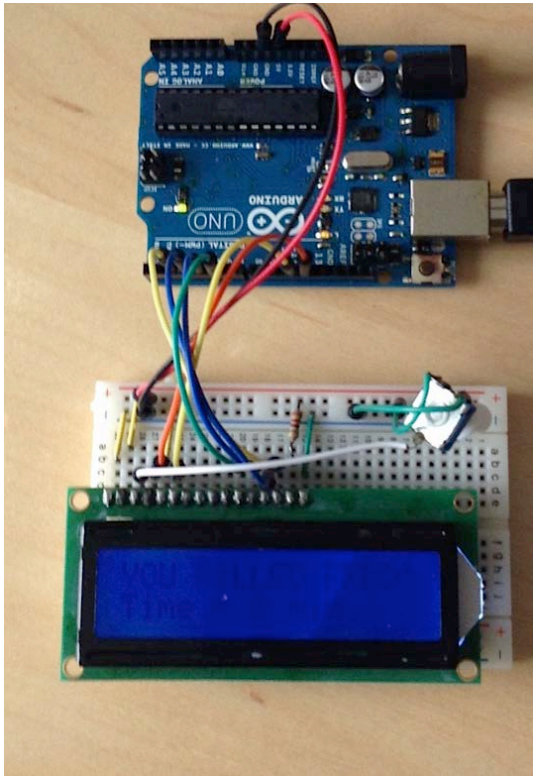
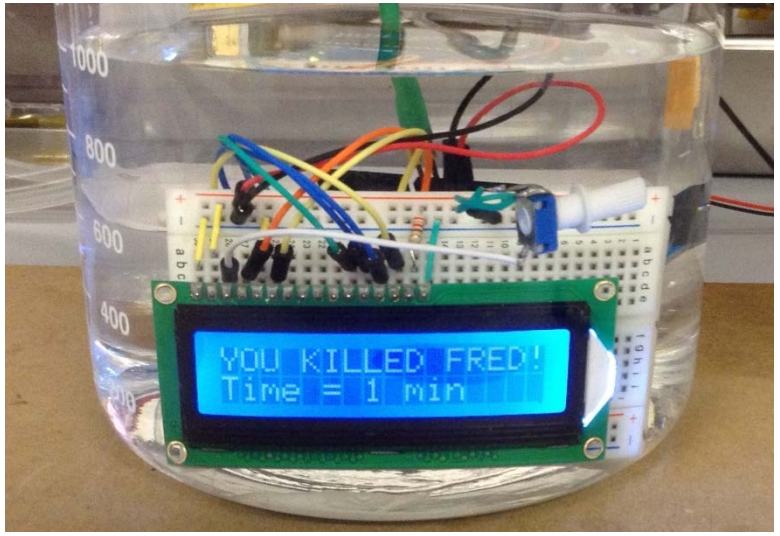
Simple testing of the 3M FC-4400 Additive with an Arduino

Feb 2015





Arduino Uno with a simple program running a timer on an LCD screen

- Test 1: Run in Clean Novec for 72 hours
- Test 2:Run in Novec + Additive 3M FC-4400
- Test 3:Repeat Test 2

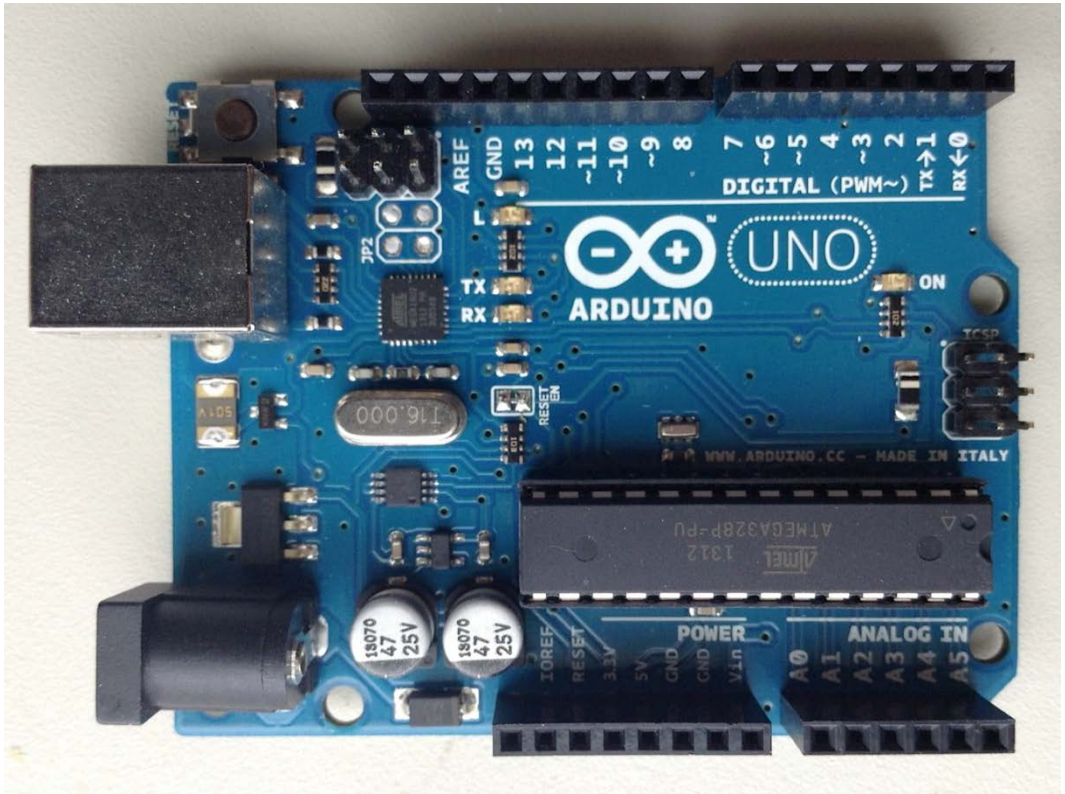
Observations from resistance measurement

•Pure Novec measure max Ohms (OL) using a fluke 179 (Max 50M Ohm)

•Novec From Chiller all have resistance higher than measurable by meter (greater than 50MOhn) .

•Just the additive → ~2 MOhm keep probe 2mm apart and submerged 2mm

•Novec + 10 drops additive → 3-5MOhm at 2 mm apart and 2mm submerged.



Observations after submerging Arduino for 72 hours in Clean Novec while running

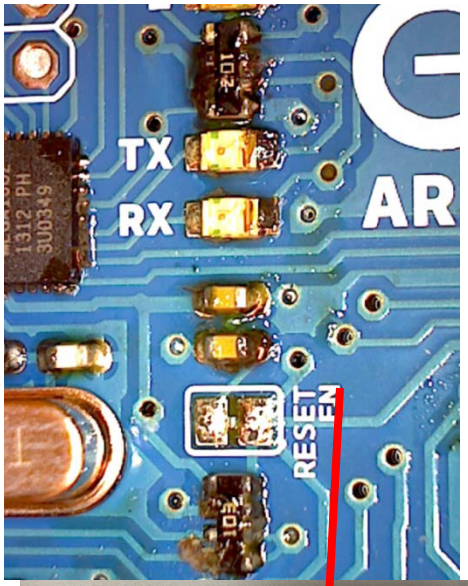
- There were no observable physical changes to the Arduino Board. Board looked like New.
- Timer was still running.
- The Arduino was still programmable with a PC

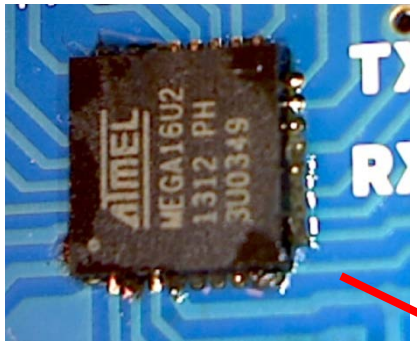
Observations after submerging Arduino for 72 hours in Novec + Additive while running. (10 drops and 1 liter of Novec)

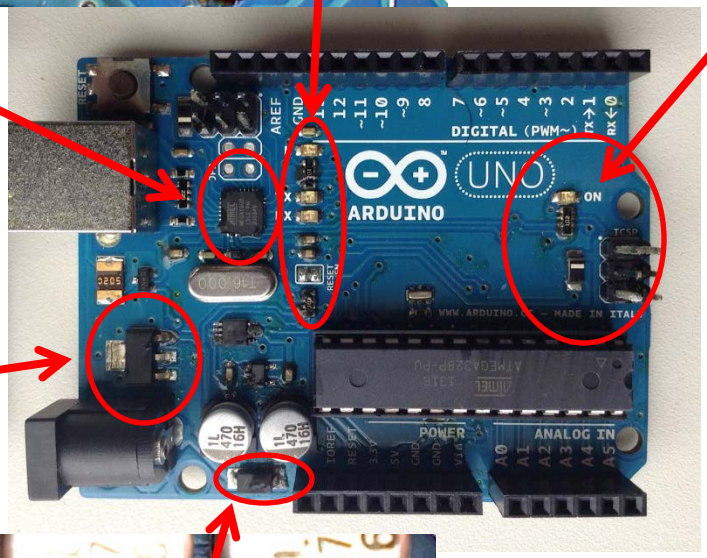
- After 72 hours, there was noticeable corrosion and damage to the board
- Timer was still running
- The Arduino is no longer recognized by the PC and cant be programmed.
- This test was repeated twice

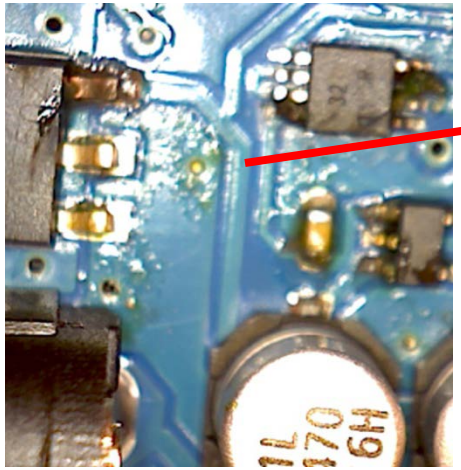
→Close-ups on next slide

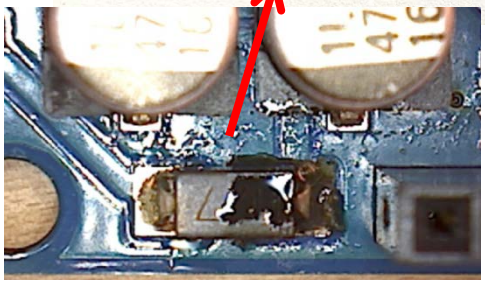
After Additive was added











RESET
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
JP2
TX
RX
ARDUINO
UNO
ON
ICSP
RESET EN
WWW.ARDUINO.CC – MADE IN ITALY
ATMEGA328P-PU
POWER
ANALOG IN
IOREF
RESET
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5