

AMENDMENT No.3

to

WSA 137-2019

Industry standard for Uplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and Polyethylene (PE) maintenance shafts, maintenance chambers and maintenance holes for sewerage

REVISED TEXT

The 2019 edition of WSA 137 Issue 3.2 is amended as follows; the amendment (should be inserted in the appropriate place(s))

SUMMARY: This Amendment applies to Preface, Clauses 1.1, 2.27, 4.5, Appendix A Table A1, Appendix B, Table B1, and Appendix F.

Published on XX/XX/XXXX

Publication history

Issue 3.3 was published on XX XXX 2024

Preface

Amend 2nd Paragraph as follows:

It was published on the XX^h XX XXX and incorporates WSA 137:2019 Amd 1, 2 and 3:2024.

Replace third last paragraph with the following:

It is recognised that low surface energy acrylic structural adhesives may be used to joint dissimilar plastics such as PE and PVC in some maintenance shaft, chamber and hole products. Test requirements for PE to PVC joints using low surface energy acrylic structural adhesives are specified in WSA PS 287.

1.1 Scope

Insert new Item (f) as follows:

- (f) Jointing between PE and PVC may be achieved using structure adhesive

New Clause 2.2.7 Materials

2.2.7 Materials

Structural adhesives shall comply with the requirements of Appendix F and WSA PS 287. Structural adhesive joints shall be formed within a controlled environment. They shall not be prepared in the field.

New Clause 4.5 STRUCTURAL ADHESIVE JOINTS

4.5 STRUCTURAL ADHESIVE JOINTS

Structural Adhesive joints shall only be produced in a controlled manufacturing environment and

not in the field.

Appendix A, Table A1.

Replace Table A1 with the Table below:

Structural adhesives tests added to table A1 for Type Test, Batch Release Test and Process verification test.

**TABLE A1
MINIMUM SAMPLING AND TESTING FREQUENCY PLAN**

Type tests				
Characteristics	Clause	Requirement	Test method	Frequency
Material requirements				
Materials General	2.2.1	No lead, cadmium or mercury based additives	Process control records	At any change in material formulation, design or process
Materials for bases	2.2.2	Material compliance of standard materials Material compliance of non-standard materials Durability of standard and non-standard materials: no cracks after 1000 h or 3000 h as appropriate	Confirm third party certification for any materials or components for which compliance with Table 2.1 is claimed Compliance with Clause B5 of Appendix B ISO 13267 and Appendix B	
Materials for risers, cones and caps	2.2.3	Material compliance of standard materials Material compliance of non-standard materials	Confirm compliance with Clause 2.2 or third party certification for any risers for which compliance with AS/NZS 1477, AS/NZS 4441 or AS/NZS 4765 is claimed Compliance with Appendix B Clause B5	
Rework	2.2.4	Confirmation that only rework from manufacturer's own production is used.	Process control records	
Elastomeric seals	2.2.5	Compliance with AS 1646 and AS 681.1 or AS 681.2	Product certification to AS 1646 and AS 681.1 or AS 681.2	
Solvent cements	2.2.6	Compliance with AS/NZS 3879	Product certification to AS/NZS 3879	

Type tests				
Characteristics	Clause	Requirement	Test method	Frequency
Structural adhesives	2.2.7	Compliance WSA PS – 287	Product certification to WSA PS – 287	
Material requirements				
Freedom from defects	2.3	Structural and surface defects, condition of sockets and spigot ends, smoothness of internal joints, condition of elastomeric seals.	Visual examination	At any change in material formulation, design or process
Dimensions of sockets and spigots and effective sealing length	2.2.4	Compliance with appropriate product Standard, drawing or specification	AS/NZS 1462.1	At any change in material formulation, design or process
Packaging, storage, handling and transportation	2.6	Specific requirements for storage depending on material properties Stacking to maintain dimensions and protects ends and projections	Review of manufacturer's instructions and visual verification of storage conditions	
Performance requirements				
Structural integrity of base	3.2	50 year predicted vertical deflections $\leq 5\%$ and horizontal deflections $\leq 10\%$	Appendix C and ISO 13267	At any change in material formulation, design or process
Impact resistance of base	3.3	No cracks or other damage that impairs the function of the base	Appendix E	
Ring stiffness of riser	3.4	Ring stiffness $\geq 4,000$ N/m/m	AS/NZS 1462.22	
High temperature stress relief	3.5	No voids, contaminations or delaminations etc. as described in Clause 3.5	AS/NZS 1462.11	
Accessibility test	3.6	Passes appropriate proving tool(s) through all connection ports	3.6	
Elastomeric seal joints between pipe and base	3.7.2	No leakage	ISO 13259 Condition D	
Elastomeric seal joints between the riser and base	3.7.3	No leakage	ISO 13259 Condition A	
Performance requirements				
Watertightness between the riser and accompanying components	3.7.4	No leakage	No leakage after 15 min when assembly filled with water.	At any change in material formulation, design or process
Watertightness of telescopic section of riser	3.7.4	No leakage	No leakage after 15 min when assembly filled with water	
Watertightness of cone section	3.7.4	No leakage	No leakage after 15 min when assembly	

Type tests				
Characteristics	Clause	Requirement	Test method	Frequency
			filled with water	At any change in material formulation, design or process
Watertightness of Riser inlet connector	3.7.4	No Leakage	No leakage after 15 min when assembly filled with water	
Effective seal	3.7.5	Contact pressure ≥ 0.4 MPa for vulcanised seals and 0.47 MPa for thermoplastic elastomeric seals over a contact width >4 mm	AS/NZS 1462.13	
Integrity of Cap and seal – liquid infiltration test	3.8.2	No leakage	AS/NZS 1462.8	
Characterisation of rotationally moulded product.	3.9	Weight variation In accordance with Table 3.3	Weighing machine with a precision of at least 0.5% of the product weight	
Riser and riser joint load resistance	3.10	Withstand frictional down-drag forces of surrounding soil	By design or testing in accordance with Appendix D	
Load bearing capacity of cone and near surface components	3.11.2	No visible cracking, collapse, or other similar form of structural failure.	ISO 13266	
Maintenance hole steps – load bearing resistance	3.12.1	Deformation under load ≤ 10 mm. Residual deformation ≤ 5 mm	EN 13101	
Maintenance hole steps – pull-out resistance	3.12.2	No pull-out with an applied horizontal force of 1 kN	EN 13101	
Slip resistance	3.13	R9	AS 4586 Appendix D	
		V10	AS 4586 Appendix E	
Manufacture				
Dimensions of base and riser	4.1	Not less than the design thickness or thickness of relevant Standard as appropriate	AS/NZS 1462.1	At any change in material formulation, design or process.
Welding	4.2	In accordance with Clause 4.2.3 and Clause 4.2.1 or 4.2.2 as appropriate	Visual verification and process control	
Solvent cement jointing	4.3	AS/NZS 2032	Visual verification and process control	
Structural adhesives	2.2.7	Compliance with Appendix F and WSA PS – 287	Visual verification and process control	
Batch release tests				
Characteristics	Clause	Requirement	Test method	Frequency

Batch release tests				
Characteristics	Clause	Requirement	Test method	Frequency
Freedom from defects	2.3	Structural and surface defects, condition of sockets and spigot ends, smoothness of internal joints, condition of elastomeric seals.	Visual verification	At start up and once per shift
Dimensions of sockets and spigots and effective sealing length	2.4	Compliance with appropriate product Standard, drawing or specification	AS/NZS 1462.1	Once per shift or once per batch, whichever is the more frequent
Packaging, storage, handling and transportation	2.6	Compliance with appropriate installation Standard, product drawing or specification	Visual examination	Once per shift
Ring stiffness of riser	3.4	Ring stiffness $\geq 4,000$ N/m/m	AS/NZS 1462.22	At start up and once per week or once per batch, whichever is the more frequent
High temperature stress relief (PVC-U)	3.5	No voids, contaminations or delaminations etc. as described in Clause 3.5	AS/NZS 1462.11	At start up and once per shift
Weight of rotationally moulded products	3.9	Table 3.3	Weighing machine with a precision of at least 0.5% of the product weight	
Dimensions of base and riser	3.1	Wall thickness not less than design wall thickness or relevant product Standard as appropriate	AS/NZS 1462.1	At start up and once per shift
Welding	3.2	Welding to be in accordance with nominated specification	Visual verification	
Solvent cement jointing	3.3	Evidence of application of primer and absence of excess cement and joint made in accordance with AS/NZS 2032	Visual verification	
Structural adhesives	2.2.7	Evidence of structural adhesives joint made in accordance with WSA PS – 287		
Marking	5	Complete, legible and permanent	Visual examination and comparison with production records	Each assembly Injection mouldings once per shift

Process verification tests				
Characteristics	Clause	Requirement	Test method	Frequency
Materials General	2.2.	Material compliance	Confirm third party certification for any materials or components for which compliance with Table 2.1 is claimed	Once per 2 years
Durability of standard and non-standard materials for bases	2.2.2.1 and 2.2.2.2	No cracks	Appendix B and ISO 13267	Once per year
Characterisation of non-standard materials for risers, cones and caps	2.2.3.2	Table B2	Appendix B Clause B5	
Rework	2.2.4	Confirmation only rework from manufacturer's own production is used	Process control records	
Elastomeric seals	2.2.5	Compliance with AS1646	Product certification to AS 1646	Once per 2 years
Solvent cements	2.2.6	Compliance with AS/NZS 3879	Product certification to AS/NZS 3879	
Structural adhesives	2.2.7	Compliance with Appendix F and WSA PS – 287	Product certification to WSA PS – 287	
Impact resistance of maintenance base	3.3	No cracks or other damage that impairs the function of the base	Appendix E	
Elastomeric seal joints between pipe and base	3.7.2	No leakage	ISO 13259 Condition D	
Elastomeric seal joints between the riser and base	3.7.3	No leakage	ISO 13259 Condition A	Once per 2 years
Water tightness between the riser and accompanying components	3.7.4	No leakage	No leakage after 15 minutes when assembly filled with water	
Water tightness of telescopic section of riser	3.7.4	No leakage	No leakage after 15 minutes when assembly filled with water	
Water tightness of cone section	3.7.4	No leakage	No leakage after 15 minutes when assembly filled with water	
Watertightness of Riser inlet connector	3.7.4	No Leakage	No leakage after 15 min when assembly filled with water	
Integrity of cap and seal – liquid infiltration test	3.8	No leakage	AS/NZS 1462.8	

Process verification tests				
Characteristics	Clause	Requirement	Test method	Frequency
Riser and riser joint load resistance	3.10	Withstand frictional down-drag forces of surrounding soil	By design or testing in accordance with Appendix D	
Load bearing capacity of cone and near surface components	3.11.2	No visible cracking, collapse, or other similar form of structural failure.	ISO 13266	Once per 5 years
Maintenance hole steps – load bearing resistance	3.12.1	Deformation under load ≤ 10 mm. Residual deformation ≤ 5 mm	EN 13101	Once per 2 years
Maintenance hole steps – pull-out resistance	3.21.2	No pull-out with an applied horizontal force of 1 kN	EN 13101	

Appendix B, Table B1.

Amend the Test temperature for PE rotational moulded material from 80 ± 2 to 60 ± 2

Replace Table B1 with the Table below:

**TABLE B1
TEST PARAMETERS**

Material	Test temperature °C	Rating Factor R (applicable to standard and non-standard materials)
PVC-U	60 ± 2	3.5
PE	80 ± 2	4.1
PE rotational moulded	60 ± 2	3.6
PP	80 ± 2	3.4
PP rotational moulded	80 ± 2	3.6

Insert New Appendix F

APPENDIX F REQUIREMENTS FOR STRUCTURAL ADHESIVES

(Normative)

The supplier shall provide a data sheet defining the:

- (a) mixing ratios,
- (b) preparation and service temperatures,
- (c) working life of the prepared adhesive, and
- (d) the cure time.

NOTE The use of the adhesive to form joints should be restricted to a controlled environment