



Designation: D3852 – 07

Standard Practice for Sampling and Handling Phenol, Cresols, and Cresylic Acid¹

This standard is issued under the fixed designation D3852; 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 (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This practice is provided to ensure that phenol and cresylic acid are properly sampled to provide representative specimens for quality assurance analyses and that they are handled in a safe manner. In general, this practice also applies to cresols, xylenols, and some other alkylated phenolic materials; however, specific information regarding these materials should be sought and used if available.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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:*²

[E300 Practice for Sampling Industrial Chemicals](#)

2.2 *Other Documents:*

[OSHA Regulations, 29 CFR, paragraphs 1910.1000 and 1910.1200](#)³

[U.S. DOT Regulations, 49 CFR Transportation, Subchapter C, Parts 171 – 180](#)³

[NFPA No. 704-1996 Standard System for the Identification of the Hazards of Materials for Emergency Response](#)⁴

3. Significance and Use

3.1 This practice is issued to provide information useful in establishing sampling and handling procedures. It is expected

¹ This practice is under the jurisdiction of ASTM Committee D16 on Aromatic Hydrocarbons and Related Chemicals and is the direct responsibility of Subcommittee D16.08 on Handling and Sampling Aromatic and Cyclic Hydrocarbons.

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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 Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

⁴ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, <http://www.nfpa.org>.

that this information will only be utilized in conjunction with an existing health and safety program. The information provided cannot be used as a substitute for expert safety and medical advice, but rather as a supplement to such advice.

4. Description of Products

4.1 Phenol is a colorless to light pink crystalline material which melts at 40 to 41°C (104 to 106°F). Technical and USP grades melt at lower temperatures.

4.2 Phenol is both extremely hygroscopic and sensitive to discoloration. Therefore, it cannot be overemphasized that proper precautions must be undertaken when unloading or sampling the product. Moisture must be excluded. The use of sampling devices that contain metals that may catalyze discoloration (iron, copper) must also be avoided.

4.3 Cresylic acid is a common chemical name applied to mixtures of alkyl-substituted phenols. Included are mixtures of cresols, xylenols, and higher alkylated phenols. Many cresylic acid mixtures contain measurable amounts of phenol.

4.4 Most cresylic acid mixtures are liquids at ambient temperatures. However, at low temperatures (<0°C) they sometimes become very viscous and difficult to pour. Some mixtures containing high concentrations of high melting isomers may form thick slurries or become solids at low temperatures.

4.5 While phenol or cresylic acids are highly dangerous when handled improperly, particularly at the elevated temperatures sometimes required to unload tank cars or tank trucks, handling and sampling need not be hazardous provided the dangers are recognized. Proper precautionary measures must be provided and scrupulously adhered to as proscribed by the MSDS or other locally relevant guidelines.

4.6 Department of Transportation (DOT) Hazardous Materials Regulations regarding the shipment of this chemical are specified in 49 CFR.

5. Hazards

5.1 For information on toxicity consult the appropriate MSDS.

5.2 Consult current OSHA regulations, suppliers' material safety data sheets (MSDS), and local regulations for all materials utilized in this practice.

*A Summary of Changes section appears at the end of this standard

5.3 *Health*—Phenol is very corrosive to the skin and produces painful and dangerous burns in a very short time. Since phenol is a skin anesthetic, the first reaction is not pain, but a whitening of the exposed area. It is readily absorbed through the skin and mucous membranes or lungs, and severe exposures may prove fatal unless prompt first aid and medical treatment are exercised. Consult the appropriate MSDS and any other applicable local regulations and guidelines for recommended unloading procedures. Producers/suppliers typically have guidelines for these procedures. Workers should wear appropriate protective clothing and personal protective equipment as recommended in such guidelines and the appropriate MSDS.

5.3.1 Qualitatively, cresylic acid is slightly less acute as a health hazard than phenol. However, contact of cresylic acid with the skin can produce painful and serious burns in a short time. It is readily absorbed through the skin and mucous membranes, through the gastro-intestinal tract, or through the lungs (either as a vapor or in droplet form), potentially resulting in systemic poisoning. Consult the appropriate MSDS and any other applicable local regulations and guidelines for recommended unloading procedures. Producers/suppliers typically have guidelines for these procedures. Workers should wear appropriate protective clothing and personal protective equipment as recommended in such guidelines and the appropriate MSDS.

5.4 *Fire*—For general fire hazards, consult the appropriate MSDS as well as any other applicable guidelines such as the NFPA 704M fire hazard classification system.

5.5 Molten phenol or cresylic acid can dissolve carbon dioxide and releases it on solidification. Therefore, special precautions should be observed if “inert gas” containing carbon dioxide is used to agitate or empty containers of phenol or cresylic acid to avoid pressure build-up (for example, leave vents open).

5.6 For chemical emergency (spill, leak, fire, exposure, or accident) consult the appropriate agency or contact as documented on the MSDS.

6. Protective Equipment

6.1 Use of personal protection equipment in and of itself is not an adequate substitute for safe working conditions and intelligent conduct on the part of employees who work with phenol or cresylic acid. Employees who work with phenol or cresylic acid should be well trained and should maintain safe working conditions.

6.2 Persons engaged in the handling of phenol or cresylic acid shall use protective equipment as dictated by the extent of their exposure, the appropriate MSDS, and any and all local regulations and guidelines. It is highly recommended that working areas have immediately and easily available deluge-type safety showers as well as eye wash fountains.

7. First Aid

7.1 The establishment of first aid procedures must be done prior to sampling and handling of phenol and cresylic acid under the guidance of competent safety and medical advice,

and based on recommendations in the appropriate MSDS. With phenol and cresylic acid, speed in acting to remove the contacting material and seeking medical care is imperative.

8. Precautions

8.1 Any person sampling or handling these products should have specific first aid instructions and equipment available for use in the event of personal contact or exposure as detailed in the appropriate MSDS or other local rules and guidelines.

8.2 It is recommended that sampling be conducted only by carefully instructed, experienced, reliable employees, under adequate supervision following all the procedures recommended in the appropriate MSDS, by the supplier, or by any other applicable local guidelines and rules, or combinations thereof.

8.3 Follow shipper’s instructions always, and read and observe all caution markings on containers.

8.4 Although the vapor given off at elevated temperatures from phenol or cresylic acid will ignite, these materials can generally be handled with little direct danger of fire. The flash points of the liquids are higher than the temperatures at which they are normally handled. In spite of this, carefully restrict open flames and smoking in the vicinity of loading, unloading, and storage operations.

8.5 Do not permit any person ever to enter an empty phenol or cresylic acid tank, tank car, or tank truck until it has been thoroughly washed out with warm water, followed by a thorough steaming. Ensure that oxygen content is acceptable and vessel is free of organic vapors. Require the approval and observation by a supervisor in every case. Review Sections 6 and 7 in detail.

9. Handling and Sampling of Drums

9.1 Before loading, unloading, or sampling of drums of phenol or cresylic acid, carefully read and proceed in accordance with Sections 4-8.

9.2 Handle drums carefully when being transported. Block drums in place during transportation to prevent movement and during unloading to prevent spilling.

9.3 Place the drum bung up, loosen the plug slowly to relieve internal pressure, and allow all internal pressure to vent prior to unloading or sampling.

9.4 Most cresylic acids are liquids at ambient temperatures. Phenol and some cresylic acids are solids at ambient temperatures. If melting is necessary to remove the contents of a drum, do the necessary heating in a special steam-heated melting chamber, hot-water bath, with steam coils, or with an approved electric drum heater. Never use a flame for melting the drum contents. Properly vent the drum during this operation in order to prevent pressuring. (**Warning**—Do not overheat drums as the danger of spillage caused by thermal expansion and excessive vapors exists.)

9.5 Prior to sampling, mix the contents of the drum thoroughly in order to ensure uniformity of the material. This may be accomplished by mechanical agitation or sparging with inert