Summary of Load Quality Distribution Shift for High-DM Supplier Loads (S7)

Category: Reference

Model: Load-Q-Dist-S7-2025

Description: This report summarizes the observed shift in load quality distributions starting 2025-08-17, where loads from supplier S7 show higher dry matter (23.4–23.9%) compared to typical levels. The report includes histograms, statistical analysis, line equipment manuals, and PSS quality specifications covering the last 6 months.

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[Histogram of DM % Distribution – Placeholder] Figure 1: Histogram of Dry Matter percentages from S7 loads (Aug 2025 – Feb 2026). *[Line Chart: Monthly Average DM % – Placeholder]* Figure 2: Monthly average dry matter content for S7 loads (Sept 2024 – Feb 2025). [image] Flowchart: Error Resolution Process

1. Introduction

This document provides a comprehensive overview of the recent shift in load quality distribution associated with supplier S7, particularly focusing on dry matter (DM) content. It is intended for operations engineers, quality analysts, and maintenance personnel responsible for overseeing raw material load consistency, equipment performance, and quality standards.

The primary objective is to analyze the cause of elevated dry matter percentages recorded from August 17, 2025, and to review relevant operational parameters, equipment performance, and process adjustments that could influence load characteristics.

2. Background and Context

2.1 Overview of Load Quality Parameters

Load quality, in this context, refers primarily to the dry matter (DM) percentage within incoming raw materials. Maintaining DM within target thresholds ensures optimal process efficiency, product quality, and equipment longevity. Typical DM targets are established per supplier SKUs and are maintained within specified tolerance bands.

2.2 Significance of Dry Matter Content

Dry matter content influences moisture levels, calorific value, and handling properties of raw loads. Variations outside established thresholds can alter process throughput, product specifications, and system downtimes.

2.3 Historical Load Data from S7

Over the past six months, load data from supplier S7 has been within expected ranges, with DM averaging approximately 21.8% ± 0.3%. Recent data indicates a notable shift where DM readings have risen to between 23.4% and 23.9%, significantly outside the historical standard deviation.

3. Load Quality Distribution Analysis

3.1 Data Collection and Methodology

The analysis involves sampling load data recorded via inline sensors during incoming material inspections. Data points are aggregated monthly, with a focus on the last 6 months. The analysis includes

generating histograms, calculating statistical parameters, and assessing variability patterns.

3.2 Histogram of Dry Matter (DM) Distribution

The following figure presents a histogram illustrating the distribution of DM percentages from loads supplied by S7, focusing on the most recent batch (post-2025-08-17).

3.3 Key Observations

- Pre-shift: typical DM levels clustered around 21.8% with a narrow distribution (standard deviation ±0.3%).
- Post-shift: considerable rightward skew toward higher DM values, with peaks around 23.4% - 23.9%.
- Increased frequency of loads exceeding the upper tolerance band (22.1% for relevant SKU).

3.4 Statistical Summary

Parameter	Pre-Shift (last 3 months)	Post-Shift (latest data)
Mean DM %	21.8%	23.6%
Median DM %	21.7%	23.7%
Standard Deviation	0.3%	0.4%
Maximum DM %	22.2%	24.1%

4. Historical Load Data (Last 6 Months)

Figure 2 illustrates the trend of average DM percentages over the past six months, indicating the onset and progression of the distribution shift.

Notable is the stable period maintained until July 2025, followed by a steady increase starting August 2025, peaking in February 2026.

Table 1 summarizes monthly statistics:

Month	Average DM %	Std Dev	Number of Loads
September 2024	21.8%	0.2%	150
October 2024	21.9%	0.3%	160

November 2024	21.8%	0.3%	155
December 2024	21.9%	0.2%	150
January 2025	22.0%	0.3%	165
February 2025	23.6%	0.4%	170

5. Line Equipment Manuals

5.1 Equipment Overview

The following major equipment lines are involved in processing and measuring raw loads from S7:

- **CUT-2000:** Rated throughput: 8.5 t/h
- **FRY-XL:** Rated throughput: 6.0 t/h

5.2 Manual Contents

Standard line equipment manuals include:

- **Installation Procedures:** Step-by-step protocols for setup, calibration, and initial start-up.
- **Operational Parameters:** Rated throughput, efficiency thresholds, and process flow descriptions.
- **Maintenance Steps:** Regular inspection schedules, lubrication points, belt tension adjustments.
- **Error Codes and Troubleshooting:** Details on common issues such as DOW-PI-45xx errors and their resolutions.

5.3 Example: Maintenance Procedure for CUT-2000

1. Ensure the equipment is powered down and lockout-tagout (LOTO) procedures are followed.
2. Inspect the screw conveyor and belt tension; adjust to manufacturer specifications.
3. Check electrical connections and sensor alignments.
4. Lubricate bearings at designated points with synthetic grease.
5. Verify calibration of throughput sensors before restart.
6. Start the unit and monitor initial load readings for consistency.

5.4 References

Refer to the latest equipment manuals version 3.2 or later for detailed

diagrams and specifications.

6. PSS Quality Specifications

6.1 SKU Targets and Tolerance Bands

SKU	Dry Matter Target (%)	Tolerance Band (%)	Fry Color Range	Defects % Tolerance
SC-9mm	21.8%	±0.3%	Gold to Light Brown	≤2%
FR-XL	22.0%	±0.4%	Golden Yellow	≤1.5%

6.2 Downgrading Protocols

If load parameters exceed tolerance levels, adherence to downgrading protocols is essential:

1. Identify the specific load batch and record measurements.
2. Classify the extent of deviation (minor, major).
3. If minor (DM within ±0.2%), adjust feed rates and re-measure.
4. If major (DM > target +0.4%), initiate load rejection and notify quality control.
5. Document the incident with date, load ID, and corrective actions taken.

6.3 Practical Example

An incoming load of S7 measuring 24.0% DM when the SKU target is 21.8% ±0.3%, triggers an immediate load rejection. The process involves halting operation, inspecting sensor calibration, and reviewing raw material conditions.

7. Error Codes and Troubleshooting

7.1 Typical Error Codes

Error Code	Description	Symptoms	Root Cause	Resolution Steps

DOW-PI-4501	Sensor calibration failure	Inconsistent load measurements, sensor alerts	Sensor misalignment or dirt accumulation	Clean sensor, recalibrate per manual, verify readings
DOW-PI-4520	Overload detected in conveyor motor	Motor overload alarms, process slowdown	Blockage or belt misalignment	Inspect and clear blockage, realign belt, restart
DOW-PI-4555	Temperature sensor fault	Temperature readings out of range	Broken or disconnected sensor wiring	Check wiring, replace sensor if faulty, reset system

7.2 Troubleshooting Flowchart

Note: Replace the placeholder image with actual flowchart diagrams in implementation.

7.3 Troubleshooting Tips

- Always verify sensor calibration before making operational adjustments.
- Monitor load variability during shift changes or maintenance activities.
- Review recent material sourcing or feed adjustments for potential causes of DM fluctuation.

8. Procedures and Protocols

8.1 Load Sampling and Measurement

1. Ensure all inline sensors are calibrated according to the schedule.
2. Record load parameters via SCADA system at entry points.
3. Sample a representative subset of loads daily, including peak load periods.
4. Log data in maintenance and quality databases.

8.2 Equipment