



UNLOCK THE CHAMBER OF SECRETS THE RIGHT CSS- WITHOUT TEARS

PART 1



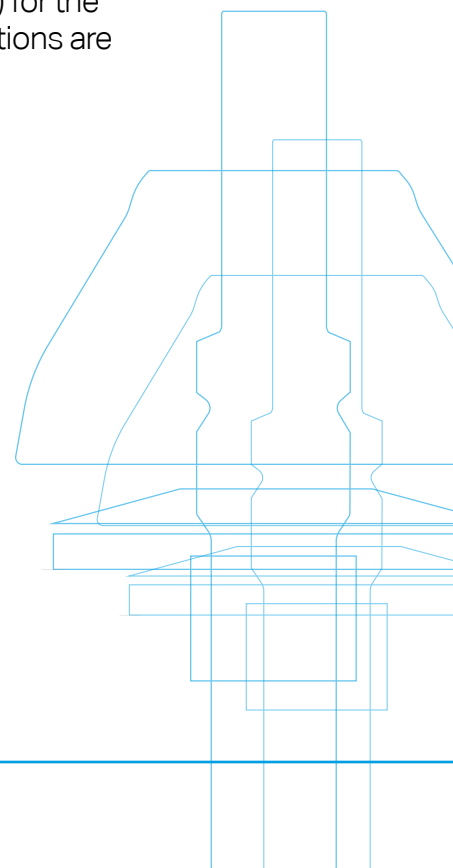
Every part of the quarry process has an impact on the final result and economy. But the final-stage cone crusher has a special place of importance as the last size-reduction step. Issues such as overcrushing cannot be rectified at this stage – rock cannot be repaired. Strict control over the crushing chamber is necessary in order to secure the most profitable output, minimize wear and avoid downtime.

One of the critical factors is achieving the optimum closed-side setting (CSS) for the desired output. The key is to balance yield with production profit. Certain fractions are always more valuable, but getting more of them may also increase fines. Find the CSS that give you the best overall result.

Take samples

Sampling is critical to mastering CSS. Run the crusher at several different settings and take at least one sample at each. Multiple samples improve accuracy. Measure the capacity at each crusher setting, as CSS will affect the final product capacity.

That was the situation faced by Oahu-based Hawaiian Cement, which supplies aggregates and cement products to the island's construction industry. The right type of natural sand was scarce on Oahu, and its use limited by legislation. To meet its needs, Hawaiian Cement had to import sand from British Columbia – more than 2,000 miles away.

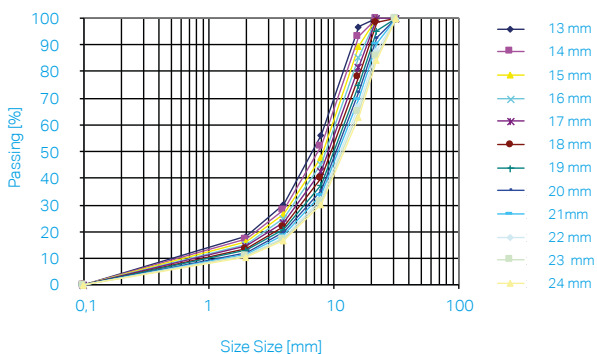


Pay special attention to safety when sampling! Choose a safe position for taking the sample, and ensure the conveyor cannot start unexpectedly.

Analyse

Use the sample data to create particle size distribution graphs.

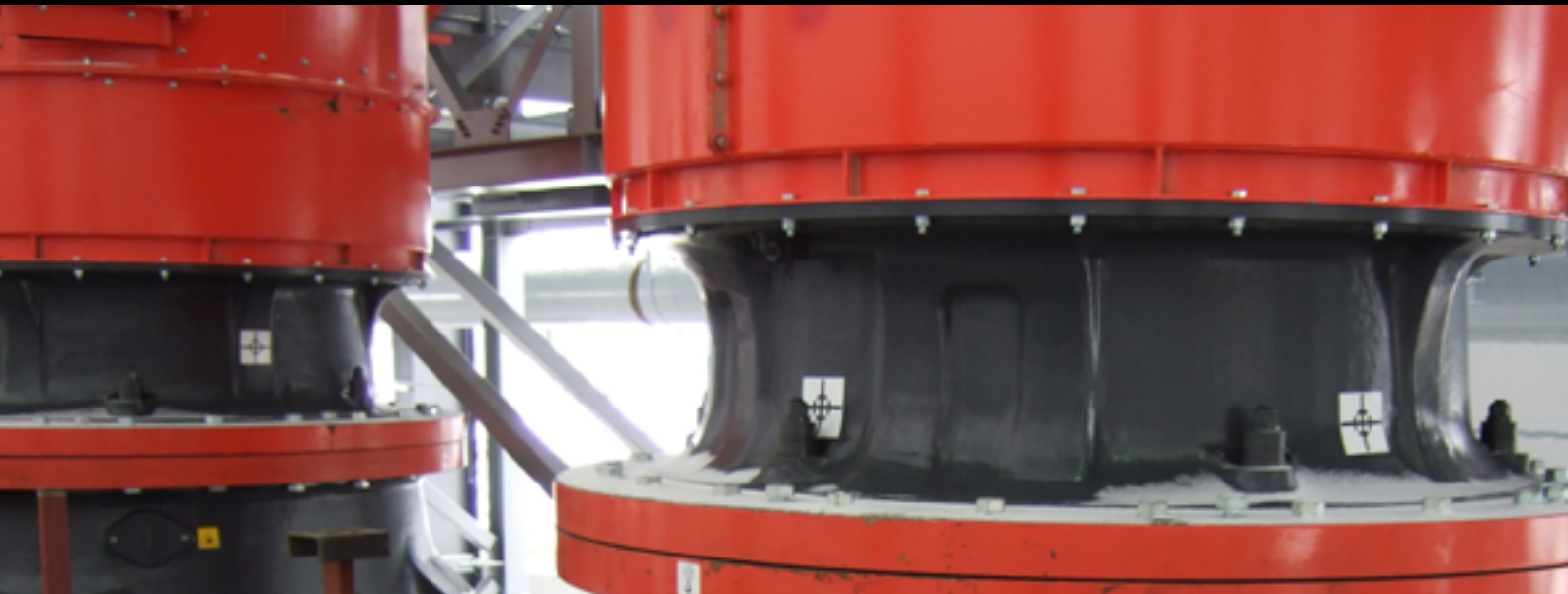
Particle Size Distribution at different CSS



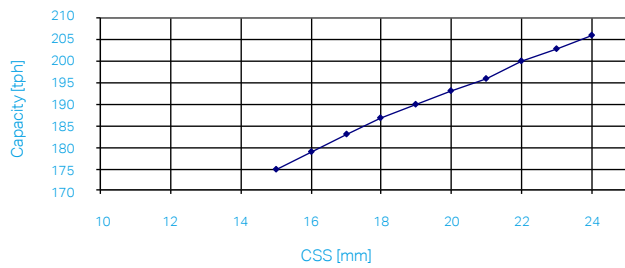
In order to make a meaningful analysis, you need to combine distribution and capacity data. The percentage of final product multiplied by capacity gives the production capacity for each product.

Here's an example:

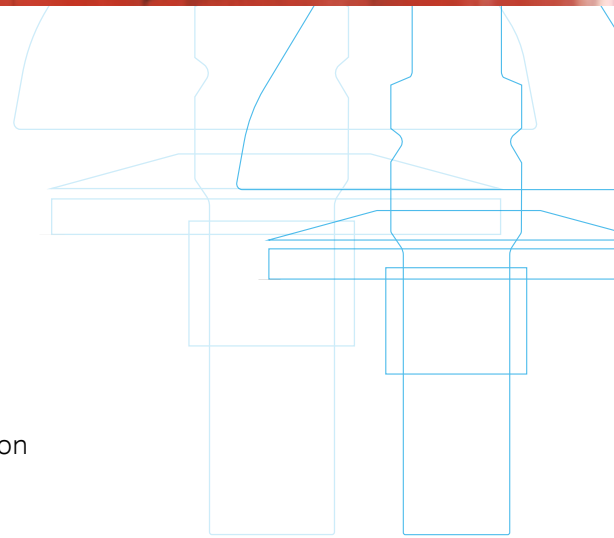
2-4 mm at CSS 20 mm
Percentage of crusher production: 9%
Crusher capacity: 193 tph
Total production: 193 tph x 9% = 17 tph



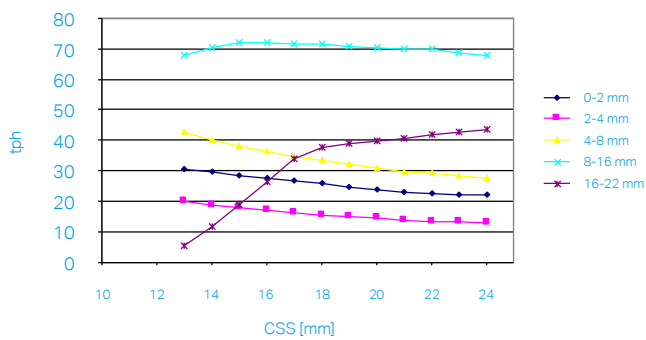
Capacity and CSS



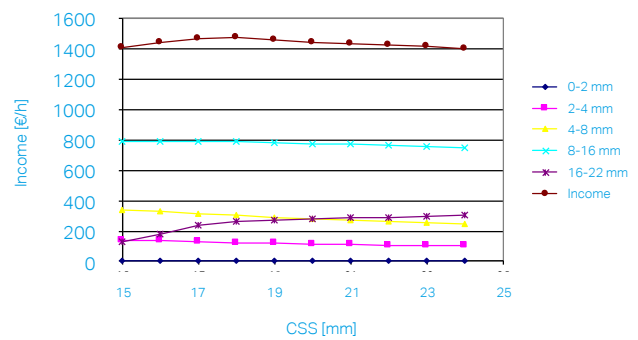
Entering all the values into a spreadsheet makes it easy to get production capacities, but you then need to factor in price per tonne for each product in order to determine the best setting for overall economy.



Crusher Production



Crusher Yield



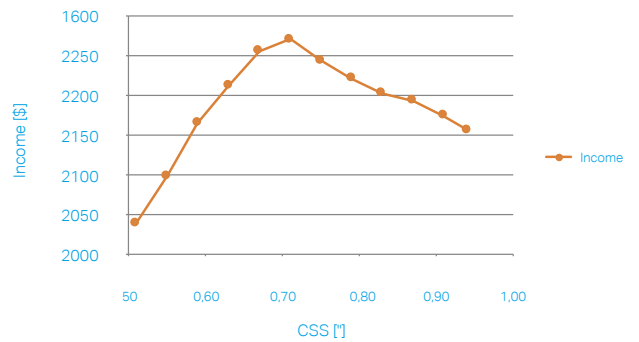
What difference does it make? Do the maths!

In this example, running the crusher 2 mm off will reduce the profit per hour by €30. If the crusher runs 1600 hours per year, that's a loss of €48,000.

What difference does it make? Do the maths!

The most effective way to ensure the right CSS is to use an automation system. This will measure the load conditions and adjust the settings accordingly. Without automation, you need to manually check and adjust on a regular basis.

Crusher Yield



Contact Sandvik to discover more ways to improve output and crushing chamber lifetime.

For more information on how to improve your operations, contact your local Sandvik team or call our global head office on +46 (0) 8 456 11 00.

crushology.sandvik

