



CEN/TC 155
CEN/TC 155 - Plastics piping systems and ducting systems
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| Original answer to the Mandate | 155-N-2354 | 2000-09-26 |
| Commission's acceptance | Commission letter 001565 (see 155-N-2629) | 2002-02-11 |
| Commission's acceptance | Commission letter 007376 (see 155-N-2678) | 2003-07-23 |
| Commission's acceptance | Commission e-mail G. Degleris | 2003-12-03 |
| 1 st Revised answer to the mandate | 155-N-3677 ⁽¹⁾ | 2011-07-08 |
| 2 nd Correction of editorial mistakes in 155-N3677 | 155-N-3747 ⁽¹⁾ | 2011-12-15 |
| This document | 155-N-4088 ⁽²⁾ | 2014-03-21 |
| <p>⁽¹⁾ Old versions 155-N-3677 and 155-N3747 can be disregarded. ⁽²⁾ 155-N-4088 is showing all changes versus the original answer 155-N-2354</p> | | |

List of changes:

| Clause of the original document | Reason for the change (short description) | Supporting information (if relevant) |
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| 0.4) | <p>The following NOTES are added:</p> <p><i>NOTE 1: The term "FITTING" includes the term "JOINT" as meant by mandate M 131</i></p> <p><i>NOTE 2: The family (1) "PIPING KITS/SYSTEMS" is not addressed.</i></p> | <p>For the standards of CEN/TC 155 the term "FITTING" includes the term "JOINT".</p> <p>The way how products are brought to the market does not correspond to the interpretations as given in Guidance Paper C for "KITS".</p> |
| 0.6) | <p>The following modification is proposed:</p> <p><i>The standards listed under point B, C and D will contain normative reference to the relevant reaction to fire standards prepared by CEN/TC 127.</i></p> | <p>The experts are aware of the existence in at least one member state provisions applicable to the reaction to fire, therefore for all the standards listed under A, B, C and D reaction to fire is now relevant.</p> |
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| A.1 | Updating of WI 00155812 numbering and dates of availability has been made. The number of the standard (EN 15012) is also given | First answer to the mandate having been issued in 2000, the WI and dates had to be updated |
| A.1(i) | The following new title is proposed: Plastics piping systems — Buried and above ground piping components for non pressure soil and waste discharge within the building structure — Requirements and test/assessment methods for pipes and fittings | It reflects more precisely the content of the standard. |
| A.1(ii) | The following new scope is proposed: This European Standard specifies product characteristics for plastics pipes and fittings for non-pressure soil and waste applications. This standard gives the associated test/assessment methods. This standard does not cover adhesives, joint sealings and gaskets. | It reflects more precisely the content of the standard. Adhesives, joint sealings and gaskets are already harmonised in compliance with separate standards from other CEN/TC's. |
| A.1 (iii) | The following intended use is proposed: Soil and waste discharge applications: — inside the building (application area code "B"); — buried in ground within the building structure (application area code "D") and with a diameter greater than or equal to 75 mm. | It reflects more precisely the content of the standard. |
| A.1(iv) Family (2) Pipes Family (4) Fittings, adhesives, joints, joints sealings and gaskets. | The following modifications are proposed: - Maximum load for admissible deformation is now considered relevant, but only for buried in ground applications - Maximum load for admissible deformation is now considered relevant , but only for buried in ground applications | This introduction results from the clarification of intended use [see A1 (iii)] This introduction results from the clarification of intended use [see A1 (iii)] |
| A.1(v) Family (2) Pipes | The following durability verification is proposed: Durability of tightness (gas and liquid): Material properties - Vicat softening point (only relevant for PVC ABS, PVC/san and PVC-C) - MFR and Oxidation Induction Time (only relevant for PE and PP) - Resistance to internal pressure (only relevant for buried in ground applications) | The proposed tests fully cover the durability issue, including durability of assemblies. Material characteristics were added to take into account the queries to the Commission, from the NL, Germany and Poland. |

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| <p>Family (4) Fittings, adhesives, joints, joints sealings and gaskets.</p> <p>Family (2) Pipes and Family (4) Fittings, adhesives, joints, joints sealings and gaskets.</p> | <p>Durability of tightness (gas and liquid): Material properties</p> <ul style="list-style-type: none"> - Vicat softening point (only relevant for PVC ABS, PVC/san and PVC-C) - MFR and Oxidation Induction Time (only relevant for PE and PP) - Resistance to internal pressure (only relevant for buried in ground applications) <p>Durability of tightness (gas and liquid):</p> <ul style="list-style-type: none"> - Resistance to temperature cycling test of pipes and fittings | <p>Material characteristics were added to take into account the queries to the Commission, from the NL, Germany and Poland.</p> <p>Resistance to temperature cycling was already mentioned in first answer, although not so explicitly referred to.</p> |
| <p>A.1(vi)</p> | <p>The following modifications are proposed: The harmonized standard will also contain: [...]</p> <ul style="list-style-type: none"> - clauses on the assessment and verification of the consistency of performances [...] | <p>Wording in consistency with CPR.</p> |
| <p>A.2.1</p> | <p>The list of supporting standards is updated by adding the following standards:</p> <ul style="list-style-type: none"> - EN 13501-1, <i>Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests</i> - EN 13823, <i>Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item</i> - EN 16000, <i>Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item</i> - EN ISO 9969, <i>Thermoplastics pipes — Determination of ring stiffness (ISO 9969:2007)</i> - ISO 13966, <i>Thermoplastics pipes and fittings — Nominal ring stiffnesses</i> - EN 1277, <i>Plastics piping system. Thermoplastics piping systems for buried non-pressure applications - Test methods for leaktightness of elastomeric sealing ring type joints</i> - ISO 13254, <i>Thermoplastics piping systems for non-pressure applications — Test method for watertightness</i> | <p>First answer to the mandate having been issued in 2000, the list of supporting standards needed to be updated.</p> <p>EN 16000 was published in 2010, and was approved by CEN/TC127.</p> <p>Ring stiffness standards are added, as proxy to cover "Maximum load for admissible deformation" (see A.1(iv))</p> <ul style="list-style-type: none"> - EN 1277 was added to assess connections between pipes and/or fittings, as proposed answer to the queries from NL and PL to the Commission. - ISO 13254 is now replacing EN 1053 for some products - ISO 13255 is now replacing |

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| | <ul style="list-style-type: none"> - ISO 13255, <i>Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for airtightness of joints</i> - ISO 13259, <i>Thermoplastics piping systems for underground non-pressure applications - Test method for leaktightness of elastomeric sealing ring type joints</i> | <p>EN 1054 for some products</p> <p>- ISO 13259 is now replacing EN 1277 for some products</p> |
| A.2.2 | <p>The list of supporting standards is updated by adding the following standards:</p> <ul style="list-style-type: none"> - EN 13501-1, <i>Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests</i> - EN 13823, <i>Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item</i> - EN 16000, <i>Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item</i> - ISO 13966, <i>Thermoplastics pipes and fittings — Nominal ring stiffnesses</i> - EN ISO 13967, <i>Thermoplastics fittings — Determination of ring stiffness</i> - EN 1277, <i>Plastics piping system. Thermoplastics piping systems for buried non-pressure applications - Test methods for leaktightness of elastomeric sealing ring type joints</i> - ISO 13254, <i>Thermoplastics piping systems for non-pressure applications — Test method for watertightness</i> - ISO 13255, <i>Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for airtightness of joints</i> - ISO 13259, <i>Thermoplastics piping systems for underground non-pressure applications - Test method for leaktightness of elastomeric sealing ring type joints</i> | <p>First answer to the mandate having been issued in 2000, the list of supporting standards needed to be updated.</p> <p>EN 16000 was published in 2010, and was approved by CEN/TC127.</p> <p>Ring stiffness standards are added, as proxy to cover "Maximum load for admissible deformation" (see A.1(iv))</p> <p>- EN 1277 was added to assess connections between pipes and/or fittings, as proposed answer to the queries from NL and PL to the Commission.</p> <p>- ISO 13254 is now replacing EN 1053 for some products</p> <p>- ISO 13255 is now replacing EN 1054 for some products</p> <p>- ISO 13259 is now replacing EN 1277 for some products</p> |
| A.2.3 | <p>The list of supporting standards is updated by adding the following standards:</p> | <p>First answer to the mandate having been issued in 2000, the list of supporting standards</p> |

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| | <p>- EN 681-2, <i>Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastics elastomers</i></p> <p>- EN 681-3, <i>Elastomeric seals — Material requirements for pipe joint seals used in drainage and sewerage applications — Part 3: Cellular materials of vulcanised rubber</i></p> <p>- EN 681-4, <i>Elastomeric seals — Material requirements for pipe joint seals used in drainage and sewerage applications — Part 4: Cast polyurethane sealing elements</i></p> <p>- EN 727, <i>Plastics piping and ducting systems. Thermoplastics pipes and fittings. Determination of vicat softening temperature (vst).</i></p> <p>- EN 728, <i>Plastics piping and ducting systems. Polyolefin pipes and fittings. Determination of oxidation induction time.</i></p> <p>- ISO 1133-1, <i>Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 1 : standard method</i></p> <p>- EN ISO 1167-2, <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 2 : preparation of pipe test pieces (ISO 1167-2:2006)</i></p> <p>- ISO 2507-2, <i>Thermoplastics pipes and fittings. VICAT softening temperature. Part 2 : test conditions for unplasticized poly(vinyl chloride) (PVC-U) or chlorinated poly(vinyl chloride) (PVC-C) pipes and fittings and for high impact resistance poly(vinyl chloride) (PVC-Hi) pipes</i></p> <p>- ISO 13257, <i>Thermoplastics piping systems for non pressure applications — Test method for resistance to elevated temperature cycling</i></p> | <p>needed to be updated.</p> <p>- EN 681-2 to -4 are now published and harmonized.</p> <p>Standards for the assessment of relevant material properties have been added, to take into account the queries of NL, D, PL.</p> <p>- ISO 2507-2 is now replacing EN 727 for some products</p> <p>ISO 13257 is now replacing former EN 1055 for some products.</p> |
| A.3.1.1 | The explanation for irrelevancy of performance characteristics for pipes is updated | This is to complete the information regarding the justification from CEN/TC 155 agreed by the Commission |

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| A.3.1.2 | The explanation for irrelevancy of performance characteristics for fittings is updated | This is to complete the information regarding the justification from CEN/TC 155 agreed by the Commission |
| A.3.2 | The following modification is proposed: The deletion of the existing text replaced by 'None' | The former wording was not relevant. |
| A.3.10 | The former text is replaced by the following: The characteristic "Maximum load for admissible deformation" which is considered to be relevant for products intended to be used under the ground will be addressed as ring stiffness. The characteristic "dimensional tolerances" will address both dimensions and dimensional tolerances. | Former text was not relevant. Ring stiffness is the most appropriate proxy to address the characteristic "maximum load for admissible deformation", which has been considered relevant in consistency with the revision of the scope. This is to grant interchange ability and proper functioning of connections when installing pipes and fittings. |
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| B.1 | Updating of WI 00155811 numbering and dates of availability has been made. The number of the standard (EN 15013) is also given | First answer to the mandate having been issued in 2000, the WI and dates had to be updated |
| B.1 (i) | The following new title is proposed: Plastics piping systems - Non-pressure drainage and sewerage systems buried in ground - Requirements and test/assessment methods for pipes and fittings | It reflects more precisely the content of the standard. |
| B.1 (ii) | The following new scope is proposed: This European Standard specifies product characteristics for thermoplastics and glass-reinforced thermosetting pipes and fittings for underground drainage and sewerage applications. This standard gives the associated test/assessment methods This standard does not cover adhesives, joint sealings and gaskets. The standard does not apply to perforated engineering drainage pipes nor to perforated highway drainage pipes. | It reflects more precisely the content of the standard |
| B.1 (iii) | The following intended use is proposed: Pipes and fittings covered by this standard are intended to be used for conveyance of drainage and sewerage water without pressure: - underground in the U area (more than | It reflects more precisely the content of the standard |

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| | <p>1 m from the building structure) - underground in the D area (connected to the soil and waste discharge system and buried within or under the building structure).</p> | |
| <p>B.1 (iv)</p> <p>Family (2) Pipes</p> <p>Family (4) Fittings, adhesives, joints, joints sealings and gaskets.</p> | <p>The following essential characteristic is added:</p> <p>- <i>Reaction to fire</i></p> <p>The following essential characteristic is added:</p> <p>- <i>Reaction to fire</i></p> <p>- <i>Maximum load for admissible deformation</i></p> | <p>Reaction to fire added as requirements exist in at least one MS</p> <p>Reaction to fire added as requirements exist in at least one MS</p> <p>This essential characteristic is relevant for fittings</p> |
| <p>B.1 (v)</p> <p>Family (2) Pipes</p> <p>Family (4) Fittings, adhesives, joints, joints sealings and gaskets.</p> | <p>The following durability verification is proposed:</p> <p>Durability of maximum load for admissible deformation related to material and wall construction:</p> <ul style="list-style-type: none"> - long term strain resistance - ring flexibility - long term creep ring stiffness <p>Durability of tightness after temperature cycling test of pipes:</p> <ul style="list-style-type: none"> - cycling test at elevated temperature. <p>Durability of tightness after temperature cycling test of fittings:</p> <ul style="list-style-type: none"> - cycling test at elevated temperature. | <p>Not specifically detailed in the original answer.</p> |
| <p>B 2.1</p> | <p>The list of supporting standards is updated by adding the following standards:</p> <p>EN 13501-1, <i>Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests</i></p> <p>EN 13823, <i>Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item</i></p> <p>EN 16000, <i>Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item</i></p> <p>EN ISO 9967, <i>Plastics pipes — Determination of creep ratio (ISO 9967:1994)</i></p> <p>ISO 13966, <i>Thermoplastics pipes and fittings — Nominal ring stiffnesses</i></p> <p>EN 1401-1, <i>Plastics piping systems for non-pressure underground drainage and</i></p> | <p>First answer to the mandate having been issued in 2000, the WI and dates had to be updated</p> |

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| | <p>sewerage — <i>Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system</i></p> <p>EN 1852-1, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene (PP) — Part 1: Specifications for pipes, fittings and the system</i></p> <p>EN 12666-1, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Polyethylene (PE) — Part 1: Specifications for pipes, fittings and the system</i></p> <p>EN 13476-2, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 2: Specifications for pipes and fittings with smooth internal and external surface and the system, Type A</i></p> <p>EN 13476-3, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 3: Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B</i></p> <p>EN 14364, <i>Plastics piping systems for drainage and sewerage with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP) — Specifications for pipes, fittings and joints</i></p> <p>EN 14758-1, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene with mineral modifiers (PP-MD) — Part 1: Specifications for pipes, fittings and the system</i></p> <p><u>The following supporting standards are deleted:</u></p> <p>EN 1119, <i>Plastics piping systems — Joints for glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods for leaktightness and resistance to damage of flexible and reduced articulation joints</i></p> <p>EN 1228, <i>Plastics piping systems - Glass-reinforced thermosetting plastics (GRP) pipes — Determination of initial specific ring stiffness</i></p> <p>EN 1448, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) components — Test methods to prove the design of rigid locked socket-and-spigot joints with elastomeric seals</i></p> | |
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| | <p>EN 1449, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) components — Test methods to prove the design of cemented socket-and-spigot joints</i></p> <p>EN 1450, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) components — Test methods to prove the design of bolted flange joints</i></p> | |
| B 2.2 | <p>The list of supporting standards is updated by adding the following standards:</p> <p>EN 13501-1, <i>Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests</i></p> <p>EN 13823, <i>Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item</i></p> <p>EN 16000, <i>Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item</i></p> <p>ISO 13966, <i>Thermoplastics pipes and fittings — Nominal ring stiffnesses</i></p> <p>EN ISO 13967, <i>Thermoplastics fittings — Determination of ring stiffness</i></p> <p>EN 1401-1, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system</i></p> <p>EN 1852-1, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene (PP) — Part 1: Specifications for pipes, fittings and the system</i></p> <p>EN 12666-1, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Polyethylene (PE) — Part 1: Specifications for pipes, fittings and the system</i></p> <p>EN 13476-2, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 2: Specifications for pipes and fittings with smooth internal and external surface and the system, Type A</i></p> <p>EN 13476-3, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 3: Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B</i></p> | |

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| | <p>EN 14364, <i>Plastics piping systems for drainage and sewerage with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP) — Specifications for pipes, fittings and joints</i></p> <p>EN 14758-1, <i>Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene with mineral modifiers (PP-MD) — Part 1: Specifications for pipes, fittings and the system</i></p> | |
| B 2.3 | <p>The list of supporting standards is updated by adding the following standards:</p> <p><i>EN ISO 9967, Plastics pipes — Determination of creep ratio (ISO 9967:1994)</i></p> <p><i>EN ISO 13968, Plastics piping and ducting systems - Thermoplastics pipes - Determination of ring flexibility (ISO 13968:2008)</i></p> <p><i>EN 14364, Plastics piping systems for drainage and sewerage with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP) — Specifications for pipes, fittings and joints</i></p> <p><i>EN 1055, Plastics piping systems — Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for resistance to elevated temperature cycling</i></p> <p><u>The following supporting standards are deleted:</u></p> <p><i>prEN ISO 10468, Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Determination of long-term specific ring creep stiffness under wet conditions and calculation of the wet creep factor (ISO/DIS 10468:1999)</i></p> <p><i>prEN ISO 14828, Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Determination of long-term specific ring relaxation stiffness under wet conditions and calculation of the wet relaxation factor (ISO/DIS 14828:1999)</i></p> | |
| B.3.10 | <p>The following wording replaces the existing text:</p> <p>'None'</p> | <p>Relating technical classes to the type of intended use was not relevant.</p> |
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| C | <p>Family (7) "VALVES and TAPS" deleted.</p> | <p>Valves and taps are dealt with by CEN/TC 69.</p> |
| C.1 | <p>Updating of WI 00155814 numbering and dates of availability has been made. The number of the standard (EN 15014) is also given</p> | <p>First answer to the mandate having been issued in 2000, the WI and dates had to be updated.</p> |
| C.1 (i) | <p>The following new title is proposed:</p> <p><i>Plastics piping systems — Buried and above ground piping components for</i></p> | <p>It reflects more precisely the content of the standard and it takes into account the queries</p> |

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| | <i>water under pressure — Requirements and test/assessment methods for pipes and fittings</i> | of The Netherlands. |
| C.1 (ii) | <p>The following new scope is proposed: <i>This European Standard specifies product characteristics for plastics pipes and fittings for pressure applications for water supply, drainage, sewerage and irrigation with the exception of water intended for human consumption.</i></p> <p><i>It gives the associated test/assessment methods.</i></p> <p><i>This standard does not cover valves, adhesives, joint sealings and gaskets.</i></p> | <p>It reflects more precisely the content of the standard and it takes into account the queries of The Netherlands.</p> <p>Adhesives, joints sealings and gaskets are already harmonised in separate standards from other CEN/TCs.</p> |
| C.1 (iii) | <p>The following intended use is proposed: <i>Buried or above-ground conveyance of water, waste water, water for general purposes, vacuum-operated soil and waste conveyance, for both outside and inside buildings.</i></p> | <p>It reflects more precisely the content of the standard and it takes into account the queries to the Commission from The Netherlands.</p> |
| C.1 (iv) | <p>Family (2) Pipes</p> <p>The following essential characteristic is deleted:</p> <ul style="list-style-type: none"> - <i>Maximum load for admissible deformation</i> <p>The following essential characteristic is added:</p> <ul style="list-style-type: none"> - <i>Reaction to fire (only for above ground uses)</i> <p>The following essential characteristic is changed as follows:</p> <ul style="list-style-type: none"> - <i>Tightness: Liquid</i> <p>Family (4) Fittings, adhesives, joints, joints sealings and gaskets.</p> <p>The following essential characteristic is added:</p> <ul style="list-style-type: none"> - <i>Reaction to fire (only for above ground uses)</i> <p>The following essential characteristic is changed as follows:</p> | <p>Wrongly addressed as relevant in the original answer to the mandate.</p> <p>Wrongly addressed as not relevant in the original answer to the mandate.</p> <p>Tightness for gas is not relevant for the intended use.</p> <p>Wrongly addressed as not relevant in the original answer to the mandate.</p> <p>Tightness for gas is not</p> |

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| <p>Family (7) "VALVES and TAPS"</p> | <p>- <i>Tightness: Liquid</i></p> <p>Deleted.</p> | <p>relevant for the intended use.</p> <p>See C</p> |
| <p>C.1 (v)</p> <p>Family (2) Pipes</p> <p>Family (4) Fittings, adhesives, joints, joints sealings and gaskets.</p> | <p><i>The following durability verification is proposed:</i></p> <p><i>Durability of internal pressure strength:</i></p> <ul style="list-style-type: none"> - <i>Degree of gelation (for PVC only)</i> - <i>Oxidation Induction Time (for PE only)</i> - <i>Adhesion of the different layers (for multilayer M pipes only)</i> - <i>Ring flexibility (for multilayer P pipes only)</i> - <i>Apparent initial longitudinal tensile strength (for GRP only)</i> <p><i>Durability of internal pressure strength:</i></p> <ul style="list-style-type: none"> - <i>Effects of heating (for PVC only)</i> - <i>Oxidation Induction Time (for PE only)</i> <p><i>Durability of tightness of connections between pipes and fittings:</i></p> <p><i>Mechanical connections:</i></p> <ul style="list-style-type: none"> - <i>Resistance to pull-out (for polyolefin pipes only)</i> <p><i>Electrofusion connections:</i></p> <ul style="list-style-type: none"> - <i>Decohesive resistance (for PE electrofusion socket connections only)</i> - <i>Evaluation of ductility (for PE electrofusion saddle connections only)</i> | <p>Not specifically detailed in the original answer.</p> <p>Material aspects were added to take into account the queries to the Commission from The Netherlands, Germany and Poland.</p> <p>Tightness of connections was added to take into account the queries to the Commission from The Netherlands, Germany and Poland.</p> |
| <p>C.1 (vi)</p> | <p>The following modification is proposed: The harmonized standard will also contain: [...] - clauses on the assessment and verification of the consistency of performance (including Factory Production Control) [...]</p> | <p>Wording changed to be in conformance with the CPR</p> |
| <p>C.2.1</p> | <p><u>The list of supporting standards is updated by adding the following standards:</u> EN 13501-1, <i>Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests</i> EN 13823, <i>Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item</i> EN 16000, <i>Plastics piping systems — Systems within the building structure —</i></p> | <p>Test methods were added to take into account complaints to the Commission from Germany, The Netherlands and Poland.</p> |

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| | <p><i>Mounting and fixing of components in the test apparatus to thermal attack by a single burning item</i></p> <p>EN ISO 1167-1, <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)</i></p> <p>EN ISO 1167-2, <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 2: Preparation of pipe test pieces (ISO 1167-2:2006)</i></p> <p>ISO 161-1, <i>Thermoplastics pipes for the conveyance of fluids — Nominal outside diameters and nominal pressures — Part 1: Metric series</i></p> <p>ISO 7685, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Determination of initial specific ring stiffness</i></p> <p>ISO 8521, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Test methods for the determination of the apparent initial circumferential tensile strength</i></p> <p>ISO 10471, <i>Glass-reinforced thermosetting plastics (GRP) pipes — Determination of the long-term ultimate bending strain and the long-term ultimate relative ring deflection under wet conditions</i></p> <p>ISO 10466, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Test method to prove the resistance to initial ring deflection</i></p> <p>ISO 10468, <i>Glass-reinforced thermosetting plastics (GRP) pipes — Determination of the long-term specific ring creep stiffness under wet conditions and calculation of the wet creep factor</i></p> <p>ISO 17456, <i>Plastics piping systems — Multilayer pipes — Determination of long-term strength</i></p> <p><u>The following supporting standards are deleted:</u></p> <p>ISO 4065, <i>Thermoplastic pipes — Universal wall thickness table</i></p> <p>EN 705, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Methods for regression analysis and their use</i></p> <p>EN ISO 9969, <i>Thermoplastics pipes — Determination of ring stiffness</i></p> <p>EN 1228, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Determination of initial specific ring stiffness</i></p> <p>EN ISO 178, <i>Plastics — Determination of flexural properties</i></p> <p>EN 715, <i>Thermoplastics piping systems — End-load bearing joints between small diameter pressure pipes and fittings — Test method for leaktightness under internal water pressure, including</i></p> | |
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| | <p><i>end thrust</i></p> <p>EN ISO 13846, <i>Plastics piping systems — End-load-bearing and non-end-load-bearing assemblies and joints for thermoplastics pressure piping — Test method for long-term leaktightness under internal water pressure (ISO 13846:2000)</i></p> <p>EN 1119, <i>Plastics piping systems — Joints for glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods for leaktightness and resistance to damage of non-thrust resistant flexible joints with elastomeric sealing elements</i></p> <p>EN 1448, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) components — Test methods to prove the design of rigid locked socket-and-spigot joints with elastomeric seals</i></p> <p>EN 1449, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) components — Test methods to prove the design of cemented socket-and-spigot joints</i></p> <p>EN 1450, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) components — Test methods to prove the design of bolted flange joints</i></p> | |
| C 2.2 | <p><u>The list of supporting standards is updated by adding the following standards:</u></p> <p>EN 13501-1, <i>Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests</i></p> <p>EN 13823, <i>Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item</i></p> <p>EN 16000, <i>Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item</i></p> <p>EN 1447, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Determination of long-term resistance to internal pressure</i></p> <p>EN ISO 1167-1, <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)</i></p> <p>EN ISO 1167-3, <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 3: Preparation of components (ISO 1167-3:2007)</i></p> <p>EN ISO 1167-4, <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 4: Preparation of assemblies (ISO 1167-4:2007)</i></p> <p>ISO 161-1, <i>Thermoplastics pipes for the</i></p> | <p>Test methods were added to take into account complaints to the Commission from Germany, The Netherlands and Poland.</p> |

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| | <p>conveyance of fluids — Nominal outside diameters and nominal pressures — Part 1: Metric series</p> <p>ISO 8521, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Test methods for the determination of the apparent initial circumferential tensile strength</i></p> <p>EN 713, <i>Plastics piping systems — Mechanical joints between fittings and polyolefin pressure pipes — Test method for leaktightness under internal pressure of assemblies subjected to bending</i></p> <p>EN 911, <i>Plastics piping systems — Elastomeric sealing ring type joints and mechanical joints for thermoplastics pressure piping — Test method for leaktightness under external hydrostatic pressure</i></p> <p>ISO 3459, <i>Plastic piping systems — Mechanical joints between fittings and pressure pipes — Test method for leaktightness under negative pressure (ISO/DIS 3459:2013)</i></p> <p>ISO 3503, <i>Plastics piping systems — Mechanical joints between fittings and pressure pipes — Test method for leaktightness under internal pressure of assemblies subjected to bending (ISO/DIS 3503:2013)</i></p> <p>EN ISO 13783, <i>Plastics piping systems — Unplasticized poly(vinyl chloride) (PVC-U) end-load-bearing double socket joints — Test method for leaktightness and strength while subjected to bending and internal pressure (ISO 13783:1997)</i></p> <p>EN ISO 13844, <i>Plastics piping systems — Elastomeric-sealing-ring-type socket joints of unplasticized poly(vinyl chloride) (PVC-U) for use with PVC-U pipes — Test method for leaktightness under negative pressure (ISO 13844:2000)</i></p> <p>EN ISO 13845, <i>Plastics piping systems — Elastomeric-sealing-ring-type socket joints for use with unplasticized poly(vinyl chloride) (PVC-U) pipes — Test method for leaktightness under internal pressure and with angular deflection (ISO 13845:2000)</i></p> <p>ISO 7432, <i>Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods to prove the design of locked socket-and-spigot joints, including double-socket joints, with elastomeric seals</i></p> <p>ISO 8483, <i>Plastics piping systems for pressure and non-pressure drainage and sewerage — Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods to prove the design of bolted flange joints</i></p> <p>ISO 8533, <i>Plastics piping systems for pressure and non-pressure drainage and sewerage — Glass-reinforced thermosetting plastics (GRP) systems based on unsaturated polyester (UP) resin — Test methods to prove the design of cemented or wrapped joints</i></p> <p>The following supporting standards are</p> | |
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| | <p><u>deleted:</u> ISO 4065, <i>Thermoplastic pipes — Universal wall thickness table</i> EN 705, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Methods for regression analysis and their use</i> EN 715, <i>Thermoplastics piping systems — End-load bearing joints between small diameter pressure pipes and fittings — Test method for leaktightness under internal water pressure, including end thrust</i> EN 1448, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) components — Test methods to prove the design of rigid locked socket-and-spigot joints with elastomeric seals</i> EN 1449, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) components — Test methods to prove the design of cemented socket-and-spigot joints</i> EN 1450, <i>Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) components — Test methods to prove the design of bolted flange joints</i></p> | |
| C.2.3 (7) VALVES and TAPS (deleted) | <p>Deleted As a result of that <u>the following supporting standards are deleted:</u> EN ISO 9080, <i>Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics material in pipe form by extrapolation (Revision of ISO/TR 9080:1992)</i> EN ISO 3126, <i>Plastics piping systems — Plastics piping components — Measurement and determination of dimensions (revision of prEN 496:1991 and ISO 3126:1974) (ISO/DIS 3126:1999)</i> ISO 5208, <i>Industrial valves — Pressure testing of valves</i> EN 28659, <i>Thermoplastics valves — Fatigue strength — Test method</i> EN 917, <i>Plastics piping systems — Thermoplastics valves — Test methods for resistance to internal pressure and leaktightness</i></p> | This clause is no longer relevant, see C. |
| C.2.4 (new C.2.3) | <p>Becomes C.2.3 DURABILITY <u>The list of supporting standards is updated by adding the following standards:</u> EN ISO 580, <i>Plastics piping and ducting systems — Injection-moulded thermoplastics fittings — Methods for visually assessing the effects of heating</i> EN ISO 13968, <i>Plastics piping and ducting systems — Thermoplastics pipes — Determination of ring flexibility (ISO 13968:2008)</i> ISO/DIS 8513, <i>Plastics piping systems —</i></p> | Test methods were added to take into account complaints to the Commission from Germany, The Netherlands and Poland. |

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| | <p><i>Glass-reinforced thermosetting plastics (GRP) pipes — Test methods for the determination of the apparent initial longitudinal tensile strength</i></p> <p>ISO 9852, <i>Unplasticized poly(vinyl chloride) (PVC-U) pipes — Dichloromethane resistance at specified temperature (DCMT) — Test method</i></p> <p>ISO 11357-6, <i>Plastics — Differential scanning calorimetry (DSC) — Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT)</i></p> <p>ISO 17454, <i>Plastics piping systems — Multilayer pipes — Test method for the adhesion of the different layers using a pulling rig</i></p> <p>ISO 3501, <i>Plastics piping systems — Mechanical joints between fittings and pressure pipes — Test method for resistance to pull-out under constant longitudinal force (ISO/DIS 3501:2013)</i></p> <p>ISO 13954, <i>Plastics pipes and fittings — Peel decohesion test for polyethylene (PE) electrofusion assemblies of nominal outside diameter greater than or equal to 90 mm</i></p> <p>ISO 13955, <i>Plastics pipes and fittings — Crushing decohesion test for polyethylene (PE) electrofusion assemblies</i></p> <p>ISO 13956, <i>Plastics pipes and fittings — Decohesion test of polyethylene (PE) saddle fusion joints — Evaluation of ductility of fusion joint interface by tear test</i></p> <p>ISO 21751, <i>Plastics pipes and fittings — Decohesion test of electrofusion assemblies — Strip-bend test</i></p> <p>The following supporting standards are deleted :</p> <p>EN 681-2, <i>Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastics elastomers</i></p> | |
| C.3.1 | <p>The following text is deleted:</p> <p>Effectiveness has to be considered as irrelevant because no legislation is known to regulate a tap is closed when closed and open when opened.</p> <p>Noise level: For installations for which the valves under this standard are designed the noise level of the valve is irrelevant.</p> | These clauses related to taps and valves are no longer relevant, see C |
| C.3.1.1 (2) PIPES | The explanation for irrelevancy of performance characteristics for pipes is updated | This is to complete the information regarding the justification from CEN/TC 155 agreed by the Commission |
| C.3.1.2 (4) FITTINGS | The explanation for irrelevancy of performance characteristics for fittings is updated | This is to complete the information regarding the justification from CEN/TC 155 agreed by the Commission |

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| <p>Family (4) Fittings, adhesives, joints, joints sealings and gaskets.</p> | <p>The following essential characteristic is added:</p> <ul style="list-style-type: none"> - <i>Reaction to fire</i> <p>The following essential characteristic is changed</p> <ul style="list-style-type: none"> - Tightness: Liquid <p>The following essential characteristic is deleted:</p> <p><i>Resistance to high temperature (for heating networks) (not relevant)</i></p> | <p>Reaction to fire added as requirements exist in at least one MS</p> <p>This is to better reflect the intended use</p> <p>It is not high but elevated temperatures that these pipes have to resist.</p> |
| <p><u>D.1(v)</u></p> <p>Family (2) Pipes</p> <p>Family (4) Fittings, adhesives, joints, joints sealings and gaskets.</p> | <p>The following durability verification is proposed:</p> <p><i>Durability of internal pressure strength:</i></p> <ul style="list-style-type: none"> - <i>Vicat softening temperature (for PVC-C only)</i> - <i>MFR (for PP, PB, PE-RT and multi-layer)</i> - <i>Degree of crosslinking (for PE-X and multi-layer of PE-X)</i> - <i>Adhesion of the different layers (for multilayer M and P pipes)</i> <p><i>Durability of internal pressure strength:</i></p> <ul style="list-style-type: none"> - <i>Vicat softening temperature (for PVC-C only)</i> - <i>MFR (for PP, PB PE-RT and fitting materials not identical to the pipe material)</i> - <i>Degree of crosslinking (for PE-X and multi-layer of PE-X).</i> <p>Durability of tightness of connections between (2) pipes and (4) fittings (plastic or metallic)</p> <ul style="list-style-type: none"> - Temperature cycling test for all types of fittings - Any sealing elements used, shall conform to EN 681-1 | <p>Not specifically detailed in the original answer.</p> <p>Tightness of connections was added to take into account the queries to the Commission from The Netherlands, Germany and Poland</p> |
| <p><u>D.1(vi)</u></p> | <p>The following modification is proposed: The harmonized standard will also contain: [...] - clauses on the assessment and verification of the consistency of</p> | <p>Wording changed to be in conformance with the CPR</p> |

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| | performance (including Factory Production Control) [...] | |
| D.2.1 | <p>The list of supporting standards is updated by adding the following standards: EN 13501-1, <i>Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests</i> EN 13823, <i>Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item</i> EN 16000, <i>Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item</i> EN ISO 1167-1, <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)</i> EN ISO 1167-2, <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 2: Preparation of pipe test pieces (ISO 1167-2:2006)</i> ISO 17456, <i>Plastics piping systems — Multilayer pipes — Determination of the long-term hydrostatic strength</i></p> <p><u>The following supporting standards are deleted:</u> EN 921, <i>Plastics piping systems — Thermoplastics pipes — Determination of resistance to internal pressure at constant temperature (with Corrigendum EN/AC 921:1995)</i> ISO 4065, <i>Thermoplastic pipes — Universal wall thickness table</i> EN 12294, <i>Plastics piping systems — Systems for hot and cold water — Test method for leaktightness under vacuum</i></p> | <p>Test methods were added to take into account complaints to the Commission from Germany, The Netherlands and Poland.</p> <p>This reflects actual practice.</p> |
| D.2.2 | <p>The list of supporting standards is updated by adding the following standards: EN 13501-1, <i>Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests</i> EN 13823, <i>Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item</i> EN 16000, <i>Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item</i> EN ISO 1167-1, <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)</i> EN ISO 1167-3, <i>Thermoplastics pipes,</i></p> | |

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| | <p><i>fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 3: Preparation of components</i> (ISO 1167-3:2007)</p> <p>EN ISO 1167-4, <i>Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 4: Preparation of assemblies</i> (ISO 1167-4:2007)</p> <p><u>The following supporting standards are deleted:</u></p> <p>EN 921, <i>Plastics piping systems — Thermoplastics pipes — Determination of resistance to internal pressure at constant temperature (with Corrigendum EN/AC 921:1995)</i></p> <p>ISO 4065, <i>Thermoplastic pipes — Universal wall thickness table</i></p> <p>EN 12294, <i>Plastics piping systems — Systems for hot and cold water — Test method for leaktightness under vacuum</i></p> | |
| D.2.3 | <p>The list of supporting standards is updated by adding the following standards:</p> <p>EN 579, <i>Plastics piping systems— Crosslinked polyethylene (PE-X)— Determination of degree crosslinking by solvent extraction</i></p> <p>EN 727, <i>Plastics piping systems— Thermoplastics pipes and fittings— Determination of Vicat softening temperature (VST)</i></p> <p>EN 12293 <i>Plastics piping systems – Thermoplastics pipes and fittings for hot and cold water – Test method for the resistance of mounted assemblies to temperature cycling.</i></p> <p>EN ISO 1133 <i>Plastics—Determination of the melt mass-flow rate (MFR) and the melt volume-flow (MVR) of thermoplastics (ISO 1133:2005)</i></p> <p>ISO 10508, <i>Thermoplastics pipes and fittings for hot and cold water systems</i></p> <p>ISO 17454 <i>Plastics piping systems – Test method for the adhesion of the different layers using a pulling rig</i></p> <p><u>The following supporting standards are deleted :</u></p> <p>EN 681-2, <i>Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastics elastomers</i></p> | <p>Material aspects introduced to take into account complaints to the Commission from Germany, The Netherlands and Poland.</p> <p>- EN ISO 1133 is replacing ISO 1133</p> |
| D.3.1.1 (2) PIPES | The explanation for irrelevancy of performance characteristics for pipes is updated | This is to complete the information regarding the justification from CEN/TC 155 agreed by the Commission |
| D.3.1.2 (4) FITTINGS | The explanation for irrelevancy of | This is to complete the |

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| | performance characteristics for fittings is updated | information regarding the justification from CEN/TC 155 agreed by the Commission |
| D.3.10 | The following text is added to the existing text: The characteristic "Dimensional tolerances" addresses both dimensions and the dimensional tolerances. | To grant interchange ability it is absolutely necessary to give also the dimension to the tolerances for a proper functioning of the connections when installing pipes and fittings to the works. |

The changes listed here above are detailed here below in the relevant clauses on basis of the template for the answer to the Mandate (Document CMF N032 rev.2 Suppl. to BTS1 N877).

Annex:

CEN/TC 155 "Plastics piping systems and ducting systems"

155-N-4xxx Revised answer of CEN/TC155 to mandate M/131

0 General comments from TC 155 related to the answer to the mandate

0.1) Requests for clarification on the scope of the mandate concerning the products and allocation of work:

None.

0.2) Requests for clarification on the intended use:

None.

0.3) Information on products under the scope of the mandate which are the subject of other CEN/TCs - Information on the organisation of the work between TCs:

Piping systems made of cast iron (e.g. EN 598 and EN 877) belong to the scope of CEN/TC 203.

Piping systems made of vitrified clay, fibre cement, longitudinal welded hot-dip galvanized steel, longitudinal welded stainless steel and concrete belong to the scope of CEN/TC 165.

Piping systems covered by the family and subfamilies 5 "DUCTS and CONDUITS" are covered by CLC/TC 213.

0.4) Information on issues concerning the scope and intended uses included in the mandate, for which no work has yet been started in the TC, or for which the TC cannot provide a standard:

TC 155 does not (intend to) cover pipes supports as there are no technical barriers to trade identified for such supports and therefore does not consider the family and subfamilies 6 "PIPE and DUCT SUPPORTS" to be relevant.

Piping systems covered by the family and subfamilies 5 "DUCTS and CONDUITS" are covered by CLC/TC 213.

NOTE 1: The term "FITTING" includes the term "JOINT" as meant by mandate M 131

NOTE 2: The family (1) "PIPING KITS/SYSTEMS" is not addressed.

0.5) Specific requests for additions to the mandate of products, materials, intended uses, performance characteristics, etc.:

None.

0.6) Liaison with other TCs for certain horizontal tests - Information on the organisation of the work between the TCs:

The standard covered by A, B, C and D will make normative reference to standards from CEN/TC 127 on reaction to fire.

0.7) Other issues which the TC considers necessary for the comprehension of the answer to the mandate:

None.

A NON-PRESSURE PIPING SYSTEMS FOR SOIL AND WASTE

Applicable families and subfamilies:

(2) PIPES

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

A.1 Harmonised standard

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| prEN 15012 [S&W discharge], WI 00155812 | Dates of availability Stage 32: 2014-01, Stage 40: 2014-04, Stage 49: 2015-03 |
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(i) Title: Plastics piping systems — Buried and above ground piping components for non pressure soil and waste discharge within the building structure — Requirements and test/assessment methods for pipes and fittings.

(ii) Scope: This European Standard specifies product characteristics for plastics pipes and fittings for non-pressure soil and waste applications.

This standard gives the associated test/assessment methods.

This standard does not cover adhesives, joint sealings and gaskets.

(iii) Intended use: Soil and waste discharge applications without pressure:

— inside the building (application area code "B"),

— buried in ground within the building structure (application area code "D") and with a diameter greater than or equal to 75 mm.

(iv) The performance characteristics according to the mandate which will be dealt with in the above standard will be:

(2) PIPES:

Reaction to fire

Maximum load for admissible deformation (only relevant for buried in ground applications)

Dimensional tolerances

Tightness: Gas and liquid

Release of dangerous substances

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Reaction to fire

Maximum load for admissible deformation (only relevant for buried in ground applications)

Dimensional tolerances

Tightness: Gas and liquid

Release of dangerous substances

(v) Durability: Considered are:

(2) PIPES:

Durability of tightness (gas and liquid):

- Material properties:

○ Vicat softening point (only relevant for PVC ABS, PVC/san and PVC-C)

○ MFR and Oxidation Induction Time (only relevant for PE and PP)

○ Resistance to internal pressure (only relevant for buried in ground applications)

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Durability of tightness (gas and liquid):

- Material properties:

- Vicat softening point (only relevant for PVC ABS, PVC/san and PVC-C)
- MFR and Oxidation Induction Time (only relevant for PE and PP)
- Resistance to internal pressure (only relevant for buried in ground applications)

(2) PIPES: and

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Durability of tightness (gas and liquid):

- Resistance to temperature cycling test of pipes and fittings

The tightness of elastomeric sealing connections is deemed to be durable if the sealing element conforms to EN 681-1, EN 681-2, EN 681-3 or EN 681-4, as applicable.

(vi) Other aspects: The harmonised standard will also contain:

- a reference to the Commission's Decision on attestation of conformity,
- clauses on the assessment and verification of the constancy of performances (including Factory Production Control),
- guidance on the characteristics to be stated in the labelling accompanying the CE marking and on the way of expressing the determined values of these characteristics.

A.2 Supporting assessment methods

The following ENs, and ISOs may serve as test or calculation methods for the determination of the performance characteristics required by the mandate and indicated in clause A.1 (iv) above:

A.2.1 (2) PIPES:

Reaction to fire:

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 16000, *Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item*

Maximum load for admissible deformation:

EN ISO 9969, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969:2007)*

ISO 13966, *Thermoplastics pipes and fittings — Nominal ring stiffnesses*

Dimensional tolerances:

EN ISO 3126, *Plastics piping systems - Plastics components - Determination of dimensions (ISO 3126:2005)*

Tightness: Gas and liquid:

EN 1053, *Plastics piping systems. Thermoplastics piping systems for non-pressure applications. Test method for watertightness.*

EN 1054, *Plastics piping systems. Thermoplastics piping systems for soil and waste discharge. Test method for airtightness of joints.*

EN 1277, *Plastics piping systems - Thermoplastics piping systems for buried non-pressure applications - Test methods for leaktightness of elastomeric sealing ring type joints*

ISO 13254, *Thermoplastics piping systems for non-pressure applications — Test method for watertightness*

ISO 13255, *Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for airtightness of joints*

ISO 13259, *Thermoplastics piping systems for underground non-pressure applications - Test method for leaktightness of elastomeric sealing ring type joints*

Release of dangerous substances:

Covered in the hEN using agreed CEN BT wording

A.2.2 (4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Reaction to fire:

- EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*
- EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*
- EN 16000, *Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item*

Maximum load for admissible deformation:

- ISO 13966, *Thermoplastics pipes and fittings — Nominal ring stiffnesses*
- EN ISO 13967, *Thermoplastics fittings — Determination of ring stiffness*

Dimensional tolerances:

- EN ISO 3126, *Plastics piping systems - Plastics components - Determination of dimensions (ISO 3126:2005)*

Tightness: Gas and liquid:

- EN 1053, *Plastics piping systems. Thermoplastics piping systems for non-pressure applications. Test method for watertightness.*
- EN 1054, *Plastics piping systems. Thermoplastics piping systems for soil and waste discharge. Test method for airtightness of joints.*
- EN 1277, *Plastics piping systems - Thermoplastics piping systems for buried non-pressure applications - Test methods for leaktightness of elastomeric sealing ring type joints*
- ISO 13254, *Thermoplastics piping systems for non-pressure applications — Test method for watertightness*
- ISO 13255, *Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for airtightness of joints*
- ISO 13259, *Thermoplastics piping systems for underground non-pressure applications - Test method for leaktightness of elastomeric sealing ring type joints*

Release of dangerous substances:

Covered in the hEN using agreed CEN BT wording

A.2.3 DURABILITY

Tightness: Gas and liquid

- **Material properties**

- EN 681-1, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*
- EN 681-2, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastics elastomers*
- EN 681-3, *Elastomeric seals — Material requirements for pipe joint seals used in drainage and sewerage applications — Part 3: Cellular materials of vulcanised rubber*
- EN 681-4, *Elastomeric seals — Material requirements for pipe joint seals used in drainage and sewerage applications — Part 4: Cast polyurethane sealing elements*
- EN 727, *Plastics piping and ducting systems. Thermoplastics pipes and fittings. Determination of vicat softening temperature (vst).*
- EN 728, *Plastics piping and ducting systems. Polyolefin pipes and fittings. Determination of oxidation induction time.*
- ISO 1133-1, *Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 1 : standard method*
- EN ISO 1167-2, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 2 : preparation of pipe test pieces(ISO 1167-2:2006)*
- ISO 2507-2, *Thermoplastics pipes and fittings. VICAT softening temperature. Part 2 : test conditions for unplasticized poly(vinyl chloride) (PVC-U) or chlorinated poly(vinyl chloride) (PVC-C) pipes and fittings and for high impact resistance poly(vinyl chloride) (PVC-Hi) pipes*

- **Resistance to temperature cycling**

EN 1055, *Plastics piping systems. Thermoplastics piping systems for soil and waste discharge inside buildings. Test method for resistance to elevated temperature cycling.*

ISO 13257, *Thermoplastics piping systems for non pressure applications — Test method for resistance to elevated temperature cycling*

A.3 Additional information, comments and remarks

A.3.1 Explanation for irrelevancy of performance characteristics mentioned in the mandate for the products with the intended use for non-pressure soil and waste discharge within the building structure.

The following performance characteristics are not considered relevant by TC 155 for the following reasons:

A.3.1.1 (2) PIPES:

- Crushing strength: Plastics piping systems are flexible and therefore do not crush but deform. This characteristic is an issue for rigid pipes such as concrete or clay pipes, and is therefore not relevant for plastic pipes.
- Internal and external pressure strength: not relevant because of the intended use, in which piping systems are not pressurized and consequently not submitted to pressure loads.
- Longitudinal bending strength: Not relevant on the ground that plastics pipes inside the building are supported by brackets, whereby distance between brackets is prescribed in installations instructions.
- Maximum load for admissible deformation: Not relevant for applications inside the building, because any deformation is limited by the use of brackets. (note: this characteristic is relevant for buried in the ground use, and will be covered by the standard)
- Resistance to high temperature (for heating networks): not relevant because of the intended use.
- Impact resistance: not applicable – Pipes are normally not subjected to impact loadings once installed and impact resistance is therefore not subject to regulatory requirements.
- Weldability (for gas networks) and penetration resistance (for gas networks): not relevant because of the intended use.
- Electrostatic behaviour (for fuel networks): not relevant because of the intended use.
- Permeability: plastics pipes are inherently impermeable. This characteristic is typical for pipes intended to be installed in contaminated soils, and is therefore not relevant because of the intended use.
- Thermal properties: Plastics pipes for soil and waste applications do not relate to energy conservation, and are not designed for any thermal purpose. This characteristic is therefore not relevant.

A.3.1.2 (4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

- Crushing strength: Plastics piping systems are flexible and therefore do not crush but deform. This characteristic is an issue for rigid pipes such as concrete or clay pipes, and is therefore not relevant for plastic fittings.
- Internal and external pressure strength: not relevant because of the intended use, in which piping systems are not pressurized and consequently not submitted to pressure loads.
- Maximum load for admissible deformation: Not relevant for applications inside the building, because any deformation is limited by the use of brackets. (note: this characteristic is relevant for buried in the ground use, and will be covered by the standard)
- Resistance to high temperature (for heating networks): not relevant because of the intended use.
- Impact resistance: not applicable – Fittings are normally not subjected to impact loadings once installed and impact resistance is therefore not subject to regulatory requirements.
- Weldability (for gas networks) and penetration resistance (for gas networks): not relevant because of the intended use.
- Electrostatic behaviour (for fuel networks): not relevant because of the intended use.
- Thermal insulation (related to energy conservation): Plastics fittings for soil and waste applications do not relate to energy conservation. This characteristic is therefore not relevant for this intended use.

A.3.2 Deviations from a performance approach in the standard:

None

A.3.3 Requests for clarification on the scope of the mandate concerning the products in A above:

None.

A.3.4 Requests for clarification on the intended uses concerning the products in A above:

None.

A.3.5 Requests for clarification on the essential characteristics for the intended uses included in the mandate concerning the products under A above:

None.

A.3.6 Information on performance characteristics required by the mandate concerning the products in A above, for which no work has yet been started in the TC, or for which the TC cannot provide a standard:

None.

A.3.7 Explanation of the state of the art concerning durability issues:

None.

A.3.8 Information on other Directives under which the products in A above falls, and compliance conditions:

None.

A.3.9 Specific requests for additions to the mandate of materials, intended uses or performance characteristics concerning the products in A above:

None.

A.3.10 Other issues which the TC considers necessary for comprehension of the answer to the mandate:

The characteristic "Maximum load for admissible deformation" which is considered to be relevant for products intended to be used under the ground will be addressed as ring stiffness.

The characteristic "dimensional tolerances" will address both dimensions and dimensional tolerances. This is to grant interchange ability and proper functioning of connections when installing pipes and fittings.

B NON-PRESSURE PIPING SYSTEMS FOR SEWER

Applicable families and subfamilies:

(2) PIPES

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

B.1 Harmonised standard

prEN 15013 [Non-press. D&S],
WI 00155811

Dates of availability

Stage 32: 2014-01,

Stage 40: 2014-04,

Stage 50: 2015-03

(i) Title: Plastics piping systems - Non-pressure drainage and sewerage components buried in ground - Requirements and test/assessment methods for pipes and fittings

(ii) Scope: This European Standard specifies product characteristics for thermoplastics and glass-reinforced thermosetting pipes and fittings for underground drainage and sewerage applications.

This standard gives the associated test/assessment methods. This standard does not cover adhesives, joint sealings and gaskets

The standard does not apply to perforated engineering drainage pipes nor to perforated highway drainage pipes.,

(iii) Intended use:

Pipes and fittings covered by this standard are intended to be used for conveyance of drainage and sewerage water without pressure:

- underground in the U area (more than 1 m from the building structure)
- underground in the D area (connected to the soil and waste discharge system and buried within or under the building structure).

(iv) The performance characteristics according to the mandate which will be dealt with in the above standard will be:

(2) PIPES:

Reaction to fire

Maximum load for admissible deformation (ring stiffness)

Dimensional tolerances

Tightness: Gas and liquid

Release of dangerous substances

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Reaction to fire

Maximum load for admissible deformation (ring stiffness)

Dimensional tolerances

Tightness: Gas and liquid

Release of dangerous substances

(v) Durability: Considered are:

(2) PIPES:

Durability of maximum load for admissible deformation related to material and wall construction:

- long term strain resistance
- ring flexibility
- long term creep ring stiffness

Durability of tightness after temperature cycling test of pipes:
- cycling test at elevated temperature.

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Durability of tightness after temperature cycling test of fittings:
- cycling test at elevated temperature.

The tightness of elastomeric sealing connections shall be deemed to be durable if the material used to manufacture the sealing elements conforms to EN 681-1, EN 681-2, EN 681-3 or EN 681-4, as applicable.

Durability for maximum load for admissible deformation = the stiffness. (see B.2.3)

(vi) Other aspects: The harmonised standard will also contain:

- a reference to the Commission's Decision on attestation of conformity,
- clauses on the assessment of constancy of performance (including Factory Production Control),
- guidance on the characteristics to be stated in the labelling accompanying the CE marking and on the way of expressing the determined values of these characteristics.

B.2 Supporting assessment methods

The following ENs and ISOs may serve as test or calculation methods for the determination of the performance characteristics required by the mandate and indicated in clause B.1 (iv) above:

B.2.1 (2) PIPES:

Reaction to fire:

- EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*
- EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*
- EN 16000, *Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item*

Maximum load for admissible deformation:

- EN ISO 9967, *Plastics pipes — Determination of creep ratio (ISO 9967:1994)*
- EN ISO 9969, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969:1995)*
- ISO 13966, *Thermoplastics pipes and fittings — Nominal ring stiffnesses*

Dimensional tolerances:

- EN ISO 3126, *Plastics piping systems — Plastics piping components — Measurement and determination of dimensions (revision of prEN 496:1991 and ISO 3126:1974) (ISO/DIS 3126:1999)*
- EN 1401-1, *Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system*
- EN 1852-1, *Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene (PP) — Part 1: Specifications for pipes, fittings and the system*
- EN 12666-1, *Plastics piping systems for non-pressure underground drainage and sewerage — Polyethylene (PE) — Part 1: Specifications for pipes, fittings and the system*
- EN 13476-2, *Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 2: Specifications for pipes and fittings with smooth internal and external surface and the system, Type A*
- EN 13476-3, *Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 3: Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B*

- EN 14364, *Plastics piping systems for drainage and sewerage with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP) — Specifications for pipes, fittings and joints*
- EN 14758-1, *Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene with mineral modifiers (PP-MD) — Part 1: Specifications for pipes, fittings and the system*

Tightness: Gas and liquid:

- EN 1277, *Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test methods for leaktightness of elastomeric sealing ring type joints*
- EN 14364, *Plastics piping systems for drainage and sewerage with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP) — Specifications for pipes, fittings and joints*

Release of dangerous substances:

Covered in the hEN using agreed CEN BT wording

B.2.2 (4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Reaction to fire:

- EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*
- EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*
- EN 16000, *Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item*

Maximum load for admissible deformation:

- ISO 13966, *Thermoplastics pipes and fittings — Nominal ring stiffnesses*
- EN ISO 13967, *Thermoplastics fittings — Determination of ring stiffness*

Dimensional tolerances:

- EN ISO 3126, *Plastics piping systems — Plastics piping components — Measurement and determination of dimensions (revision of prEN 496:1991 and ISO 3126:1974) (ISO/DIS 3126:1999)*
- EN 1401-1, *Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system*
- EN 1852-1, *Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene (PP) — Part 1: Specifications for pipes, fittings and the system*
- EN 12666-1, *Plastics piping systems for non-pressure underground drainage and sewerage — Polyethylene (PE) — Part 1: Specifications for pipes, fittings and the system*
- EN 13476-2, *Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 2: Specifications for pipes and fittings with smooth internal and external surface and the system, Type A*
- EN 13476-3, *Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 3: Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B*
- EN 14364, *Plastics piping systems for drainage and sewerage with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP) — Specifications for pipes, fittings and joints*
- EN 14758-1, *Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene with mineral modifiers (PP-MD) — Part 1: Specifications for pipes, fittings and the system*

Tightness: Gas and liquid:

- EN 1277, *Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test methods for leaktightness of elastomeric sealing ring type joints*

EN 14364, *Plastics piping systems for drainage and sewerage with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP) — Specifications for pipes, fittings and joints*

Release of dangerous substances:

Covered in the hEN using agreed CEN BT wording

B.2.3 DURABILITY

Maximum load for admissible deformation:

a) For thermoplastics pipes.

EN ISO 9967, *Plastics pipes — Determination of creep ratio (ISO 9967:1994)*

EN ISO 13968, *Plastics piping and ducting systems - Thermoplastics pipes - Determination of ring flexibility (ISO 13968:2008)*

b) For thermosetting pipes:

EN 14364, *Plastics piping systems for drainage and sewerage with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP) — Specifications for pipes, fittings and joints* ISO 10468, *Glass-reinforced thermosetting plastics (GRP) pipes — Determination of the long-term specific ring creep stiffness under wet conditions and calculation of the wet creep factor*

Tightness: Gas and liquid:

EN 681-1, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*

EN 681-2, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastics elastomers*

EN 681-3, *Elastomeric seals — Material requirements for pipe joint seals used in drainage and sewerage applications — Part 3: Cellular materials of vulcanised rubber*

EN 681-4, *Elastomeric seals — Material requirements for pipe joint seals used in drainage and sewerage applications — Part 4: Cast polyurethane sealing elements*

Tightness after temperature cycling of pipes and fittings

EN 1055, *Plastics piping systems — Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for resistance to elevated temperature cycling*

B.3 Additional information, comments and remarks

B.3.1 Explanation for irrelevancy of performance characteristics mentioned in the mandate for the products with the intended use for non-pressure drainage and sewerage

B.3.1.1 (2) PIPES:

- Crushing strength: Plastics piping systems are flexible and therefore do not crush but deform. This characteristic is an issue for rigid pipes such as concrete or clay pipes, and is therefore not relevant for plastic pipes.
- Internal and external pressure strength: not relevant because of the intended use, in which piping systems are not pressurized and consequently not submitted to pressure loads.
- Longitudinal bending strength: Not relevant on the following grounds: Longitudinal bending strength is a typical issue for rigid pipes such as concrete and clay. Plastic pipes are flexible and therefore, when buried in the ground, follow the movements of the soil instead of trying to withstand them.
- Resistance to high temperature (for heating networks): not relevant because of the intended use.
- Impact resistance: not applicable – Pipes are normally not subjected to impact loadings once installed and impact resistance is therefore not subject to regulatory requirements.
- Weldability (for gas networks) and penetration resistance (for gas networks): not relevant because of the intended use.
- Electrostatic behaviour (for fuel networks): not relevant because of the intended use.
- Permeability: plastics pipes are inherently impermeable. This characteristic is typical for pipes intended to be installed in contaminated soils, and is therefore not relevant because of the intended use.

- Thermal properties: Plastics pipes for sewer applications do not relate to energy conservation, and are not designed for any thermal purpose. This characteristic is therefore not relevant.

B.3.1.2 (4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

- Crushing strength: Plastics piping systems are flexible and therefore do not crush but deform. This characteristic is an issue for rigid pipes such as concrete or clay pipes, and is therefore not relevant for plastic pipes.
- Internal and external pressure strength: not relevant because of the intended use, in which piping systems are not pressurized and consequently not submitted to pressure loads.
- Resistance to high temperature (for heating networks): not relevant because of the intended use.
- Impact resistance: not applicable – Fittings are normally not subjected to impact loadings once installed and impact resistance is therefore not subject to regulatory requirements.
- Weldability (for gas networks) and penetration resistance (for gas networks): not relevant because of the intended use.
- Electrostatic behaviour (for fuel networks): not relevant because of the intended use.
- Thermal insulation (related to energy conservation): Plastics fittings for sewer applications do not relate to energy conservation. This characteristic is therefore not relevant for this intended use.

B.3.2 Deviations from a performance approach in the standard:

None.

B.3.3 Requests for clarification on the scope of the mandate concerning the products in B above:

None.

B.3.4 Requests for clarification on the intended uses concerning the products in B above:

None.

B.3.5 Requests for clarification on the performance characteristics for the intended uses included in the mandate concerning the products under B above:

None.

B.3.6 Information on performance characteristics required by the mandate concerning the products in B above, for which no work has yet been started in the TC, or for which the TC cannot provide a standard:

None.

B.3.7 Explanation of the state of the art concerning durability issues:

None.

B.3.8 Information on other Directives under which the products in B above falls, and compliance conditions:

None

B.3.9 Specific requests for additions to the mandate of materials, intended uses or performance characteristics concerning the products in B above:

None

B.3.10 Other issues which the TC considers necessary for comprehension of the answer to the mandate:

None

C PRESSURE PIPING SYSTEMS FOR SEWER and NON-DRINKING WATER

Applicable families and subfamilies:

(2) PIPES

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

C.1 Harmonised standard

| | |
|---|--|
| prEN 15014 [Press. D&S, non-drinking water], WI 00155814 | Dates of availability Stage 32: 2014-01, Stage 40: 2014-04, Stage 49: 2015-03 |
|---|--|

- (i) Title: Plastics piping systems — Buried and above ground piping components for water under pressure — Requirements and test/assessment methods for pipes and fittings
- (ii) Scope: This European Standard specifies product characteristics for plastics pipes and fittings for pressure applications for water supply, drainage, sewerage and irrigation with the exception of water intended for human consumption. It gives the associated test/assessment methods. This standard does not cover valves, adhesives, joint sealings and gaskets.
- (iii) Intended use: Buried or above-ground conveyance of water, waste water, water for general purposes, vacuum-operated soil and waste conveyance, for both outside and inside buildings.
- (iv) The performance characteristics according to the mandate which will be dealt with in the above standard will be:

(2) PIPES:

Reaction to fire (only for above ground uses)
Internal and external pressure strength
Dimensional tolerances
Tightness: Liquid
Release of dangerous substances

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Reaction to fire (only for above ground uses)
Internal pressure
Dimensional tolerances
Tightness: Liquid
Release of dangerous substances

(v) Durability: Considered are:

(2) PIPES:

Durability of internal pressure strength:

- Degree of gelation (for PVC only)
- Oxidation Induction Time (for PE only)
- Adhesion of the different layers (for multilayer M pipes only)
- Ring flexibility (for multilayer P pipes only)
- Apparent initial longitudinal tensile strength (for GRP only)

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Durability of internal pressure strength:

- Effects of heating (for PVC only)
- Oxidation Induction Time (for PE only)

Durability of tightness of connections between (2) pipes and (4) fittings:

Elastomeric sealing ring connections:

They are deemed to be durable if the sealing element conforms to EN 681-1 or EN 681-4, as applicable.

Mechanical connections:

- Resistance to pull-out (for polyolefin pipes only)

Electrofusion connections:

- Decohesive resistance (for PE electrofusion socket connections only)

- Evaluation of ductility (for PE electrofusion saddle connections only)

(vi) Other aspects: The harmonised standard will also contain:

- a reference to the Commission's Decision on attestation of conformity,
- clauses on the assessment and verification of the constancy of performance (including Factory Production Control),
- guidance on the characteristics to be stated in the labelling accompanying the CE marking and on the way of expressing the determined values of these characteristics.

C.2 Supporting assessment methods

The following ENs and ISOs may serve as test or calculation methods for the determination of the performance characteristics required by the mandate and indicated in clause C.1 (iv) above:

C.2.1 (2) PIPES:

Reaction to fire:

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 16000, *Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item*

Internal and external pressure strength:

EN 1447, *Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Determination of long-term resistance to internal pressure*

EN ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)*

EN ISO 1167-2, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 2: Preparation of pipe test pieces (ISO 1167-2:2006)*

EN ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics material in pipe form by extrapolation (Revision of ISO/TR 9080:1992)*

EN ISO 12162, *Thermoplastics materials for pipes and fittings for pressure applications — Classification and designation — Overall service (design) coefficient*

ISO 161-1, *Thermoplastics pipes for the conveyance of fluids — Nominal outside diameters and nominal pressures — Part 1: Metric series*

ISO 7685, *Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Determination of initial specific ring stiffness*

ISO 8521, *Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Test methods for the determination of the apparent initial circumferential tensile strength*

ISO 10471, *Glass-reinforced thermosetting plastics (GRP) pipes — Determination of the long-term ultimate bending strain and the long-term ultimate relative ring deflection under wet conditions*

ISO 10466, *Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Test method to prove the resistance to initial ring deflection*

ISO 10468, *Glass-reinforced thermosetting plastics (GRP) pipes — Determination of the long-term specific ring creep stiffness under wet conditions and calculation of the wet creep factor*

ISO 17456, *Plastics piping systems — Multilayer pipes — Determination of long-term strength*

Dimensional tolerances:

EN ISO 3126, *Plastics piping systems — Plastics piping components — Determination of dimensions (ISO 3126:2005)*

Tightness: Liquid:

For pipes see internal and external pressure strength.
For connections between pipes and fittings see C.2.2.

Release of dangerous substances:

Covered in the hEN using agreed CEN BT wording

C.2.2 (4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS**Reaction to fire:**

- EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*
- EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*
- EN 16000, *Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item*

Internal pressure:

- EN 1447, *Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Determination of long-term resistance to internal pressure*
- EN ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)*
- EN ISO 1167-3, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 3: Preparation of components (ISO 1167-3:2007)*
- EN ISO 1167-4, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 4: Preparation of assemblies (ISO 1167-4:2007)*
- EN ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics material in pipe form by extrapolation (Revision of ISO/TR 9080:1992)*
- EN ISO 12162, *Thermoplastics materials for pipes and fittings for pressure applications — Classification and designation — Overall service (design) coefficient*
- ISO 161-1, *Thermoplastics pipes for the conveyance of fluids — Nominal outside diameters and nominal pressures — Part 1: Metric series*
- ISO 8521, *Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Test methods for the determination of the apparent initial circumferential tensile strength*

Dimensional tolerances:

EN ISO 3126, *Plastics piping systems — Plastics piping components — Determination of dimensions (ISO 3126:2005)*

Tightness: Liquid:

- For fittings see internal pressure.
- For connections between pipes and fittings:
 - EN 713, *Plastics piping systems — Mechanical joints between fittings and polyolefin pressure pipes — Test method for leaktightness under internal pressure of assemblies subjected to bending*
 - EN 911, *Plastics piping systems — Elastomeric sealing ring type joints and mechanical joints for thermoplastics pressure piping — Test method for leaktightness under external hydrostatic pressure*
 - EN 1119, *Plastics piping systems — Joints for glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods for leaktightness and resistance to damage of non-thrust resistant flexible joints with elastomeric sealing elements*
 - ISO 3459, *Plastic piping systems — Mechanical joints between fittings and pressure pipes — Test method for leaktightness under negative pressure (ISO/DIS 3459:2013)*
 - ISO 3503, *Plastics piping systems — Mechanical joints between fittings and pressure pipes — Test method for leaktightness under internal pressure of assemblies subjected to bending (ISO/DIS 3503:2013)*

- EN ISO 13783, *Plastics piping systems — Unplasticized poly(vinyl chloride) (PVC-U) end-load-bearing double socket joints — Test method for leaktightness and strength while subjected to bending and internal pressure (ISO 13783:1997)*
- EN ISO 13844, *Plastics piping systems — Elastomeric-sealing-ring-type socket joints of unplasticized poly(vinyl chloride) (PVC-U) for use with PVC-U pipes — Test method for leaktightness under negative pressure (ISO 13844:2000)*
- EN ISO 13845, *Plastics piping systems — Elastomeric-sealing-ring-type socket joints for use with unplasticized poly(vinyl chloride) (PVC-U) pipes — Test method for leaktightness under internal pressure and with angular deflection (ISO 13845:2000)*
- EN ISO 13846, *Plastics piping systems — End-load-bearing and non-end-load-bearing assemblies and joints for thermoplastics pressure piping — Test method for long-term leaktightness under internal water pressure*
- ISO 7432, *Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods to prove the design of locked socket-and-spigot joints, including double-socket joints, with elastomeric seals*
- ISO 8483, *Plastics piping systems for pressure and non-pressure drainage and sewerage — Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods to prove the design of bolted flange joints*
- ISO 8533, *Plastics piping systems for pressure and non-pressure drainage and sewerage — Glass-reinforced thermosetting plastics (GRP) systems based on unsaturated polyester (UP) resin — Test methods to prove the design of cemented or wrapped joints*

Release of dangerous substances:

Covered in the hEN using agreed CEN BT wording

C.2.3 DURABILITY

Internal and external pressure strength:

- EN ISO 580, *Plastics piping and ducting systems — Injection-moulded thermoplastics fittings — Methods for visually assessing the effects of heating*
- EN ISO 13968, *Plastics piping and ducting systems — Thermoplastics pipes — Determination of ring flexibility (ISO 13968:2008)*
- ISO/DIS 8513:2011, *Plastics piping systems - Glass-reinforced thermosetting plastics (GRP) pipes - Test methods for the determination of the apparent initial longitudinal tensile strength*
- ISO 9852, *Unplasticized poly(vinyl chloride) (PVC-U) pipes — Dichloromethane resistance at specified temperature (DCMT) — Test method*
- ISO 11357-6, *Plastics — Differential scanning calorimetry (DSC) — Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT)*
- ISO 17454, *Plastics piping systems — Multilayer pipes — Test method for the adhesion of the different layers using a pulling rig*

Tightness: Liquid:

Of elastomeric sealing connections:

- EN 681-1, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*
- EN 681-4, *Elastomeric seals — Material requirements for pipe joint seals used in drainage and sewerage applications — Part 4: Cast polyurethane sealing elements*

Of mechanical connections:

- ISO 3501, *Plastics piping systems — Mechanical joints between fittings and pressure pipes — Test method for resistance to pull-out under constant longitudinal force (ISO/DIS 3501:2013)*

Of electrofusion connections:

- ISO 13954, *Plastics pipes and fittings — Peel decohesion test for polyethylene (PE) electrofusion assemblies of nominal outside diameter greater than or equal to 90 mm*
- ISO 13955, *Plastics pipes and fittings — Crushing decohesion test for polyethylene (PE) electrofusion assemblies*

C.3 Additional information, comments and remarks

C.3.1 Explanation for irrelevancy of performance characteristics mentioned in the mandate for the products with the intended use for underground drainage and sewerage under pressure and non-drinking water under pressure.

C.3.1.1 (2) PIPES:

- Reaction to fire: not applicable for underground applications.
- Crushing strength: Plastics piping systems are flexible and therefore do not crush but deform. The characteristic is an issue typical for rigid pipes such as made of concrete or clay. It is therefore not relevant.
- Longitudinal bending strength: When buried in the ground, plastics pipes follow the movements of the soil instead of trying to withstand them. It is therefore not relevant.
- Maximum load for admissible deformation: Operational conditions of systems under pressure require a wall thickness resulting in a ring stiffness of the pipe such that deformation loads are insignificant for the design. It is therefore not relevant.
- Impact resistance: Not applicable - not subject to regulatory requirements
- Resistance to high temperature (for heating networks), Weldability (for gas networks), Penetration resistance (for gas networks) and Electrostatic behaviour (for fuel networks) are not relevant because of the intended use.
- Tightness for gas is not relevant for the intended use
- Permeability: Plastics pipes are inherently impermeable. It is a characteristic typical for pipes especially designed to be used in contaminated soils. It is not relevant because of the intended use.
- Thermal properties: Pressure pipes do not relate to energy conservation and are not designed for any thermal purposes. It is therefore not relevant.

C.3.1.2 (4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

- Reaction to fire: not applicable for underground applications.
- Crushing strength: Plastics piping systems are flexible and therefore do not crush but deform. The characteristic is an issue typical for rigid fittings such as made of concrete or clay. It is therefore not relevant.
- Maximum load for admissible deformation: Fittings are designed for a specific pressure (class) and are always stiffer than the corresponding pipe because of their geometry. It is therefore not relevant.
- Tightness for gas is not relevant for the intended use
- Resistance to high temperature (for heating networks), Impact resistance (for gas networks), Weldability (for gas networks), Penetration resistance (for gas networks), Electrostatic behaviour (for fuel networks) and Thermal insulation (related to Energy conservation) are not relevant because of the intended use.

C.3.2 Deviations from a performance approach in the standard:

None.

C.3.3 Requests for clarification on the scope of the mandate concerning the products in C above:

None.

C.3.4 Requests for clarification on the intended uses concerning the products in C above:

None.

C.3.5 Requests for clarification on the performance characteristics for the intended uses included in the mandate concerning the products under C above:

None.

C.3.6 Information on performance characteristics required by the mandate concerning the products in C above, for which no work has yet been started in the TC, or for which the TC cannot provide a standard:

None.

C.3.7 Explanation of the state of the art concerning durability issues:

None.

C.3.8 Information on other Directives under which the products in C above falls, and compliance conditions:

None.

C.3.9 Specific requests for additions to the mandate of materials, intended uses or performance characteristics concerning the products in C above:

None.

C.3.10 Other issues which the TC considers necessary for comprehension of the answer to the mandate:

The characteristic "Dimensional tolerances" was addressed as "Dimensions and the dimensional tolerances". This is to grant interchange ability and proper functioning of connections when installing pipes and fittings.

D HOT AND COLD WATER not intended for human consumption INSIDE BUILDINGS

Applicable families and subfamilies:

(2) PIPES

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

D.1 Harmonised standard

prEN 15015 [H&C water],
WI 00155813

Dates of availability

Stage 32: 2014-01,

Stage 40: 2014-04,

Stage 50: 2015-03

- (i) Title: Plastic piping systems – Hot and cold water piping components - Requirements and test/assessments methods for pipes and fittings.
- (ii) Scope: This European Standard specifies requirements for plastics pipes and fittings for hot and cold water installations. It gives associated test/assessment methods. This standard does not cover adhesives, joint sealings and gaskets.
- (iii) Intended use: It is intended to be used for distribution of hot and cold water and for heating systems inside buildings with the exception of water intended for human consumption.
- (iv) The performance characteristics according to the mandate which will be dealt with in the above standard will be:

(2) PIPES:

Reaction to fire
Internal and external pressure strength
Dimensional tolerances
Tightness: Liquid
Release of dangerous substances

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Reaction to fire
Internal pressure
Dimensional tolerances
Tightness: Liquid
Release of dangerous substances

(v) Durability: Considered are:

(2) PIPES:

Durability of internal pressure strength:
- Vicat softening temperature (for PVC-C only)
- MFR (for PP, PB, PE-RT and multi-layer)
- Degree of crosslinking (for PE-X and multi-layer of PE-X)
- Adhesion of the different layers (for multilayer M and P pipes only)

(4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Durability of internal pressure strength:
- Vicat softening temperature (for PVC-C only)
- MFR (for PP, PB, PE-RT and plastics material not identical to the piping material)
- Degree of crosslinking (for PE-X and multi-layer of PE-X).

Durability of tightness of connections between (2) pipes and (4) fittings (plastic or metallic):

- Temperature cycling test for all types of fittings
- Any sealing elements used, shall conform to EN 681-1

(vi) Other aspects: The harmonised standard will also contain:

- a reference to the Commission's Decision on attestation of conformity,
- clauses on assessment and verification of the consistency of performance (including Factory Production Control),
- guidance on the characteristics to be stated in the labelling accompanying the CE marking and on the way of expressing the determined values of these characteristics.

D.2 Supporting assessment methods

The following ENs and ISOs may serve as test or calculation methods for the determination of the performance characteristics required by the mandate and indicated in clause D.1 (iv) above:

D.2.1 (2) PIPES:

Reaction to fire:

- EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*
- EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*
- EN 16000, *Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item*

Internal and external pressure strength:

- EN ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)*
- EN ISO 1167-2, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 2: Preparation of pipe test pieces (ISO 1167-2:2006)*
- EN ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics material in pipe form by extrapolation (Revision of ISO/TR 9080:1992)*
- EN ISO 13760, *Plastics pipes for the conveyance of fluids under pressure — Miner's rule — Calculation method of cumulative damage (ISO 13760:1998)*
- ISO 10508, *Thermoplastics pipes and fittings for hot and cold water systems*
- ISO 17456, *Plastics piping systems — Multilayer pipes — Determination of the long-term hydrostatic strength*

Dimensional tolerances:

- EN ISO 3126, *Plastics piping systems — Plastics piping components — Measurement and determination of dimensions (revision of prEN 496:1991 and ISO 3126:1974) (ISO/DIS 3126:1999)*

Tightness: Liquid:

- EN 12293, *Plastics piping systems — Thermoplastics pipes and fittings for hot and cold water — Test method for the resistance of mounted assemblies to temperature cycling*
- ISO 10508, *Thermoplastics pipes and fittings for hot and cold water systems*

Release of dangerous substances:

- Covered in the hEN using agreed CEN BT wording

D.2.2 (4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

Reaction to fire:

- EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*
- EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 16000, *Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item*

Internal pressure:

EN ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)*

EN ISO 1167-3, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 3: Preparation of components (ISO 1167-3:2007)*

EN ISO 1167-4, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 4: Preparation of assemblies (ISO 1167-4:2007)*

EN ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics material in pipe form by extrapolation (Revision of ISO/TR 9080:1992)*

EN ISO 13760, *Plastics pipes for the conveyance of fluids under pressure — Miner's rule — Calculation method of cumulative damage (ISO 13760:1998)*

ISO 10508, *Thermoplastics pipes and fittings for hot and cold water systems*

Dimensional tolerances:

EN ISO 3126, *Plastics piping systems — Plastics piping components — Measurement and determination of dimensions (revision of prEN 496:1991 and ISO 3126:1974) (ISO/DIS 3126:1999)*

Tightness: Liquid:

EN 12293, *Plastics piping systems — Thermoplastics pipes and fittings for hot and cold water — Test method for the resistance of mounted assemblies to temperature cycling*

ISO 10508, *Thermoplastics pipes and fittings for hot and cold water systems*

Release of dangerous substances:

Covered in the hEN using agreed CEN BT wording

D.2.3 DURABILITY

Internal and external pressure strength

EN 579, *Plastics piping systems—Crosslinked polyethylene (PE-X)—Determination of degree crosslinking by solvent extraction*

EN 727, *Plastics piping systems—Thermoplastics pipes and fittings—Determination of Vicat softening temperature (VST)*

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

ISO 17454, *Plastics piping systems – Test method for the adhesion of the different layers using a pulling rig*

Tightness: Liquid

Sealing ring connections

EN 681-1, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*

Connections

EN 12293, *Plastics piping systems – Thermoplastics pipes and fittings for hot and cold water – Test method for the resistance of mounted assemblies to temperature cycling.*

ISO 10508, *Thermoplastics pipes and fittings for hot and cold water systems*

D.3 Additional information, comments and remarks

D.3.1 Explanation for irrelevancy of performance characteristics mentioned in the mandate for the products with the intended use for the conveyance of hot and cold water not intended for human consumption.

D.3.1.1 (2) PIPES:

- Crushing strength: Plastics piping systems are flexible and therefore do not crush but deform.

The characteristic is an issue typical for rigid pipes such as made of concrete or clay. It is therefore not relevant.

- Longitudinal bending strength: When buried in the ground, plastics pipes follow the movements of the soil instead of trying to withstand them. It is therefore not relevant.
- Maximum load for admissible deformation: Operational conditions of systems under pressure require a wall thickness resulting in a ring stiffness of the pipe such that deformation loads are insignificant for the design. It is therefore not relevant.
- Impact resistance: not applicable: not subject to regulatory requirements
- Resistance to high temperature (for heating networks), Weldability (for gas networks), Penetration resistance (for gas networks) and Electrostatic behaviour (for fuel networks) are not relevant because of the intended use.
- Tightness for gas is not relevant for the intended use
- Permeability: plastics pipes are inherently impermeable. It is a characteristic typical for pipes especially designed to be used in contaminated soils. It is not relevant because of the intended use.
- Thermal properties: Pressure pipes do not relate to energy conservation and are not designed for any thermal purposes. It is therefore not relevant.

D.3.1.2 (4) FITTINGS, ADHESIVES, JOINTS, JOINT SEALINGS AND GASKETS

- Crushing strength: Plastics piping systems are flexible and therefore do not crush but deform. The characteristic is an issue typical for rigid fittings such as made of concrete or clay. It is therefore not relevant.
- Maximum load for admissible deformation: Fittings are designed for a specific pressure (class) and are always stiffer than the corresponding pipe because of their geometry. It is therefore not relevant.
- Tightness for gas is not relevant for the intended use
- Resistance to high temperature (for heating networks), Impact resistance (for gas networks), Weldability (for gas networks), Penetration resistance (for gas networks), Electrostatic behaviour (for fuel networks) and Thermal insulation (related to Energy conservation) are not relevant because of the intended use..

D.3.2 Deviations from a performance approach in the standard:

None.

D.3.3 Requests for clarification on the scope of the mandate concerning the products in D above:

None.

D.3.4 Requests for clarification on the intended uses concerning the products in D above:

None.

D.3.5 Requests for clarification on the performance characteristics for the intended uses included in the mandate concerning the products under D above:

None.

D.3.6 Information on performance characteristics required by the mandate concerning the products in D above, for which no work has yet been started in the TC, or for which the TC cannot provide a standard:

None.

D.3.7 Explanation of the state of the art concerning durability issues:

None.

D.3.8 Information on other Directives under which the products in D above falls, and compliance conditions:

None.

D.3.9 Specific requests for additions to the mandate of materials, intended uses or performance characteristics concerning the products in D above:

None.

D.3.10 Other issues which the TC considers necessary for comprehension of the answer to the mandate:

Technical classes (temperature and pressure classes) and their corresponding threshold values may be considered related to the type of intended use.

The characteristic "Dimensional tolerances" has been addressed as "Dimensions and the dimensional tolerances". This is to grant interchange ability and proper functioning of connections when installing pipes and fittings.