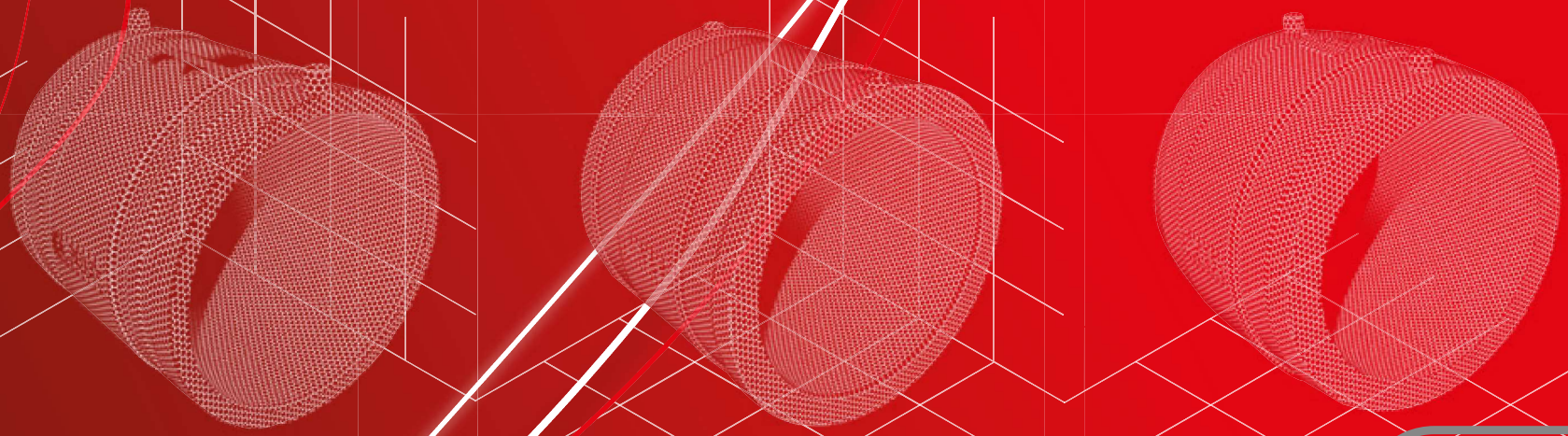
TECHNICAL DATA

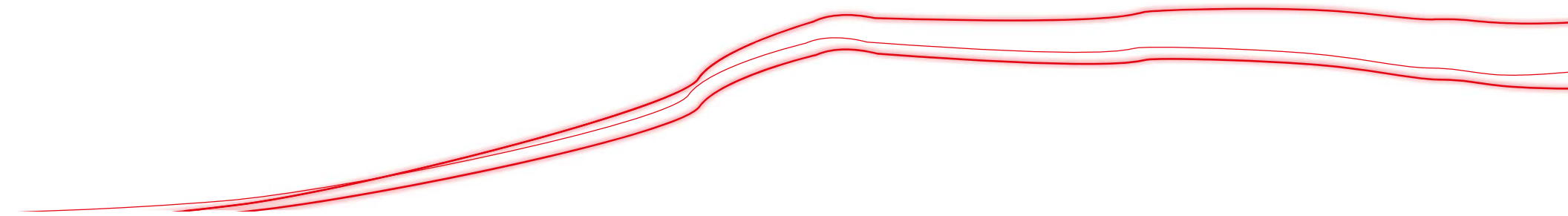


EURO STANDARD®

CONNECTING WORLDS


// EDITION FEBRUARY 2020

TECHNICAL DATA // 5
BUTTFUSION FITTINGS // 15
TRANSITION FITTINGS // 29
ELECTROFUSION FITTINGS // 47
ELECTROFUSION WELDING UNITS // 65
ACCESSORIES // 71
BUTTFUSION WELDING UNITS // 77



TECHNICAL DATA

DEFINITIONS // POLYETHYLENE CLASSIFICATION //
MATERIALS // PRODUCT TESTINGS // MARKING //
LABORATORY ACCREDITATION // CONFORMITY MARKINGS //
QUALITY SYSTEM CERTIFICATION // ENVIRONMENTAL CERTIFICATION //
PIPE-FITTINGS DIMENSIONS // PRESSURES // DIMENSIONS //

// DEFINITIONS

This publication, referring to the UNI, EN and ISO standards, uses the following geometrical definitions:

d_n	**NOMINAL DIAMETER**	specified diameter, in millimeters, of a PE pipe or fitting
e_n	**NOMINAL WALL THICKNESS**	numerical designation of the wall thickness, in millimeters, of a PE pipe or fitting
d_e	**OUTSIDE DIAMETER**	external diameter, in millimeters, measured at any point of the circumference of a PE pipe or fitting spigot end
d_{em}	**MEAN OUTSIDE DIAMETER**	dimension value of the external circumference of a PE pipe or fitting spigot end divided by π, in millimeters
SDR	**STANDARD DIMENSION RATIO**	relationship between the outside nominal pipe diameter d_n and the nominal wall thickness e_n
D	**NOMINAL DIAMETER STEEL PIPE**	nominal diameter, in inches, of a steel pipe or in millimeters
G	**GAS THREAD DIAMETER**	dimension, in inches, of the thread part

// POLYETHYLENE CLASSIFICATION

The polyethylene classification, defined by the ISO and the EN standards is issued depending on the parameter MRS = MINIMUM REQUIRED STRENGTH, that is the minimum resistance that the polyethylene must guarantee after 50 working years at the reference temperature of 20 °C.

Each MRS has a design stress value sigma (σs), derived by MRS dividing it with the design coefficient (C). In case of water distribution the UNI EN 12201 standard defines equal to 1,25.

DESIGNATION	**MPa**	
	MRS	**σs** (C=1,25)
PE 80	8,0	6,3
PE 100	10,0	8,0

The choice of the polyethylene type determines the nominal pressure PN of the pipe/fitting. For water distribution, the PN corresponds to the maximum allowable working pressure (PFA) in bar which can be maintained at the temperature of 20 °C with a design basis of 50 years, based on the design coefficient.

// MATERIALS

CHARACTERISTICS	TYPICAL VALUES	UNITS	TEST METHODS
DENSITY	958 – 959	$\frac{kg}{m^3}$	ISO 1183-1
MELT MASS FLOW RATE (MFR) 5 KG/190 °C	0,23 – 0,45	g/10 min	ISO 1133-1
TENSILE STRENGTH AT YIELD	23 – 25	MPa	ISO 527
TENSILE ELONGATION AT BREAK	≥ 350	%	ISO 527
CARBON BLACK CONTENT	2,0 – 2,5	%	ISO 6964
LINEAR THERMAL EXPANSION COEFFICIENT	$2,0 \times 10^{-4}$	$\frac{m}{m\ °C}$	
BRITTLENESS TEMPERATURE	– 80	°C	ASTM D746

All fittings in the EUROSTANDARD range are injection moulded using polyethylene compounds type PE 100 and PE 100-RC suitable for pipelines for the distribution of gas, water and other fluids under pressure.

The characteristics are in conformity with the standards EN 1555, EN 12201 and EN ISO 15494. The compounds used, normally added at the origin with carbon black for the UV stabilization, are suitable for drinking water and foodstuffs as provided in the D.M. 21 March 1973 and the D.M. n. 174 dated 6 April 2004.

EUROSTANDARD fittings are weldable with PE 80 and 100 pipes and fittings having melt mass-flow rate 0,2 - 1,4 g/10 min (ISO 1133-1 5 kg / 190 °C).

PE 100 fittings are weldable with PE 80 pipes/fittings and viceversa, either using buttfusion (if only of the same nominal thickness and same nominal diameter) or using electrofusion.

// PRODUCT TESTINGS

EUROSTANDARD fittings are continuously monitored throughout the entire production process in accordance with the internal testing programs in compliance with the standards EN 1555, EN 12201 and EN ISO 15494.

The testing activities are continuously carried out following up the complete observance of the reference standards and foresee tests of mechanical and physical type, either on the fittings and on the raw material.

Particularly, the production is subjected to the following tests:

MELT MASS FLOW RATE (MFR)

UNI EN ISO 1133-1

DIMENSIONAL CONTROL – APPEARANCE TEST – MARKING CONTROL – ELECTRICAL WIRE RESISTANCE

UNI EN 1555

UNI EN 12201

UNI EN ISO 15494

UNI EN ISO 3126

RESISTANCE TO HYDROSTATIC INTERNAL PRESSURE AT 20 °C AND 80 °C

UNI EN ISO 1167

TENSILE STRENGTH ON BUTTFUSION FITTINGS

ISO 13953

IMPACT RESISTANCE ON ELECTROFUSION SADDLES

UNI EN 1716

DECOHESIVE RESISTANCE ON ELECTROFUSION FITTINGS (PEEL TEST AND CRUSH TEST)

ISO 13954

ISO 13955

ISO 13956

OXIDATION INDUCTION TIME (OIT)

ISO 11357-6

// MARKING

EUROSTANDARD fittings have the following information stated on the fitting and/or on a label:

EURO	producer identification
I00001 01/20	batch reference and/or month and year of manufacture
PN _	nominal pressure rating at 20 °C for water
S _	gas series of pipe
SDR _	standard dimension ratio
d _	nominal size of the fitting (mm)
PE 100	raw material type used
UNI _ EN _ ISO _	product standard
RINA	conformity marking
GRADO B	dimensional tolerance

The barcode label is applied on the electrofusion fittings containing the welding parameters according to standard ISO 13950 and the traceability data of the fitting according to standard ISO 12176-4.

// LABORATORY ACCREDITATION EUROLAB

The EUROLAB Laboratory, belonging to Eurostandard, operates in accordance to the standard EN ISO/IEC 17025:2018 and is accredited from ACCREDIA - Italian Accreditation Body - with accreditation number 0740L.

The accreditation certifies the technical qualification of the Laboratory relatively to the accreditation field reported in the Test List enclosed to the certificate, downloadable from the website **www.accredia.it.**

The in-force status of the accreditation can be checked on the same website.

// CONFORMITY MARKINGS

Eurostandard is authorized to use the RINA Quality Marking with reference to the standards UNI EN 12201-3, EN 12201-3, UNI EN 1555-3, EN 1555-3, UNI EN ISO 15494, EN ISO 15494 for the fittings as detailed in the enclosed papers to the Conformity Certificates.

For information on the validity of the Conformity Certificates, visit the website **www.rina.org**.

Download of Certificates of Conformity and relevant enclosures on website **www.eurostandard.it**.

Eurostandard is also authorized to use several conformity markings of primary international certification bodies operating in the relevant sector. Here below are some examples. For information on the validity of the Conformity Certificates and the applicability to each fitting, please contact Eurostandard.

// QUALITY SYSTEM CERTIFICATION

ISO 9001

The **EUROSTANDARD QUALITY MANAGEMENT SYSTEM** involves and manages all activities within the Company in order to achieve the optimum level of the quality standards. That is on the basis of the directions imposed in the ISO 9001 standard, which points out the requirements for an organization that needs to demonstrate its capability to regularly provide products or services which satisfy the client requirements and those mandatory, and wants to increase the satisfaction of its clients.

The codified and controlled management of the company activities is described in the documents which form the System Manual and in the relative managing and technical procedures.

The “Quality & Environment” function guarantees the integration of the various activities which determine the quality of the supplied products and of the system itself.

The correct management of all documents allows the complete traceability of the product through the batch reference number or other codes assigned during the production.

The Eurostandard policy is published on the website **www.eurostandard.it**.


CERTIFICATO N.
CERTIFICATE No. 21071/10/S
EUROSTANDARD S.P.A.
ISO 9001:2015

// ENVIRONMENTAL CERTIFICATION

ISO 14001

The **EUROSTANDARD ENVIRONMENTAL MANAGEMENT SYSTEM** involves and manages all activities within the Company in order to render to the minimum the environmental impacts deriving from themselves and avoid pollution.

This happens in conformity to the prescriptions of the standard ISO 14001, which specifies the requirements of an environmental management system that an organization can use to improve its environmental performances and fulfil the expected and specified results; among these, the fulfilment of the conformity requirements and the achievement of the environmental targets.

The management and control methodologies of the firm activities are described in details in the System Manual and in the environmental procedures.

The Eurostandard policy for environment is published on the website **www.eurostandard.it**.


CERTIFICATO N.
CERTIFICATE No. EMS-2935/S
EUROSTANDARD S.P.A.
ISO 14001:2015

// PIPE-FITTINGS DIMENSIONS

UNI EN 12201
UNI EN 1555
UNI EN ISO 15494

	SDR 17	SDR 11	SDR 7,4
PE 100	PN 10	PN 16	PN 25
d_n	wall thickness e_n (mm)	wall thickness e_n (mm)	wall thickness e_n (mm)
20	1,8 3,0 ★	2,0 3,0 ★	3,0
25	1,8 3,0 ★	2,3 3,0 ★	3,5
32	2,0 3,0 ★	3,0	4,4
40	2,4 3,0 ★	3,7	5,5
50	3,0	4,6	6,9
63	3,8	5,8	8,6
75	4,5	6,8	10,3
90	5,4	8,2	12,3
110	6,6	10,0	15,1
125	7,4	11,4	17,1
140	8,3	12,7	19,2
160	9,5	14,6	21,9
180	10,7	16,4	24,6
200	11,9	18,2	27,4
225	13,4	20,5	30,8
250	14,8	22,7	34,2
280	16,6	25,4	38,3
315	18,7	28,6	43,1
355	21,1	32,2	48,5
400	23,7	36,3	54,7
450	26,7	40,9	61,5
500	29,7	45,4	
560	33,2	50,8	
630	37,4	57,2	
710	42,1	64,5	

★ minimum thickness outlined by UNI 9034 for gas distribution

// OPERATING PRESSURES OF PE PIPELINES
FOR WATER SUPPLY

UNI EN 12201

°C	MAXIMAL OPERATING PRESSURE (bar) ACCORDING TO TEMPERATURE OF THE CARRIED FLUID					
	PN 8	PN 10	PN 12,5	PN 16	PN 20	PN 25
20	**8,0**	**10,0**	**12,5**	**16,0**	**20,0**	**25,0**
30	7,0	8,7	10,9	13,9	17,4	21,8
40	5,9	7,4	9,3	11,8	14,8	18,5

// OPERATING PRESSURES OF PE PIPELINES
FOR GASEOUS FUELS SUPPLY

D.M. 16.04.2008

SDR ★	ALLOWED DIAMETERS (mm)	PE 80 PRESSURE (bar)	PE 100 PRESSURE (bar)
17	≥ 50	3,1	3,8
11	≥ 16 ★	5	5

★ minimum thickness outlined by UNI 9034