Material Sensing with KAS capacitive sensors

KAS capacitive sensors detect liquids, powders, or solid materials by measuring a change in capacitance. The amount of change in capacitance is dependent on the dielectric constant of the material being sensed. The larger the dielectric constant, the easier the material is to detect. This means that materials with a high dielectric constant can be detected at greater distances than materials with low dielectric constants. Also, materials with high dielectric constants can be detected through wall of containers made of material with a lower dielectric constant. For example, water (with a dielectric constant of 80) can be detected through a piece of glass (with a dielectric constant of 4 to 10).

Standard KAS capacitive sensors can detect materials with a dielectric constant of 1.2 or greater. Special capacitive sensors can even detect materials with a dielectric constant down to 1.1.

The best method to test whether your material can be detected is to physically test the material with a sensor. If this is not practical, consult a list of dielectric constants.

General guidelines:

1. Products with dielectric constants of 1.2 or greater can be detected.
2. The higher the dielectric constant, the easier the material is to detect.
3. Materials with high dielectric constants can be detected through a container wall with a low dielectric constant (less than 10).
4. Larger amounts of material and higher densities of material will be easier to detect than small amounts of material.
5. The best way to ensure reliable detection is to be in physical contact with the product.
6. Solid materials (like bottles) should be detected at a short distance.

RECHNER SENSORS

Dielelectric Constants
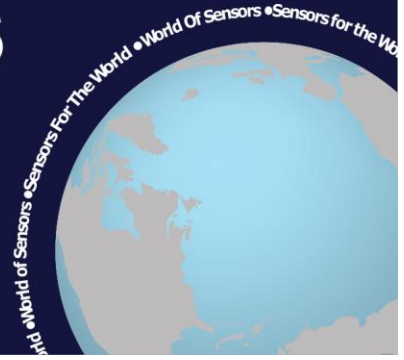
Acetone	21.5	Molasses	31.3
Air	1.000264	Mustard	24
Ammonia	15	Oat	4.9
Aniline	7	Oil	2
Benzene	2.3	Paper, Scraps	1.2
Cacao Beans	1.8	Paraffin	1.6
Carbon Dioxide	1.000985	Peanuts	3.1
Carbon Tetrachloride	2.3	Phenol Resin	7.4
Chalk	2.1	Plastic Pellets	1.2
Charcoal	1.3	Polyamide	1.7
Chlorine Fluid	2.1	Polypropylene	1.6
Clay	2.3	Potato Starch	1.7
Coal Dust	2.5	Printing Ink	4.6
Coconut Oil	2.9	Rapeseed	3.3
Coffee Beans	1.5	Rice	3
Coke	3	Rye	6
Corn	3.6	Salt	6
Corn Starch Syrup	18.4	Salt Water	32
Cream, Skin	19	Skim Milk Powder	2.3
Diesel Fuel	2.1	Soap Flakes	9.2
Dry Yeast	2	Soda	3
Ethanol	16.2	Styrene	2.4
Fatty Acid	1.7	Sugar	1.8
Fertilizer	4.3	Sulphur	3.5
Fish Oil	2.6	Sunflower Seeds	2
Flour	2.5	Tea Powder	2
Gas	2	Toluene	2.4
Glass Granulate	4 to 10	Toothpaste	18.3
Glucose	30	Urea	2.9
Glue	2	Vinegar	24
Honey	24	Water	80.3
Hot Glue	2.3	Wax	1.8
Isopropanol	18	Wheat	4
Ketchup	24	Wheat Starch	2.5
Marble Stones	2.5	Wood Chips	2.3