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AMENDMENT 1
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**Plastics piping systems —
Polyethylene (PE) pipes and fittings
for water supply —**

**Part 1:
General**

**AMENDMENT 1: Melt mass-flow rate
(MFR) for PE 80 and PE 100**

*Systèmes de canalisations en plastique — Tubes et raccords en
polyéthylène (PE) destinés à l'alimentation en eau —*
Partie 1: Généralités - amd-1-2015

*AMENDEMENT 1: Indice de fluidité à chaud en masse pour PE 80 et
PE 100*



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Foreword

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The committee responsible for this document is ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 2, *Plastics pipes and fittings for water supplies*.

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Introduction

This amendment introduces a change to the minimum value of the melt flow rate [MFR] for PE 80 and PE 100 from 0,2 g/10 min ($\pm 10\%$) to 0,15 g/10 min ($-0\%/+10\%$).

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Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply —

Part 1: General

AMENDMENT 1: Melt mass-flow rate (MFR) for PE 80 and PE 100

Clause 2, Normative references

ISO 1133-1 *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method*

to replace

ISO 1133:2005, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics*

Subclause 4.4, Table 1

In the column “Characteristic”, change “Melt mass-flow rate (MFR) for PE 63, PE 80, and PE 100” to “Melt mass-flow rate (MFR) for PE 63”

In the column “Test parameters”, change normative reference ISO 1133:2005 to ISO 1133-1.

In the column “Test method”, change normative reference ISO 1133:2005 to ISO 1133-1, and delete reference to test condition D and T

Insert at end of Table 1 before the table footnotes new row with table footnote g as follows:

Characteristic	Requirement ^a	Test parameters		Test method
		Parameter	Value	
Melt mass-flow rate (MFR) for PE 80 and PE 100	0,20 g to 1,40 g/10 min ^g Maximum deviation of $\pm 20\%$ of the nominated value	Load	5 kg	ISO 1133-1
		Test temperature	190 °C	
		Time	10 min	
		Number of test pieces ^b	According to ISO 1133-1	
^g Materials of nominated value $0,15 \leq \text{MFR} < 0,20$ can be introduced. In such case, attention is drawn to the fusion compatibility (see 4.5). The lowest MFR value resulting from the maximum lower deviation of the nominated value shall be not less than 0,15.				

Subclause 4.5, Fusion compatibility

Add a second paragraph in list item a)

For $0,15 \leq \text{MFR} < 0,20$ compounds, fusion compatibility of larger diameter thicker walled pipes should be investigated to confirm compatibility. If electrofusion is used, appropriate testing should be carried out to verify the fusion capability of such pipes.

For information:

The amended [Table 1](#) will then read as follows:

Table 1 — Characteristics of PE compound as granules (amended)

Characteristic	Requirement ^a	Test parameters		Test method
		Parameter	Value	
Compound density	≥930 kg/m ³	Test temperature	23 °C	ISO 1183-2
		Number of samples	According to ISO 1183-2	
Carbon black content (black compound only)	(2 to 2,5) % by mass	In accordance with ISO 6964		ISO 6964
Carbon black dispersion (black compound only)	≤grade 3	In accordance with ISO 18553 ^c		ISO 18553
Pigment dispersion (blue compound only)	≤grade 3	In accordance with ISO 18553 ^c		ISO 18553
Water content ^d	≤300 mg/kg	Number of test pieces ^b	1	ISO 15512
Volatile content	≤350 mg/kg	Number of test pieces ^b	1	EN 12099
Oxidation induction time	≥20 min	Test temperature	200 °C ^e	ISO 11357-6
		Number of test pieces ^b	3	
Melt mass-flow rate (MFR) for PE 40	0,2 g to 1,4 g/10 min ^f Maximum deviation of ±20 % of the nominated value	Load	2,16 kg	ISO 1133-1
		Test temperature	190 °C	
		Time	10 min	
		Number of test pieces ^b	According to ISO 1133-1	
Melt mass-flow rate (MFR) for PE 63	0,2 g to 1,4 g/10 min ^f Maximum deviation of ±20 % of the nominated value	Load	5 kg	ISO 1133-1
		Test temperature	190 °C	
		Time	10 min	
		Number of test pieces ^b	According to ISO 1133-1	
Melt mass-flow rate (MFR) for PE 80 and 100	0,20 g to 1,40 g/10 min ^{fg} Maximum deviation of ±20 % of the nominated value	Load	5 kg	ISO 1133-1
		Test temperature	190 °C	
		Time	10 min	
		Number of test pieces ^b	According to ISO 1133-1	

^a Conformity to these requirements shall be proved by the compound manufacturer.

^b The number of test pieces given indicates the quantity required to establish a value for the characteristic described in this table. The number of test pieces required for factory production control and process control should be listed in the manufacturer's quality plan.

^c In case of dispute, the test pieces for carbon black dispersion and pigment dispersion shall be prepared by the compression method.

^d Only applicable if the measured volatile content is not in conformity with its specified requirement. In case of dispute, the requirement for water content shall apply. The requirement applies to the compound producer at the stage of compound manufacturing and to the compound user at the stage of processing (if the water content exceeds the limit, drying is required prior to use).

^e The test can be carried out as an indirect test at 210 °C provided there is a clear correlation to the results at 200 °C. In case of dispute, the test temperature shall be 200 °C.

^f Nominated value given by the compound producer.

^g Materials of nominated value $0,15 \leq \text{MFR} < 0,20$ can be introduced. In such case, attention is drawn to the fusion compatibility (see 4.5). The lowest MFR value resulting from the maximum lower deviation of the nominated value to be not less than 0,15.

For information:

The amended Clause 4.5 will then read as follows:

4.5 Fusion compatibility

The following applies:

- a) the compound manufacturer shall demonstrate that each compound conforming to [Table 1](#) is fusible by testing the tensile strength of a butt fusion joint of pipes manufactured from the compound in accordance with Table 2;

For $0,15 \leq \text{MFR} < 0,20$ compounds, fusion compatibility of larger diameter thicker walled pipes should be investigated to confirm compatibility. If electrofusion is used, appropriate testing should be carried out to verify the fusion capability of such pipes.

- b) compounds conforming to [Table 1](#) are considered fusible to each other, and on request this shall be demonstrated by the compound manufacturer on compounds from his own product range by the testing of a butt fusion joint for tensile strength in accordance with Table 2.

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