

Application Sheet

Humidity Sensor Chemical Resistivity

INTRODUCTION

Humidity sensors are routinely exposed to chemically active environments in the process of making moisture measurements. Chemical resistivity is an important differentiator between competing sensors and resulting system accuracy and reliability.

To address this, Honeywell always uses proprietary, chemically resistive and thermally stable thermoset polymer as the active medium in all of its humidity and moisture sensors.

Although the following data reflects testing on the HIH-3602 sensor, the results are indicative of all other Honeywell moisture sensors. Protocols are severe relative to typical applications.

SATURATION AND RECOVERY PROTOCOL

- For each chemical tested, seven HIH-3602 Series sensors were calibrated at 0 %RH and 75.3 %RH.
- A chemical saturation test was done by placing a drop of chemical on top of the sensor completely covering the hydrophobic filter for 175 minutes. A blow dryer was then applied to reduce the RH reading from 100% back down to room ambient.
- The sensors were again tested at 0 %RH and 75.3 %RH.
- The sensors were then allowed to recover under ambient RH for 60 hours.
- The sensors were again tested at 0 RH% and 75.3 %RH.

Table 1. Saturation and Recovery Results

Chemical	Post Saturation		Post Recovery	
	Δ% at 0 %RH	Δ% at 75.3 %RH	Δ% at 0 %RH	Δ% at 75.3 %RH
Alcohol Isopropyl, 66%	+0.1	+1.13	+0.0	+1.83
Endo-Spor Hydrogen Peroxide	+0.46	-0.16	+0.4	-0.43
Glutaraldehyde Cydex Plus	+0.56	-2.13	+0.63	-1.63
Idophors Solution Westcodyne	+0.23	0.16 +	+0.36	+0.93
Kleenaseptic	+3.13	+4.5	+2.96	+4.66
Quaternary Ammonium Virex	+0.43	+0.2	+0.3	+0.8
Sodium Hypochlorite	+0.36	+0.6	+0.43	+1.53

LONG TERM VAPOR EXPOSURE PROTOCOL

- For each chemical tested, three HIH-3602 sensors were suspended 0.75 in above the liquid chemical surface in a hermetically closed flask.
- Periodically, sensors were removed and tested at 0 %RH and 75.3 %RH.
- “F” indicates sensor failure; “-” indicates that the data was not taken.

Table 2. Long Term Exposure Results

Chemical	Δ% RH Change over Exposure Time							
	89.0 hr		231.5 hr		400.0 hr		893.0 hr	
	0%	75.3%	0%	75.3%	0%	75.3%	0%	75.3%
Ammonia Hydroxide	F	F	F	F	F	F	F	F
Acetone	F ¹	F	F	F	F	F	F	F
Ethanol	F	F	F	F	F	F	F	F
Methanol	-1.9	25.1	-1.9	29.4	-3.7	35.0	-5.4	39.8
50% Ethanol + 50% Methanol	14.5	-17.4	-	-	7.8	-31.8	4.2	-22.0
Formaldehyde (hyst. grade)	0.8	0.0	1.5	-0.3	1.5	-1.4	1.9	3.5
Formaldehyde neutral soln.	0.6	-0.7	1.2	-2.0	1.1	3.5	1.6	-6.1
Formaldehyde (norm. and buffered)	0.4	0.8	1.2	-0.4	1.1	-1.3	1.5	-3.2
Benzene	-2.0	1.5	-1.1	-1.7	-0.3	-8.1	-1.1	-24.7
Toluene	-1.7	1.4	-0.8	0.4	0.4	0.0	-0.9	-4.3
Xylene	-1.7	1.5	-0.8	-0.2	-0.6	-0.7	-0.9 ²	0.0
30% Benzene + 30% Toluene + 40% Xylene	-0.3	-1.2	-	-	-0.1	-6.0	-0.6	-16.1

Notes:

1. Sensors are resistant to acetone over shorter exposures.
2. One sensor failed.

Humidity Sensor Chemical Resistivity

WARNING

PERSONAL INJURY

- DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

WARNING

MISUSE OF DOCUMENTATION

- The information presented in this technical note sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

E-mail: info.sc@honeywell.com

Internet: www.honeywell.com/sensing

Phone and Fax:

Asia Pacific	+65 6355-2828
	+65 6445-3033 Fax
Europe	+44 (0) 1698 481481
	+44 (0) 1698 481676 Fax
Latin America	+1-305-805-8188
	+1-305-883-8257 Fax
USA/Canada	+1-800-537-6945
	+1-815-235-6847
	+1-815-235-6545 Fax

Sensing and Control
Honeywell
1985 Douglas Drive North
Golden Valley, MN 55422
www.honeywell.com/sensing

009068-1-EN IL50 GLO Printed in USA
June 2011
Copyright © 2011 Honeywell International Inc. All rights reserved.

Honeywell