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AMENDMENT 1
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**Plastics piping systems for the supply
of gaseous fuels - Unplasticized
polyamide (PA-U) piping systems
with fusion jointing and mechanical
jointing —**

**Part 1:
General**

AMENDMENT 1

*Systèmes de canalisations en matières plastiques pour la distribution
de combustibles gazeux — Systèmes de canalisations en polyamide
non plastifié (PA-U) avec assemblages par soudage et assemblages
mécaniques —*

Partie 1: Généralités

AMENDEMENT 1



Reference number
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Foreword

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Amendment 1 to ISO 16486-1:2012 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 4, *Plastics pipes and fittings for the supply of gaseous fuels*.

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Plastics piping systems for the supply of gaseous fuels - Unplasticized polyamide (PA-U) piping systems with fusion jointing and mechanical jointing —

Part 1: General

AMENDMENT 1

Page 6, 5.2.5, [Table 1](#)

Replace the existing table with the following one:

Table 1 — Characteristics of the compound in the form of granules

Characteristic	Requirement	Test parameters		Test method
		Parameter	Value	
Density	PA-U 11 compound: (1 020 to 1 050) kg/m ³ PA-U 12 compound: (1 000 to 1 040) kg/m ³	Test temperature	23 °C	ISO 1183-1 ISO 1183-2
Viscosity number	≥ 180 ml/g	Solvent	m-Cresol	ISO 307
Water content	≤ 0,10 %			ISO 15512, Method B
Carbon black content ^a	(0,5 to 1,0) % (by mass)			ISO 6964
Pigment or carbon black dispersion	A.3			Annex A
^a Only for black compound.				

Page 6, 5.2.5, [Table 2](#)

Replace the existing table with the following one:

Table 2 — Characteristics of compound in form of pipe/bar

Characteristic	Requirement	Test parameters		Test method
		Parameter	Value	
Chemical resistance	Change in mean hoop stress at burst between specimens tested in reagent and in the corresponding control fluid $\leq 20\%$ or Change in tensile strength at yield of injection moulded bar specimens tested in reagent and in the corresponding control fluid $\leq 20\%$	According to Annex B		Annex B
Resistance to weathering	The weathered test pieces shall have the following characteristics:	Preconditioning (weathering): cumulative solar radiation	$\geq 3,5 \text{ GJ/m}^2$	ISO 16871
a) Elongation at break	a) Elongation at break: $\geq 160\%$	Testing speed	25 mm/min	a) ISO 6259-1, ISO 6259-3 ^a or ISO 527-1, ISO 527-2 ^b
b) Hydrostatic strength	b) No failure during the test period of any test piece	End caps Orientation Conditioning time Type of test Circumferential (hoop) stress: PA-U 11 160 and PA-U 12 160 ^c PA-U 11 180 and PA-U 12 180 ^c Test period Test temperature	Type A Free 6 h Water-in-water 10,0 MPa 11,5 MPa 165 h 80 °C	b) ISO 1167-1, ISO 1167-2

NOTE 1 bar = 0,1 MPa = 10^5 Pa; 1 MPa = 1 N/mm².

^a For test pieces taken from samples in the form of pipe.

^b For test pieces in the form of injection moulded bar prepared according to ISO 1874-2.

^c For material classification and designation, see 5.4.

^d The critical pressure, p_c shall be determined for each new PA-U compound and for every pipe dimension with $d_n > 90$ mm.

^e The temperature of cooling for the crack initiation groove shall be appropriate to produce a high speed crack or cracks emanating from the initiation. For some PA-U compounds a crack initiation groove temperature between 0 °C and –60 °C has been found to be suitable.

^f The critical pressure, $p_{c,S4}$ shall be determined on a pipe produced from the same batch of PA-U compound and the same lot of pipes, as the pipe submitted to the full-scale test.

^g The value of $p_{c,S4}$ determined in this test is the reference value, $p_{c,S4,REF}$, to be referred to in the requirement of the S4 test specified in ISO 16486-2^[10].