

PT/515/0223 - AS (November 2025)

Assessment Schedule for the LOCTITE GeoSpray and LOCTITE GeoSpray HCE geopolymer pipe lining systems as supplied by Henkel Corporation (DBA GeoTree Solutions)



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1. SCOPE

This schedule specifies characteristics for the LOCTITE GeoSpray and LOCTITE GeoSpray HCE geopolymer pipe lining systems as supplied by Henkel Corporation (DBA GeoTree Solutions).

The LOCTITE GeoSpray and LOCTITE GeoSpray HCE geopolymer pipe lining systems are applicable to the renovation of gravity surface water and foul (sewage) applications in a range of horizontal pipe internal diameters typically above 800mm.

2. PRODUCT DESCRIPTION

2.1 Introduction

The LOCTITE GeoSpray and LOCTITE GeoSpray HCE systems use a high strength, low porosity fibre reinforced mortar for structural renovation of numerous types of structure. This inorganic polymeric material is made from natural mineral polymers and recycled industrial waste streams and adheres strongly to prepared cement surfaces.

The LOCTITE GeoSpray and LOCTITE GeoSpray HCE systems are designed for use through multiple application techniques including pouring, placing, trowelling, spraying or centrifugal casting.

The LOCTITE GeoSpray HCE system geopolymer mortar is indistinguishable from the LOCTITE GeoSpray system except it has been developed to have a higher level of corrosion resistance.

2.2 Relevant Standards

The following product standard was identified:

- ASTM F3706-24⁽¹⁾.

2.3 Approval History

This is the first re-approval of the LOCTITE GeoSpray system.

The previous approval was:

- PT/414/0218.

The LOCTITE GeoSpray HCE system was added to the approval in November 2025.

3. TESTING AND REQUIREMENTS

3.1 Materials

Materials shall comply with the material property standards contained in ASTM F3706-24.

3.2 Type Testing

Mechanical Characteristics Testing: The mechanical testing requirements under laboratory conditions are listed below:

Mechanical characteristics for the LOCTITE GeoSpray and LOCTITE GeoSpray HCE systems

- Compressive strength (ASTM C-39⁽²⁾):
 - 2500 psi / 17.2 MPa – 1 day.
 - 8000 psi / 55.1 MPa – 28 day.
- Flexural strength (ASTM C-78⁽³⁾):
 - 1500 psi / 10.3 MPa – 28 days.

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- Tensile strength (ASTM C-496⁽⁴⁾):
 - 800 psi / 5.5 MPa – 28 day.
- Bond strength to concrete (ASTM C-882⁽⁵⁾):
 - 900 psi / 6.2 MPa – 1 day.
 - 2,500 psi / 17.2 MPa – 28 day.
- Set time (ASTM C-807⁽⁶⁾):
 - Initial set 60-70 Minutes.
 - Final set 90-110 Minutes.
- Shrinkage (ASTM C-1090⁽⁷⁾):
 - 0.00% @ 65% RH - 28 days.
- Freeze thaw durability (ASTM C-666⁽⁸⁾):
 - Negligible loss 300 cycles.
- Corrosion resistance (DIN 19573⁽⁹⁾):
 - Geospray XWW1-XWW3.
 - Geospray HCE XWW4.

Requirements: The LOCTITE GeoSpray and LOCTITE GeoSpray HCE systems shall comply with the following requirements.

Appearance: The internal surface of the lining shall be smooth, clean and free from scoring, cavities and other surface defects that would prevent the LOCTITE GeoSpray or LOCTITE GeoSpray HCE systems from meeting the general fitness for purpose requirement.

Mechanical Resistance: The LOCTITE GeoSpray and LOCTITE GeoSpray HCE lining systems shall be designed in accordance with the methodology in LOCTITE GeoSpray® Mortar Design Guide for Gravity (Non-Pressure) Pipelines and Culverts⁽¹⁰⁾. The GeoSpray thickness calculator⁽¹¹⁾ uses this design methodology for structural applications. These are based on equation 3 from Exploration of

Engineering Design Methods for Cementitious Spray Applied Liner Systems⁽¹²⁾, which is in compliance with the design requirements found in ASTM F3706-24.

Alternatively, a method that produces a more conservative, thicker design thickness can be used.

3.3 Manufacture

To ensure the quality and performance of the LOCTITE GeoSpray and LOCTITE GeoSpray HCE mortars, the manufacturing process shall include appropriate systems for:

- Specification of component materials.
- Verification that component materials received are to specification.
- Handling and storage of all component materials and finished material.
- Blending of dry mortar mix.

The production of the LOCTITE GeoSpray and LOCTITE GeoSpray HCE mortars and related Quality Control procedures shall comply with requirements to ensure the stated performance of the product is reliably achieved.

3.4 Installation

When installed in accordance with the installation documentation⁽¹³⁾, the LOCTITE GeoSpray and LOCTITE GeoSpray HCE geo-polymer pipe lining systems shall be reasonably expected to perform as described. Any equipment or process changes different from the standard manual should be approved and verified by Henkel Corporation (DBA GeoTree Solutions) in advance of installation.

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4. APPROVAL

The LOCTITE GeoSpray and LOCTITE GeoSpray HCE geo-polymer pipe lining systems have been audited and successfully met all the requirements stated within this assessment schedule.

Signed:

A handwritten signature in black ink that reads 'A Russell'.

Valid Until: 8th February 2028

5. REFERENCES

1. ASTM F3706-24: Standard Practice for In Field Spray Applied Mortar Linings for Large Diameter Stormwater and Sewer Conduits.
2. ASTM C39 / C39M – 17a Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
3. ASTM C78 / C78M - 16 Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
4. ASTM C496 / C496M – 11 Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.
5. ASTM C882 / C882M - 13a Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete by Slant Shear.
6. ASTM C807 – 13 Standard Test Method for Time of Setting of Hydraulic Cement Mortar by Modified Vicat Needle.
7. ASTM C1090 / C1090M – 15 Standard Test Method for Measuring Changes in Height of Cylindrical Specimens of Hydraulic-Cement Grout.
8. ASTM C666 / C666M – 15 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
9. DIN 19573:2025-04 (Draft) Mortar for construction and rehabilitation of drains and sewers outside buildings.
10. LOCTITE GeoSpray® Mortar Design Guide for Gravity (Non-Pressure) Pipelines and Culverts, Version 1.2, 24th March 2023.
11. LOCTITE Geospray Thickness Calculator spreadsheet, Version July 6, 2022.
12. Exploration of Engineering Design Methods for Cementitious Spray Applied Liner Systems, Royer J.R.; Matthews J.C.; ASCE UESI Pipeline 2022, Indianapolis, IN USA.
13. LOCTITE GeoSpray Contractor Training Manuals, 2016 to 2023.