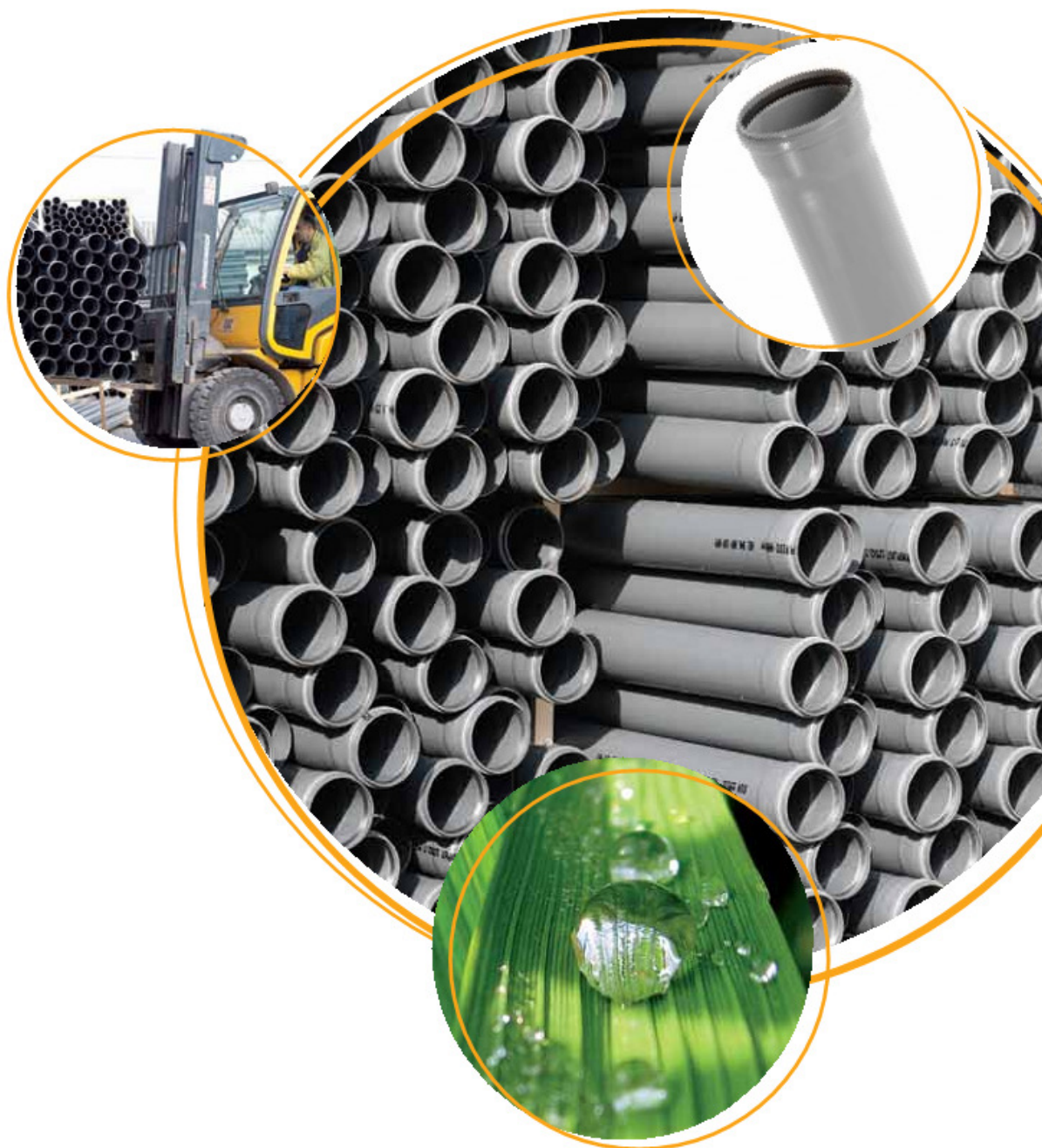




Plastic piping systems for soil and waste discharge





Plastic piping systems for soil and waste discharge

Vinidurit[®] KCM-ECO

Non-lead PVC pipes for soil and waste discharge produced by Kemoplast d.o.o.

PURPOSE

vinidurit KCM-ECO – non-lead PVC pipes with rubber ring sockets for soil and waste discharge are manufactured according to DIN 19531:1987¹ as special contributions to environmental protection. The stabilizers which are used for production these pipes are a heavy-metal free organic based stabilizers environmentally suitable and therefore marked as PVC-ECO.

vinidurit KCM-ECO – non-lead PVC pipes are used for soil and waste discharge pipework for the conveyance of domestic waste waters (low and high temperature), ventilation and rainwater pipework within the building structure.

The pipes have excellent resistance to chemical attack up to max 60°C for continuous and 90°C for discontinuous discharge which makes them particularly suitable for a wide range of applications.

Further guidance can be found in ISO/TR 10358:1993 “Classification of chemical resistance of plastic pipes and fittings”.

COLOUR

vinidurit KCM-ECO pipes are coloured dark grey (approximately RAL 7011²).

BENEFITS

- **High chemical resistance**

Vinidurit KCM pipes offer a considerable resistance to a large number of chemical agents up to 60° C for continuous and 90° C for discontinuous discharge.

¹ **DIN 19531:1987**

Pipes and fittings of unplasticized polyvinylchloride (PVC-U) with rubber ring socket for waste and soil installation inside buildings, dimensions, technical specifications for delivery

² According to the colour register RAL 840-HR



Plastic piping systems for soil and waste discharge

- **Smooth interior, excellent hydraulic characteristics, free of incrustations**

The smooth interior of vinidurit KCM pipes prevents the build-up of deposits, assuring low friction loss and high flow rates. These high flow rates continue for the life of the pipe system.

- **Easy to install**

Easy installation due to the rubber ring push-fit system. A tight and durable connection is ensured.

Jointing: push-fit sockets;

Sealing material: pre-inserted lip ring seal, system BL, conform to EN 681-1.

- **Light weight**

The low weight of the system makes it easy to install. It also reduces transportation, handling and installation costs.

- **Cost effective**

The many advantages of vinidurit KCM pipes ensure a lower installed cost compared to other piping systems.

- **Maintenance free**

Vinidurit KCM pipes do not rust, corrode or promote build-up of deposits on the system interior.

- **Reliable and durable**

Vinidurit KCM pipes are highly durable with high tensile and high impact strength with service life of at least 50 years.



PACKING AND DELIVERY

Standard length of pipes without in-line socket is 25, 50, 100, 200, 300 and 400 cm.

Generally, pipes are delivered pre-packed in block bundles of standard quantities. In these bundles, pipes are held by straps and timber stretchers.



MARKING OF PIPES

Longitudinal:

Number of standard (DIN 19531), manufacturer's name (KEMOPLAST), manufacturer's trade mark (KCM), diameter x wall thickness (d x s), material (PVC-ECO), length in cm, date, hour, line No. (L1)



Plastic piping systems for soil and waste discharge



FEATURES AND CLASSIFICATION OF PVC MATERIAL

MRS (Minimum Required Strength) value in MPa is the basis for the classification of plastics for piping systems.

The MRS value represents the long-term circumferential stress in the pipe where the break may occur after 50 years at the earliest (ISO/DIS 9080, ISO 12162). The calculation design stress σ_s is applied for dimensioning of the piping network. This is calculated

$$\sigma_s = \text{MRS}/C$$

with C= overall service (design) coefficient.

Minimum Required Strength for PVC is **MRS=25 MPa**.

Each pipe series is geometrically defined by the SDR code = Standard Dimension Ratio, whereby:

$$\text{SDR} = d / s$$

Where: **d** – Outside diameter of pipe, **s** – Wall thickness of pipe

Nominal Ring Stiffness (**SN**) is defined as: $\text{SN} = EI/d_m^3$

Where: **SN** – Nominal Ring Stiffness in kN/m², **E** – Modulus of Elasticity, **I** – Moment of Inertia of wall cross section, ($I = s^3/12$), **d_m** – mean diameter of pipe

Physical properties of KCM pipes

Characteristic	Standard	Value	Unit
Density at 23 °C	EN ISO 1183-2	1.350-1.460	kg/m ³
MRS	EN ISO 9080	≥ 25	MPa
Tensile strength	ISO 6259	≥ 45	MPa
Elongation at break	ISO 6259	≥ 80	%
Modulus of elasticity	DIN 53457	3.000-3.600	MPa
Thermal conductivity	DIN 52612	-0,15	W/Mk
Coefficient of linear thermal expansion	DIN 53752	60-80x10 ⁻⁶	K ⁻¹
Longitudinal reversion at 150 °C	EN 743	≤ 5	%
Vicat softening temperature (VST) (5kg)	EN 727	≥ 78	°C
Surface resistance	DIN 53482	> 1.000.000	MΩ
Water Absorption	DIN 8061 paragraph 4.6	≤ 40	g/m ²
Fire classification	NF 055-L3	M1	Self-extinguish

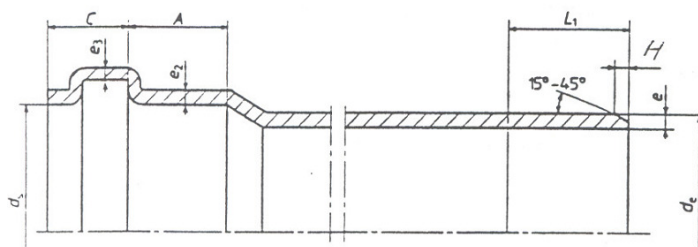
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Plastic piping systems for soil and waste discharge

Vinidurit[®] KCM-ECO

Non-lead PVC pipes for soil and waste discharge
according to DIN 19531:1987
-dimensions -



DN/OD	d_e	$d_{e,max}$	e	e_{max}
32	32,0	32,2	1,8	2,2
40	40,0	40,2	1,8	2,2
50	50,0	50,2	1,8	2,2
75	75,0	75,3	1,8	2,2
110	110,0	110,3	2,2	2,7
125	125,0	125,3	2,5	3,2
160	160,0	160,4	3,2	3,8

where:

DN/OD - nominal size, related to the outside diameter in mm,
 d_e - outside diameter in mm,
 e - wall thickness in mm,



Plastic piping systems for soil and waste discharge

HT[®]

PP (polypropylene) plastic piping system for soil and waste discharge produced by Kemoplast d.o.o.

PURPOSE

HT – PP (polypropylene) plastic piping system for soil and waste discharge are manufactured according to HRN EN 1451-1³. Pipes, fittings and the system of polypropylene are used for soil and waste discharge pipework for the conveyance of domestic waste waters (low and high temperature), ventilation and rainwater pipework within the building structure.

The pipes have excellent resistance to chemical attack up to max 90°C for continuous and 110°C for discontinuous discharge which makes them particularly suitable for a wide range of applications.

Further guidance can be found in ISO/TR 10358:1993 “Classification of chemical resistance of plastic pipes and fittings”.

COLOUR

HT pipes and fittings are coloured dusty grey (approximately RAL 7037⁴).

BENEFITS

• High chemical resistance

HT pipes and fittings offer a considerable resistance to a large number of chemical agents up to 90° C for continuous and 110° C for discontinuous discharge.

• Smooth interior, excellent hydraulic characteristics, free of incrustations

The smooth interior of HT pipes and fittings prevents the build-up of deposits, assuring low friction loss and high flow rates. These high flow rates continue for the life of the pipe system.

³ EN 1451-1:1998

Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure -- Polypropylene (PP) -- Part 1: Specifications for pipes, fittings and system

⁴ According to the colour register RAL 840-HR(EN 1451-1:1998)



Plastic piping systems for soil and waste discharge

- **Easy to install**

Easy installation due to the rubber ring push-fit system. A tight and durable connection is ensured.

Jointing: push-fit sockets;

Sealing material: pre-inserted lip ring seal, system BL, conform to EN 681-1.

- **Light weight**

The low weight of the system makes it easy to install. It also reduces transportation, handling and installation costs.

- **Cost effective**

The many advantages of HT pipes and fittings ensure a lower installed cost compared to other piping systems.

- **Maintenance free**

HT pipes and fittings do not rust, corrode or promote build-up of deposits on the system interior.

- **Reliable and durable**

HT pipes and fittings are highly durable with high tensile and high impact strength with service life of at least 50 years.



PACKING AND DELIVERY

Standard length of pipes without in-line socket is 25, 50, 100, 200, 300 and 400 cm.

Generally, pipes are delivered pre-packed in block bundles of standard quantities. In these bundles, pipes are held by straps and timber stretchers.



MARKING OF PIPES

Longitudinal:

Number of standard (EN 1451), manufacturer's name (KEMOPLAST), manufacturer's trade mark (HT), diameter x wall thickness (d x s), material (PP), length in cm, date, hour, line No. (L1)



FEATURES AND CLASSIFICATION OF PP MATERIAL

MRS (Minimum Required Strength) value in MPa is the basis for the classification of plastics for piping systems.



Plastic piping systems for soil and waste discharge

The MRS value represents the long-term circumferential stress in the pipe where the break may occur after 50 years at the earliest (ISO/DIS 9080, ISO 12162). The calculation design stress σ_s is applied for dimensioning of the piping network. This is calculated

$$\sigma_s = \text{MRS}/C$$

Material	Overall service (design) coefficient	Minimum Required Strength
PPH (polypropylene homopolymer)	C=1,6	MRS=10 MPa
PPC (polypropylene block-coopolymer)	C=1,25	MRS=8 MPa
PPR (polypropylene random-coopolymer)	C=1,25	MRS=8 MPa

Each pipe series is geometrically defined by the SDR code = Standard Dimension Ratio, whereby:

$$\text{SDR} = d / s$$

Where: **d** – Outside diameter of pipe, **s** – Wall thickness of pipe

Nominal Ring Stiffness (**SN**) is defined as: $\text{SN} = EI/d_m^3$

Where: **SN** – Nominal Ring Stiffness in kN/m², **E** – Modulus of Elasticity, **I** – Moment of Inertia of wall cross section ($I = s^3/12$), **d_m** – mean diameter of pipe

Physical properties of HT pipes and fittings

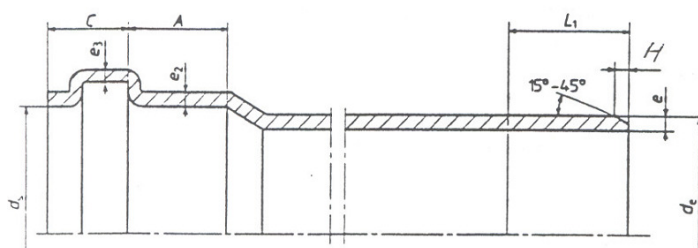
Characteristic	Standard	Value	Unit
Mfi (230/2,16)	ISO 1133	≤ 3,0	MPa
Density at 23 °C	EN ISO 1183-2	920-930	kg/m ³
MRS	EN ISO 9080	≥ 10 (PPH) ≥ 8 (PPC) ≥ 8 (PPR)	MPa
Tensile strength	ISO 6259	≥ 30	MPa
Elongation at break	ISO 6259	≥ 700	%
Modulus of elasticity	DIN 53457	≥ 1200	MPa
Thermal conductivity	DIN 52612	-0,24	W/Mk
Coefficient of linear thermal expansion	DIN 53752	1,5x10 ⁻⁴	K ⁻¹
Longitudinal reversion at 150 °C	EN 743	≤ 2	%
Vicat softening temperature (VST) (5kg)	EN 727	≥ 100	°C
Surface resistance	DIN 53482	> 1.000.000	MΩ
Ring stiffness	EN ISO 9969	S 20: ≥ 2 S 16: ≥ 4 S 14: ≥ 6,3	kN/m ²



Plastic piping systems for soil and waste discharge

HT[®]

PP (polypropylene) pipes for soil and waste discharge
according to EN 1451-1:1998
-dimensions -



			SN 2 S 20	
DN/OD	d_e	$d_{e,max}$	e	e_{max}
32	32,0	32,3	1,8	2,2
40	40,0	40,3	1,8	2,2
50	50,0	50,3	1,8	2,2
75	75,0	75,4	1,9	2,3
110	110,0	110,4	2,7	3,2
125	125,0	125,4	3,1	3,7
160	160,0	160,5	3,9	4,5

where:

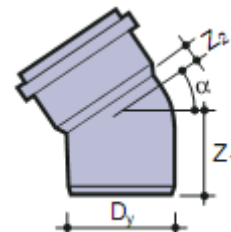
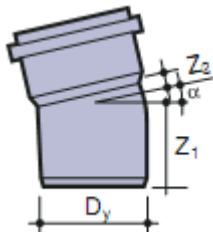
- DN/OD - nominal size, related to the outside diameter in mm,
- d_e - outside diameter in mm,
- e - wall thickness in mm,
- SN - nominal ring stiffness in kN/m^2
- S - pipe series



Plastic piping systems for soil and waste discharge

HT[®]

PP (polypropylene) fittings for soil and waste discharge according to EN 1451-1:1998 and DIN 19560

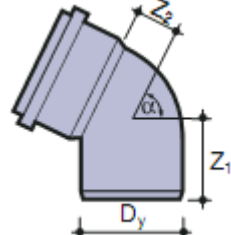
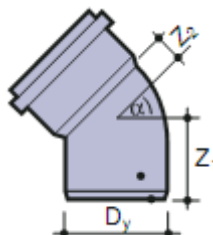


Bend HTB DN x 15°

DN	30	40	50	70	100	125	150
45°			+		+		

Bend HTB - 30°

DN	30	40	50	70	100	125	150
87°30'			+		+		

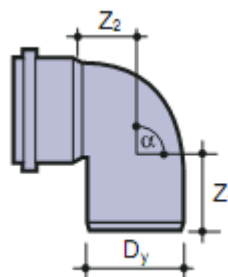


Bend HTB DN x 45°

DN	30	40	50	70	100	125	150
45°	+	+	+	+	+	+	+

Bend HTB - 67°

DN	30	40	50	70	100	125	150
87°30'			+		+		

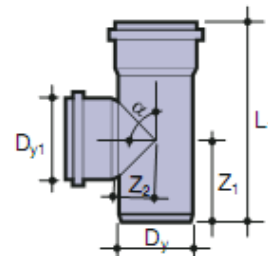
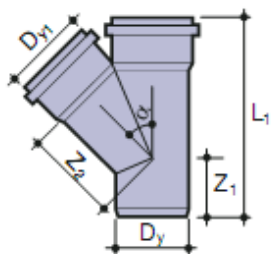


Bend HTB - 87°

DN	30	40	50	70	100	125	150
87°30'	+	+	+	+	+	+	+



Plastic piping systems for soil and waste discharge

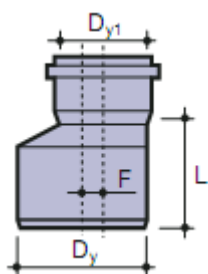


Branch HTEA - 45°

DN	30	40	50	70	100	125	150
30	+						
40		+					
50			+	+	+	+	+
70				+	+	+	+
100					+	+	+
125						+	+
150							+

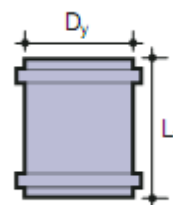
Branch HTEA - 87°

DN	30	40	50	70	100	125	150
30	+						
40		+					
50			+	+	+	+	+
70				+	+	+	+
100					+	+	+
125						+	+
150							+



Reducer HTR

DN ₁ / DN	30	40	50	70	100	125	150
30		+	+				
40			+	+	+		
50				+	+	+	
70					+	+	
100						+	+
125							+

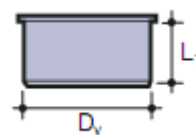
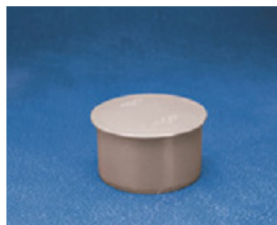
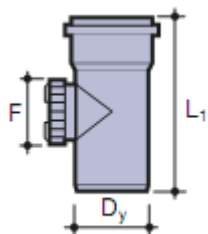


Repair socket HTU

DN	30	40	50	70	100	125	150
	+	+	+	+	+	+	+



Plastic piping systems for soil and waste discharge

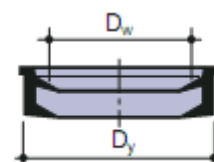
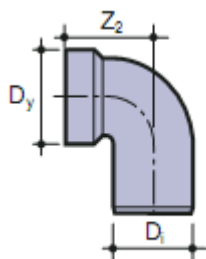


Pipe with screw cap HTRE

DN	30	40	50	70	100	125	150
			+	+	+	+	+

End cap HTM

DN	30	40	50	70	100	125	150
	+	+	+	+	+	+	+

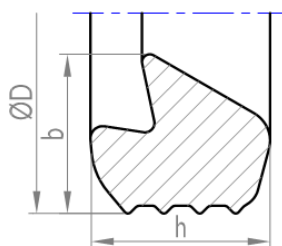


Bend socket HTSW

DN	30	40	50	70	100	125	150
30			+				
40			+				

Collar seal

DN	30	40	50	75	110	125	160
30			+				
40			+				



Lip seal -BL

DN	30	40	50	70	100	125	150
	+	+	+	+	+	+	+