

CROSS BELT SAMPLER

(Hammer Sampler /
Auto Sampler)



**SERIOUS
ABOUT
SERVICE**



MALVERN
ENGINEERING

www.malvern.co.za

PRECISE SAMPLE COLLECTION

The Malvern Engineering Cross belt (or hammer) sampler has been robustly designed using the ISO 13909 standard as a basis for design. In most cases, the sampler will mount directly onto the stringer or gantry section of the conveyor belt where a sample is required to be taken.

The sampler has been designed with a double sweep/cleaning system which, together with flexible idlers that shape the belt into an arc in the area of sampling, ensure that a clean sample increment is taken. The servo controlled, minimum backlash drive system ensures extremely accurate speed control of the sampling arm and the most mechanically correct sample as a result. The sampling arm is designed to make full contact with the conveyor belt to ensure a “clean cut” of material is taken. Damage to the belt is mitigated by installing belt tracking limit switches to ensure the belt is tracked as well as a lead in flap that assists the sampling arm onto the belt when it first makes contact. The sampler is fitted with skirts on the feed and discharge ends of the conveyor.



The sampler has 4 modes of operation, Manual, Auto Timed, Remote and Inspection/Maintenance.

The inspection/maintenance mode includes two pre-programmed positions of the sampling arm which are directly opposite the two inspection windows in the sampler body. This allows for easy inspection and maintenance of the sampling arm which if regular maintenance protocols are followed, will result in extremely accurate sampling. The control panel has a number of feedback channels that allow the end user to remotely monitor the performance and operation of the autosampler.

These are: sampler on, sample taken, sampler healthy, remote selected, sampler homed, sampler tripped, drive ready, drive running, belt tracking, left and right.

OPERATING PROCEDURES

The operation of the sampler requires a belt running interlock as well as a belt trip condition to be commissioned such that the conveyor belt is protected from damage and spillage. Before the running of the sample cut, there is a warning siren that sounds for 10 seconds to alert the operator that the sampler will run. There is access to Emergency Stop buttons which will cancel any movement as well as remove torque from the system and cause the sampling arm to come to an emergency stop.

In order to maintain sample integrity, the inspection positions should be used weekly to inspect the condition of the cutter and the sweeping elements. This can be done during shut maintenance, and any adjustment or replacements can be done through the inspection window, provided the correct operating procedure is followed.

INTEGRATED DIVERTER CHUTE OPTION

'ESKOM AUTO SAMPLER'

The Malvern Engineering Cross Belt Sampling Solution for Eskom coal production sites has been designed and tested specifically for Eskom Sampling Requirements that produce in the order of a 470kg Eskom Sample per 6000 Ton stockpile (or within a specific time/shift period). The system also allows for an additional, separate sample to be extracted for plant control purposes, and is done so automatically by use of a flopper/diverter gate.

The system is comprised of a cross belt sampler together with an integrated diverter chute (flopper gate) that will direct two successive samples into the two different sample collection bins within a very short space of time to avoid any sample variance on the two results.

Depending on the application, calculations can be performed to ensure that the minimum sample mass for the client is achieved based on the sampling scheme, with the same amount of sample being achieved for plant control. Effectively, this will depend on the amount of material collected per sample, together with the sampling interval.

This relationship holds for a random amount of material on the belt over the period of building a 6000 Ton stockpile for a particular sampling scheme:

The adjacent graph is calculated based on a number of variables, which will determine whether enough sample will be collected prior to making the stockpile or not, for the use of Eskom to approve the stockpile.

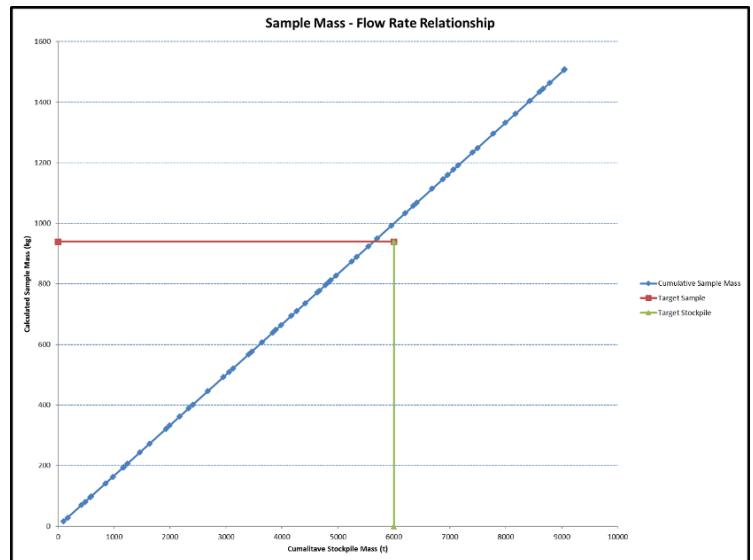


Figure 1: Sampling Scheme Calculations

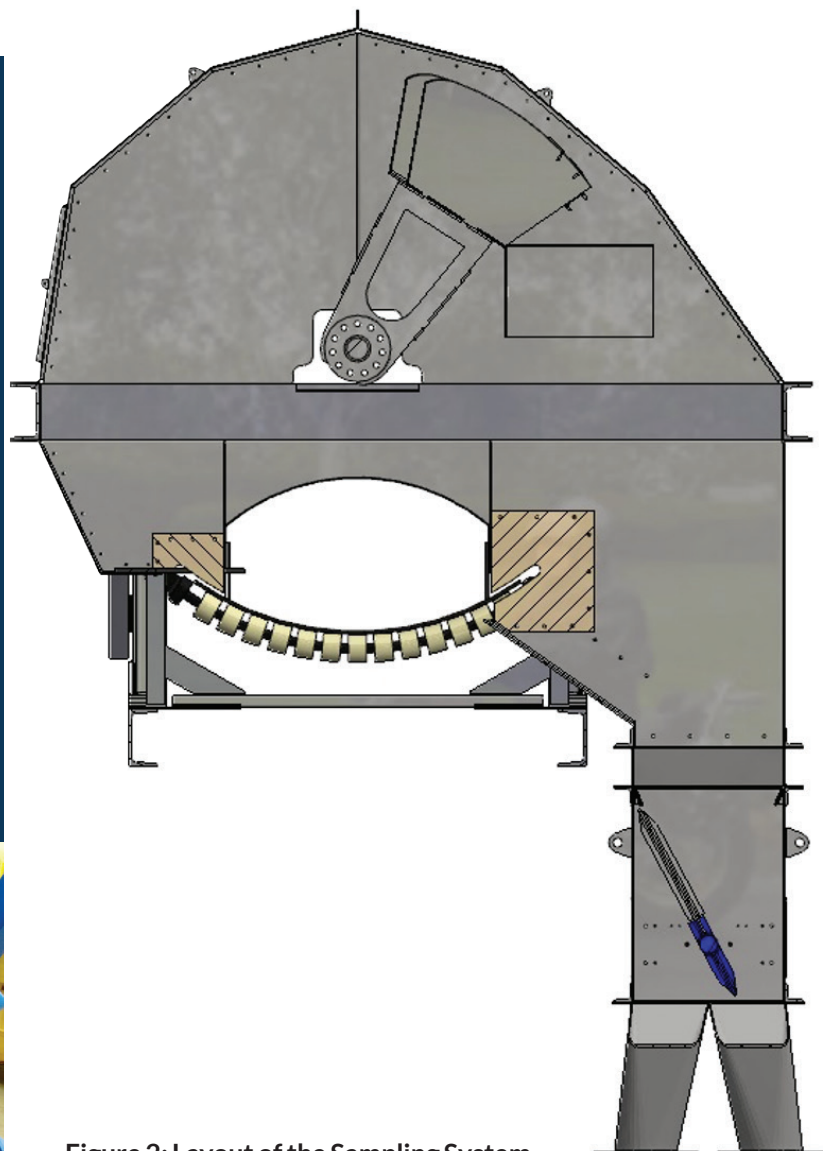
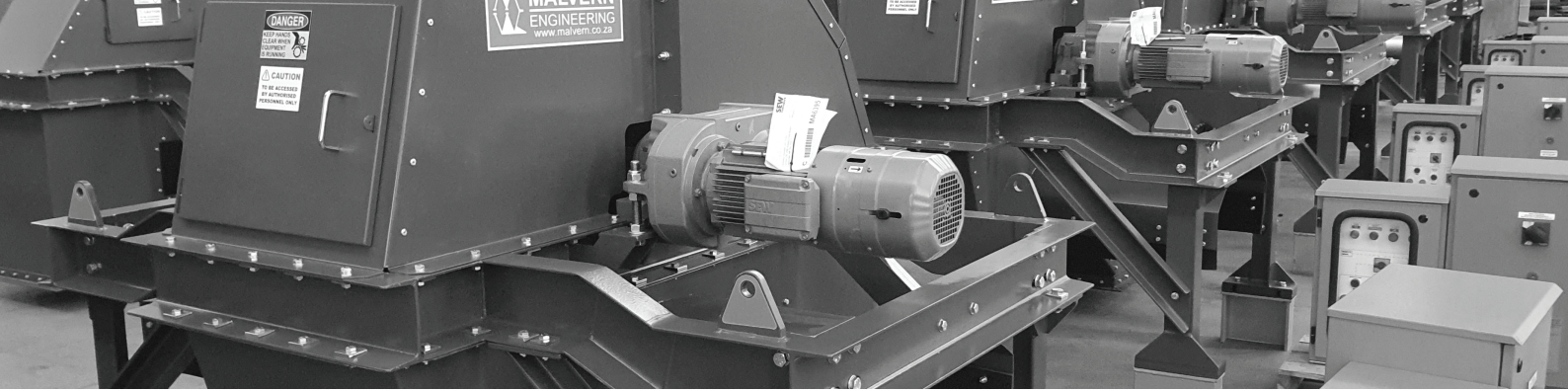


Figure 2: Layout of the Sampling System



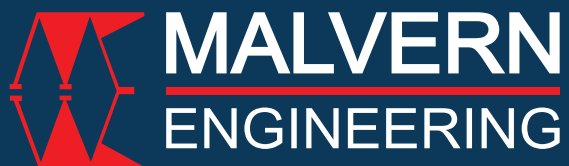


LABORATORY TEST FACILITIES

Malvern Engineering has a well equipped laboratory at their Johannesburg office. This facility allows for the quick and efficient testing of customer samples in a controlled environment.

FIELD TRIALS

Malvern Engineering is able to supply tailor made pilot scale machines for onsite field trials fully supported by trained and experienced technical staff.



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