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| Issue Date | Rev. No. | Summary Of Amendments |
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## 1 INTRODUCTION

1.1 This document prescribes the specific rule for certification of Polyethylene (PE) water tanks, in accordance with the requirements of DM Third Party Product Certification Scheme Through Factory Assessment, taking into consideration the applicable normative references and standard specification, in addition to the requirements for conformity evaluation, as stated below.

1.2 The applicant/client shall comply with this specific rule, and to all provisions under the "General Rule for DM Third Party Product Certification Scheme Through Factory Assessment "DM-DCLD-RD-DP21-2001 (IC).

1.3 This specific rule is an integral part of the general rules, and both shall always be read together.

## 2 SCOPE

2.1 This specific rule covers flat-bottom, upright, cylindrical tanks molded in one-piece seamless construction by rotational molding. The tanks are molded from polyethylene for above ground vertical installation and are capable of containing aggressive chemicals at atmospheric pressure.

2.2 For Polyethylene (PE) water tanks intended for human consumption (drinking water use), only specific grades of materials are permitted — these must meet safety, hygiene, mechanical, and migration requirements set by standards like BS 6920, GSO 149, NSF/ANSI 61, or Water Regulations Advisory Scheme (WRAS) , the list of materials are listed in ANNEX A.

2.3 It provides the general conformity assessment criteria for evaluation and certification. Regulatory requirements from local authorities must also be met.

2.4 This specific rule does not -by itself- permit the use of the below product market access or building use approval. However, it does provide the necessary general conformity assessment criteria, which are required for the evaluation and issuance of the certification and authorization of the use of the DCLD Conformity Mark. Other relevant requirements issued by the regulatory bodies, if any; shall always be fulfilled.

## 3 PRODUCT IDENTIFICATION AND APPLICABLE STANDARD/NORMATIVE REFERENCE

3.1 Product name: Polyethylene (PE) Water Tanks – upright, cylindrical, above-ground tanks.

3.2 Applicable standard/Normative reference: ASTM D1998-21— Standard Specification for Polyethylene Upright Storage Tanks.

3.3 Additional reference:

ISO 9001 Quality Management System – Requirements

ISO 19011 Guidelines for Auditing Management Systems

## 4 DEFINITION OF TERMS

In addition to the definitions given in ASTM D1998-21 and the General Rule of the scheme [DM-DCLD- RD-DP21-2001 (IC)], the following shall apply: -

4.1 ASTM D1998-21— Standard Specification for Polyethylene Upright Storage Tanks.

4.2 Definitions and abbreviations are in accordance with ASTM D1998 terminology.

## 5 REQUIREMENTS FOR INITIAL CERTIFICATION

5.1 The process of application, initial assessment and product sampling shall be in line with the related provisions in the general rule and the standard specifications.

5.2 The factory shall have a laboratory with the following testing equipment as a minimum:

a. Internal pressure (leakage) tester
b. Dimensional test equipment
c. Hydrostatic Testing equipment
d. Oven (for gel content or stress crack testing, if applicable)
e. Visual Inspection Tools
f. MFI Tester
g. Pycnometer setup
h. Surface Roughness Tester

5.3 Internal product quality assurance plan

The client shall have an internal product quality assurance plan giving details of the tests to be carried out at the factory. Design of the tank shall be as clause 6 of the standard. Testing shall be in accordance with clause 9, 10 & 11 of the standard specification and the Type classification of product to be certified, all applicable tests shall be carried out as per test methods mentioned below.

5.4 Product Evaluation and testing

5.4.1 Visual inspection for defects, ASTM D 1998, Section 10.1

5.4.2 Low-temperature impact resistance ASTM D 1998 (clause 11.3)

5.4.3 Hydrostatic water testing ASTM D 1998 (clause 11.5)

5.4.4 Gel content verification for crosslinked PE (XLPE) ASTM D 1998 (clause 11.4)

5.4.5 Wall Thickness Measurement ASTM D 1998 (Clause 9)

5.4.6 Tensile Strength / Elongation, ASTM D638

5.4.7 UV Resistance (for external tanks), ASTM D2565 or ISO 4892

5.4.8 UV Weathering Test (for external tanks), QUV Accelerated Weathering Tester (ASTM G154)

5.4.9 Density and Melt Index (MFI), ASTM D1505 / D1238

5.4.10 Sampling shall be done as per the table below:

| Test | Sample Source | Sample Type & Length |
|---|---|---|
| Wall Thickness Measurement | Molded tank wall | No cutting needed (measured in-place or from cut cross-section) |
| Tensile Strength & Elongation (ASTM D638) | Flat section from side/top wall | Minimum length: 125 mm (Type IV Die) |
| Environmental Stress Crack Resistance (ESCR) | Molded sample panel or flat wall | Minimum: 150 mm × 13 mm × tank wall thickness |
| Low Temperature Impact Test | Cross-section from tank base or side | Sample size: 25 mm x 13 mm x wall thickness |
| Specific Gravity Test (ASTM D792) | Small cut piece from any section | ~ 5–10 g sample |
| Hydrostatic Load or Structural Performance | Entire tank | Full tank test (no sample cutting) |

5.4.11 The results of testing must meet the requirements as per the standard specification.

5.5 Marking

Each tank must be permanently marked as per clause 12 of the standard specification which includes the following:

5.5.1 Manufacturer name or trademark

5.5.2 Production date and location

5.5.3 Maximum specific gravity of tank design

5.5.4 Product batch number

5.5.5 Nominal capacity and classification

5.6 Material Composition

For multilayer polyethylene tanks, the use of certified food-grade recycled polyethylene is permitted only in non-potable contact layers (e.g., the core layer of a three-layer structure), under the following conditions:

- The inner surface (water-contact layer) shall be made of virgin PE material compliant with BS 6920 or NSF/ANSI 61.
- The recycled material used in non-contact layers must be traceable, food-grade, and demonstrate compliance with mechanical and chemical requirements of ASTM D1998.
- The finished product must meet all relevant tests specified in ASTM D1998, including impact resistance, hydrostatic design stress, and environmental stress crack resistance (ESCR).
- Manufacturers shall maintain material traceability records and make them available during audit or review.

## 6 GRANTING OF THE DCLD CERTIFICATION

6.1 The DCLD product conformity certificate and the authorization to use the DCLD conformity mark shall be granted upon conformance with all related provisions in the general rule.

6.2 Use of the DCL Conformity Mark shall be as per DM-DCLD-RD-DP21-2069 (IC).

6.3 Fees shall be as per DM-DCLD-RD-DP21-2074 (IC) and other relevant provisions in the general rule.

6.4 DCLD-CQPS shall carry out surveillance of certified clients based on the approved periodic plans and related provisions in the general rule.

6.5 Appeals, disputes, and complaints shall be in line with the relevant provisions in the General Rule.

# ANNEX A

## Material Requirements for PE Water Tanks Certified under ASTM D1998

### Scope

This annex outlines the acceptable and prohibited materials for polyethylene (PE) water tanks, including monolayer and multilayer constructions, in accordance with the structural and safety requirements of ASTM D1998. It clarifies the interpretation of Clause 5.1 regarding virgin materials and multilayer tank designs.

Table A1: Approved Materials by Component:

| Component | Allowed Material |
|---|---|
| Tank Body | Virgin HDPE (High-Density Polyethylene) - Food grade, WRAS/NSF approved |
| | Virgin LLDPE (Linear Low-Density Polyethylene) - For rotational molding |
| | Black PE with Carbon Black Additive - UV-resistant, only if food-contact grade certified |
| Colorants/Additives | Only food-contact compliant masterbatches. |
| | UV stabilizers such as HALS (Hindered Amine Light Stabilizers) |
| Inner Liners / Barrier Layers (for multilayer tanks only) | FDA/NSF/BS 6920-compliant PE liners |
| | Co-extruded virgin PE barrier layers that do not compromise structural integrity |
| | Must be physically and functionally distinct from the load-bearing tank wall |
| Weld Rods / Repair Materials | Same-grade virgin HDPE rods with food-contact certification |

Table A2: Prohibited Materials:

| Material/Component | Remarks |
|---|---|
| Recycled PE (non-certified) | Unless part of a non-contact layer in multilayer tanks and fully certified food-grade. |
| Non-food-grade colorants | Must use food-contact compliant pigments only. |
| PVC, PS, or non-NSF liners | Not compatible with potable water use or structural standards. |