Sasco Africa

Accurately Weighing Africa

sanas Verification Laboratory

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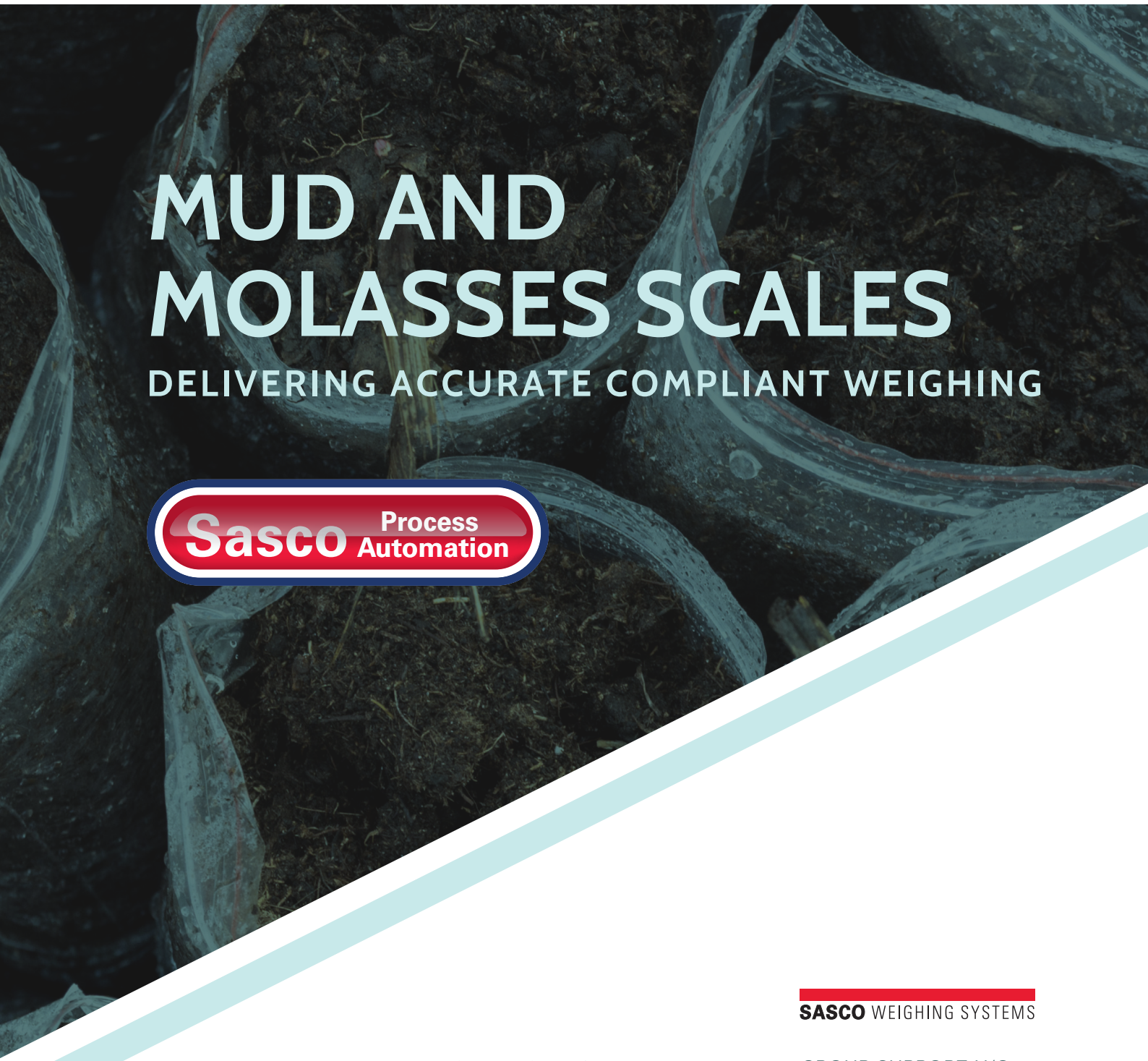

MUD AND MOLASSES SCALES

DELIVERING ACCURATE COMPLIANT WEIGHING

Sasco Process Automation

MMS-25-01

SASCO WEIGHING SYSTEMS

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SASCO MUD AND MOLASSES SCALES are specialised process weighing scales used in the sugar industry. Sugar mills primarily produce raw sugar, with the main secondary products being “mud” and “molasses.” Additionally, various extract waste is generated, which is typically utilised in bio-fuels.

Mud and Molasses is generated as follows:

- **Mud:**This by-product results from the buildup of impurities extracted during the clarification or filtration stages of sugar processing. When sugarcane juice is extracted, it contains various non-sugar materials, including soil and other organic compounds. During processing, lime is often added to the juice, causing impurities to coagulate and settle out, forming “mud.”

- **Molasses:** This by-product is generated from the buildup of sugary residues in different parts of the mill, particularly in areas dealing with the evaporation and crystallisation of sugar. Molasses is the thick, dark by-product of sugar extraction.

Mud and Molasses are weighed using a specialised type of automated throughput weigher known as a Mud and Molasses scale.

Importance of Weighing

Raw Sugar is the highest value output, followed by Molasses, and then Mud, which typically fetches about 10 percent of the price of raw sugar.

The economics of a sugar mill are optimised by maximising the production of raw sugar and minimising the output of less valuable by-products like molasses and mud. Accurate output data is crucial for this optimisation, which is provided by specialised process weighing scales.

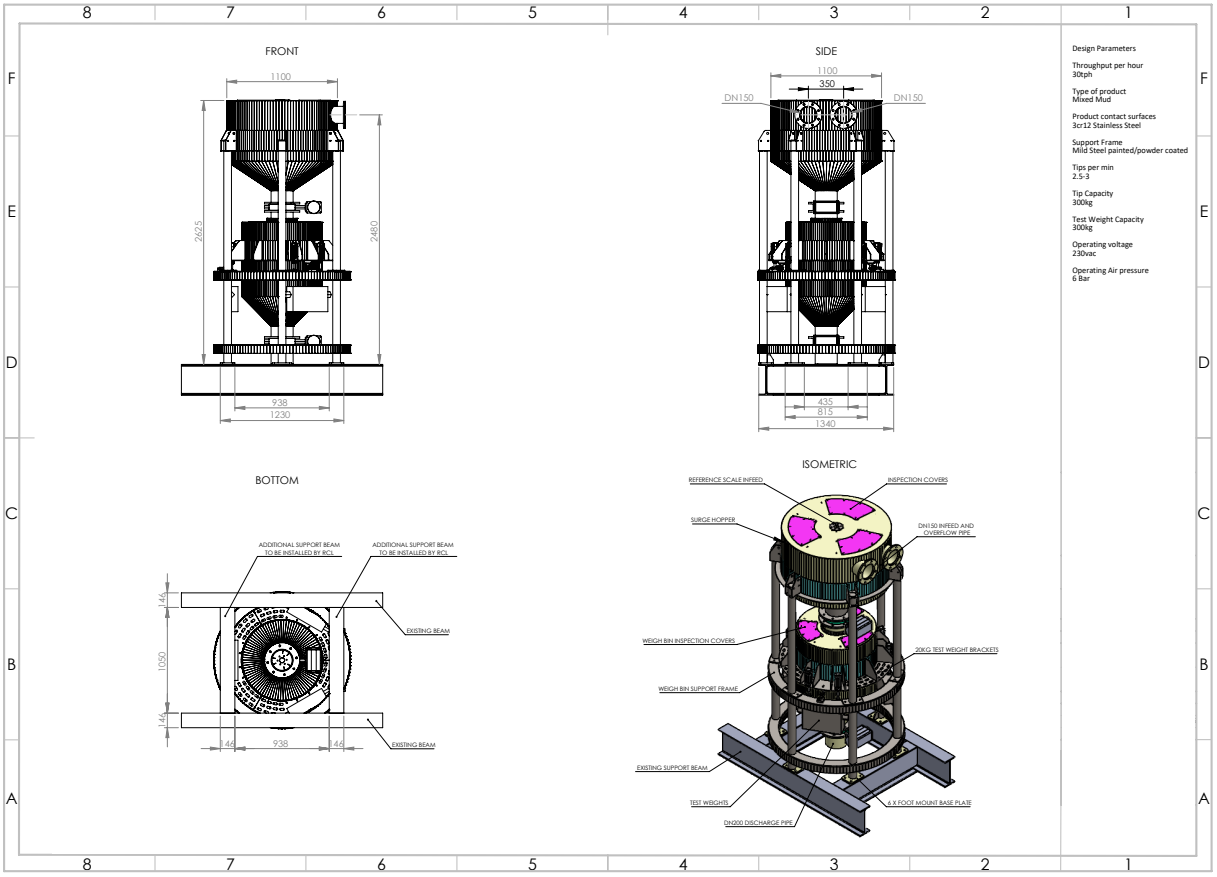
Additionally, raw sugar, mud, and molasses are sold by weight, necessitating the use of trade-approved scales to determine their weight.

Mud and Molasses Scales, therefore, play a critical dual role in sugar mill operations, providing accurate, real-time data on the production volumes of these by-products and supplying weighing information for commercial invoicing when the scales are trade approved.

Product Overview

SASCO’S MUD AND MOLASSES SCALES have a standardised 15 - 30T Throughput Weigher. The Sasco MMS Scale is compact with a foot-print of 50% of traditional designs for the same throughput.

Mud and Molasses Scale Mechanical Overview



Standard Product

PRODUCT FEATURES

Sasco's Mud and Molasses Scale can be configured to weigh either Mud or Molasses and in each case uses the Sasco L337 Indicator:

SPECIFICATIONS AND FEATURES	MSS
Controllers	 L337
Approval	Trade Approval In Process
Applications	Integrated throughput weighing applications interface to a DCS or plant control system.
Mud	15 - 30 TPH
Molasses	15 - 30 TPH
Tip Cycle	1.8 per minute
Product Contact Surface	3CR13 Stainless Steel
Non-Product Contact Surface	Mild Steel Powder
Pneumatic Actuated Test Weights	Yes, weigh frame design incorporates test weight brackets
Actuator Type	Pneumatic Operated
Reference Scale Connection	Dedicated in feed reference flange for reference scale connection for verifications

Controller Features

The features of the Sasco L337 Indicator controllers are as follows:

	L337 Controller
Display	12.5cm/5.7” TFT colour screen
Display Type	Colour Graphic LCD
Mounting	Panel, Wall, Desk
Key Pads	30-key Alphanumeric keypad Ability to plug into a key pad separate from the controller.
Built in Web Server	Yes
IP Rating	IP69K
Digital Filter	Motion filter and digital
Input Power	110-240 VAC or 12-30 VDC
Load Cells Operated	16 load cells
Scales Operated	2
Standard Comms	USB, RS232, Ethernet
Communication Options	RS232, RS485, RS422, RS4220, PROFIBUS, Modbus and Ethernet/WiFi
Ticket Formats	Standard formats with limited used defined fields
Approvals	EN 45501 OIML R 76-1 EN 61000-6-2 EN 61000-6-3 NAMUR NE21 EN 62368-1 OIML R 51 OIML R 61 OIML107
Applications	Truck scales with axle-weighing Loss-in-weight controller Through-put weigher Bag filling Big-bag filling Batch weigher Belt weigher Counting scales Check weighing Filling systems for solid and liquid material Mobile scales
Memory	To record 120,000 weighing records
Configurable Set Points	99
I/O Digital Channels	8 (4 in, 4 out) internal / up to 64 DIO external
Analog In/Out	Optional analog inputs and outputs

Questions and Answers

Q: Can technicians or operators easily perform an in-season accuracy test?
A: Yes, they can do so by using the automated side test weights.

Q: Will debris buildup inside the weigh hopper affect the accuracy of the scale?
A: No, the scale will tare the debris, and only the net mass of the product being measured will be added to the totalizer.

Q: How often should the scale be serviced?
A: Sasco recommends every 3 months.

Q: Is there an output or a means of determining if the scale has an error?
A: Yes, the scale prompts the error message and has a dry contact relay output that can be hardwired to the rest of the plant's control logic. Modbus TCP can be used to obtain the scale's status and totalized values, etc.

Q: How often should the scale be verified or calibrated?
A: A Trade Approved Weighing Systems such as a Mud and Molasses Scales need to be verified once every 24 months as per the Legal Metrology Act of South Africa. Calibration (adjustment) needs to take place prior to verification. Sasco recommends that verification takes place annually during off-crop season due to the thorough service and maintenance that is undertaken. Should a metrological change occur, such as a replacement of a loadcell, then the Legal Metrology Act requires that a verification to takes place.

Q: Does the scale have a filter to eliminate vibration?
A: Yes, the indicator has an advanced digital filter to dampen the effect of vibration, and we also have an additional optional mechanical vibration mounting kit for the scale if excessive vibration is present.

Q: If a load cell is faulty, will the scale indicate an error?
A: Yes, the scale will indicate an ADC error if the millivolt signal received back from the load cells is out of range.

Q: Does the scale have overload protection devices?
A: Yes, the load cells have a safe overload of 150%, and the weigh-bin has a mechanical stop to prevent ultimate overloads.

Questions and Answers

Q: Is it possible to tamper with the totalised device?

A: No, the totalizers are hard-coded in the controller's operating system. The Totalisers are not standalone nor removeable.

Q: Can you clean the mechanical components with water?

A: Yes, water will not damage the loadcells as they are IP69k sealed.

Q: What is the mechanism to detect faulty loadcells on both scales?

A: Electronically, the ADU will evaluate the readings from the load cells, if they are out of range, the indicator will prompt an error message.

Q: What is displayed/indicated on each scale when the respective scale is out-of-range?

A: An ADC Overload error message will be displayed.

Q: Is there an interlock to prevent zero-setting of the totaliser during normal operating conditions?

A: Device or software lock prevents the operators from altering the totalised values.

Q: What is the scale's overload protection mechanism?

A: The scale has a mechanical overload stop.

Application Example

MUD AND MOLASSES SCALE

In order to comply with Metrological Laws in South Africa, a large Southern African Sugar Mill - **Company A** sought to purchase both a new Mud Scale and a new Molasses scale to replace older Non-trade approved units.

In addition to the requirement that both these scales be approved for trade purposes Company A wanted to ensure that these new scales offered the following additional benefits:

- Standardisation
- Occupation of less space in the plant.
- Improved self-checking functionality
- Simplified calibration and testing procedures
- Reduced flow restrictions so as to minimize residue build up.

The Sasco MSS Scale was the optimal solution for several compelling reasons:

1. **Versatile Configuration:** The unit can be easily configured as either a Mud Scale or a Molasses Scale, providing flexibility to meet various needs.
2. **Compact Footprint:** With a footprint that is just 50% of traditional units, it saves valuable space without compromising on functionality.
3. **Efficient Design:** Its cylindrical design effectively minimizes flow restrictions and prevents residue buildup, ensuring consistent and accurate measurements.
4. **Integrated Test Weight Brackets:** The weigh frame includes test weight brackets, streamlining the calibration process and enhancing ease of use.
5. **Closed-Loop System:** This system ensures that the valves are always in the correct state before weighing, guaranteeing precise and reliable results.
6. **Built-In Flange Coupling:** The inbuilt flange coupling allows for straightforward and direct connection to a reference scale, simplifying calibration and verification.

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