



Standard Practice for Cleaning of Materials and Components by Ultrasonic Techniques¹

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1. Scope

1.1 This practice covers a procedure for the cleaning of materials and components used in systems requiring a high level of cleanliness, such as oxygen, by ultrasonic techniques.

1.2 This practice may be used for cleaning small parts, components, softgoods, etc.

1.3 The values stated in SI units are 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.* Specific precautionary statements are given in **Note 1**.

2. Referenced Documents

2.1 *ASTM Standards*:²

D1193 Specification for Reagent Water

E1235 Test Method for Gravimetric Determination of Nonvolatile Residue (NVR) in Environmentally Controlled Areas for Spacecraft

F311 Practice for Processing Aerospace Liquid Samples for Particulate Contamination Analysis Using Membrane Filters

F324 Test Method for Nonvolatile Residue of Volatile Cleaning Solvents Using the Solvent Purity Meter (Withdrawn 1987)³

F331 Test Method for Nonvolatile Residue of Solvent Extract from Aerospace Components (Using Flash Evaporator)

G121 Practice for Preparation of Contaminated Test Cou-

pons for the Evaluation of Cleaning Agents
G122 Test Method for Evaluating the Effectiveness of Cleaning Agents

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *contaminant (contamination), n*—unwanted molecular and particulate matter that could affect or degrade the performance of the components upon which they reside.

3.1.2 *contaminate, v*—a process of applying a contaminant.

3.1.3 *control coupon (witness coupon), n*—a coupon made from the same material and prepared in exactly the same way as the test coupons, which is used to verify the validity of the method or part thereof.

3.1.3.1 *Discussion*—In this practice, the control coupon will be contaminated in the same manner as the test coupons and will be subjected to the identical cleaning procedure.

3.1.4 *degas, v*—the process of removing gases from a liquid.

3.1.5 *nonvolatile residue (NVR), n*—residual molecular and particulate matter remaining following the filtration and controlled evaporation of a solvent containing contaminants.

3.1.6 *particle (particulate contaminant), n*—a piece of matter in a solid state with observable length, width, and thickness.

3.1.6.1 *Discussion*—The size of a particle is usually defined by its greatest dimension and is specified in micrometres.

4. Summary of Practice

4.1 A part, material or component is placed in a container containing the cleaning agent. This container is then placed in an ultrasonic cleaner and treated for a given period of time at the recommended temperature for the cleaning agent. This results in a solution if the contaminant is soluble in the test fluid or a emulsion if the contaminant is not soluble in the test fluid. The cleaning solution combined with the rinse solutions may then be analyzed for particulate, NVR, or total carbon (TC).

4.1.1 In the case of aqueous based agents, the parts are rinsed after the removal from the cleaning bath and ultrasonically cleaned in reagent water to provide a solution for TC analysis using G TC.

¹ This practice is under the jurisdiction of ASTM Committee G04 on Compatibility and Sensitivity of Materials in Oxygen Enriched Atmospheres and is the direct responsibility of Subcommittee G04.02 on Recommended Practices.

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² 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 The last approved version of this historical standard is referenced on www.astm.org.