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Development of software for effective measurement of the moisture content of the plastic mass coming out of the filter press

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Abstract: In this article, the effectiveness of measuring the moisture content of the viscous mass coming out of the filter press using arduino uno and the FC-28 sensor was determined, and the scheme and software were developed

Using the Arduino system, it is cost-effective to control many quantities and processes in various industries, especially in the fine ceramics industry, and its software is easy to develop. In addition, it is convenient from the point of view of security. Electricity saving expands their fields of application even more, the use of low power is also very convenient from the point of view of equipment safety.

The humidity of the plastic mass is one of the main parameters in the production of porcelain products. Forming, drying, and baking processes are a sequence of porcelain production processes, and the moisture content of the plastic mass is constantly monitored. Moisture is especially important for the molding process. Usually, in a filter press, the slip is dewatered at high pressure. The moisture content of the plastic mass coming out of the filter press should be in the range of 18-24%. If the humidity exceeds it, it will have negative consequences. In the process of shaping, it affects the shape of the porcelain object. It is a traditional method to take samples of plastic mass moisture and obtain it based on analyzes obtained from special chemical processes and devices in laboratory conditions, and the process takes a certain amount of time. The human factor also leads to an increase in errors. This creates interruptions in the production process. In this situation, the use of moisture measuring devices is an effective method. In the process of moisture measurement, the device and automatic systems reduce errors. Laboratory equipment and an inspector with special knowledge are not required for moisture measurement. There are differences in the moisture content of the mass coming out of the filter press. It is caused by uneven pressure and cracks in the disc fabric. As a result of high pressure, fabrics become unusable. We must always control the humidity. If we do this with Arduino Uno and a humidity sensor, the performance will be even better.

Writing a program in the Arduino uno programmer is different. In this, the microcontroller is checked before writing the program. In some cases, a file is also made. The connection scheme of the microcontroller programmer differs depending on the type of sensor selected.

In the Arduino program, the code is not as complicated as other programs, the writing style is similar to c++. Accordingly, the program consists of two parts, the first part is void setup() {} the program written to it is read only once. The second part is the void loop() {} part, and the program written to it is repeated. The main window of the Arduino program looks like this:

Arduino uno and FC-28 humidity sensor wiring diagram software

```
#include <LiquidCrystal_I2C.h>
```

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```
LiquidCrystal_I2C lcd(0x27, 16, 2); // I2C address 0x27, 16 columns and 2 rows
int sensor_pin = A0;
int output_value ;
void setup() {
lcd.init();
  lcd.clear();
  lcd.backlight();
}
void loop() {
output_value= analogRead(sensor_pin);
output_value = map(output_value,550,0,0,100);
lcd.setCursor(2,0); //Set cursor to character 2 on line 0
lcd.print("Mosture : ");
lcd.print(output_value);
Serial.println("%"));
Serial.print(output_value);
Serial.println("%");
delay(1000);
```

}

Figure 2. Arduino program window.

The written software pins are based on different signals and transmit the signal in analog or digital form. Arduino is an open source platform, its pins are easy to find and user-friendly. Different Arduino processors, microcontrollers, differ in the number of digital and analog outputs. When determining the moisture level of the plastic mass, the moisture sensor is connected to the Arduino using connectors

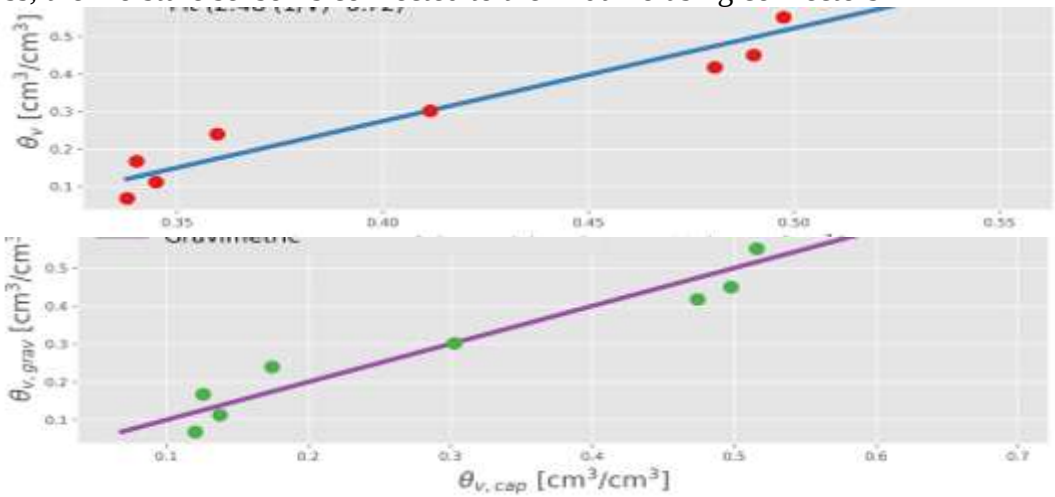

Figure 2. Graph of humidity measurement using the FC-28 sensor.

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The memory size of Arduino is estimated to be 8kbytes and it is used for smaller programs. 5 volts or 0 volts are supplied or taken from the digital pins of the microcontroller, and this is a 1 (HIGH) or 0 (LOW) signal, respectively. Two of the three connectors are (VCC) and Ground (GND). The third output is the We Get Show (SIG). They transmit the humidity level analogically to the Arduino based on the potential difference. The sensor oxidizes quickly due to its metallicity

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