

## HUMIDITY INDICATOR CARDS

An integral part of a complete moisture barrier packaging assembly is the Humidity Indicator Card. High relative humidity can cause significant, possibly irreparable damage to sensitive equipment, supplies, and products. To ensure dehydration measures work, humidity indicator cards measure the relative humidity (RH) inside sealed packages to allow immediate visual inspection of whether it has sustained unsafe humidity levels.

The Monitor Card contains chemically impregnated, humidity sensitive, indicating spots that will change color with moisture. The comparison bar is used to determine relative humidity of air. Select the indicating spot that most closely matches the color of the comparison bar. The measured relative humidity is the percentage indicated on the matching spot. The chemical reaction of the indicating spots is completely reversible; the spots will continue to change color as the moisture levels change.

Humidity Monitor cards are sold in cans of 100 each. The 5.1 cm x 7.6 cm blotting paper cards indicate relative humidity. Humidity Indicator Cards should be inserted and sealed within an Moisture Barrier Bag with the desiccant packs.

Item#	Unit Size	Std. Package	Relative Humidity
90664	5.1 cm x 7.6 cm Card	125 pieces/can	5/10/15
90665	5.1 cm x 7.6 cm Card	125 pieces/can	5/10/60

The 90664 and 90665 humidity indicator cards meet the requirements of MIL-I-8835 and IPC/JEDEC J-STD-033A.

"Humidity Indicator Card (HIC) A card on which a moisture-sensitive chemical is printed such that it will change color from blue to pink when the indicated relative humidity is exceeded. This is packed inside the moisture-sensitive bag, along with the desiccant, to aid in determining the level of moisture to which the moisture-sensitive devices have been subjected." (IPC/JEDEC J-STD-033A section 1.5.7)

### Application

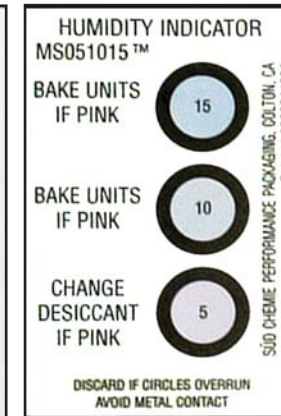
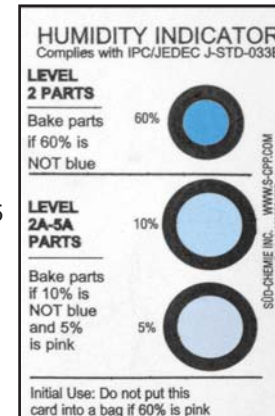
- The humidity indicator spots will change from blue (dry condition) to pink (humid condition) as the relative humidity changes in the volume of air surrounding the indicator.

- Relative humidity is indicated at the lavender color.
- Indicator spots will change within eight hours of being exposed to a change in relative humidity.
- The humidity indicator spots are reversible, and the pink spots will change back to blue when the volume of air is dried. Humidity indicator cards with pink or lavender spots can be returned to a blue color by placing indicators in a sealed container with 33 grams (1 unit) of desiccant for four hours.
- The highest humidity indicator spot should be blue before being put into use.
- The humidity indicator will be at its most accurate at a temperature of 23 °C (73 °F).
- Avoid contact with indicator spots. Wash any irritated areas with clean water.

### Handling

- Store humidity indicators in original container with desiccant when possible and keep sealed. Never reuse a indicator card if it has already changed color.
- Replace desiccant bag after three openings of container.
- Store in dry, cool area.
- Keep indicators out of direct sunlight.
- Keep humidity indicators away from water or steam.
- Ammonia gases will damage humidity indicators.

90665



90664



Made in America



## Humidity Indicator Cards (HIC)

CHARLESWATER LTD.  
UNIT 17, MILLBROOK BUSINESS PARK, SYBRON WAY  
CROWBOROUGH, EAST SUSSEX TN6 3JZ UNITED KINGDOM  
PHONE: 00 44 (0) 1892-665313, FAX: 00 44 (0) 1892-668838  
INTERNET: Charleswater.co.uk

Drawing Number  
**90664.E**

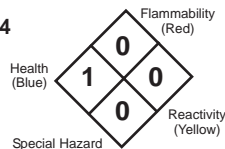
DATE:  
**November  
2007**

**Material Safety Data Sheet**

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910. 1200. Standard must be consulted for specific requirements.

**NFPA Designation 704**

Degree of Hazard:  
4 = Extreme  
3 = High  
2 = Moderate  
1 = Slight  
0 = Insignificant

**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING****Product information**

COMMERCIAL PRODUCT NAME: REVERSIBLE HUMIDITY INDICATOR

COMPANY: Desco  
3651 Walnut Ave.  
Chino, CA. 91710  
PHONE: (909) 627-8178  
FAX: (909) 627-7449

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Chemical nature: Cobalt dichloride on cardboard

Components	CAS-No.	Symbol(s)	R-phrases(s)	Concentration
cobalt(II) chloride	7646-79-9	T, N	R49, R22, R42/43 R50-53	>0.10 - <1.00%

**3. HAZARDS IDENTIFICATION**

None under normal use

**4. FIRST AID MEASURES**

General advice: None  
Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes  
Skin contact: Wash off with soap and plenty of water  
Inhalation: N.A.  
Ingestion: Rinse mouth

**Notes to physician**

Treatment: None

**5. FIRE-FIGHTING MEASURES**

Suitable extinguishing media: Use extinguishing measures appropriate to the envirn.  
Extinguishing media which must not be used for safety reasons: None

**6. ACCIDENTAL RELEASE MEASURES**

Environmental precautions: Do not flush into surface water or sanity sewer system  
Methods for cleaning up: Take up contaminated material by mechanical means, load into clean containers, and dispose of in accordance with legal regulations

**7. HANDLING AND STORAGE****Handling**

Safe handling advice: No special precautions required

**Storage**

Requirement for storage area and containers: Keep in a dry place

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Components with workplace parameters**

Components	CAS-No.	Value	Remarks	Basis
cobalt	7440-48-4	0.5 mg/m3	Inhalable dust. Sensitizer	TRGS900 TRK

**Personal protective equipment**

Respiratory protection: N.A.  
Hand protection: Protective gloves  
Eye protection: N.A.  
Skin and body protection: Not required  
Hygiene measures: Wash off with warm water and soap  
Protective measures: Prophylactic use of protective ointment (barrier cream) is recommended.

**9. PHYSICAL AND CHEMICAL PROPERTIES****Appearance**

Form: Plates  
Color: Pink to blue  
Odor: None

**Other data**

Water solubility: Partly soluble, max. 600 ppm CoCl<sub>2</sub> can be leached out  
pH: 4.5 - 6

<p><b>10. STABILITY AND REACTIVITY</b></p> <p>Hazardous reactions: (Conditions to avoid)      hygroscopic</p> <p>Hazardous reactions: (Materials to avoid)      Alkali metals</p> <p>Information about decomposition:      No decomposition if stored and applied as directed</p>	<p><b>14. TRANSPORT INFORMATION</b></p> <p>Land transport:      Not classified as dangerous in the meaning of transport regulations.</p> <p>Sea transport:      Not classified as dangerous in the meaning of transport regulations.</p> <p>Air transport:      Not classified as dangerous in the meaning of transport regulations.</p>
<p><b>11. TOXICOLOGICAL INFORMATION</b></p> <p><b>Acute toxicity</b></p> <p>Acute oral toxicity:      LD50 Dose: 766mg/kg (cobalt (II)chloride-hexahydrate)</p> <p><b>Irritation, Sensitization, Other Data Toxicology</b></p> <p>Sensitization:      Result: May cause sensitization by skin contact.</p> <p>Repeated dose toxicity:      No data available</p>	<p><b>15. REGULATORY INFORMATION</b></p> <p>General advice:      The product does not need to be labeled in accordance with EC directives or respective national laws.</p> <p>Hazardous components which must be listed on the label:</p> <p>Preparation:      Not applicable</p> <p>Other information:      Follow the usual precautions required when handling chemicals.</p>
<p><b>12. ECOLOGICAL INFORMATION</b></p> <p>Decomposition:      Not readily biodegradable</p> <p><b>Ecotoxicity effects</b></p> <p>Further information: Ecotoxicity      No data available</p> <p>Heavy metals:      Heavy metals should not be released into the environment.</p> <p>Additional information about ecology:      Heavy metals should not be released into the environment</p>	<p><b>16. OTHER INFORMATION</b></p> <p>Responsible for SDS: Environmental Protection Contact person: Dep. CEQ Tel.08761/82-654</p> <p>The information presented herein is believed to be accurate, but is not warranted. It does not represent any assurance of properties of the product. The specifications are to be drawn from the corresponding leaflet.</p>
<p><b>13. DISPOSAL CONSIDERATIONS</b></p> <p>Product:      Dispose as special waste. Can be landfilled or incinerated, when in compliance with the Environmental Protection (Duty of Care) Regulations 1991.</p>	<p>A vertical bar ( ) in the left margin indicates an amendment from the previous version.</p> <p><b>Legend</b></p> <p>N.A.:      Not applicable</p> <p>N.AV.:      Not Available</p> <p>N.R.:      Not relevant</p> <div style="border: 1px solid green; padding: 5px;"> <p><b>RoHS Compliance Statement</b></p> <p>None of the following materials are intentionally added in manufacturing this product: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) as outlined in the Directive 2002/95/EC Article 4.1. See Desco Industries Inc. letter on-line at <a href="http://Charleswater.co.uk">Charleswater.co.uk</a>.</p> </div>