

Mactenn installation case study: Barley Grain Conveying Systems, Scotland.

IN BRIEF

Two systems were supplied to convey 10t/h and 25t/h over a distance of 65m horizontal and 25m vertical. The systems were 342 and 857 liter vessels with a 150mm pipe line for the smaller system and a 200mm pipeline for the larger. Both systems are located under a feed hopper with start and stop controlled in automatic by the feed hopper and silo reception level probes. The vessels are built to ATEX Dust Zone 22 Cat 3D. The system control panels are located in a safe area not far from the vessels. The systems are working very reliably with no line blockages and exceed the customer's expectation regarding transfer rate giving 12t/h for the smaller system and 29t/h for the larger system. The particular difficulty with this application was the very small reception silos offering little more than a single cycle volume and an undersized reception silo vent filter. The problem of pressure build up and filter bag damage was resolved by optimizing for low conveying pressure and low velocity while still meeting the expected transfer rate. Convey air manifold pressure regulator setting was reduced to 2.75Bar from the standard 4.0Bar giving an actual pipe line conveying pressure of just 0.9Bar. Air usage for system 1 was 14Nm³/min and for system 2 was 7Nm³/min.



MATERIAL CHARACTERISTICS

Barley & wheat grains	2-3mm
Bulk Density	550 -650 Kg/m ³
Temperature	Ambient
Moisture Content	0%
Condition	Free Flowing

SYSTEM OBJECTIVES

1. Dense phase low velocity conveying & low degradation.
2. Short delivery.
3. Reliable operation.

SYSTEM PERFORMANCE

Transfer Capacity	System 1 = 29.2t/h, System 2 = 11.9t/h
Conveying Distance	90m
Reception Points	1 feed and 1 reception point per system.

System 2 fully installed and running

IMPROVEMENTS ACHIEVED

1. Increased transfer rate.
2. Reduced compressed air requirements.
3. Low grain damage.



System 1 (342/12-6)



Single control panel for both systems



System 2 (857/12-8)