

Application note: N° F001

April 2011

Confectionery industry

Facts & figures:

In 2008/09, 165.547 Million tons of sugar were consumed!

In Europe and the Americas, people consume around 40kg a year.

The world average being 20kg a year per person.

Confectionery in general

Candy is made by dissolving sugar in water or milk to form a syrup, which is boiled until it reaches the desired concentration or starts to caramelize.

concentration. As the syrup is heated, it boils, water evaporates, the sugar concentration increases and the boiling point rises. A given temperature corresponds to a particular sugar concentration.

In general, higher temperatures and greater sugar concentrations result in hard, brittle candies and lower temperatures result in softer candies.

Around the world today, Haribo produces over 100 million Golden bears every day.

Trays are filled with a flattened heap of fine powdery starch. The golden bear form is then



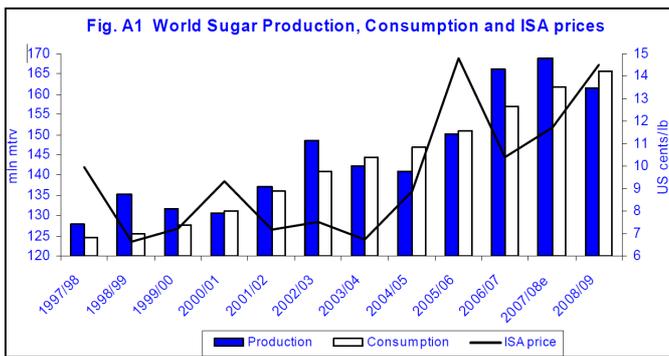
The famous Haribo „Goldbären“

pressed into the starch. The negative forms are transported to production where the fruit gum mixture is poured into the starch moulds.

After a long drying process the fruit gums get a final coating of bees wax and carnauba wax, giving them a shiny appearance and keeps them from sticking to each other.



The starch moulds
Source: Haribo website



Source: ISO quarterly Market Outlook, Feb 2011

The type of candy depends on the ingredients and how long the mixture is boiled. The final texture depends on the sugar

Why the need to measure humidity?

In the confectionery industry, there are quite a few applications where the need to measure humidity exists: drying, storage & packaging are the main ones.

1) Other ingredients included in sweets are: glucose syrup, dextrose, flavouring, citric acid... Glucose syrup is highly hygroscopic, so when placed in a high humidity environment, the product will absorb moisture!

Who has never unwrapped a sweet and found it sticking to the wrapper? This example is perhaps for the storage of the finished product, but if this was to happen during the production process, the sweet would then stick to everything: the machinery, other sweets...

2) Moisture gain in the product will also affect the shelf life. It may also favour the growth of different micro organisms depending on the total water activity.

3) The storage of confectionery must also be monitored in order to avoid issues during the different seasons: at high temperatures, the sweets may lose their form, colour and taste among other things.

4) In order to reuse the starch in the production process, the starch is recovered, sieved and conveyed into a dryer in order to condition it for the next use.

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What solution can Rotronic offer?

The heart of the humidity measurement is the Rotronic capacitive foil sensor: Hygro-Mer IN-1.

The AirChip3000 is the brains: combining an ASIC, a microcontroller and an EE-

PROM memory all in one.

All products with this logo contain an AirChip3000.



AirChip3000 advantages:

- Relative humidity, temperature and dew point outputs
- Can store 2'000 points
- Sensor self test function

And much, much more...



HF5 transmitter combined with the HC2-S probe

Rotronic products:

Humidity and temperature probes:

- **HC2-IM102**
-100...200°C,
0...100%rh,
Ø15mm,
±0.8%rh and ±0.1K...
- **HC2-S**
-50...100°C,
0...100%rh,
Ø15mm,
±0.8%rh and ±0.1K...
- **HC2-C05**
-40...85°C,
0...100%rh,
Ø5mm,
±1.5%rh and ±0.3K...

Transmitter:

- **HF5 series**
For interchangeable probes,
2 or 3/4 wire configuration,
Various analogue and digital
outputs,
Display,
All psychrometric calculations
available...
- **HF7 series**
Stainless steel probe,
-100...200°C,
3/4 wire configuration,
Various analogue outputs,
Display...

Dataloggers:

- **HL-NT range**
For interchangeable probes
(up to 7 probes with docking
station)
32MB flash card,
Display,
Conform to FDA21 CFR Part 11
and GAMP4...
- **HL-20**
20'000 measurement pairs,
Display,
±0.8%rh and ±0.2K,
Conform to FDA21 CFR Part 11
and GAMP4...

„We were able to supply the HF5 transmitter with the HC2-S probe. The dehumidifier is controlled with the absolute humidity value.”
Xavier Nolla, Iberfluid Instruments, Spain.

Customer benefits:

Accuracy:

Choosing Rotronic gives you the best accuracy on the market.

Precise humidity measurements can be obtained: meaning that as soon as the required relative humidity level is reached, the dehumidifier can be switched off.

How is this better for the drying process?

The sooner the dehumidifier is switched off, the less power will be consumed.

From the other side, if the

humidity level is critical and defines the „softness“ and „hardness“ of the sweet, then the more accurate the measurement, the better the end result!

Communication:

Networking with Rotronic is an easy affair! With all of the different communication methods, from RS-485, Wireless to Ethernet RJ45, Rotronic can provide a solution.

Long term stability:

With a long term stability of

under 1%rh per year (depending on the environment), Rotronic offers the possibility to “plug & play”: install the device and leave it. We would recommend frequent spot checks in-between calibrations.

Calibration:

In order to calibrate humidity measurement devices, we can offer a factory calibration (certified or not). We can also supply a humidity and temperature generator, the HG2-S as well as unsaturated salts for calibration on site.



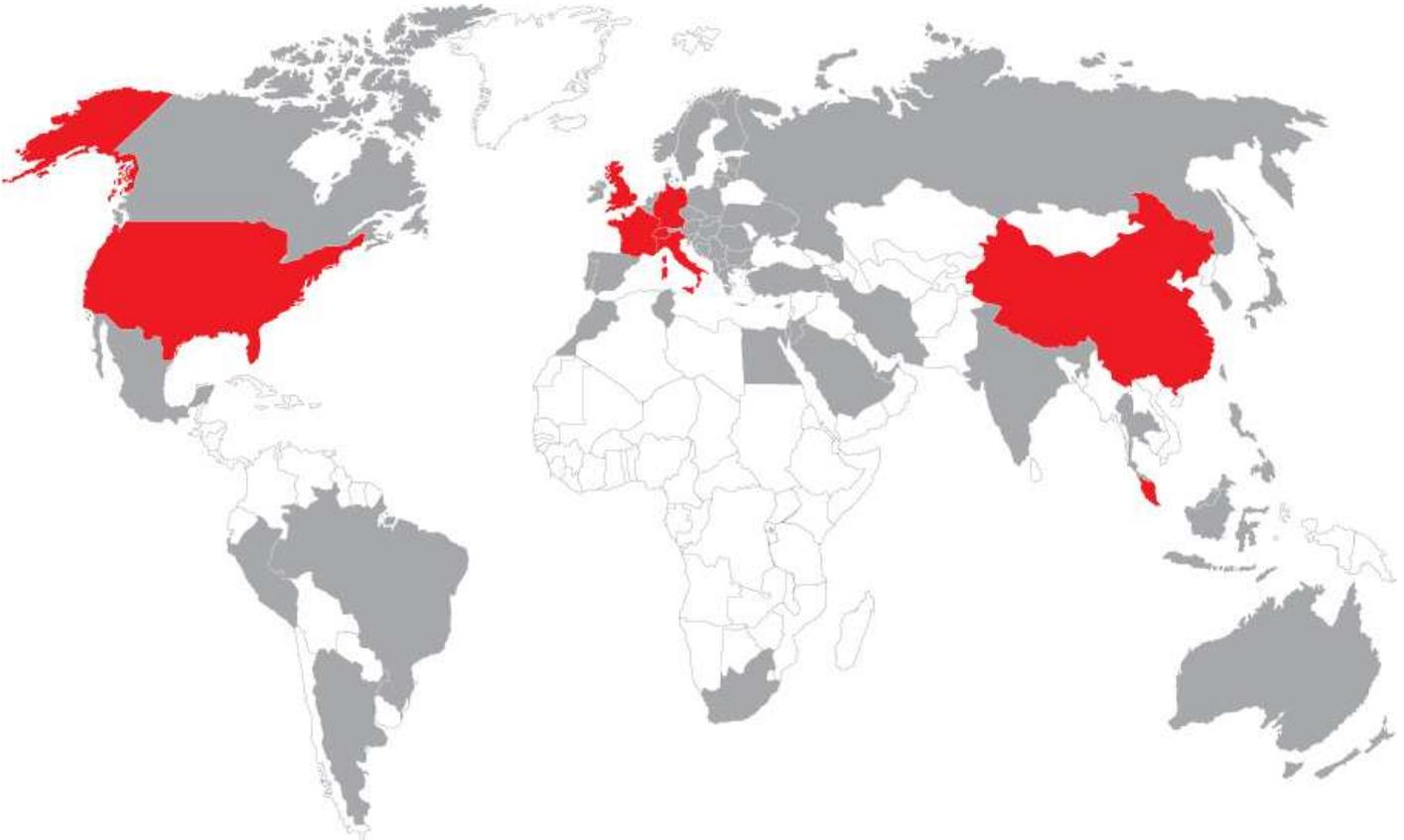
HC2-C05 probe

HC2-IC102 probe

Contact us:

Rotronic is represented in over 40 countries around the world. An up to date list of all our partners is available on our website:

www.rotronic.com



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