SAMPLING SYSTEMS
A NEW ERA IN SAMPLING

INVENTION ON SAMPLING BY YUNEL

NEW TECHNOLOGY ON SAMPLING SYSTEMS OVER CONVEYOR

'SAMPLING SYSTEM WITH SUPER SHOCK PRINCIPLE IS IN CHARGE OVER CONVEYOR BELTS IN A COAL MINE
In New Technology, Super Shock Sampling Systems

- There is no mechanical component entering into the material. Sampling is done by air shock principle. Need for maintenance is minimum. System serves for many years without any problem to the customers. Operation and maintenance costs are considerably less compared with other mechanical systems.

- The sample collected by New Technology Super Shock Sampling Systems completely represents the lot. Because:
  • The air shock transports all fine & coarse particles to the transfer chute.
  • It completely sweeps the belt surface.
  • The sample increment geometry is almost perpendicular to the conveyor belt axis. Since the sampling procedure is carried out by air shock that reaches a speed much more than the speed of sound. Therefore, sample increment is extracted as a whole crosscut.

In conventional Mechanical Sampling Systems

- Operating and moving mechanical components fail frequently so they require maintenance. The system in mechanical samplers operating with swinging arm is composed of motor, driving mechanism, gear box, mechanical shafts and electrical components, which need continuous monitoring and maintenance.

- The sample collected by conventional mechanical sampling systems does not completely represent the lot. Because:
  • Mechanical Sampling Systems are only capable of taking the increment from the top of the material. Mechanical arms collect the coarse material and fine material remains on the belt. If the mechanical arms approach to collect the fines, this may damage the conveyor belt surface unless properly applied.
  • Mechanical arms do not completely sweep the belt surface.
  • The sample increment geometry is not perpendicular to the conveyor belt axis instead it is hyperbolical. This is caused by the long time interval occurred as the mechanical arm travels throughout the material. The speed of the mechanical arm is much more lower than the speed of air shock moving along the material.
In the proceeding process of sampling extraction, the material will be in free fall and move towards the inlet of the modular hammermill. Hard Steel Blades are used inside the hammermill. Material is grinded continuously to reach underscreen size. The material will pass through the transfer chute. The particle size can be adjusted with interchangeable screens.

Hammermills can be not only standard models but also customized models in accordance with customer requirements.

We introduce you a masterpiece divider in order to:

- Set apart the excess sample from the main sample, after it has been taken and crushed.
- Prepare the sample increments with the identical characteristics for laboratories.
- Separate the evident sample and sample increments for other analysis.

AN INTEGRATED PART OF THE SAMPLING STATION
Applications for various belt angles and capacities.

Systems designed for defined sampling standards.

Quick delivery and installation.

Fully automatic sampling.

Ultimate technology with minimum investment.

Minimum maintenance requirement and problem free operation for many years.

Proven Technology as a result of many applications.

System with satisfactory results both for seller’s and buyer’s point of view.

SUPER SHOCK SAMPLING SYSTEM is patented by Turkish Republic Patent Institute.

SUPER SHOCK SAMPLING SYSTEM is on your service integratedly with Hammermill and Rotary Cone divider no matter or what the angle and the capacity of the conveyor band are.
Engineering solutions for Coal-Fired Thermal Power Plants.

Optimization of the system, ensuring the product quality and operating efficiency of the production line from beginning to the end.

World wide accepted technology on sampling, analysis and system optimization.

Sampling, analysis and system optimization in compliance with ISO Standards.
Following information on bulk material:

- Moisture content
- Hardness
- Content of mineral
- Content of Contamination
- Size Distribution
- and other specifications

are essential when controlling the quality of the material.

The properties are identified by taking statistically representative samples from each lot or sub-lots of material.
The DAP is designed to measure gas velocity / differential pressure in pneumatic transport pipes of pulverized fuel, or other dry bi-phase powder transportations.

The DAP measures also the temperature of the gas inside the pipes.

The RCA 2000, provides the operators with vital real time information about the combustion efficiency through continuous monitoring of the unburnt carbon content in the fly ash.

The RCA 2000 is very reliable and low maintenance online monitoring instrument, which to a great extent reduces the need for performing the labour intensive laboratory analysis.

**BENEFITS**

- Combustion efficiency
- Coal mill performance
- Production of high quality fly-ash for sale
The ACFM-2200 is a fully automatic monitoring and sampling unit, which collects pulverized coal samples from pneumatic transport pipes between mills and burners. The measuring results are transmitted to the control room for evaluation and control of the coal flow.

The Sampling operation is carried out according to the international ISO Standard 9931.

Main application areas:
- Routine flow measurements
- Adjustment of fuel distribution
- Sampling of coal
- Testing of new types of pulverized coal samples

The unit consists of a heated cyclone through which a part of the flue gas is continuously drawn by an ejector.

A detachable glass container connected to the bottom of the cyclone collects the ash. The ash builds up in layers, which make it quite easy for the boiler operator to observe the rate of accumulation and make notes of any perceptible change in color of the ash that might, for instance, result from the carryover of unburnt carbon.

The ADS units operates continuously, and has no moving parts. Once it is set for sampling at a suitable selected point in the flue gas stream it continues to operate isokinetically.

Changes in velocity of the flue gas in flue gas duct will result in same velocity changes in the flue gas sample drawn.
The Automatic trimming damper is flanged into each pulverized fuel feeder pipe from the coal mills to the burners.
At receipt of electrical signals it is closing or opening the orifice created by the two flaps.
The ATD 2100 has an electronic panel with push buttons for activating opening and closing movements of the two flaps.
The panel has a digital display that shows the opening of the orifice in terms of percentages.

The Dustless connection is inserted into the mounting socket on the pulverized fuel pipe.
Compressed air is connected to the DC to create an air curtain preventing coal dust from escaping from the fuel pipe.
The fitting creates an air curtain, which enables the operator to access the coal fuel pipe without dust escaping from the pipe.
DC-SL is ready for introduction of the measuring instrument; either a Dirty Air Pitot (DAP-SL) or a Pulverized Fuel Sampler (PFS-SL).
SAMPLING SYSTEMS FOR CONVEYOR BELTS

CROSS BELT HAMMER SAMPLER

The Cross Belt Hammer Sampler takes a representative sample increment over the conveyor belt.

The Hammer Sampler will be applied for granular material and offer high flexibility in the installation place anywhere along the conveyor belt.

NOTE: Please contact to YUNEL for more information.

CROSS BELT BUCKET SAMPLER

The Bucket Sampler is designed to take out representative sample of powdered and granular material at free flow of the conveyor belt discharge point. Electric motor driven bucket moves through the cross section of the belt at discharge point and delivers the sample increment into a chute or reservoir.

NOTE: Please contact to YUNEL for more information.
OTHER SAMPLING SYSTEMS

SCREW SAMPLER
TYPE SCR & TYPE SMX

The screw sampler can be mounted in chutes with maximum inclination of 30°. The sampler is driven by a geared motor coupled to a transport screw, towards the flow of material. The screw transports the extracted material to a discharge outlet chute, where the material falls by gravity to the subsequent sample preparation equipment. The SMX type sampler can be delivered with the drive unit installed next to the mixing tank. The screw sampler can be produced from Stainless Steel.

NOTE: Please contact to YUNEL for more information.

AIR SLIDE SAMPLER TYPE AS

The Air Slide Sampler Type AS is designed for continuous or intermittent sample extraction of dry, non-sticky powdered material flowing in air slides in Cement and Lime Plants.

By intermittent sample extraction the rotating tube is parked between the sampling period.

The AS Sampler is manufactured from stainless steel. It is easy to mount.

NOTE: Please contact to YUNEL for more information.
THE ACCESSORIES OF SAMPLING SYSTEMS

AUTOMATIC SAMPLE COLLECTOR

The Sample Collector is designed for automatic loading of powder, fine granulated material into sample bottles from 6 to 26 nos. and in sizes ranging from 250 ml to 20 l.

The Sample Collector consists of:

- The Turn Table
- The Turn Table Shaft
- Motor and Gearbox for Drive
- Gradual Disc
- Pneumatic Locks
- Telescopic Filling Tube
- Sampling Cover

DOSSING UNIT

Mixer:

Arms around the shaft are used for mixing operation and help to homogenize the sample extracted and/or crusher

Dosing Unit and Sample Transfer Station:

Collects a sample from the mixer outlet of a sampler into a cartridge in a pneumatic tube system forwarding the sample in the tubes to the laboratory via pneumatic line.

The dosing unit sits in a vertical or suitable inclined duct under the mixer outlet. A sample drawer is inserted into the stream of material to be filled, while the mixer outlet is opened. The powder is then released to the sending station when the drawer is retracted from the stream.

NOTE: Please contact to YUNEL for more information.
Why M&W sampling device?

- This instrument extracts a sample increment according to the ISO 9931 Standard coal sampling.
- A sampling procedure is needed to eliminate the biases generated from human factor in sampling. As a result PFS-A has been developed.
- The number of operators is reduced from two to one.
- The Snap-Lock by M&W will reduce time spend on each sampling.

The sampling probe is rotated by an electric motor. The control unit is equipped with a PLC that controls the isokinetically. Changes in velocity of the flue gas in duct will result in same velocity changes in the flue gas sample drawn.

Based on electronic signals from the built-in scale weighing the sample, the PLC calculates the total mass flow of pulverized coal in the complete cross section (t/h).

**Technical Data for PFS**

**Sampling according to ISO 9931**

**Fuel pipe dimensions** \( \varnothing210\text{mm – } \varnothing1400\text{mm} \)

Please contact for \( \varnothing1400\text{mm and bigger than } \varnothing1400\text{mm} \)

<table>
<thead>
<tr>
<th>Sampler lance size</th>
<th>Internal fuel pipe diameter in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>210-290</td>
</tr>
<tr>
<td>320</td>
<td>290-350</td>
</tr>
<tr>
<td>400</td>
<td>340-460</td>
</tr>
<tr>
<td>500</td>
<td>410-600</td>
</tr>
<tr>
<td>630</td>
<td>510-730</td>
</tr>
<tr>
<td>800</td>
<td>650-1000</td>
</tr>
<tr>
<td>1000</td>
<td>850-1400</td>
</tr>
</tbody>
</table>

**Number of sampling points** : 64

**Media** : Pulverized mineral fuel

**Power supply** : 230V/50Hz, opt. 115V/60Hz

**Power Consumption** : 800W

**Net weight** : Sampler unit : 7 kg, Control unit : 17 kg

**Compressed air requirement** : Clean oil-free compressed air 6 bar

**Minimum Consumption** : Approx. 1000 N liters / sample
These few snap-shots demonstrate the easy and simple operation of the PFS-A-SL. The snap-lock coupling (not shown) makes the connection and disconnection very swift.

Before sampling, the present temperature and dirty air speed inside the coal pipe has been verified by the Dirty Air Pitot (optional).