



March 5th, 2004

Technical Update #1

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## **Important - Thermocouple Change**

It is extremely important to us that you know how committed we are to the quality of our products and the distributors who provide them. Hopefully after reading this you will understand that we have been diligently looking for the best solution to an unfortunate situation.

In May of 2002 our primary supplier of MI Cable Type K thermocouples, Hoskins, unexpectedly went out of business. We immediately found a new supplier whose quality tested to be comparable to Hoskins.

After about a year of use we noticed an unusual spike in thermocouple related problems, primarily with people who were high firing (above Cone 1). Given the number of kilns that we sold and the relatively small number of problems being reported we chose to stick with the MI Cable thermocouple and work and solving the problem.

After a few months of testing we determined it must be a problem with the quality of the raw material or manufacturing process of our supplier. Unable to get a suitable answer from our supplier we again switched to a new supplier.

The new supplier, while better than the previous supplier, was still not performing at the level of quality our customers rightly expect from us. At this point we chose to go back to a proven quality and immediately began using the 8-Gauge Type K thermocouples that we had used prior to MI Cable thermocouples.

Given the fact that there is no longer a suitable supplier of MI Cable thermocouples available, our research has shown us that there are currently only 3 viable solutions available; 8-Gauge Type K, Type S with a Ceramic Protection Tube and 8-Gauge Type K with a Ceramic protection tube. We are going to offer all 3. The following is a description of the pros and cons of each.

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# Thermocouple Choices

## **8-Gauge Type K**

Like the Hoskins MI Cable thermocouple this one is; accurate, extremely responsive, relatively durable, and, due to its low cost, the price per firing is very low. We used this thermocouple when we first came out with the KM kiln line and only switched to Hoskin's MI Cable because of its extended life and lesser propensity to flake.

Although the Hoskins MI Cable thermocouples lasted slightly longer, the value of the 8-Gauge thermocouple is still excellent because of its lower cost. As before, we are supplying a free replacement thermocouple with each kiln so the customer will actually fire more before they need purchase a replacement.

Scaling was never an issue with most customers because the particles fall straight down. Since we recommend that customers do not place ware too close to the thermocouple there should be no loss of loading capacity. We carefully studied using ceramic or refractory thermocouple sheaths to limit the flaking however we found they significantly reduced the performance of the thermocouple and are therefore not recommending them unless the customer requests them. (See 8-Gauge Type K with Ceramic Protection Tube).

We are using this thermocouple as our standard unless the customer chooses to upgrade to a Type S. Replacements thermocouples are \$10.00 retail and the part number is #1515.

## **Type S with Porcelain Protection Tube**

This is an excellent thermocouple. It is extremely accurate, very responsive and will virtually last forever at a wide range of temperature ranges and atmospheres. It has only 2 draw backs; it is extremely fragile and relatively expensive to replace if it is broken. Since the protection tube is very low in mass, the Type S is still very responsive and accurate. This thermocouple is used as a standard in many scientific and industrial applications.

Since it holds up very well in high temperature applications we are strongly recommending that your high fire customers purchase the upgrade. This is especially true for anyone doing Crystal Glaze Firings. The price for an upgrade on a new kiln ordered from the factory is \$200.00 retail and the part number is #1582.

Upgrades for existing kilns are a little more complicated since the controller and thermocouple lead wires need to be upgraded at the same time so they will be compatible. **Do not ever use a Type S thermocouple with a Type K controller or Type K thermocouple lead wire. This will result in an overfire.**

## **8-Gauge Type K with Ceramic Protection Tube**

This is not an option we are recommending however we understand that there will be a limited number of customers that are concerned about flaking and do not want to pay the cost of upgrading to a Type S thermocouple. The reason we do not recommend this is because the thermocouple protection tubes available for 8-Gauge thermocouples are high in mass and bias the reading considerably.

This makes it necessary to trick the controller by entering thermocouple offsets and cone offsets. Since it takes longer for the heat to reach the thermocouple, a thermocouple offset is needed to insure it does not go too fast through preheat temperatures. Once the thermocouple offset is entered it stays with the kiln throughout the entire firing and must be compensated for at the cone correlation range by entering cone offsets.

There are many problems that can result from introducing thermocouple offsets and cone offsets. For more information please contact us.

## **Specifics**

### ***When was the switch made?***

We began shipping all KilnMaster kilns with 8 -Gauge Type K thermocouples beginning February 17, 2004. GlassMaster Kilns are not affected by this change. The MI Cable is still an excellent thermocouple for the low temperature range of glass.

### ***Do all MI Cable thermocouples need to be replaced?***

No, for most applications, the MI cable thermocouple performs very well and can be used with confidence.

### ***What is involved with changing the thermocouple?***

It's actually quite easy. Just remove the old thermocouple and re-drill the hole with a 1/2" drill bit. The 8-Gauge thermocouple uses the same porcelain thermocouple terminal block and lead wire. If you have any customers who want to prove the thermocouple is the cause of their problem before they drill their kiln, we have a 14-Gauge thermocouple with the same Outside Diameter as the MI Cable thermocouples (0.250 inch). These have a much shorter operating life so they should not be used as a long term solution.

### ***How will Skutt be getting the word out?***

We are creating a section on our website titled Technical Updates. This will be located on the Resources drop down menu and will list all future relevant technical changes we make to the product in the future. This posting will include a description of why we made the change and the process for retrofitting their kiln.

Thank you for helping us ensure Skutt continues to provide the highest quality and best support on the market today!