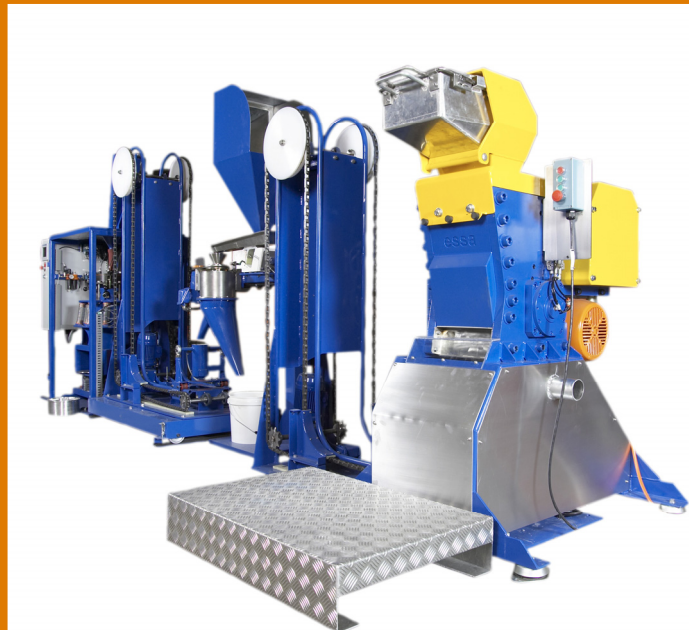




# Four Stage Sample Preparation System

**Linear Automation System:  
Fine Crush - Divide - Fine Pulverise -  
Divide**



## A Simple, Robust and Cost Effective Automation Solution

Essa's linear automation systems link high capacity sample preparation equipment with proven mechanical sampling devices using reliable sample transfer mechanisms.

Simply load your dried field sample into a crusher and collect the assay portion and pulp residue at the other end.

Linear automation systems offer many of the benefits associated with more flexible robot-based automation cells but at a fraction of the cost.

Greater consistency, improved traceability, better hazard management and insulation from labour availability and cost fluctuations are benefits from automating sample preparation processes.

These systems are specifically designed for medium throughput mineral laboratory sample preparation requirements. They are ideal for processing mineral ores such as gold, nickel and iron ore.

They are well suited for use at remote mining and exploration sites and do not require skilled labour to operate.

## System Features

- Up to 15kg of lump ore can be fed into the system
- Rapid crushing to 2mm from 110mm prior to dividing
- System output of 75 micron with selectable pulp weight and number of collected portions
- Coarse reject automatically removed via conveyor
- In built air blast cleaning minimises contamination
- Small footprint
- Readily transportable and ideal for remote location work
- Simple and fast installation
- Manual handling of samples greatly reduced
- Less risk of human error - skilled labour not needed
- Designed for easy maintenance as all component equipment is at floor level
- Modular design incorporating proven Essa equipment

## Description and Capabilities

This four stage linear automation system includes a Model JC2500 jaw crusher, a variable split rotary tube sampler, a fine pulverising Autobatch Mill and a rotary divider.

An in-feed load cell is also supplied as standard. The system's PLC determines the appropriate coarse split ratio based on initial sample mass to ensure the required sample weight for fine pulverising.

The JC2500 accepts lump ore and core up to 110mm and produces a fine crushed material, 90% passing 2mm, suitable for division and pulverising.

The crusher features a simple self feeding mechanism. This prevents the crusher being choke fed with an excess of fine or compatible material that may overstress the crusher. In addition it completely prevents operator exposure to the crushing chamber whilst sample is being crushed.

The variable split rotary tube sampler (VSRTS) delivers a coarse split of between 5% and 48% of 2mm material.

Coarse material reject from the sampler is discharged directly from the rear of the cabinet via a belt conveyor.

The ever reliable Autobatch Mill (ABM2), fitted with a 2000cc bowl, pulverises up to 1.2kg to 75 micron. Typically 800g is selected.

The rotary divider after the ABM2 divides the sample to a selectable weight. This is done by placing one or more segments into a standard rotary sample divider.

Trouble-free bucket and cup lifters move samples from one component to another keeping all major equipment items on ground level for easy maintenance.



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### Method of Operation

The system is controlled by a single operator weighing and feeding samples at the in-feed point.

Typically samples are crushed to 2mm and then fed to the VSRTS, a coarse split of 800g is taken and introduced to the ABM2 where it is pulverised to 75 micron before being fine split to configurable segments.

Up to three samples are processed in the system at any one time.

### Typical Throughput

If crushing 2kg to 10kg of sample and fine pulverising nominally 0.8kg you can achieve a maximum of ten (10) prepared samples per hour.

### Manpower Requirements

A single operator could easily tend to multiple systems and perform other tasks while feeding and collecting samples.

Skilled labour is not required to operate this system.

### System Availability

These reliable systems will achieve typical throughput specifications in 22 hours with a recommended 2 hours allowed for cleaning and maintenance per day.

### Safety Features

Improved operator safety is a major benefit of this system.

A sound reducing cabinet and inbuilt dust extraction minimises operator exposure to noise and dust.

Mechanical lifters transfer the sample between equipment items and the coarse reject is removed via conveyor. Manual handling is limited to simply loading the crusher and collecting up to 1.2kg of finely pulverised sample.

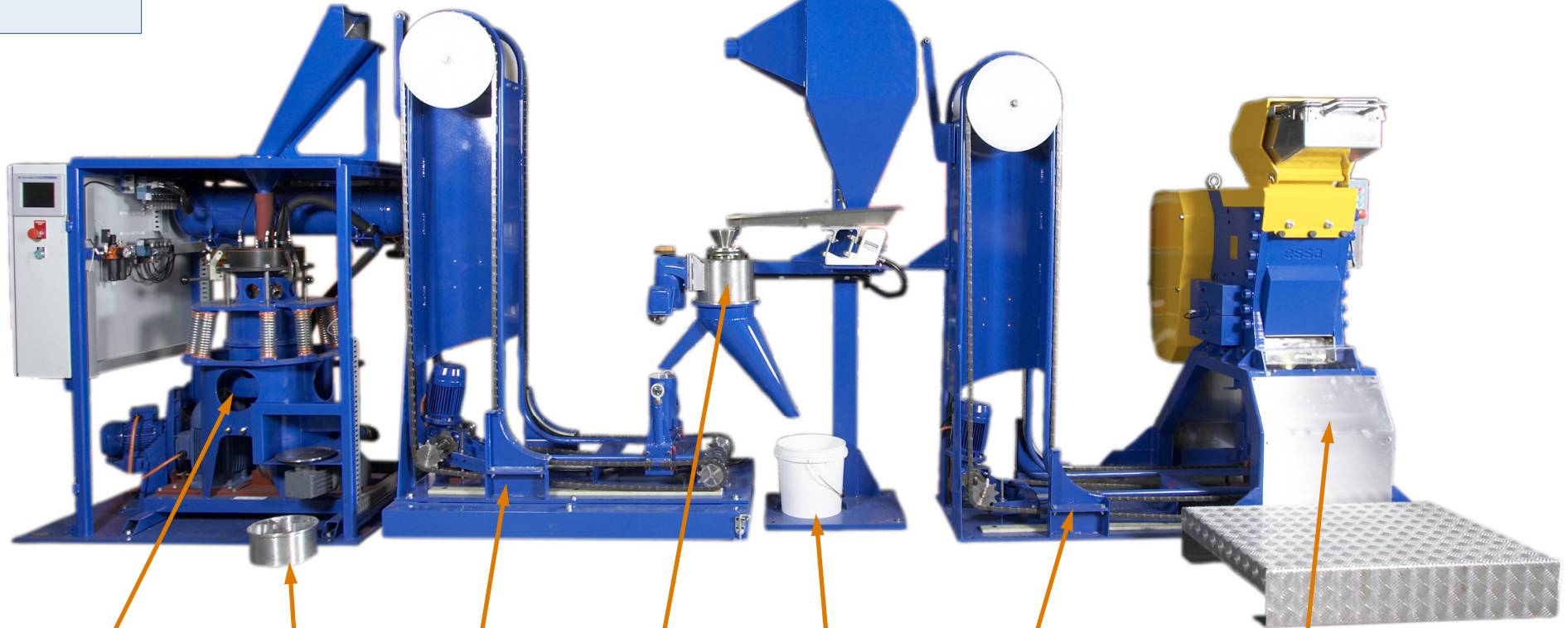
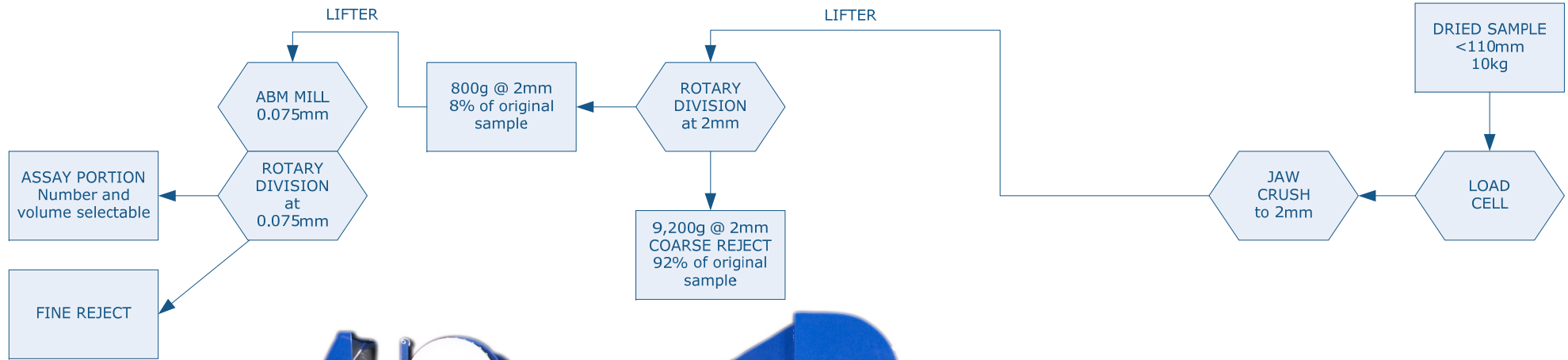
The system includes protective guarding and emergency stops. Coded safety switches are incorporated into each removable guard and door to ensure operator safety.

Both the sample in-feed and out-feed are at comfortable heights for the operator's use.

By keeping all equipment at ground level the ergonomics for both operators and maintenance personnel is greatly improved over other systems on the market.

Process Stage	1 Jaw Crush	2 Lift to RTS Hopper	3 Coarse Division	4 Lift to ABM	5 Fine Pulverise	6 Fine Division
Equipment	Jaw Crusher Model JC2500	Bucket Lifter	Variable Split Rotary Tube Sampler	Cup Lifter	Auto Batch Mill Model ABM2	ABM Rotary Sample Divider
Typical Input Size	Up to 110mm	-	2mm	-	2mm	0.075mm
Typical Input Mass	10kg	10kg	10kg	0.8g	0.8kg	0.8kg
Typical Output	90% < 2mm	-	0.8kg Split	-	95% < 0.075mm	Selectable
Typical Reject	-	-	9.2kg	-	-	Selectable
Typical Throughput	Up to ten (10) samples per hour (with up to 3 samples in system at one time)					
Operating Flexibility	Up to 15kg	Up to 15kg	5% to 48% Split	Up to 1.2kg	0.2kg to 1.2kg	0.2kg to 1.2kg
Standard Features	Load Cell	Bucket Cleaner	Coarse Reject Conveyor	Cup Cleaner		

*Please note that the figures quoted in this document are nominal only performance expectations that can vary according to the physical characteristics of the material being prepared, the condition of the equipment, the gap adjustment and the method of feeding the equipment.*



**ABM Mill**  
800g of 2mm  
to 95% less  
than 75um

**Rotary Divider**  
Assay Portion(s)  
And Fine Reject

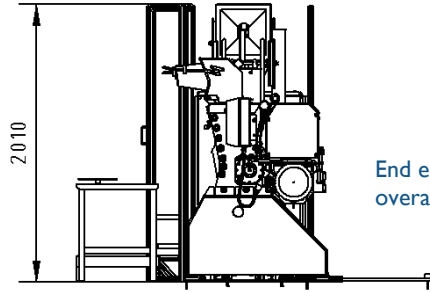
**Cup  
Lifter**

**Variable Split  
Rotary Tube  
Sampler**

**Coarse  
Reject**  
(shown here  
with bucket  
instead of  
conveyor)

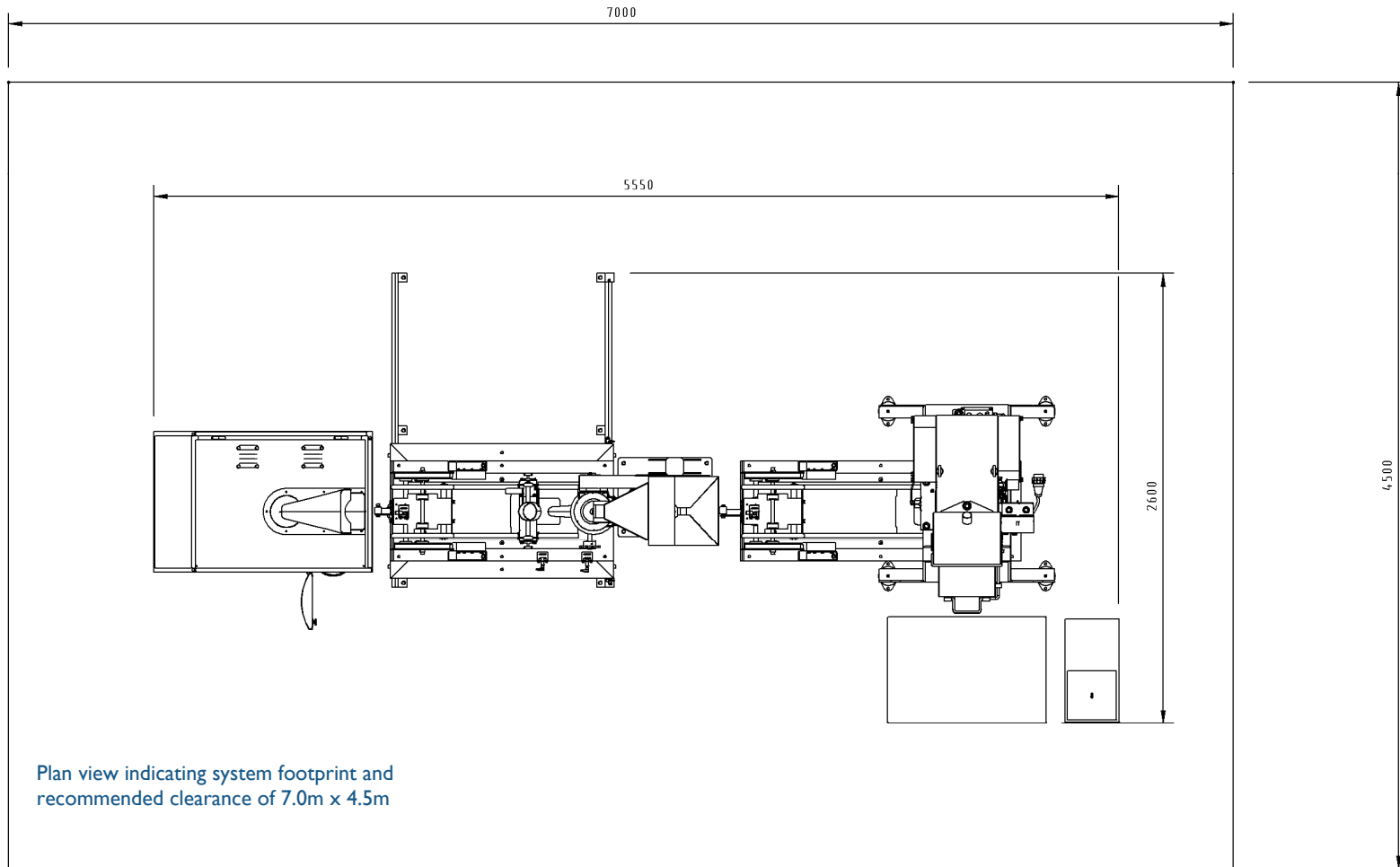
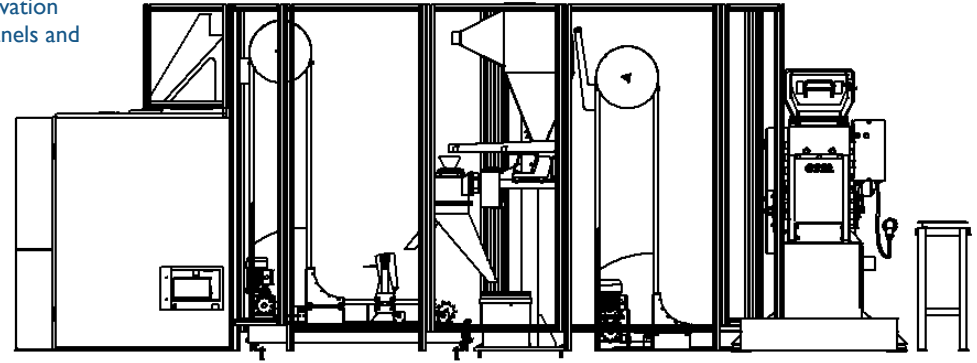
**Bucket  
Lifter**

**Jaw Crusher: Model JC2500**  
110mm to 90% less than 2mm



End elevation indicating overall height of 2.01m

4 Stage System side elevation with sound reducing panels and doors removed



Plan view indicating system footprint and recommended clearance of 7.0m x 4.5m