{+0.7}$	47	3.0	5.8	8.6	11.4	95	775	1775	2775	3775
	105	$125^{+0.3}$	137	$7.5^{+1.0}$	47	4.3	8.5	12.6	16.7	95	775	1775	2775	3775
125	122	$140^{+0.4}$	149	6.5^{+09}	62	4.3	8.2	12.4	16.5	160	710	1710	2710	3710
	118	$140^{+0.4}$	152	$8.0^{+1.0}$	62	5.2	10.1	15.1	20.0	160	710	1710	2710	3710
150	144	$165^{+0.4}$	176	$7.5^{+1.0}$	62	5.9	11.4	16.9	22.4	170	700	1700	2700	3700
	139	$165^{+0.4}$	180	$9.5^{+1.2}$	62	7.3	14.2	21.1	27.9	170	700	1700	2700	3700
175	170	$195^{+0.5}$	205	$8.5^{+1.2}$	62	7.5	14.5	21.6	28.6	175	695	1695	2695	3695
	163	$195^{+0.5}$	211	$11.5^{+1.8}$	62	10.4	20.3	30.0	39.9	175	695	1695	2695	3695
200	195	$225^{+0.5}$	241	$10.0^{+1.2}$	72	10.7	20.7	30.7	40.7	180	690	1690	2690	3690
	188	$225^{+0.5}$	247	$13.0^{+1.8}$	72	13.7	26.5	39.4	52.5	180	690	1690	2690	3690
250	243	$280^{+0.5}$	297	$12.5^{+1.5}$	88.5	16.9	32.4	48.0	63.5	220	640	1640	2640	3640
	236	$280^{+0.5}$	304	$16.0^{+1.6}$	88.5	21.2	40.8	60.4	80.0	220	640	1640	2640	3640
300	290	$330^{+0.6}$	350	$14.5^{+1.7}$	88.5	23.0	44.3	65.6	86.8	220	640	1640	2640	3640
	281	$330^{+0.6}$	359	$19.0^{+2.0}$	88.5	29.7	57.1	84.5	112.0	220	640	1640	2640	3640
350	350	$400^{+0.7}$	425	$17.5^{+2.0}$	88.5	33.7	64.8	95.8	126.8	240	620	1620	2620	3620
	342	$400^{+0.7}$	433	$21.5^{+2.4}$	88.5	40.9	78.6	116.2	153.9	240	620	1620	2620	3620
400	395	$450^{+0.8}$	475	$19.5^{+2.2}$	99	42.6	81.5	120.5	159.4	240	620	1620	2620	3620
	387	$450^{+0.8}$	490	$23.5^{+2.6}$	99	50.3	97.2	143.6	190.0	240	620	1620	2620	3620

1) The value apply for a check plug length of 100mm.
2) In specifying the mass, no deductions have been made for the perforations.
3) Up to DN 100 pipes or casings with Whitworth pipe thread as in DIN 2999-1; see DIN 4925-1.

Dimensions and Pattern of Perforations

Perforation width, ω				$0.2^{+0.06}$	$0.3^{+0.016}$	$0.5^{+0.1}$	$0.75^{+0.2}$	$1.0^{+0.2}$	$1.5^{+0.2}$	$2.0^{+0.2}$	$3.0^{+0.3}$
Nom Size DN	Pipe dimensions d x s	η min.	∑∩a ±5%	f, as a percentage							
35	42 x 3.5	3	75	3.7	5.2	6.0	9.1	9.4	9.7	12.1	-
40	48 x 3.5	3	85	3.7	5.2	6.0	9.1	9.4	9.7	12.1	-
50	60 x 4.0	3	108	3.7	5.2	6.0	9.1	9.4	9.7	12.1	-
80	88 x 4.0	3	168	3.7	5.2	6.0	9.1	9.4	9.7	12.1	-
100	113 x 5.0	5	216	3.7	5.2	6.0	9.1	9.4	9.7	12.1	-
	113 x 7.0		206	-							
115	125 x 5.0	5	240	3.7	5.2	6.0	9.1	9.4	9.7	12.1	-
	125 x 7.5		230	-							
125	140 x 6.5	5	240	-	4.7	5.6	8.2	8.5	8.8	11.0	13.5
	140 x 8.0		235	-	-						
150	165 x 7.5	5	285	-	-	5.6	8.2	8.5	8.8	11.0	13.5
	165 x 9.5		278								
175	195 x 8.5	6	340	-	-	5.6	8.3	8.5	8.8	11.0	13.5
	195 x 11.5		330	-	-	-					
200	225 x 10.0	6	390	-	-	-	8.3	8.5	8.8	11.0	13.5
	225 x 13.0		380	-	-	-	-				
250	280 x 12.5	6	450	-	-	-	7.6	7.9	8.1	10.2	12.5
	280 x 16.0		435								
300	330 x 14.5	6	530	-	-	-	7.6	7.9	8.1	10.2	12.5
	330 x 19.0		512								
350	400 x 17.5	8	640	-	-	-	-	7.9	8.1	10.2	12.5
	400 x 21.5		626	-	-						
400	450 x 19.5	8	720	-	-	-	-	7.9	8.1	10.2	12.5
	450 x 23.5		706								
Rib width, b (±0.5)1				4.0	4.0	5.5	5.5	6.8	9.5	9.5	11.0

1) For every metre of filter pipe length, ten ribs up to 2mm wider are permitted.

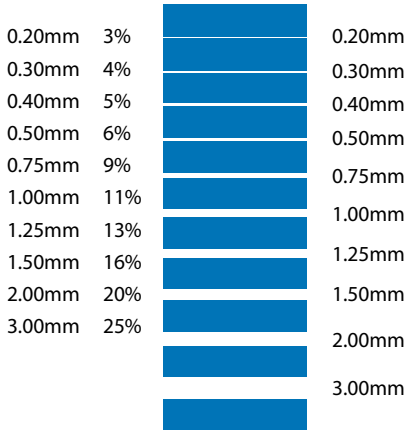
Key to symbols:

f Approximate total effective perforations area (with ∩a and ω in the middle of the tolerance zone)

∑ηa Total length of perforations in one plane

η Minimum number of perforations in one plane.

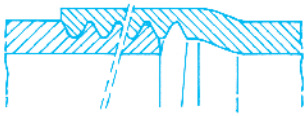
Standard slot width range showing average percentage open area



Screw Threads

All well casing and screens are provided with a male thread at the spigot end and female thread at the socket end.

A range of thread types are available :



Whiteworth
Pipe thread

According to DIN 2999
from sizes 35/1.25" to 100/4"

Trapezoidal thread
DIN 4925

6mm Pitch on 100/4" to 200/8"
12mm Pitch on 250/10" to 400/16"

Flush Joint
Trapezoidal thread

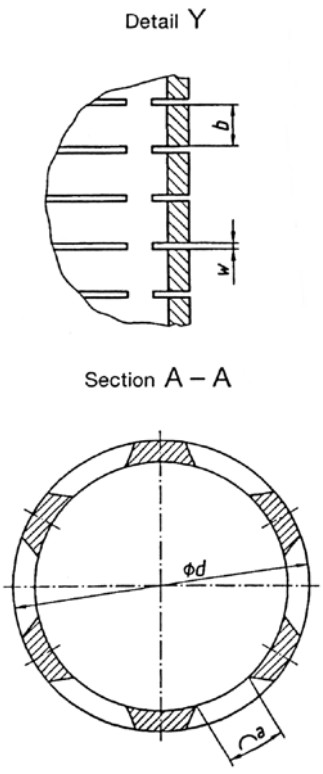
Only to be used on extra thick walled pipe as thread is machined into pipe wall

Trapezoidal
round shoulder thread

For use on heavy duty large diameter screens sizes 250/10" and above

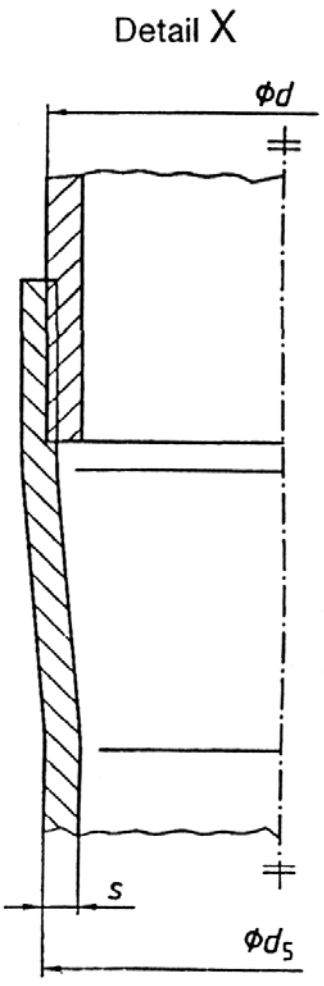
Flush Joint with
Trapezoidal round shoulder thread

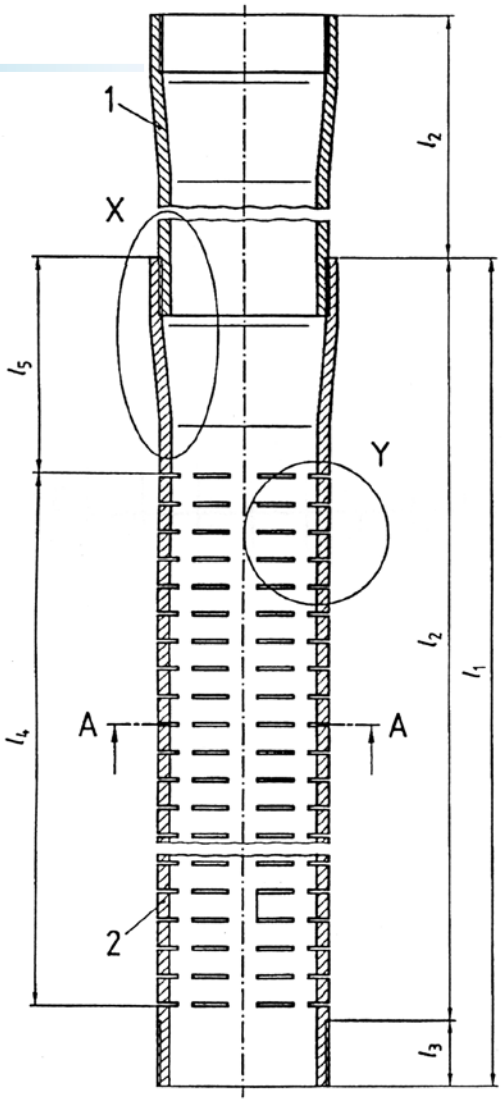
Casing & Filter Pipe Assembly



Dimensions, designation, mass and pattern of perforations.

l_2 is the effective pipe length after assembly, l_1 being equal to l_2 plus the thread length, l_3.





Usage & Installation

Casing

The standard wall thickness casing has a collapse resistance rate of approximately 6 bars. The mechanical properties of this casing permit installation in wells up to approximately 100m(328 feet) depending on local installation conditions. Under special installation methods even greater depths are possible.

The thick-walled casing has a collapse resistance rate of approximately 14 bar and this casing can be installed up to depths of more than 300m(1000ft). The threads on both types of casing are the same depending on nominal diameter and the tensile strength of these joints permit freely suspended installation.

Screen

According to DIN 4925 screens can be supplied either plain or with ribs up to ND 200/8". Screens above ND 200/8" are supplied plain only.

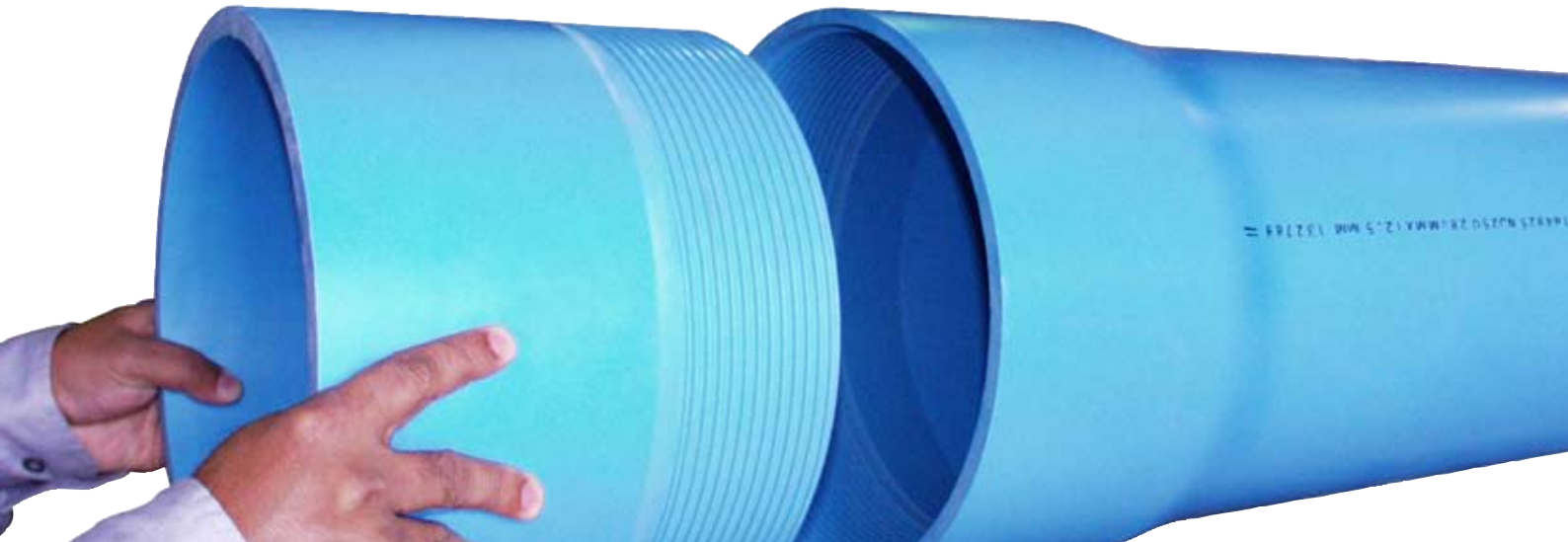
The thread joints of National Plastic screens are identical with casing guaranteeing the jointing of different pipe of the same diameter.

Screen are available in a range of slot sizes and when selecting the type and dimensions of the screen to be used the following should be borne in mind.

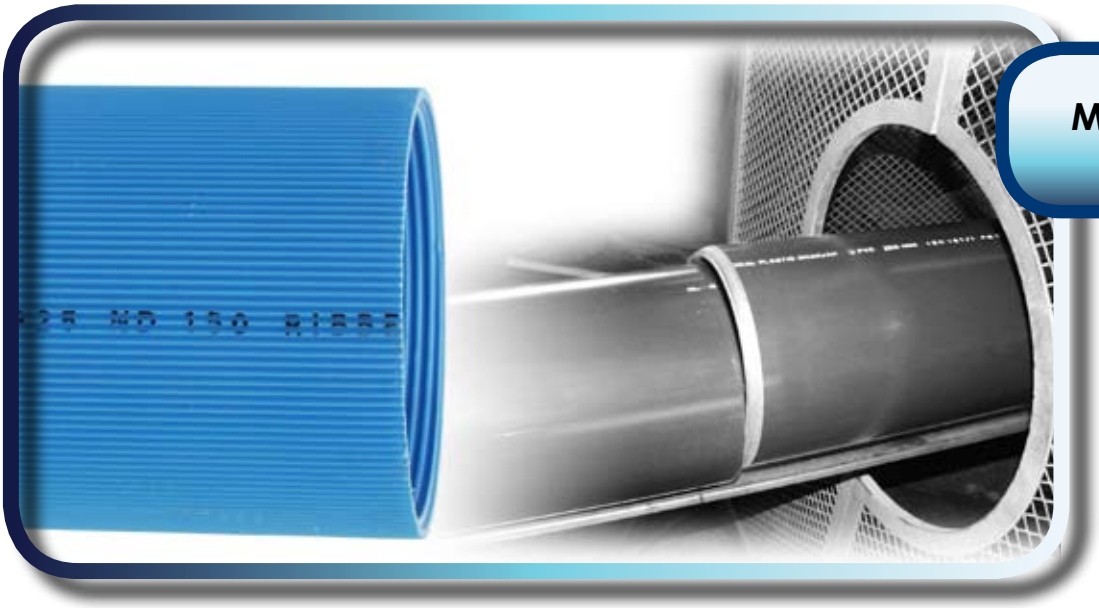
- The permeability of the screen has to be higher than that of the sand or gravel layer directly next to the outer layer of the screen.
- The slot width should be selected as to permit the construction of a sand or gravel screen around the well screen during development.
- That the screen does not corrode and that it can be regenerated by mechanical or chemical means without damage.

Technical Data

Material	:	uPVC to DIN 8061 & 4925
Lengths	:	Normally supplied in 2.85m and 5.8m overall lengths to fit inside standard containers for economical land and sea transport. Other lengths available on request.
Slot Sizes	:	Available in a range of slot widths 0.2, 0.3, 0.5, 0.75, 1.0, 1.5, 2.0 and 3.0mm.
Thread Style	:	Mechanical jointing by threaded connection to DIN 4925. Whitworth threads on small sizes from 100/4" and up.
Joints	:	Each length is supplied with a male/female socketed joint as standard. Flush joints can be supplied on thickwalled pipe.
Marking	:	Standard marking is applied to all casing and screen and includes OD and WT.

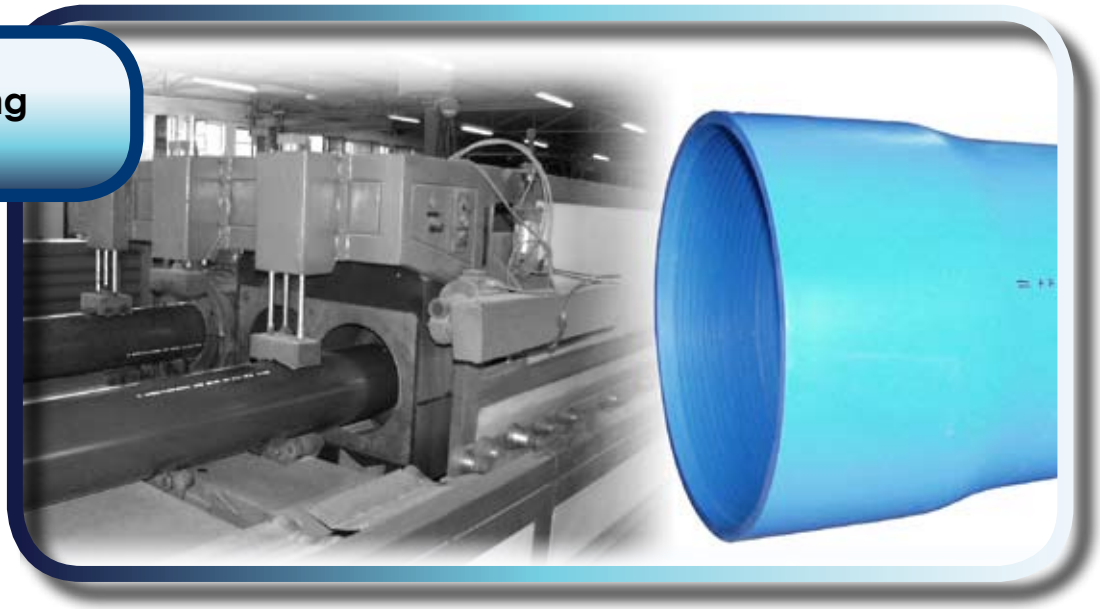


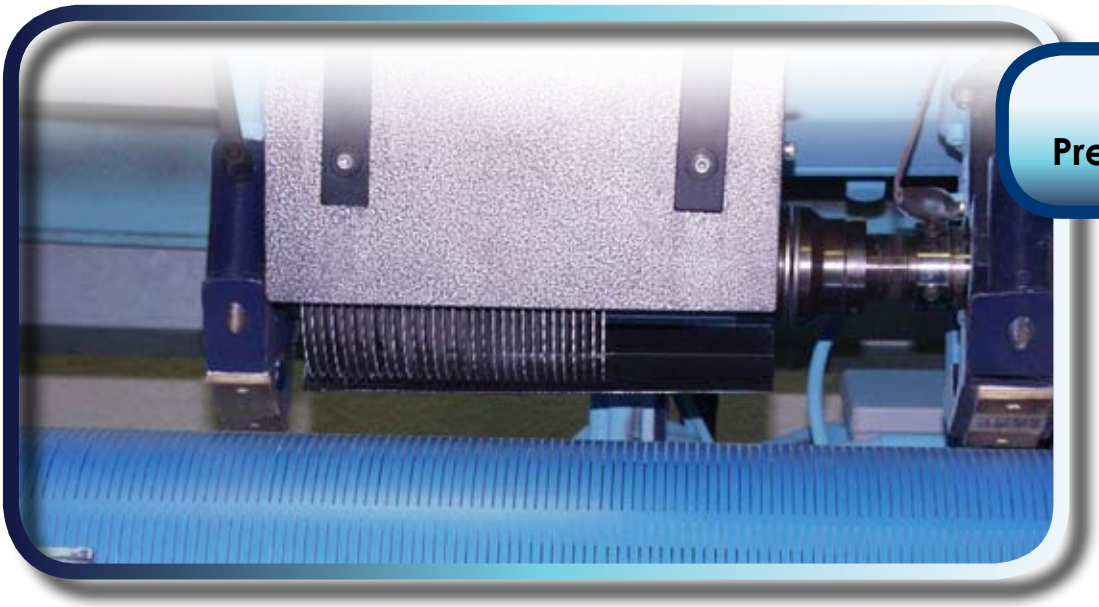
High-Tech Production Facilities



Manufacturing

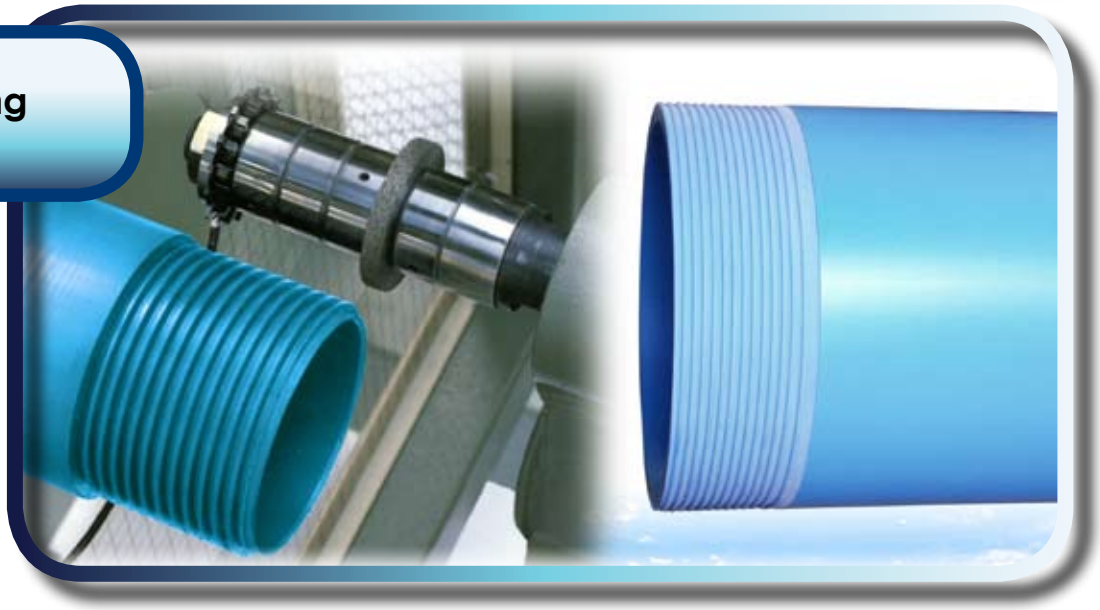
Socketing





Modern
Precision Slotting

Threading



Worldwide Export

Since the last 36 years National Plastic products have been used in thousands of projects in over 60 countries in four continents of Europe, Africa, Asia and Australia. Worldwide users include Municipalities, Water Authorities, Public Works Depts, Ministries, Development Banks, Agriculture Organisations, Aid Agencies including over five United Nations and International contractors.

Accessories

National Plastic produces a range of high quality accessories and tools for successful installation of Casing and Screen. The accessories are available for the full range of sizes produced.

Top Caps

Made of UPVC to close and seal top of well casing.

Bottom Plugs

Made of UPVC to match male or female end of casing / screen as required.

Centralizers

Made of Steel. Should be fixed at regular intervals to ensure correct vertical installation. Includess/bolts.

Reducers

Made of UPVC to match well screen & casing of different diameters.

Sand Traps

V-shaped made of UPVC to trap sand at bottom of screen. Length to be specified at time of order.

Hoisting Device

Machined from high quality steel to ensure safe lifting of the casing string during installation. Heavy duty for maximum strength.

Casting Clamps

Made of steel and hard wood in two halves, internally lined with anti friction material and complete with nuts, bolts for clamping to casing.

National Plastic accessories are produced according to industry standards however the safe and proper installation of casing / screen is the responsibility of the end user who should be fully trained in all aspects of installation.

HDPE Casing & Screen

HDPE Casing & Screens are become an increasing popular choice for water wells, soil monitoring, bio-gas
abstraction from landfill sites, mining and other industries. HDPE has a number of benefits over traditional materials namely light weight, non-corrosive, non toxic, fatigue resistance and facilitates ease & speed of installation.

HDPE Casing & Screens are particularly preferred for soil monitoring and landfills as it has excellent resistance to a variety of aggressive chemicals.

DIN 8074
ISO 9002

Range of HDPE Casing & Screen

Outside Diameter mm	Wall Thickness PN 6 mm	Wall Thickness PN 10 mm
50	2.9	4.6
63	3.6	5.8
75	4.3	6.9
90	5.1	8.2
110	6.3	10.0
160	9.1	14.6

** other sizes available on request.*

Specification

Material	:	High Density Polyethylene
Density	:	0.95
Size	:	50mm to 160mm available in PN6 & PN10
Melting Range	:	127-131 ˚C
Standard	:	Dimensions to DIN 8074
Length	:	2.9m, 3.0m, 5.8m, 6.0m
Slot Size	:	0.75mm, 1.0mm, 1.5mm, 2.0mm & 3.0mm
Thread Style	:	Trapezoidal threads, 6mm pitch
Joint	:	Flush Joints

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