

HUMIDITY SENSOR CHEMICAL RESISTIVITY

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, MICRO SWITCH always uses proprietary, chemically resistive and thermally stable thermoset polymer as the active medium in all of its humidity and moisture sensors.

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

SATURATION AND RECOVERY PROTOCOL

- For each chemical tested, seven HIH-3602 sensors calibrated at 0% 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% and 75.3% RH.
- The sensors are next allowed to recover under ambient RH for 60 hours.
- The sensors are again tested at 0% and 75.3% RH.

SATURATION & 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 0.2%	+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 inches above the liquid chemical surface in a hermetically closed flask.
- Periodically, sensors were removed and tested at 0% RH and 75.3% RH.

Note that an entry of "F" denotes sensor failure. Blank entries indicate that the data was not taken.

LONG TERM EXPOSURE RESULTS

Chemical	Δ% RH Change over Exposure Time							
	89.0 hr		231.5 hr		400.0 hr		893.0 hr	
	0%	100%	0%	100%	0%	100%	0%	100%
Ammonia Hydroxide	F	F	F	F	F	F	F	F
Acetone	F*	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 & buff'd	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**	0.0 ^o
30% Benzene + 30% Toluene + 40% Xylene	-0.3	-1.2			-0.1	-6.0	-0.6	-16.1

*Sensors are resistant to acetone over shorter exposures.

**One sensor failed.