Mactenn Systems Limited
Case Study

Allen Sugar

Cleveland, Ohio, U.S.A.
March 1992

SUMMARY
Food quality components for automated transfer of sugar, dextrose and a sugar/dextrose mixture without segregation or degradation.

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CASE STUDY

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Shrewsbury, Shropshire, ENGLAND

APPLICATION FEATURE

Efficient, economical sugar and dextrose transfer without product degradation or mixture segregation

CUSTOMER	Allen Sugar Company
LOCATION	Cleveland, Ohio, U.S.A.
INDUSTRY	Food
INSTALLATION DATE	March 1992
APPLICATION	Sugar, dextrose and sugar/dextrose mixture transfer
TECHNOLOGY	Plug-flow discontinuous dense-phase
SYSTEM SUMMARY	VV/H-5 Maxflo® VQ/H-6 Maxflo® VQ/K-6 Maxflo® PHO Inflatek Valves® with food grade seals

■ SYSTEM OBJECTIVES

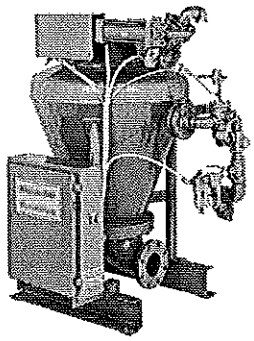
System design requirements were:

1) Transfer sugar and dextrose in a clean environment with minimal degradation of product.

2) Minimize power requirements for efficient handling while automating processes.

■ MATERIAL CHARACTERISTICS

Materials	Sugar, dextrose and sugar/dextrose mixture
Bulk Density	Sugar 801 kg/m^3
	Dextrose 721 kg/m^3
Temperature	Ambient
Moisture Content	Sugar 0%
	Dextrose: 8.1%
Transfer Requirements	11,500-27,300 kg per hour
Number of Receptions	Two to five
Conveying Distance	35-76 metres



■ SYSTEM A APPLICATION/PERFORMANCE

■ To provide transfer from the sugar/dextrose blender into two (2) package machine hoppers via a Flintflex-coated VQ/K-6 Maxflo®

Average Material Velocity	2.03 m/s
Phase Density	27.3
Air to Material Ratio	24.7 to 1
Average Air Consumption	10 nm³/min at 6-7 barg.
Product Degradation	negligible
Product Segregation	negligible

■ A model VQ/K-6 Maxflo® was supplied under the customer's vibrating hopper. A low level probe (by others) in the hopper signaled the Maxflo® that material was present causing the inlet Inflatek Valve® to open and the vessel to fill. Once the fill cycle was finished, the inlet Inflatek Valve® closed and sealed. The vessel then pressurized and the material was conveyed through 150mm pipeline to the customer's receiving hoppers via a S D Valve and End Diverter. The conveying air was cleaned and vented via bin vent filters

■ SYSTEM B APPLICATION/PERFORMANCE

■ To provide transfer from two sugar Silos to the Blender, Brown Sugar area, Powder Mill or System A packaging hopper via a Flintflex-coated VQ/H-6 Maxflo®

Average Material Velocity	1.5 m/s
Phase Density	43.2
Air to Material Ratio	16.3 to 1
Average Air Consumption	7.3 nm³/min at 6-7 barg.
Product Degradation	negligible

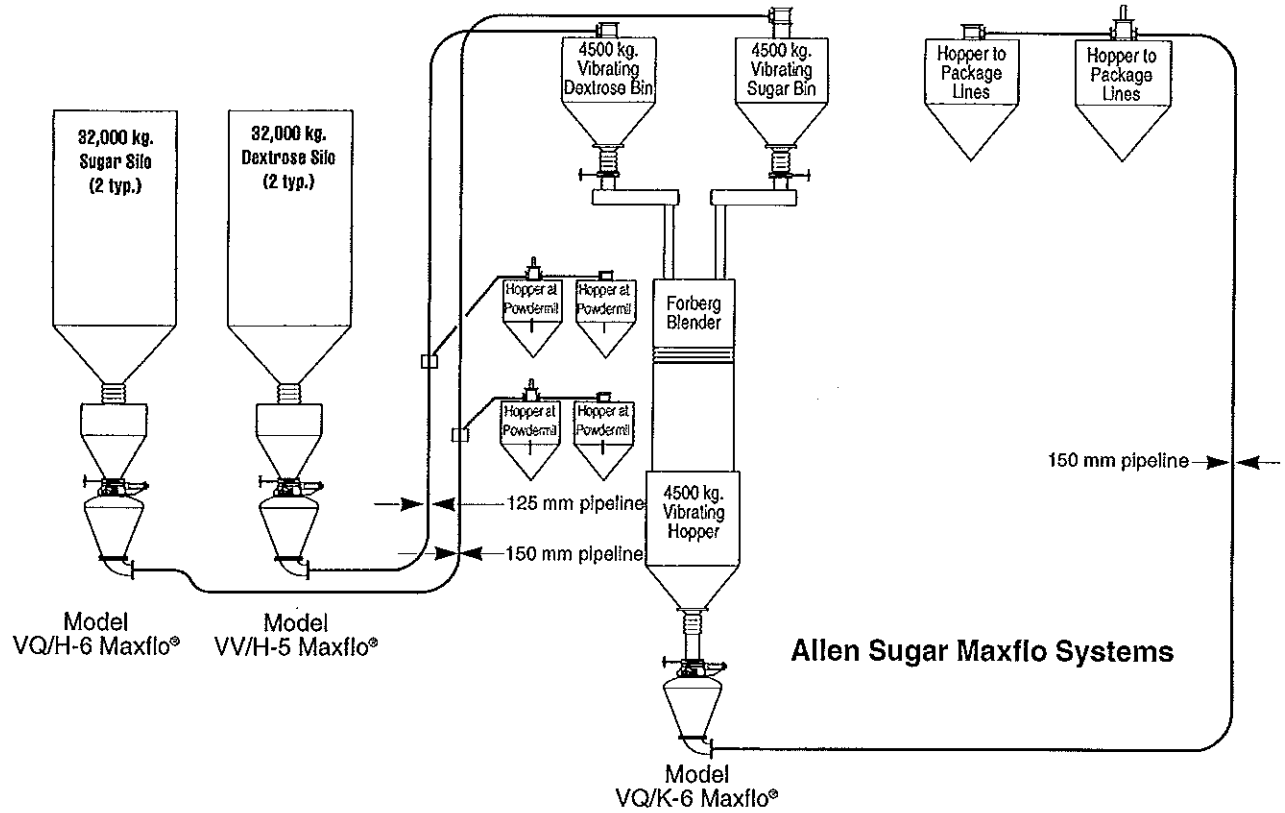
■ A model VQ/H-6 Maxflo® was supplied to receive material from the customer's two sugar silos. Low level proves (by others) signaled the Maxflo® that material was present causing the inlet Inflatek Valve® to open. Once the fill cycle is complete, the inlet Inflatek Valve® closed and sealed. The vessel then pressurized and the material was conveyed by a 150mm pipeline that was split using a switch valve to divert the material to either the customer's receiving hopper or to a hopper in the Brown Sugar area and a hopper in the Powder Mill via a S D Valve and End Diverter. The conveying air was cleaned and vented via bin vent filters.

■ SYSTEM C APPLICATION/PERFORMANCE

■ To provide dextrose transfer from two Silos to the Blender, Brown Sugar area, Powder Mill via a Flintflex-coated Model VV/H-5 Maxflo®

Average Material Velocity	6.4 m/s
Phase Density	19.4
Air to Material Ratio	25.5 to 1
Average Air Consumption	10.5 nm³/min at 6-7 barg.
Product Degradation	negligible

■ A model VV/H-5 Maxflo® was supplied to receive material from the customer's two dextrose silos. low level proves (by others) signaled the Maxflo® that material was present causing the inlet Inflatek Valve® to open. Once the fill cycle is complete, the inlet Inflatek Valve® closed and sealed. The vessel then pressurized and the material was conveyed by a 125 mm pipeline that was split using a switch valve to divert the material to either the customer's receiving hopper or to a hopper in the Brown Sugar area and a hopper in the Powder Mill via a S D Valve and End Diverter. The conveying air was cleaned and vented via bin vent filters.



SYSTEM ADVANTAGES

- Eliminates spillage and offers sterile handling of food ingredients
- Minimal food product degradation and mixture segregation
- Minimal power requirement for automated processes
- Purpose-built system design for maximum productivity

ORGANIZATION NOTES

- Mactenn® Systems Limited specializes in the design and manufacture of advanced pneumatic conveying systems and provides systems for every process industry throughout the world.
- The company provides pneumatic conveying systems representing the entire range of conveying regimes from dilute-phase to solid dense-phase. The company utilizes a unique design approach to system requirements by carefully reviewing material characteristics and system design objectives before selecting process has proven to be completely successful in satisfying customer requirements.
- The company owns and operates comprehensive manufacturing facilities, full size precontract testing facilities, full size precontract testing facilities, and performs turnkey contracts to the highest quality standards.

SCOPE OF CONTRACT

- Mactenn® Systems Limited provided complete turnkey services for the performance or this contract. The scope of supply included:
  - Manufacture, supply and installation of the new system comprising mechanical and electrical components.
  - Startup and training of operating and maintenance staff.
  - Completion of Acceptance Test

REFERENCE OF CONTACTS

- Donald Lesiak Allen Sugar Company 216/432-3222

CONTRACT PERFORMANCE NOTES

- The contract was completed on schedule and has performed to specification.
- All system objectives were achieved.