Challenge

For process control of conveyor dryer applications the moisture of the product (water in solids) is a crucial determining factor.

The moisture will be measured outside the dryer, where the temperature of the product is around 50-60°C.

We are looking for a reliable, ready to use sensor with a low/simple calibration procedure and a cost limit of 10'000 CHF.

Below you can find a description of several applications including the parameters. As a single technology may not be applicable to all products and moisture ranges, we would also accept a solution for a dedicated application.

Application examples

Application 1
- Particle Size: 5-15 mm diameter (particles may not be spherical)
- Bulk Density: Wet 380-640 kg/m³
  Dry 290-480 kg/m³
- Range of Moisture: 20-30% mass of water in solids (dryer inlet), uniform moisture within particles
  5-15% mass of water in solids (dryer outlet), residual moisture within center of particles

Application 2
- Particle Size: 5-15 mm diameter
- Bulk Density: 80-160 kg/m³
- Range of Moisture: 5-20% mass of water in solids (dryer inlet), uniform moisture within particles/moisture on surface of particles
  0-5% mass of water in solids (dryer outlet), residual moisture within center of particles or uniform within particles

Application 3
- Particle Size: 5-100 mm irregular shapes of leaf
- Bulk Density: 40-65 kg/m³
- Range of Moisture: 20-40% mass of water in solids (dryer inlet), uniform moisture within particles
  5-15% mass of water in solids (dryer outlet), uniform moisture within particles

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**Application 4**
Particle Size: 5-25 mm diameter  
Bulk Density: 400-600 kg/m³  
Range of Moisture: 50-60% mass of water in solids (dryer inlet), uniform moisture within particles  
2-10% mass of water in solids (dryer outlet), residual moisture within center of particles

**Application 5**
Particle Size: 5-25 mm diameter  
Bulk Density: 350-770 kg/m³  
Range of Moisture: 5-20% mass of water in solids (dryer inlet), uniform moisture within particles  
0-1% mass of water in solids (dryer outlet), residual moisture within center of particles

**Application 6**
Particle Size: Fiber diameter 1.2-7 denier  
Range of Moisture: 40-60% mass of water in solids (dryer inlet), uniform moisture within particles  
8-12% mass of water in solids (dryer outlet), residual moisture within center of particles

**Application 7**
Particle Size: 5-20 mm  
Bulk Density: 520-610 kg/m³  
Range of Moisture: 8-15% mass of water in solids (dryer inlet), uniform moisture within particles  
0-4% mass of water in solids (dryer outlet), residual moisture within center of particles

**Application 8**
Particle Size: 4-8 mm  
Bulk Density: 640-950 kg/m³  
Range of Moisture: 30-60% mass of water in solids (dryer inlet), uniform moisture within particles  
5-15% mass of water in solids (dryer outlet), residual moisture within center of particles