



Conserve O Gram

September 2005

Number 2/15

Supersedes Number 2/15 Dated June 2001

Cobalt Indicating Silica Gel Health and Safety Update

Standard indicating silica gel is often used within microclimates to control Relative Humidity (see *Conserve O Gram* 1/8). Cobalt is present in small concentrations (0.5 to 1.0% by weight) in indicating silica gel. As of July 1, 2000, British Chemical Regulations have required that indicating silica gel be labeled and disposed of as a hazardous material. While cobalt chloride has not yet been listed on any U.S.-based hazardous materials registries, its change in status suggests that this material should be treated with the same level of protection as is required elsewhere.

Health and Safety Issues

Cobalt is a skin and respiratory system sensitizer. It is a European Union (EU) List II substance for control of dangerous substances in the aquatic environment and must not be allowed to contaminate soil and water. The cancer status varies on Material Safety Data Sheet (MSDS) reports provided by manufacturers and suppliers from “no reports” to “Cobalt and its compounds have been shown to cause cancer in laboratory animals.” The threshold limit value (TLV) is 0.01 mg/m³. Although the concentration of cobalt is small in indicating silica gel, concerns revolve around the possible contamination of silica gel dust with cobalt chloride. There also are hazards stemming from the inhalation of silica dust. Small RH indicating cards and test papers that turn from blue to pink also contain cobalt chloride. Since the danger is potential

inhalation of cobalt dust, the use of these cards should not be a problem. However, if the card gets wet, there is the possibility that the cobalt chloride could migrate and recrystallize where it could conceivably become airborne.

Disposal of Silica Gel

All silica gel offered for disposal is listed as “hazardous waste” by the Environmental Protection Agency (EPA) and must be disposed of appropriately. Cobalt from indicating gel could pose a greater hazard than standard silica gel as cobalt can leach into runoff or groundwater and poison aquatic life. Contact your park or regional HAZMAT coordinator to obtain information on appropriate storage containers and disposal instructions.

An Alternative Material

Sorbead Orange[®] desiccant features a biodegradable, organic indicator (available from Engelhard Corporation). The amount of indicator used in Sorbead Orange[®] is five to ten times lower than the amount of cobalt chloride found in cobalt chloride indicating desiccants. It changes from bright orange to translucent in color when it has adsorbed approximately 6% of water by weight.

This desiccant can be regenerated (returned to its original orange color and adsorption capacity) by heating to a temperature of 270°-320°F.

Note: Indicating silica gels will alert you when standard gel is nearing its saturation point, but they won't reveal the exact RH. Use a hygrometer to evaluate your microenvironment's climate.

Answers to Frequently Asked Questions

Has indicating silica gel (blue) changed?

No. Indicating silica gel (blue) is the same as it has been for the past 60 years. There has been no change in its formulation.

Is indicating silica gel a hazardous substance?

Indicating silica gel with cobalt chloride is listed as a hazardous substance for disposal by the EU. Cobalt chloride has **not** been listed on any U.S.-based hazardous materials registries.

Has cobalt impregnated silica gel been banned?

No, it has not been banned from use.

Why should I take additional precautions?

The dust from all types of silica gel is an irritant. You should always use appropriate ventilation (fume hood or respirator) when working with the gel. Cobalt chloride could be a component of silica gel dust when you are working with indicating gel.

Are there special instructions for shipping silica gel?

Contact your park or regional HAZMAT coordinator for information on shipping containers for disposal. Silica gel is still classified as non-hazardous for transportation.

Recommendations

1. Substitute Sorbead Orange® desiccant for future purchases of indicating silica gel (see supplier list below).
2. Begin phasing out and replacing cobalt impregnated silica gel.
3. When handling all silica gel, take the following precautions:
 - Wear gloves, lab coat and safety glasses.
 - Work in a fume hood or wear an appropriate respirator with a HEPA filter (see *Conserve O Gram 2/13*).
 - Place silica gel in appropriate, well-marked containers. Contact your park or regional HAZMAT Coordinator for disposal.
4. Work toward replacing humidity indicator strips with dial hygrometers, thermohygrometers, or dataloggers.

Safety Information on the Web

The International Chemical Safety Card for Cobalt (II) Chloride can be found at: <http://www.cdc.gov/niosh/ipcsneng/neng0783.html>

Safe handling procedures for indicating silica gel can be found at: www.geejaychemicals.co.uk/cobaltchloride.htm

Material Safety Data Sheets:

Sorbead Orange®: <http://www.engelhard.com/msds/loadDoc.aspx?FileNav=P8773>

Cobalt Chloride (Blue Indicating Silica Gel):
<<http://msds.ehs.cornell.edu/msds/siri/files/byq/byqrt.html>>

Sources of Sorbead Orange® Indicating Silica Gel

Conservation Resources International, LLC
5532 Port Royal Road
Springfield, VA 22151
(800) 634-6932
www.conservationresources.com

Engelhard Corporation
101 Wood Avenue; PO Box 770
Iselin, NJ 08830-0770
(732) 205-5000
www.engelhard.com

University Products
517 Main Street, PO Box 101
Holyoke, MA 01041
www.universityproducts.com

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Updated by the NPS Park Museum Management Program, September 2005.

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