

CASE STUDY

COMPARING PORTABLE PYROMETER PERFORMANCE WITH TRADITIONAL DIP THERMOCOUPLES IN THE FOUNDRY

INTRODUCTION

AMETEK Land, the leading specialist in infrared non-contact temperature measurements for global industry, has supplied its Cyclops L portable pyrometer to Turkish foundry operator Atik Metals. This device was used to measure liquid metal in the foundry for direct comparison with results obtained through dip thermocouples.

ABOUT ATIK METAL

Atik Metal operates one of the oldest foundries in the İzmir area of Turkey, producing high-quality grey and ductile iron parts. The company has been casting for more than 60 years, and currently has around 500 employees. The foundry operates six furnaces, each with an 8 ton/h capacity.



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THE CHALLENGE

Atik Metal wanted to use AMETEK Land's Cyclops L pyrometer in the foundry area, and to compare the measurements with traditional dip thermocouple instruments.

As part of Atik's quality management system, measurements are taken at furnaces, at the casting line and at the pouring line. Temperature data is retained for each part of casting.

The long-term aim of this test was to assess the Cyclops suitability for furnace measurements to support quality, reduce casting defects, reduce costs, and minimise the use of short-lived dip thermocouples.

THE SOLUTION

The Cyclops L is a handheld optical pyrometer that makes instant temperature measurements using a trigger control. It can be aimed at the desired area on liquid metal by looking through the eyepiece on the device.

A small circular grid, visible when viewed through the lens, precisely defines the measured area. Measurement range is up to five meters, and only a 9V battery cell is required to power the instrument. Results can be transferred to computers and mobile devices, via Bluetooth and USB connection, allowing temperature readings to be viewed and analysed.

The Cyclops L was tested by the chiefs of melting furnaces and moulding plants, and by workers measuring temperature in the plants to evaluate its ergonomics, accurate data transfer and use.

Measurements were made at Atik's furnaces, transfer ladles, and during pouring to the mould, and taken in the same way other thermocouple results, which are currently used in the system, are compared with each other.

To calibrate the Cyclops L, a temperature measurement was made with both a dip thermocouple and a Cyclops on the sixth furnace. It was then calibrated in a few seconds with Cyclops L emission adjustment.



Measurement with Cyclops L Portable Pyrometer.



Cyclops L

Portable Handheld Pyrometer
200 to 3000 °C / 392 to 5432 °F



THE RESULTS

The measurement time for a dip thermocouple is 13-14 seconds. For the Cyclops, it was 1-2 seconds. During the demonstration, all the measurements were completed without the need to open the lid of furnaces and were directly measured from pouring metal. Operators using the Cyclops L found it provided a safer measurement environment for this, as it can measure at a range of up to five metres away.

A further benefit of the Cyclops L is that, unlike thermocouples, it does not use disposable tips, and so allowed for successive measurements without having to stop to replace the tip.

Replacing the thermocouple tip can take a few minutes, whereas the Cyclops makes several measurements in just a few seconds. These multiple measurements allow far better control of the furnace temperature and casting quality, avoiding defects caused by inconsistent temperatures. Estimated return on investment on the Cyclops L is between 6-8 months.



Temperature result using Cyclops L to measure melted metal pouring into the mould.

CONCLUSION

Following the assessment, the Cyclops L was approved by Atik Metals' technical department and added to their investment plan. Purchasing and foundry managers will now discuss acquiring further supplies of the instrument with the management team.

C055L Meltmaster

SPECIFICATION

Measurement Range	1000 to 2000 °C / 1832 to 3632 °F
Measuring Mode	Continuous, Peak, Valley and advanced Meltmaster
Applications	Ideal for Molten Metals and Foundry applications

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