Case Study

Churchill China Ltd uses **Bullers Rings** as an essential part of its Quality Assurance programme in the production of First Class Hotel Ware.

An Overview of Churchill China

Churchill China plc is one of the world's major manufacturers of high quality ceramic tableware for the catering industry. Based in Stoke on Trent, England, Churchill can trace its development back to 1795. Today, all of Churchill's hotel ware is still manufactured with great pride in that very region of England. Currently, Churchill products are used in restaurants and hotels in over 40 countries worldwide.

Years of manufacturing expertise and responding to the professional market place resulted in the development of the 'Churchill Super Vitrified' and 'Alchemy Fine China' bodies. The former is believed to be one of the strongest ceramic dinnerware ranges available, whilst the latter is used in 5 star hotels and exclusive restaurants all over the world. The Alchemy product range is designed to be the ultimate in food presentation.

Churchill prides itself on quality and employs a strict Quality Control system to ensure that its corporate mission statement is met…

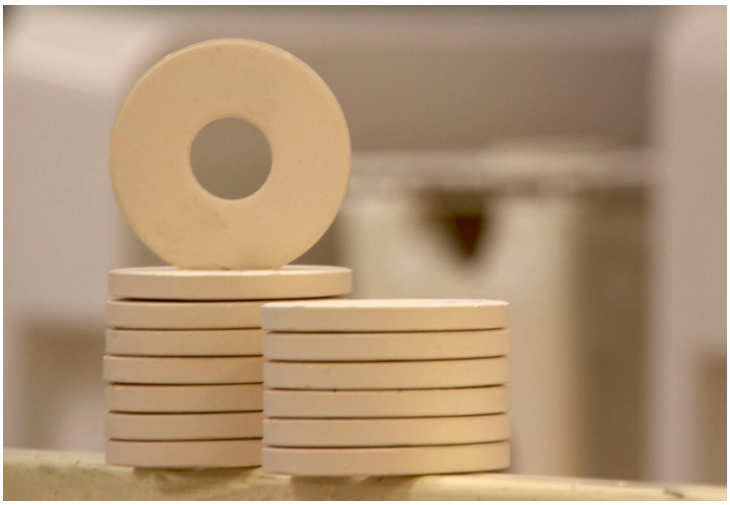
"To be a leading provider to the global tabletop market and deliver value through excellence in design, quality and customer service."

With this in mind, Bullers Rings are utilised as an essential part of its Quality Assurance programme.

What are Bullers Rings?

Bullers Rings are Pyrometric Devices for accurately measuring the effects of 'Heat Work' within a kiln firing environment.

UK based Mantec Technical Ceramics Ltd specialises in the manufacture of the 'World Famous' Bullers Rings, which are utilised by many of the world's leading Tableware, Sanitaryware, Brick, Refractory and Technical Ceramics Manufacturers to measure and monitor the amount of Heat Work that has taken place within the kiln.



Bullers Rings provide an independent, accurate, reliable and essential indication that the firing of the product is correct and unaffected by any variations in temperature and kiln loading.

Heat Work

Heat work is the action and effect of temperature over time on a ceramic product. It is often called 'heat energy'. Simply put, 'heat work' is a defined measurement of how you have 'cooked' or 'processed' your product. Too much or little time at the correct thermocouple temperature and the product may not have been fired correctly—it will be under or over fired. Therefore the measurement of heat work should be an essential QA parameter for all ceramic manufacturing facilities.

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Note: Information contained herein is correct at the date of issue. August 2009.

Why does Churchill China Ltd use Bullers Rings?

Churchill employs five tunnel kilns at its modern factory in Stoke-on-Trent. The use of Bullers Rings is written into the company's QA Procedures so that even and consistent firing is achieved time after time.

How does Churchill China Ltd use Bullers Rings?

For its vitreous hotel ware, firings are carried out in the Portland Tunnel Kiln, Bullers Rings are placed on the bottom deck of every kiln car, increasing to each deck on every 5th kiln car, with a further increase in number on every 10th kiln car.

The rings are positioned in accordance with a pre-determined kiln car map. Once the kiln has been fired, the Bullers Rings are measured using a Long Life TR-100 Bullers Rings gauge and the ring numbers are recorded into a record book as part of the quality procedure. The range (minimum and maximum) and average readings are calculated and recorded. Action is then taken if the readings fall outside the acceptable parameters, as shown in the following table:

	Min	Max	Action
Acceptable	41	43	No action required.
Warning	40	44	Supervisor is contacted if 2 or more occurrences per shift.
Action Tolerance	39	45	Supervisor is contacted if 1 occurrence per shift.

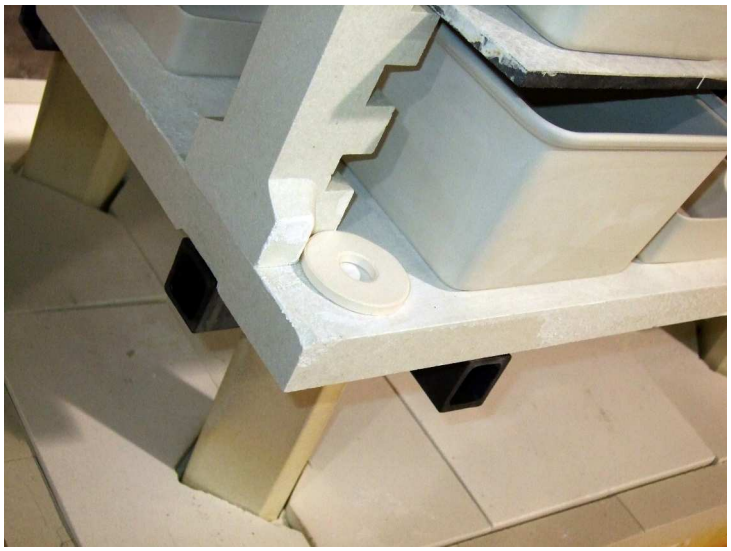
The supervisor will then explore the reasons behind the 'out of specification' readings and corrective action can be taken, minimising any scrap and thus increasing the production yield.

For the Alchemy range of cups and cast products, the same method is employed, but the acceptance criteria is modified to:

	Min	Max	Action
Acceptable	46	48	No action required.
Warning	45	49	Supervisor is contacted if 2 or more occurrences per shift.
Action Tolerance	44	50	Supervisor is contacted if 1 occurrence per shift.

The Benefits

The Bullers Rings readings are recorded and analysed over a period of time, enabling the company to amass accurate 'heat work' characteristics about each and every firing. This enables immediate corrective action if 'out of specification' readings are observed.



Bullers Rings are considered an "essential quality tool", without which, the company would be left with a higher number of rejects and the need to carry out re-work on ware. The use of Bullers Rings leads to maximum yields and thus profits, which come from consistent and reliable production. The consistent use of Bullers Rings have therefore ensured profitable firings time after time for Churchill China.

Footnote: MTCL would like to thank the firing department at Churchill China Ltd for their assistance in compiling this Case Study.

Mantec Technical Ceramics

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