



Strand Condition Monitor Buyer's Guide



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SCM Buyer's Guide

What is an SCM?

An SCM (Strand Condition Monitor) is an automated measuring tool, which measures the critical mechanical parameters of a continuous casting machine. It helps in ensuring that you have the exact information you need regarding the mechanical condition of a continuous casting machine. It can provide users with this information in the space of an hour, rather than multiple days like other methods. This in turn helps improve the quality of the steel manufacturing process and iron manufacturing process among others in the long run.

Who uses an SCM?

Most modern slab and bloom continuous casters use SCM's as they are seen as essential quality assurance and engineering tools for the steel making process. Maintenance departments use the SCM data to plan proactive and targeted maintenance tasks, to maximise process efficiency and reduces machine breakdowns, while Production and Quality departments use the data as a guarantee of process control and mechanical parameter assurance and so reduce defects such as deformation and product rejection.

What are the benefits of an SCM?

SCM's provided specific information about the actual mechanical condition of a continuous casting machine rather than assumed knowledge. Manual measuring tasks, which would normally take days to complete can be undertaken in a matter of an hour, providing Production and Maintenance with the information they need to continue to produce grade A quality product. In turn, this not only optimizes company time, but also helps provide a better product and more of it.

What size caster can an SCM measure?

Each SCM is custom designed for each individual continuous casting machine and can typically measure slab and bloom casters of any size and configuration. Thicknesses range from 65mm up to +450mm, while widths typically range from 300mm up to 3000mm.

Can an SCM measure more than one thickness?

SCM's are design to measure a base thickness, which is typically the thinnest thickness of the caster type. From this base thickness the SCM can then be enhanced by adding spacer plates, so that other thicknesses can be measured, as necessary.

Can SCM's measure vertical casters?

SCM's can be used on both radial and vertical caster designs. The configuration of caster is taken into consideration at the design stage and appropriate changes are incorporated to ensure that the most suitable SCM is engineered for each individual application.

Can an SCM be used for a top feeding caster?

For Top feeding casters SCM's are provided with onboard hydraulics, which are used to reduce the SCM thickness, so allowing it to pass through the mould, without causing damage. Once through the mould, the hydraulics are deenergised, returning the SCM to its normal measuring thickness.

Do I need to change my caster to use an SCM?

SCM's do not require any specific changes to the standard caster operation to be used. The only requirement is that during operation, the drive rolls of the caster should not press onto the body of the SCM. Even though the SCM is robustly design and manufactured to withstand the harsh environment of the casting machine, repeated rolling of the SCM body by drive rolling force would eventually cause deformation to the SCM body.

What parameters does and SCM measure?

The range of measurements that an SCM can provide are:

- Roll gap – distance between inner and outer face rolls
- Roll bend - measurement of the roll gap deviation caused by inner and outer roll eccentricity
- Roll alignment / back face alignment – the smoothness of the outer roll curve of the caster
- Outer face roll condition - Indication of misplacement of the outer face roller elements
- Roll rotation – Quantitative indication of freedom of rotation for each roller element
- Secondary cooling efficiency – Analysis of water spray nozzle performance at each nozzle location

What measurements do I need?

All measurements are valid and can be used on any type of caster, although bend measurements are generally more necessary for casters where full width roller elements are present rather than casters with sectioned roll elements.

Are there different types of SCM's?

As SCM's are custom designed for each particular casting machine, there are rarely two SCM's which are identical, however there are two specific types of SCM's which have very different features and operation. There are offline SCM's which are the most common type on the market, which take caster measurements while the caster has stopped producing steel and there are online systems, sometimes referred to as In-chain SCM's, which are integrated into the casting machine which take measurements during the casting process.

What are the main differences between offline and online SCM's?

The main differences between the two systems is the range of measures that the two systems can offer and the frequency of measurement. Offline SCM's offer the full range of available caster measurements, as there are no restrictions in space or configuration, allowing the full range of measuring sensors to be used, while online SCM's have to integrate with the casting process and equipment, which restricts the space and limits the range of measurements which can be offered to just gap measurements. However, an online system will take casting measurements whenever a new casting sequence commences, which may be 4 or 5 times a day, whereas an offline system is usually only used during down time, such as during routine maintenance activities.

How does an offline SCM work?

The SCM replaces the dummy bar head of the dummy bar chain and is passed through the caster in the normal manner of the insertion sequence, whilst the caster is out of production. During the passage of travel through the caster the SCM is set to record, and measurements are taken for all the critical mechanical parameters. The data that is obtained is stored to memory and at the end of measuring the data is downloaded to a laptop or PC for analysis and display. The SCM is then removed from the chain and the dummy bar head replaced, in preparation for the next casting sequence

How does an online SCM work?

Unlike an offline SCM, online systems are integrated permanently into the dummy bar chain. The dummy bar head remains in place and the measuring assemblies are dispersed around the chain, interconnected via cables. During the actual casting process, as the dummy bar chain is inserted at the start of casting, the In-Chain SCM automatically initiates measuring and records the data, which is wirelessly transferred at the end of the casting start sequence, to a base station PC, for analysis and display. The In-chain system remains mounted on the chain and is charged in situ, ready for the next start of casting sequence.

Which type of SCM do I need?

It is recommended that both types of SCM are used to obtain an accurate and up to date assessment of the caster's mechanical parameters. Each complements the other, with the offline system providing a full comprehensive assessment of the caster condition on a less frequent basis, while the online SCM provides a daily check of just the roller gaps, to ensure that the caster remains within production tolerances. However, if you are new to SCM's and do not have any caster measuring equipment then an offline SCM's would be our first recommendation.

What information is required to produce an SCM design proposal?

To produce a preliminary SCM design proposal, some basic information is required, this includes:

- Caster width and thickness(es)
- Number of roller elements and configuration within the caster
- Entry and exit target gaps for each segment
- Direction of dummy bar insertion
- Whether an online or offline SCM is desired

To produce a detailed design proposal additional information is required, which includes:

- Design geometry of each roll and segment including X&Y coordinates (if available)

How much maintenance does an SCM require?

SCM's need to be calibrated on a routine basis to ensure that the data gathered is accurate. Typically, calibration should be performed around 4 times a year, with a full calibration taking around 3 hours. Regarding routine maintenance, only an annual service is required, which would typically require around 1 day, including calibration.

How long should I expect an SCM to last?

A good SCM which is well looked after should last 15 to 20 years. The only limitation to this is the availability of supporting electronics, which are becoming increasingly obsolete at a faster rate. If an electronics upgrade could be performed, this would eliminate the need to purchase a complete replacement unit.

What is the project execution time for an SCM?

Once a preliminary design has been agreed, detailed design and manufacturing takes around 22 weeks depending on the complexity of the unit. Delivery anywhere in the World takes 10 days to 6 weeks depending on the preferred method of transportation. Site installation, commissioning and training takes around 2 weeks for an offline SCM and 3-4 weeks for an online system.

Why should I buy from Sarclad?

Sarclad have been manufacturing SCM's for the Steel Industry for over 35 years. The knowledge and experience of continuous caster measuring is unrivalled by any competitor anywhere in the World. All manufacturers of SCM now use Sarclad's original design and with over 400 references World-wide, Sarclad remains the premier producer of SCM's for caster slab and bloom measuring.

What support does Sarclad offer?

From its international offices in the USA, UK, India and China and supported by our extensive network of regional native agents, Sarclad can provide around the clock, global coverage and support for all service and aftersales requirements.