



# Standard Practice for Determination of the Effectiveness of Anti-Graffiti Coating for Use on Concrete, Masonry and Natural Stone Surfaces by Pressure Washing<sup>1</sup>

This standard is issued under the fixed designation D7089; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This practice covers a basic method for evaluating the performance of anti-graffiti products on mineral building substrates by a series of increasingly abrasive cleaning methods. The anti-graffiti materials are applied to a series of concrete, masonry and natural stone specimens for evaluation. Graffiti resistance is based on how a defined set of markings are removed by a designated set of cleaning techniques.

1.2 This practice also defines a procedure to evaluate graffiti removal after re-marking with subsequent re-cleaning. It does not address the re-treatment of substrates after a material is no longer graffiti resistant.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

**D3924** Specification for Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials  
**D6578** Practice for Determination of Graffiti Resistance

## 3. Terminology

3.1 *Definitions:*

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.47 on Concrete, Stone and Masonry Treatments.

Current edition approved Dec. 1, 2014. Published December 2014. Originally approved in 2006. Last previous edition approved in 2006 as D7089 – 06. DOI: 10.1520/D7089-06R14.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.1.1 *graffiti resistant, n*—the property of coatings to be resistance to the application of graffiti or exhibit easy removal of graffiti without surface damage, or both.

3.1.2 *non-sacrificial anti-graffiti coatings, n*—the property of a coating in which they remain intact or undamaged after the removal of graffiti from their surface.

3.1.3 *sacrificial anti-graffiti coatings, n*—the property of coatings in which they are destroyed or damaged during the removal of graffiti, therefore requiring subsequent re-application.

## 4. Summary of Practice

4.1 Spray paints and markers are applied to a series of concrete, masonry and natural stone test panels pre-treated with the product(s) to be evaluated. The paint(s) and mark(ers) are removed using a series of commercial building cleaning methods which begin with the least aggressive method, high-pressure water wash with a commercial graffiti cleaner and proceed to increasingly aggressive cleaning methods such as high-pressure hot water wash and high-pressure sodium bicarbonate wash.

## 5. Significance and Use

5.1 Graffiti on buildings and structures is a significant problem in various regions across the country. A variety of coatings have been developed to be either resistant to the application of paints/marker or to aid in their removal. This standard practice describes a procedure for evaluating the effectiveness of anti-graffiti coatings applied to various concrete, masonry and natural stone substrates. It does not address graffiti removal on metal or any other non-mineral substrate.

5.2 This practice only addresses graffiti removal on substrates in a laboratory environment, that have not been exposed to either natural or artificial weathering. Specification D6578 describes a method for graffiti removal after both natural and artificial weathering.

## 6. Apparatus

6.1 Commercial based graffiti removers used for concrete, masonry and stone surfaces are utilized to remove graffiti.

Follow manufacturer guidelines for application instructions. This is followed by high-pressure cold water washer to clean the substrate.

6.2 High-pressure cold water washer, capable of maintaining a pressure of 800 to 1500 psi, equipped with a fan type spray tip that disperses water at an angle of at least 15 degrees, with a flow rate of 4 to 6 gal per minute.

6.3 High-pressure hot water washer, capable of maintaining a pressure of 800 to 1500 psi, and temperatures of 140 to 180°F equipped with a fan type spray tip that disperses water at an angle of at least 15 degrees, with a flow rate of 4 to 6 gal per minute.

6.4 High-pressure sodium bicarbonate washer, capable of maintaining a pressure of 800 to 1500 psi, equipped with a fan type spray tip that disperses water at an angle of at least 15 degrees, with a flow rate of 4 to 6 gal per minute. Also known as baking soda or soda blasting.

## 7. Reagents and Materials

7.1 Anti-graffiti product(s) to be evaluated.

7.2 Solvent based spray paint recommended colors: black, blue and red.

7.3 Solvent based ink markers recommended colors: black, blue and red.

NOTE 1—Blue and red colors are known to be the most difficult colors to remove.

## 8. Sampling, Test Specimens, and Test Units

8.1 Any of the following mineral building substrates including; concrete, masonry, and natural stone.

8.2 A minimum of 3 test specimens of each type of substrate will be required for each anti-graffiti product to be evaluated. Include a minimum of 3 untreated test specimens of each type of substrate.

8.3 Concrete specimens shall be typically a minimum of 12 by 12 in., masonry specimens shall be a minimum of 7.5 by 3.5 in. and natural stone specimens shall be a minimum of 8 by 8 in.

## 9. Application of Anti-Graffiti Coatings

9.1 Substrates will be treated with anti-graffiti products in accordance with manufacture instructions.

9.2 Treated substrates should be given a seven-day curing period, under ambient conditions as outlined in Specification [D3924](#) with each specimen placed so it has free air circulation.

## 10. Application of Graffiti

10.1 Apply spray paint and marker to three previously treated specimens in parallel lines that covers the entire specimen. Apply each color of paint and marker parallel to the previous. Apply paint at a constant speed, maintaining a distance of 6 in. from the specimen. Apply markers with a constant pressure.

10.2 Painted/marked specimens shall be given typically a five-day cure period under the same conditions as the conditioning period in [9.2](#).

## 11. Graffiti Removal Procedure Using High-Pressure Equipment

11.1 Clean each specimen with a high-pressure water washer. Maintain a distance of 10 in. from each specimen, applying horizontal back and forth sweeping motion. Clean each type of substrate for the same length of time. The same type of spray nozzle must be used for all testing.

11.2 Report the percent of paint/marker removed. If the paint is completely removed from all replicate test specimens the surface is rated as “Cleanability Level 1.”

NOTE 2—Always test the specimen to ensure the high pressure water doesn’t cause damage to the surface.

11.3 Clean each specimen with a commercial based graffiti cleaner followed by a high-pressure cold water wash. Maintain a distance of 10 in. from each specimen, applying horizontal back and forth sweeping motion. Clean each type of substrate for the Report the percent of paint/marker removed. If the paint is completely removed from all replicate test specimens the surface is rated as “Cleanability Level 2” (see [Note 2](#)).

11.4 Clean each specimen with a high-pressure hot water washer. Maintain a distance of 10 in. from each specimen, applying horizontal back and forth sweeping motion. Clean each type of substrate for the Report the percent of paint/marker removed. If the paint is completely removed from all replicate test specimens the surface is rated as “Cleanability Level 3” (see [Note 2](#)).

11.5 If cleaning with the high-pressure hot water washer fails to remove all the paint from each specimen, use a high-pressure sodium bicarbonate washer. “Cleanability 4” is noted when using a high-pressure sodium bicarbonate washer.

11.6 If any paint remains of each specimen, report the percent of paint remaining.

	Cleanability Levels
Cleanability 1	Graffiti completely removed with high-pressure cold water wash
Cleanability 2	Graffiti completely removed with commercial based graffiti remover and high-pressure cold water wash
Cleanability 3	Graffiti completely removed with high-pressure hot water wash
Cleanability 4	Graffiti completely removed with a sodium bicarbonate pressure wash

## 12. Recleanability of Graffiti Procedure

12.1 In many cases, it is necessary to evaluate whether a graffiti resistant material will show the same level of cleanability after it has been cleaned and remarked with graffiti. To evaluate recleanability on nonsacrificial coatings only, use the following procedure.

12.2 Reapply the graffiti markings to each specimen in accordance with [Section 10](#).

12.3 Repeat cleaning procedure using the same cleaning equipment that completely removed the markings in [Section 11](#) with the exception of sodium bicarbonate cleaning.

12.4 If the markings are not completely removed, record the percent of paint remaining.

12.5 Repeat [12.2](#) and [12.3](#) until the paint can no longer be successfully removed and report number of cleaning cycles performed successfully.

### **13. Report**

13.1 Report the following information for each anti-graffiti coating being evaluated:

13.1.1 Identification, product type either sacrificial or non-sacrificial and manufacturer of anti-graffiti coating being tested.

13.1.2 Procedure of application of material, cure time and temperature,

13.1.3 Type(s) of substrate used in evaluation,

13.1.4 Pressure, temperature and length of time for pressure washing,

13.1.5 Cleanability level employed for successful removal of markings, and

13.1.6 Any deviations from the above practice.

### **14. Keywords**

14.1 anti-graffiti; cleanability; concrete; graffiti removal; masonry; natural stone

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