KONTI HIDROPLAST®

PRODUCTION OF POLYETHYLENE AND POLYPROPYLENE PIPES

PE 80/100 POLYETHYLENE GAS PIPES

www.konti-hidroplast.com.mk

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KONTI HIDROPLAST®

WELCOME TO OUR WORLD

Konti Hidroplast is part of the world's largest manufacturer and supplier of high performance plastic pipes and offers the best and the most cost effective pipe systems for its customers.

Konti Hidroplast specialises in polyethylene pipe systems for gas and water transportation in the utilities and industrial markets.

MARKET ORIENTED

Konti Hidroplast products find a broad range of applications in the industrial and utilities market on a worldwide scale.

The water and gas distribution enterprises are important sectors for high integrity products where the maintenance of water quality and the safe transport of gaseous fuels are of paramount importance.

Industrial applications include alternative energy installations in landfill gas systems to effluent transportation and mineral slurry.

Products are widely used in pipeline installation, repair and maintenance.

Many of the brands in the Konti Hidroplast portfolio have a long record of innovation in meeting the needs of the water and gas utilities.

Being one of the foremost pioneers in polyethylene pipe systems, Konti Hidroplast is continually improving and updating its offer to meet the ever growing needs of the distribution engineer, ensuring they stay at the forefront of world gas and water distribution/treatment systems.

CUSTOMER FOCUS

The key to our success lies in the commitment to provide the highest quality service and support. We are a team of highly motivated and experienced individuals.

We place the utmost importance on meeting the needs of our customers, constantly evolving our extensive product portfolio to meet the ever changing demands of the water and gas utilities, industrial and foreign markets.

QUALITY

Konti Hidroplast is a result-driven busines – its people, products and service. Designed, manufactured and supplied under EN ISO 9001:2000 accredited Quality Management Systems, Konti Hidroplast products comply with relevant national, European and international product standards to ensure complete reliability for our customers.

Besides the ISO certificates for Quality Management Systems and ecology, the gas pipes are also certified by DVGW CERT GmbH.

THE ENVIRONMENT

Committed to sustainable manufacture and systems, Konti Hidroplast operates and maintains an environmental policy fully accredited by ISO 14001.

GAS STANDARDS

EN 549	SPECIFICATION FOR ELASTOMERIC MATERIALS USED IN THE MANUFACTURE OF SEALS
ISO 161-1:1996	THERMOPLASTIC PIPES – NOMINAL OUTSIDE DIAMETERS AND NOMINAL PRESSURES
ISO 4065:1996	THERMOPLASTIC PIPES – UNIVERSAL WALL THICKNESS TABLES
ISO 4437:1997	BURIED PE PIPES FOR THE SUPPLY OF GASEOUS FUELS
ISO 11922-1:1997	THERMOPLASTIC PIPES FOR THE CONVEYANCE OF FLUIDS. DIMENSIONS AND TOLERANCES. METRIC SERIES
6437-1984	POLYETHYLENE PIPES (TYPE 50) IN METRIC DIAMETERS FOR GENERAL PURPOSES
ISO 8085:2001 Part 1 Part 2 Part 3	POLYETHYLENE FITTINGS FOR USE WITH PIPES FOR THE SUPPLY OF GASEOUS FUELS GENERAL POLYETHYLENE REQUIREMENTS SPIGOT FITTINGS FOR BUTT-FUSSION OR SOCKET FUSION USING HEATED TOOLS AND FOR USE WITH ELECTROFUSION FITTINGS ELECTROFUSION FITTINGS
EN 1555-1	PLASTIC PIPING SYSTEMS FOR SUPPLY OF GASEOUS FUELS – POLYETHYLENE
EN 1555-2	PLASTIC PIPING SYSTEMS FOR SUPPLY OF GASEOUS FUELS – PIPES
EN 1555-3	PLASTIC PIPING SYSTEMS FOR SUPPLY OF GASEOUS FUELS – FITTINGS
EN 1555-4	PLASTIC PIPING SYSTEMS FOR SUPPLY OF GASEOUS FUELS – VALVE

MATERIAL PROPERTIES & COMPATIBILITY

MATERIALS

KONTI HIDROPLAST manufactures polyethylene systems in both PE80 and PE100. The numbers relate to the MRS (Minimum Required Strength) values of the material.

PE 80

This is a term used to denote the polyethylene material which has been widely used for gas, water and industrial applications for many years. The terms MDPE and HDPE were commonly used for this material.

PE 100

This is a term used to denote high performance polyethylene, and PE100 pipes are sold by KONTI HIDROPLAST under the brand name. PE100 is a higher density material than PE80 and demonstrates exceptional resistance to rapid crack propagation as well as to long-term stress cracking..

Moreover, the higher performance permits thinner pipe walls than PE80 for the same operating pressure.

It therefore uses less polymer and provides for a larger bore and increased flow capacity for a given nominal pipe size. This can result in significant cost savings at certain sizes and pressure ratings.

PE80 and PE100 are not recommended for continuos pressure operation at temperatures above 60°C for liquids, including sewerage and industrial effluents, or 30°C for gaseous fluids.

PROPERTIES AND METHOD OF TESTING OF MATERIALS AND THEIR COMPATIBILITY

PROPERTY	TEST METHOD	UNIT	PE 80	PE 100
MELT FLOW RATE 2,16KG LOAD 5 KG	ISO 1133 ISO 1133	G/10 MIN G/10 MIN	0.2 1.0	< 0,15 < 0,5
DENSITY (MEAN VALUES)	ISO 1872	KG/M^3	YELLOW 940 BLACK 950	ORANGE 951 BLACK 957
TENSILE STRENGTH AT YIELD	ISO R527	MPA	18	23
ELONGATION AT BREAK	ISO 527	%	> 600	> 600
FLEXURAL MODULUS	ISO R527	MPA	700	1000
VICAT SOFTENING POINT	BS2782	°C	116	124
BRITTLENESS TEMPERATURE	ASTM D746 ISO 9784	°C	< -70	< -100
LINEAR THERMAL EXPANSION	ASTM D696	°C	1.5×10^{-4}	1.3×10^{-4}
THERMAL CONDUCTIVITY	DIN 52612	W/M°K	0.4	0.4

STANDARD DIMENSIONAL RATIO (SDR)

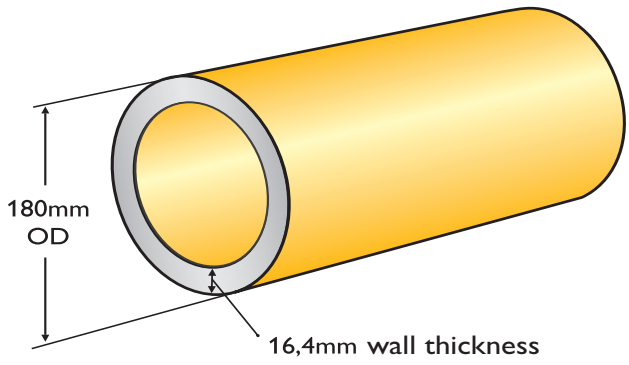
One of the items of information contained on both pipe and fittings is the standard dimensional ratio.

In all but the smallest sizes of PE pipe (<25mm) the ratio between wall thickness and outside diameter remains constant for a given pressure rating of the pipe.

This relationship, called the standard dimensional ratio of SDR, can be expressed as an equation:

$$SDR = \frac{\text{NOMINAL (MINIMUM) OUTSIDE DIAMETER}}{\text{MINIMUM WALL THICKNESS}}$$

EXAMPLE: $SDR11 = \frac{180}{16.4}$



EXPANSION AND CONTRACTION

The average coefficients of linear thermal expansion between 20°C and 60°C for PE80 (MDPE) (1.3x10-4°C-1) and PE100 (1.5x10-4°C1) are approximately ten times greater than for metal. Allowance must be made for this when designing polyethylene pipeline installations where significant temperature variation is expected (eg. above ground).

In above ground installations the natural flexibility of the pipe, coupled with judicious sitting of anchor and support brackets, will conveniently accommodate expansion and contraction at changes of direction, etc. In installations where fully end-load bearing joints are used, the compressive or tensile forces set up in the pipeline due to constraint of thermal movement will not detract from long-term performance, but the effect of these forces on pipe support, ancillary equipment and so on, must be considered and allowance must be made.

The potential for thermal movement is a particular issue where a (fully end-load bearing) PE system is connected to any non end-load bearing mechanically jointed system. It is essential that such transitions are securely anchored, to obviate the risk of any joints in the mechanically jointed system separating.

It is also prudent to allow a newly installed pipeline time to conform to ambient temperature before end connections are made.

PIPE BENDING RADIUS FOR PE

The minimum bend radius for KONTI HIDROPLAST PE pipes is 15 times the pipe OD under optimum conditions (ie.warm ambient temperature and thick-wall/low SDR pipe).

A more typical safe bending radius for SDR11 and SDR17 pipes is 25 times, increasing to 35 times the pipe OD in very cold weather. For thin-walled SDR26 and SDR33 pipes, these values should be increased by 50%.

Electrofusion or mechanical joints and fittings should not normally be incorporated in sections of pipework which are to be bent. Instead a formed bend or elbow should be welded into the pipeline in order to prevent excessive stress.

In the case of pipe supplied in coils or drums, the above bend radius values apply only if pipe is bent in the same direction as it was previously coiled.

JOINTING PE TO PE BY FUSION PE PIPES OF DIFFERENT SDRS

BUTT-WELDING

Butt-welding should only be used for jointing pipes of the same SDR value.

ELECTROFUSION

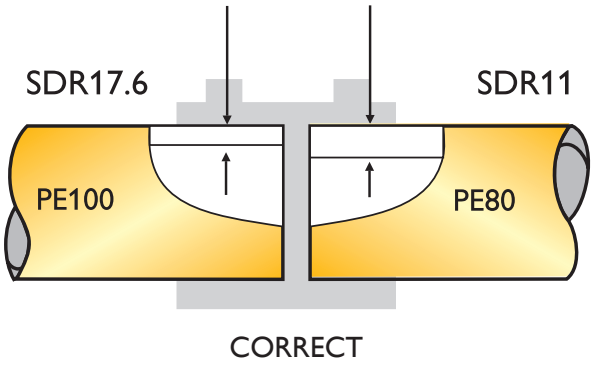
Electrofusion fittings are able to weld pipes having different wall thicknesses (SDRs). They are available in a choice of 10bar or 16bar (water) and 5.5bar or 7bar (gas) rating. Care should be taken to ensure that the pressure rating is equal to or greater than that of the pipe. SDR applications are marked on individual fittings. However, for the more unusual SDRs, specific advice should be sought from our Technical Support Department.

JOINTING DIFFERENT TYPES OF PE

Any medium density PE80 can be joined to any other medium density PE80 either by butt-welding or electrofusion. Different pipe producers may have alternative suppliers of preferred PE80 grades, but these are all intended to be joined by identical techniques.

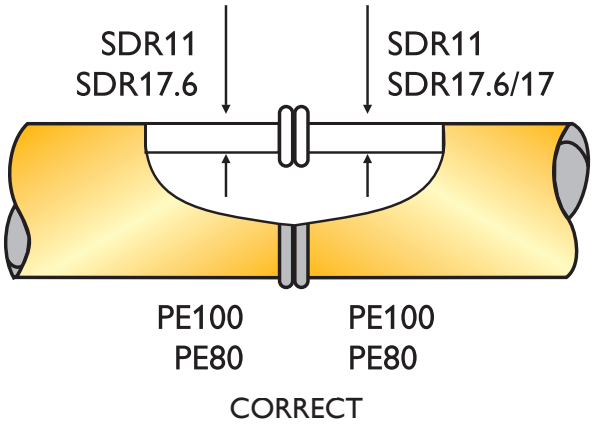
Similarly different grades of PE can be joined together in like fashion. Butt-welding different pipe materials – for example, PE80 to PE100 – is not recommended on site.

MATERIAL AND SDR COMPATIBILITY SUMMARY



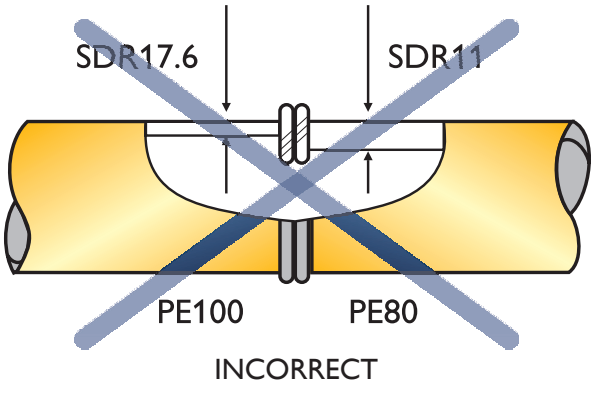
Dissimilar materials and dissimilar wall thicknesses can be jointed by electrofusion.

NB. The maximum working pressure should not exceed the lower value for the two pipes



Similar materials and/or wall thicknesses may be jointed by butt-fusion or electrofusion.

NB. SDR17 may be butt-fused to SDR17,6



Dissimilar wall thicknesses must not be jointed on-site using butt-fusion.

NB: PE80 should only be butt-fused to PE100 under closely controlled factory conditions.

PRESSURE TESTING – GAS

Pressure testing procedures vary according to utility: It is advisable that the regulations of the relevant body are based on the procedure of the Institute of Gas Engineers.

PNEUMATIC PRESSURE TESTING

This is a leakage test that simulates the system at its maximum operating pressure under gas conditions.

When conducting this type of test the barometric pressure must be taken into account. For pipes greater than 63mm stand pipes and gauges should be connected at the ends of the new main and include a pressure relief valve. Air should be introduced into the main until the correct test pressure is attained.

Before the start of the test period, the temperature of the air should be allowed to stabilise.

At the start of the test period a pressure reading should be taken followed by another reading at the end. If the period is long, it may be wise to take several readings during the test. In this way, any early indication of probable test failure avoids the need of running the full test period.

When completed, air should be vented in a controlled manner until the main is at atmospheric pressure.

For pipes of a diameter not greater than 63mm, and of low pressure (not greater than 75mbar), air is introduced into the service through the meter control valve, which is left open whilst the opposite end of the service, at the electrofusion tapping tee, is securely blanked of.

For medium pressure (greater than 75 mbar but not greater than 2bar) and intermediate pressure (greater than 2 bar, but not greater than 7 bar) the test is from the main to the inlet valve of the service governor.

The pressure in the service should be increased to the relevant value.

The test period should be as recommended by the relevant governing body. No pressure loss is permissible.

For low pressure services, once a successful test has been completed, the meter control valve should be closed, the test apparatus detached and the integrity of the meter control valve tested. The pressure can then be released from the electrofusion tapping tee end.

LEAKAGE DETECTION

The pipeline should be dosed with a suitable tracing agent (eg. sulphur hexafluoride or ethyl mercaptan – usage instructions must be followed carefully) and pressurised to 350 mbar.

The length of the pipe should then be checked using a suitable detection device. Once the leak(s) has/ have been located, the pipe should be repaired and all pressure tests repeated.

TEMPERATURE EFFECTS

Pressure changes with temperature and any calculations must consider this. To reduce temperature variations as much as possible the pipe trench should be backfilled.

HANDLING AND STORAGE

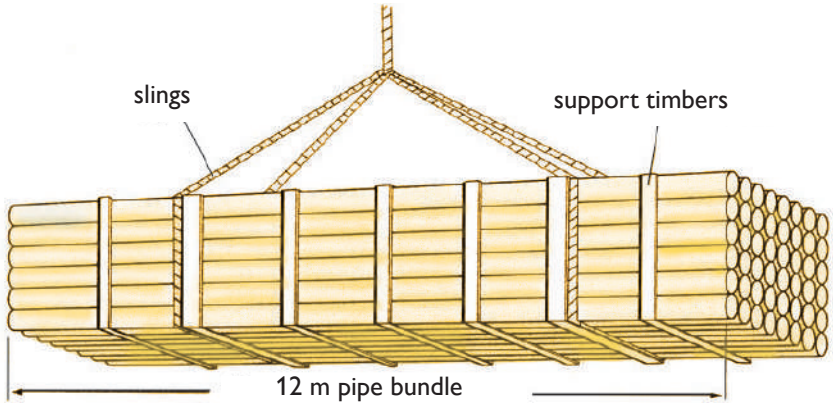
GENERAL HANDLING

Polyethylene is a resilient material, lightweight and easy to handle. Nonetheless, care should be taken not to cause excessive scuffing or gouging of the surface.

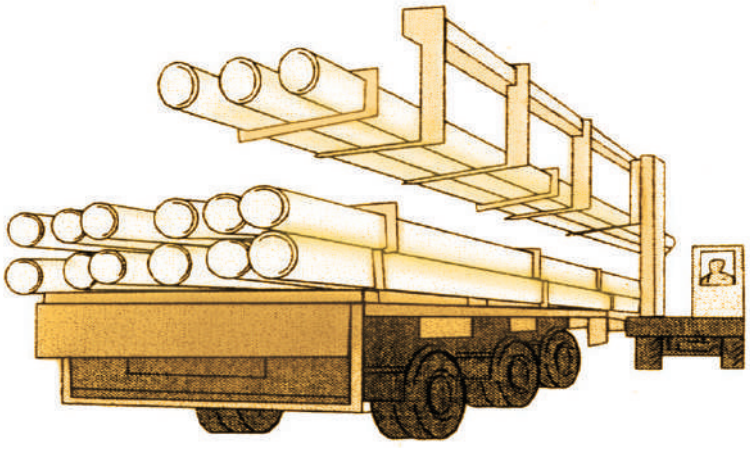
LENGTHS AND BUNDLES

A flat-bed vehicle, free from sharp objects and projections should be used for transporting pipes. When lifting pipe bundles by crane, wideband slings should be used; do not use chains, hooks or hawsers. For lengths greater than six meters, load-spreading beams should be inserted at equal distances apart.

Allow for a certain amount of deflection or slight bending of pipe bundles when loading or unloading. Standard six meter bundles may be handled by forklift, but longer lengths should be moved by a side-loader with a minimum of four supporting forks or by a crane with a spread beam. Individual lengths should be handled similarly. Off-loading on site will be eased by skid timbers and rope slings.



Good lifting practise



Handling of long lengths

COILS

Small coils of pipe strapped on to pallets are easily handled by forklift. Larger coils of 125mm or 180mm pipe will require lifting individually by forklift.

RELEASING COILS

Safety first: Pipe held in coils is under tension and is strapped accordingly. Coils may be hazardous if released in the incorrect manner – particularly if the end of the pipe is not kept restrained at all times. It is most important to read and understand the following guidelines before attempting to release coils.

Coils are secured by one of two methods depending on the pipe's diameter

OUTER BANDS WITH ADDITIONAL STRAPPING OF INDIVIDUAL LAYERS.

Do not remove any of these bands until pipe is required for use. Remove them carefully, from the outermost layer first, so that only the length of pipe needed immediately is released.

Successive layers can be released by removing bandling as the pipe is drawn away from the coil. Coils of pipe above 32mm diameters should only be dispensed in the field from proprietary trailers.

FITTINGS

Never use hooks to lift fittings. Make sure that the tines on forklift trucks are adequately covered. (eg. by scrap PE pipe offcuts).

STORAGE

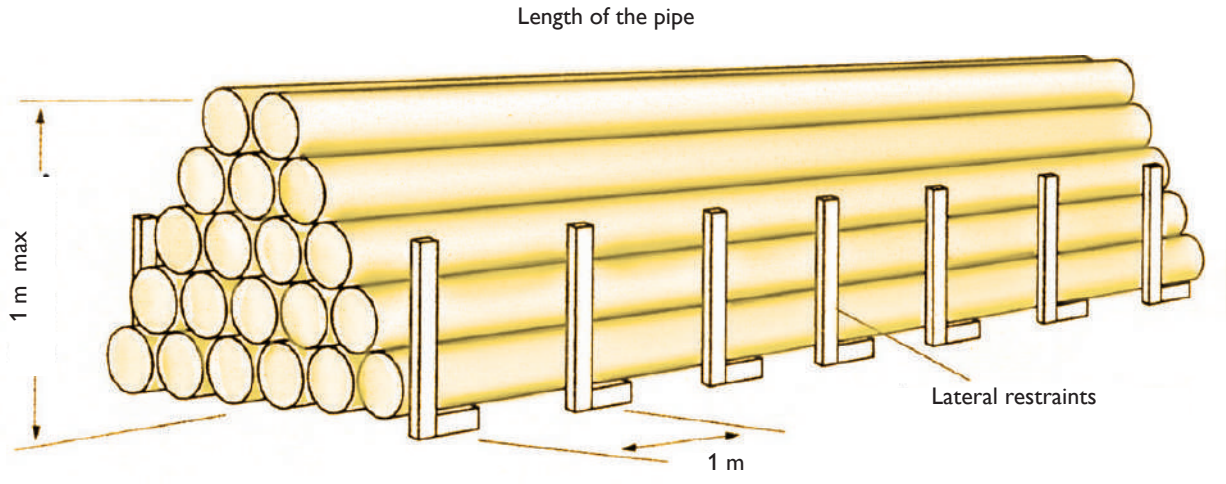
Badly stacked pallets, coils or bundles may slip or collapse, causing injury to personnel or damage to the pipe. Pipe-end caps, intended to prevent ingress of contamination, should be kept in place during storage.

LENGTHS

Pipe lengths stored individually should be stacked in a pyramid not higher than one metre with the bottom layer fully restrained by wedges. Where possible, the bottom layer of pipes should be laid on timber battens at e-metre centres. On site, pipes may be laid out individually in strings. Where appropriate, protective barriers should be placed with adequate warning signs and lamps.

BUNDLES

Bundled packs of pipe should be stored on clear, level ground, with the battens supported from the outside by timbers or concrete blocks. For safety, bundled packs should not be stacked more than three meters high.

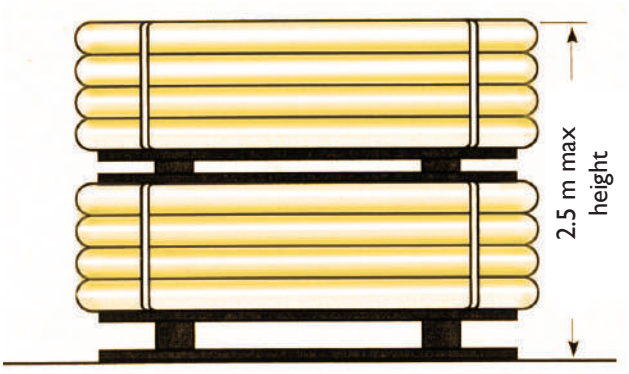


Storage of loose pipes

COILS

Coiled pipe should be stored flat, especially during periods of warm weather, and on firm level ground which has suitable protection for the bottom coil. Where space is limited and coils are to be stacked, the height of stacked coils should be such that the stack is stable and the uppermost coil can be safely handled. Under no circumstances should the stack exceed 2,5 meters in height.

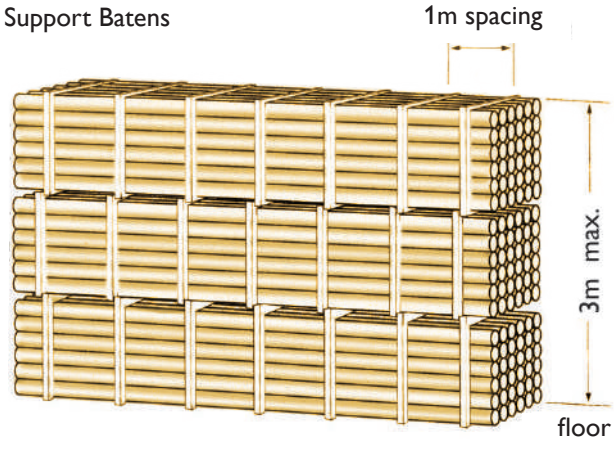
The use of wooden battens below the bottom coil and as spacers between each layer will facilitate easy acces for slinging when the need for transportation to the job is required, which should be carried out by a trained plant operator.



Storage of coils

FITTINGS

Electrofusion fittings should be stored under cover in dry conditions, preferably on racking. They should be kept in their boxes or packaging until ready for use. Butt fusion and spigotted fittings may be stored outdoors, as long as they are protected against damage and prolonged direct sunlight. Electrofusion fittings should be retained in their plastic bags until used.



Storage of bundles

STORAGE OUTSIDE

Black polyethylene material contains pigment to provide excellent protection against degradation due to UV radiation. Blue and yellow polyethylene is UV stabilised to resist degradations in storage only. The maximum reccomended storage outside in Europe is 12 months. Products stored for longer periods should be covered with black polyethylene sheeting or stored under cover.

THE RULES ON HANDLING AND STORAGE

ALWAYS...

- store pipes on flat, firm ground, able to withstand the weight of pipe/fittings and lifting apparatus;
- keep pipe/fittings well away from sharp objects, such as flints;
- use wide non-metalic slings (eg. nylon or polypropilene);
- apply special care when handling pipes in wet or frosty conditions, since they may become slippery;
- keep protective packaging (battens, shrink warp, pallets strapping, etc.) intact until pipes/fittings are required for use;
- keep pipes/fittings away from intense heat, except when jointing;
- allow for some bending deflection when pipes are loaded and unloaded.

Lifting points should be evenly spaced.

NEVER...

- drag or roll individual pipes or bundles;
- throw/drop pipe/fittings from delivery vehicles
- use metal slings, hooks or chains when handling;
- expose pipe/fittings to prolonged sunlight. (Protect with opaque sheeting or tarpaulin) stack more than three meters of three bundles high;
- place pipes or fittings in contact with lubricating or hydraulic oils, gasoline, solvents or other aggressive materials.

PROCEDURES & TECHNIQUES FOR PIPELINE INSTALLATION

Polyethylene pipe systems from KONTI HIDROPLAST are designed to make installation quicker, easier and more cost-effective. Installation is as much a part of the costing equation as ease of maintenance and the cost of the pipe system itself.

PE's great advantage in installation is its lightness and flexibility, coupled with its durability and totally secure jointing methods. For all modern pipelaying techniques, whether in rehabilitation work or the construction of new pipeline above or below ground level, PE80 and PE systems from KONTI HIDROPLAST usually provide the simplest, most economic solution. Indeed, rehabilitation techniques have been developed which rely completely on polyethylene's properties.

A major advantage of PE is that pipe lengths can be butt-fused or electrofusion jointed to form a continuous string of pipe and there is rarely need for thrust blocks. Together with the material's inherent flexibility, this makes polyethylene ideally suited to a full range of new and innovative installation techniques.

CONVENTIONALLY BURIED PIPELINES

Considerable savings in the costs of imported backfill (where necessary, see below) reinstatement and waste spoil disposal can be made if trench width is minimised. The dimensions of a trenchline opening are normally governed by the pipe diameter, method of jointing and site conditions. Normal minimum depth of cover for mains should be 900mm from ground level to the crown of the pipe. Trench width should not normally be less than the outside diameter of the pipe plus 250mm to allow for adequate compaction of sidefill unless specialised narrow trenching techniques are use and/or specially free flowing and self-compacting side materials are employed.

In many instances it may be acceptable to lay PE pipe directly on the bottom of the trench – especially where the soil is uniform, and there are no large flints, stones, or other large hard objects present. In rocky ground, the trench should be cut to a depth which will allow for the necessary thickness of selected bedding material below the bottom of the pipe. Where the finished top surface will subsequently be trafficked, and spoil from the exavation is unlikely to give the degree of ground stability required, even after a degree of grading and compaction, granular material should be imported.

Gravel or broken stone graded between 5 & 10mm in size provides suitable bedding, since it needs little compaction. Coarse sand, a sand and gravel mix, or gravel smaller than 20mm are also all acceptable.

After lowering the pipe into position, the trench can be backfilled and the layers consolidated. It is important to emphasize that the above requirements generally only apply when the PE pipe is buried in ground that will subsequently be trafficked, with or without a road pavement.

The stated sidefill and backfill materials are required to give a stable top surface – the PE pipe itself will not be harmed if laid in much poorer surrounding provided there are no large sharp stones pressing against it.

NORMAL SIDEFILL & BACKFILL REQUIREMENTS

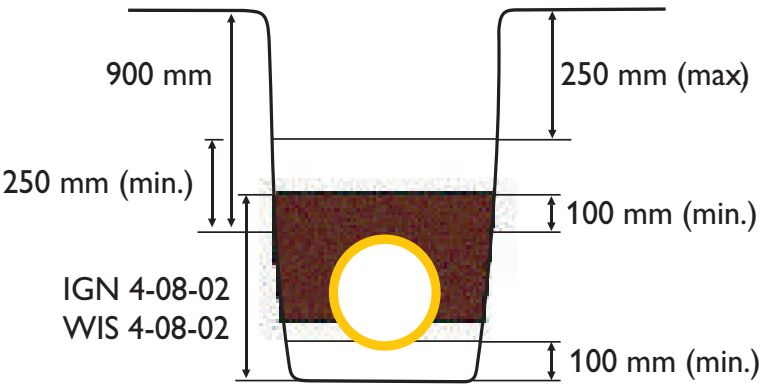
For minor roads the excavated material can often be returned to the trench and compacted in layer thicknesses specified by the Utility Company.

When KONTI HIDROPLAST pipes are laid in fields it is preferable and most cost effective to use the originally excavated material all around the pipe, provided that there are no large sharp stones positioned underneath it (see above). Large clay masses should be kept as dry as possible after excavation and broken up by rotovating. By using as-dug the drainage characteristics of the land are not altered, and any slight future soil movement as the ground re-stabilises is easily accommodated by the flexible and ductile nature of the PE pipes. It can rarely be justified to import granular benefits from using a geotextile wrap around the fill area.

BAR CODED ELECTROFUSION FITTINGS

Technology is now available which eliminates the need to enter the fusion time manually. Special control units can be supplied with the ability to read a bar code where fixed to an electrofusion fitting. These machines have a "light pen" attached which the operator uses to input the data contained within the bar code. Bar code control units also have data logging facilities to ensure traceability of welding parameters. An output socket allows the downloading of this information onto a computer database or printer to obtain a complete record of the joints which have been made.

This information can be downloaded daily, or upon completion of the project. The units will store up to 200 operations. The ECU will display a description of the fitting which includes three digits to denote size and this should be read and checked by the operator before proceeding.



TEMPERATURE/FUSION TIME COMPENSATION

DuraFuse products are designed to work on a fixed fusion time for temperature between -5°C and +23°C.

BUTT-FUSION JOINTING PRINCIPLES

GENERAL

Butt-fusion is a jointing method which allows on-site jointing of pipes from 90mm to 100mm. It is a thermofusion process which involves the simultaneous heating of the ends of two components which are to be joined, until a melt state is attained at each contact surface. The two surfaces are then brought together under controlled pressure for a specific fusion/cooling time and homogenous fusion takes place.

The resultant joint is fully resistant to end thrust and has identical performance under pressure to the pipe. This method of jointing requires an electrically heated plate to raise the temperature. It is used for both PE80 and PE100 grades of material for pipe of size 90mm and above of the same Standard Dimension Ratio (SDR).

Butt-fusion machines are available in manual, semi-automatic and fully automatic configurations. The machine sizes start at 90mm and can weld up to 1000mm OD pipe.

JOINTING METHOD

PRE-WELDING CHECKS

Before commencing a welding operation check that:

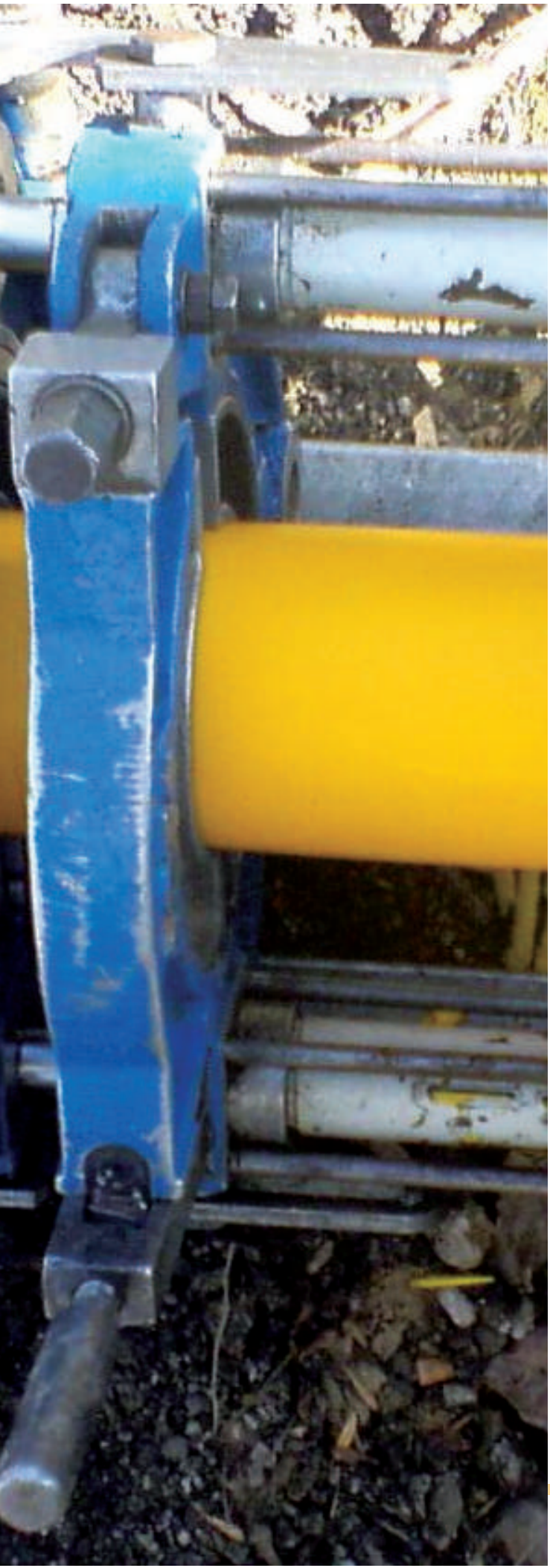
- there is sufficient fuel for the generator to complete the joint and that it is functioning correctly before it is connected to the machine
- the trimming tool and hydraulic pump are in working order
- the heater plate is clean and residues from previous welds have been removed
- a tent is available to provide shelter during welding
- the machine is complete and undamaged
- the pipes and/or fittings to be jointed are of the same size, SDR and material
- the operator knows the correct welding parameters for the machine and pipe being welded
- the heater plate is at the correct temperature. (Connect the heater plate to the power supply and retain it for at least 20 minutes inside the thermally insulated guard)

The heater plate may be washed when cold at the start of the jointing session, with copious quantities of clean water to remove dirt deposits. Only clean, lint free materials may be used to clean the plate. To remove grease and oily films the plate may be wiped with lint free material dampened by a suitable solvent, eg. isopropanol.

TECHNICAL CHARACTERISTIC OF GAS PIPES

GENERAL TABLE

	MOP*	PE80	PE100
DVGW	1 bar	SDR 17	
	4 bar	SDR 11	SDR 17
	10 bar		SDR 11
EN 1555-2	5 bar	SDR 17	
	6.2 bar		SDR 17
	8 bar	SDR 11	
	10 bar		SDR 11



GAS PIPES

SDR	17	11
S	8	5
SF	2.0	2.0

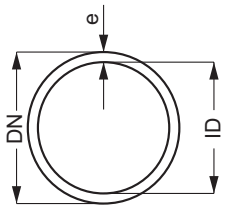
D (mm)	S (mm)	WEIGHT (kg/m)	S (mm)	WEIGHT (kg/m)
20	2.3	0.133	3.0	0.163
25	2.3	0.171	3.0	0.212
32	2.3	0.192	3.0	0.276
40	2.4	0.296	3.7	0.431
50	3.0	0.454	4.6	0.667
63	3.8	0.722	5.8	1.050
75	4.5	1.020	6.8	1.470
90	5.4	1.460	8.2	2.130
110	6.6	2.170	10.0	3.150
125	7.4	2.770	11.4	4.090
140	8.3	3.470	12.7	5.090
160	9.5	4.530	14.6	6.680
180	10.7	5.730	16.4	8.440
200	11.9	7.060	18.2	10.400
225	13.4	8.950	20.5	13.200
250	14.8	11.000	22.7	16.200
280	16.6	13.800	25.4	20.300
315	18.7	17.400	28.6	25.700
355	21.1	22.200	32.2	32.600
400	23.7	28.00	36.3	41.400
450	26.7	35.500	40.9	52.300
500	29.7	43.000	45.4	64.600
560	33.2	55.000	50.8	81.000
630	37.4	69.600	57.2	103.000

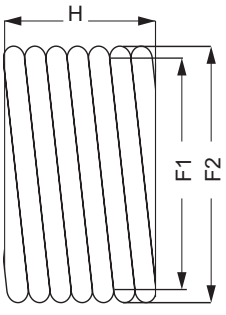
PE 100 RC MULTILAYER GAS PIPE

PIPE TYPE 1 AND 2	
PIPE DESIGN	BLACK PIPE WITH ORANGE - YELLOW COLOURED STRIPE OR BLACK MEDIUM PIPE WITH DIMENSIONALY INTEGRATED ORANGE - YELLOW LAYER
APPLICATION	GAS PIPE FOR BURIED INSTALLATION, LAYING POSSIBLE WITH AND WITHOUT SAND BEDDING
PRODUCT STANDARD	EN 1555-2; PAS 1075 TYPE 3
PROCESSING STANDARD	EN 12007-2, EN 805, DIN ENV 1046
MATERIAL	PE 100 RC
APPROVALS	DVGW, MPA CERT
CERTIFICATION	ISO 9001/ISO 14001
DIMENSIONS	SDR 17; SDR 11; SDR 9; SDR 7.4; SDR 6
DELIVERY FORM	AVALIABLE UP TO 125mm IN COILS, DIMENSIONS FROM 140mm AND ABOVE IN STRAIGHT LENGTH

TABLE OF PIPE DIMENSIONS

PE 100 RC TYPE 3



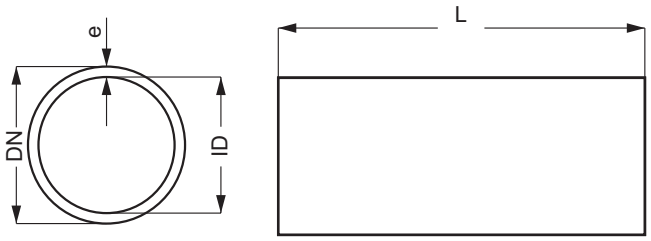


SDR	17	11
S	8	5
SF	2.0	2.0

D (mm)	S (mm)	S (mm)
20	2.3	3.0
25	2.3	3.0
32	2.3	3.0
40	2.4	3.7
50	3.0	4.6
63	3.8	5.8
75	4.5	6.8
90	5.4	8.2
110	6.6	10.0

TABLE OF PIPE DIMENSIONS

PE 100 RC TYPE 3



SDR	17	11
S	8	5
SF	2.0	2.0

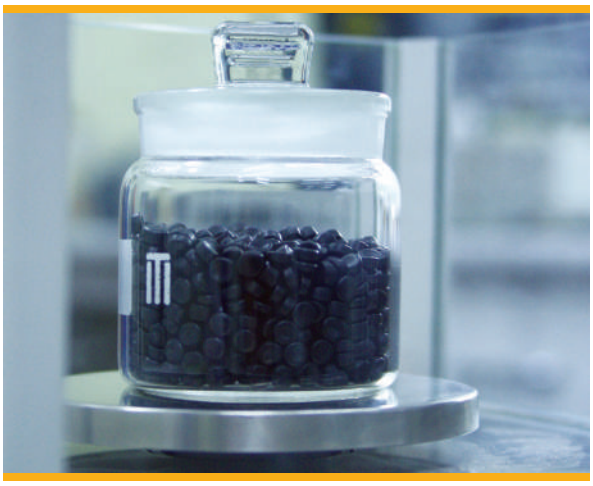
D (mm)	S (mm)	S (mm)
125	7.4	11.4
140	8.3	12.7
160	9.5	14.6
180	10.7	16.4
200	11.9	18.2
225	13.4	20.5
250	14.8	22.7
280	16.6	25.4
315	18.7	28.6
355	21.1	32.2
400	23.7	36.3
450	26.7	40.9
500	29.7	45.4
560	33.2	50.8
630	37.4	57.2

CERTIFICATES

LABORATORY TESTING

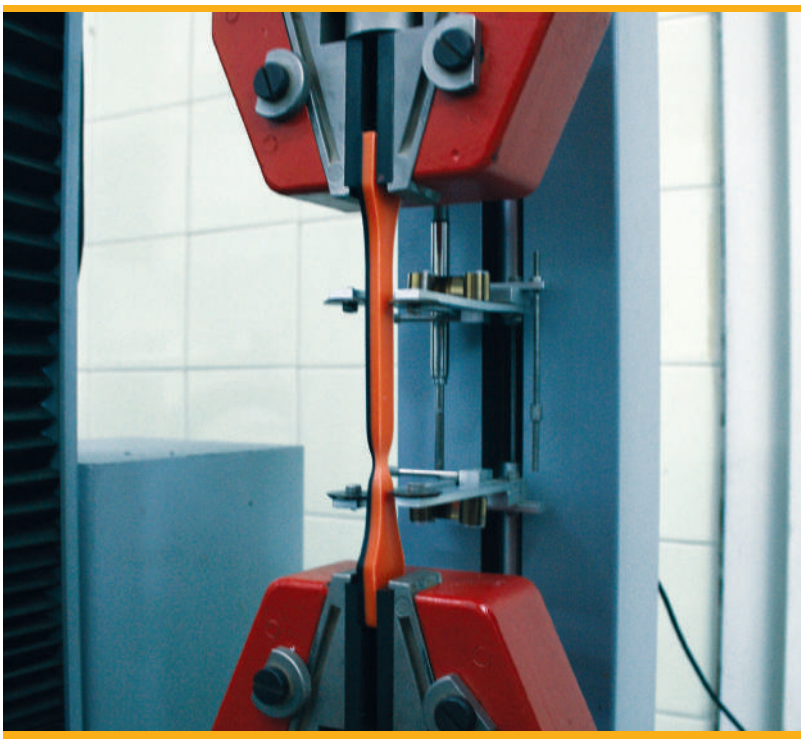
MELT MASS-FLOW RATE

VOLATILE CONTENT



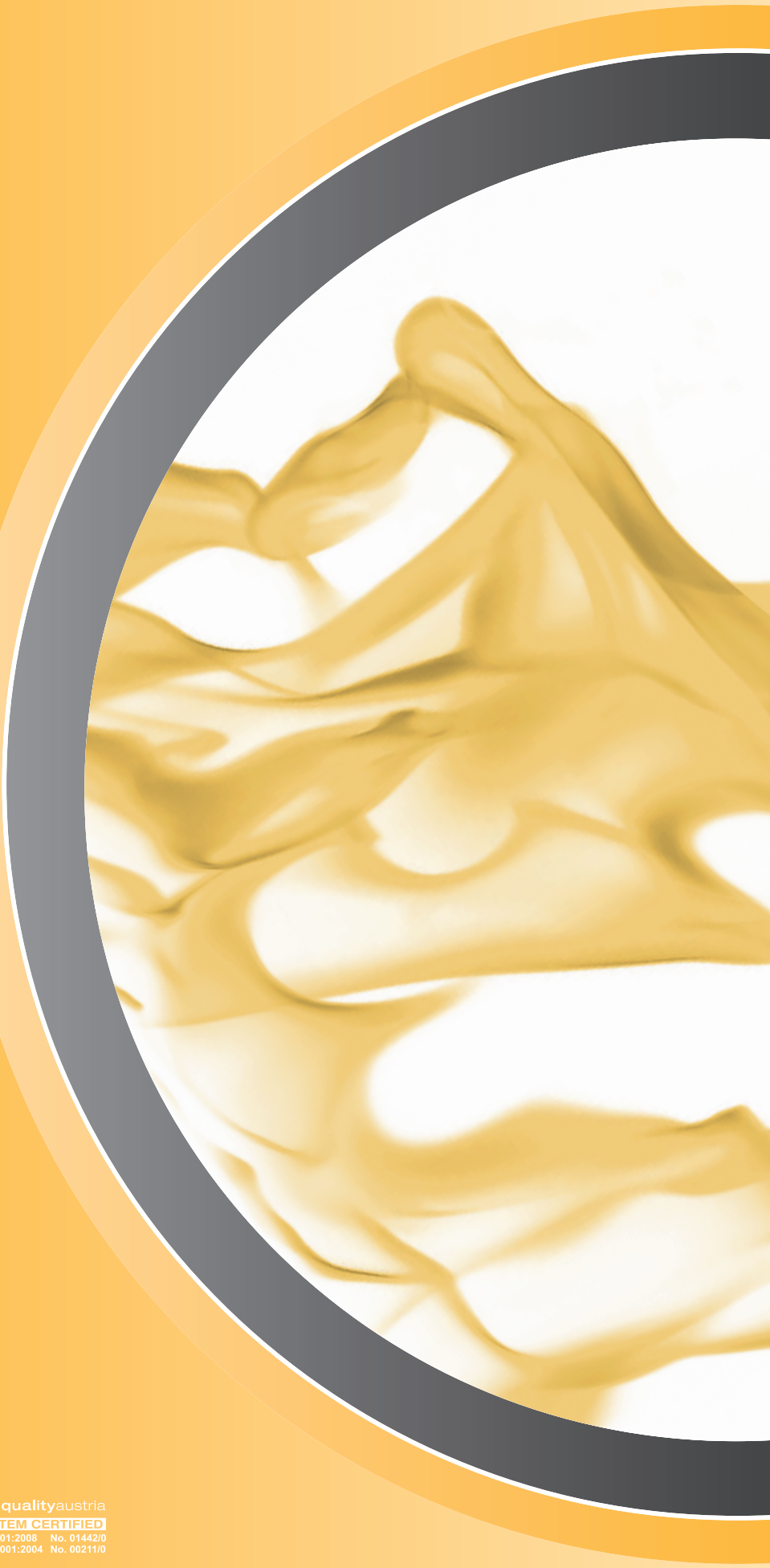
DENSITY

ELONGATION AT BREAK



LONGITUDINAL REVERSION

HYDROSTATIC STRENGTH AT 80° AND 20° C



KONTI HIDROPLAST®

NORTH MACEDONIA
1480 Gevgelija, Industriska bb
+389 34 212 064 +389 34 215 225
+389 34 211 757 +389 34 215 226
+389 34 211 964
contact@konti-hidroplast.com.mk
hidroplast@t-home.mk
www.konti-hidroplast.com.mk

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SYSTEM CERTIFIED
ISO 9001:2008 No. 01442/0
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MAY, 2019