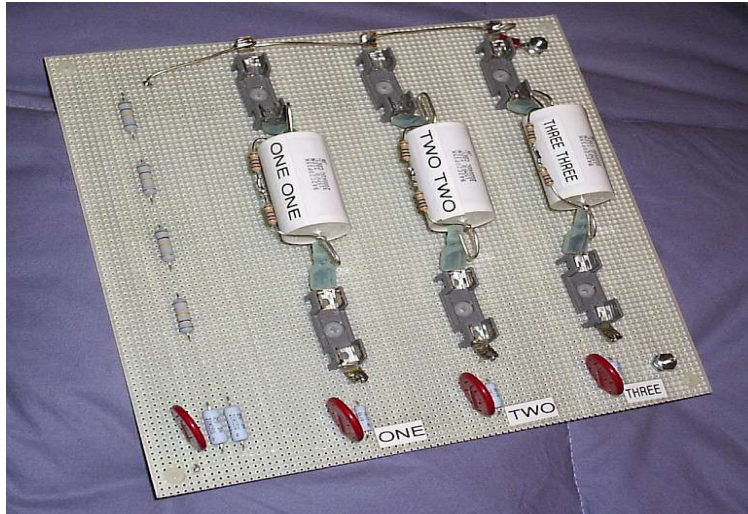


# CD942C20P15K MMC Capacitor Life Test

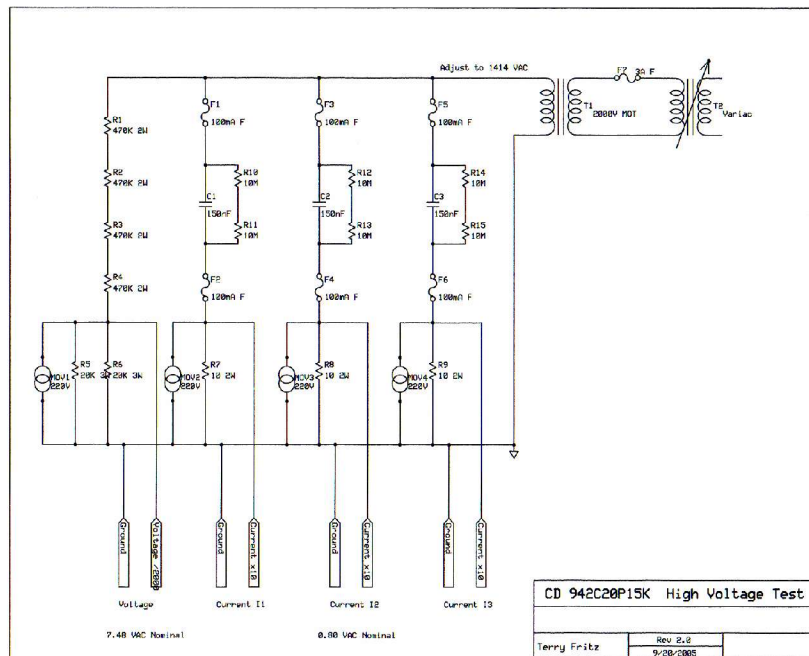
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Three Cornell Dubilier CD942C20P15K polypropylene capacitors were tested at high voltage to see how long they would last running well over their rated AC voltage. They were run at 1414 VAC (60Hz 2000Vpeak). Their normal AC voltage rating is 500VAC.



They were wired so that a data logger could record the currents and voltages over time.





The goal was to see how long the dielectric would hold up to ionization at the edges of the plates which is the limiter.

The results were:

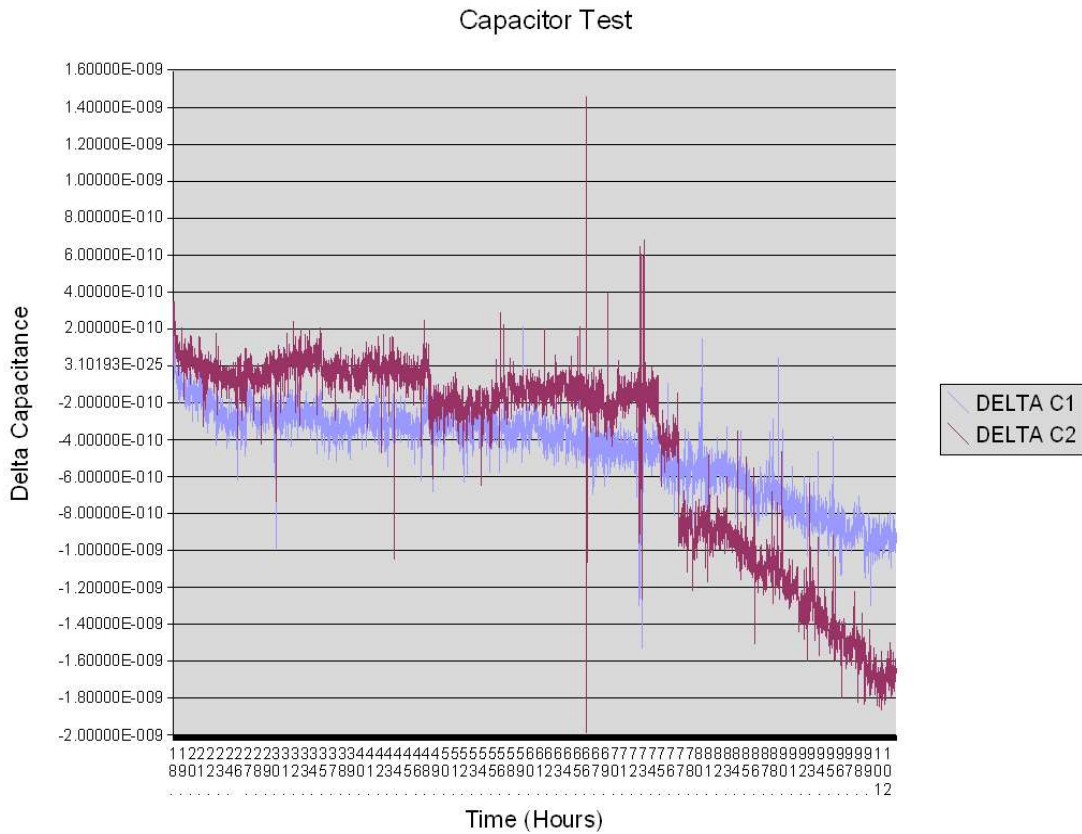
At 10.3 hours, capacitor #3 went out of circuit with blown fuses. It was torn apart and only "one" blow hole was found. The dielectric looked fine... Hard to say what happened, but this capacitor seems to be fine. The dual 100mA fuses are right on the edge so it is easy for something odd to blow them. A data point to be thrown out...

At 103.2 hours the fuses on the other two caps went open at the same time.

Capacitor #1 was torn open and it had substantial dielectric damage with a few hundred self healing blow outs. It probably could have gone longer, but it was definitely at or very near end of life. The edges of the plates had burned and weakened the dielectric at the plate edges. The dielectric turned a chalky white color and it easily tore along the damage lines.

Capacitor #2 was put back into the test, but it only went a few minutes more since it was making consistent popping sounds several times a minute. Obviously, it was having serious problems and was arcing consistently, but not failing outright.

The data was put in the form of change of capacitance vs. time chart:



At about the 75 hour mark, the capacitance started to drop at an obvious faster pace and ended up at about 1% lower than the 20 hour mark. This is very likely due to internal arcing. Both capacitors seem to degrade at about the same time and pace. Capacitor #2 also had "something" happen at 45 hours but it did not seem to really hurt anything.

So it appears that the CD942C20P15K capacitors can go for 75 hours at 2000V<sub>peak</sub> with little problem. The next 25 hours will see significant internal arcing with total failure probably at the 100 hour mark. At 10 hours, practically no damage is observed.