MSW processing: years of waste handling knowledge paired with technology

PROCESS EVOLUTION

Presentation by J.Bourgeois, Eng.
Sherbrooke OEM

Presentation Goal

Present some of the key design factors in a MSW process

Summary

- About OEM
- MSW processing : key components
- Example of a facility: Valoris
- Conclusion

About Sherbrooke OEM

- Founded in 1997
- American and Canadian partner
- Started as an heavy duty equipment manufacturer
- Owned a multi-material facility and research center
- No cookie-cutter: custom design

About Sherbrooke OEM

- Two facilities totalizing 72,000 sq.ft in Sherbrooke, Qc, Canada

Few customers of Sherbrooke OEM

WASTE MANAGEMENT — New York, Toronto, Tampa, Portland

CellMark — Syracuse, Birmingham, Atlanta, Pittsburgh

U.S.A. HAULING & RECYCLING INC. — Hartford, Berlin

SWS Recycling for Zero Waste — Pompano Beach, Miami, Dania Beach, West Palm beach, Lantana, Deerfield

casella

TRIBORO FIBERS A CELLMARK COMPANY

MARPAN RECYCLING

METROPOLITAN RECYCLING

LOOP PAPER RECYCLING, INC.

General Design Parameters

- Applies to all kind of waste:
  - Material composition
  - Desired Throughput
  - Labor costs
  - Disposal costs
  - End markets
- It’s all about $$$

3” minus organic waste

General Design Parameters

By use of separators, screens and sorters, divide the different types of materials in multiple streams of similar density / shape / composition

1” minus organic waste

MSW Processing

Material we have to deal with is:

- Dirty
- Sticky
- Smelly
  - Impact on sorting efficiency

MSW Tipping floor

MSW Typical composition

MSW Processing

Design Key #1: Automation

Automate as much as possible and whenever required, only use humans to perform quality control on sorted products

X-Ray and NIR optical sorter to clean the organic

MSW Processing

Design Key #2: opening the bags

- Manual vs Automation
- Trommel vs Bag opener vs Shredder
- Capacity and advantages
- Where in the process

Anti-wrapping rotor on bag opener

Kick sorting with grapple prior to feed the processing line

MSW Processing

Design Key #3: Screening

- Finger Screen
- Trommel
- Starscreen
- Pros and cons
  - Accumulation
  - Maintenance
  - Throughput

Starscreens with rubber stars for fines

Finger Screen as primary screen

MSW – Key equipment

Design key #4: Cleaning the organic fraction

- Glass
- Metals
- Others

  NIR & X-RAY

Small contaminants optically sorted from organic

MSW – Key equipment

Design key #5: plastic film vs paper vs container

- Ballistic separator
- Fiberscreen
- Optical sorter
- Film grabber
- Air vacuum

2D separator separates fiber/film/light 2D

Air Vacuum System

Mixed fiber optically sorted before manual QC

MSW – Key equipment

Design key #6: finished products

- 2-Ram baler
- Loading Docks

Dual Ram baler used to bale rejects and recyclables

Example - Valoris

- **Valoris, Bury, Quebec, Canada**
- Municipality owned landfill that wanted to increase its overall recycling rate;
- OEM designed, manufactured and installed three (3) processing lines:
  - 50 tph C&D
  - 25 tph Commercial
  - 50 tph MSW

Valoris 70,000 sq.ft facility in Bury, Qc, Canada

Example: Valoris

- **Labor:** 16 people on all three (3) processing lines
- **C&D sorted products:** metals, fines (2”-), aggregates, wood (A & B), shingles, hard plastics
- **MSW & Commercial:** Plastic film, Cardboard, Wood, Metals, Hard plastics, Mixed Fiber, Organics, PET, PE, PP, Tetrapak

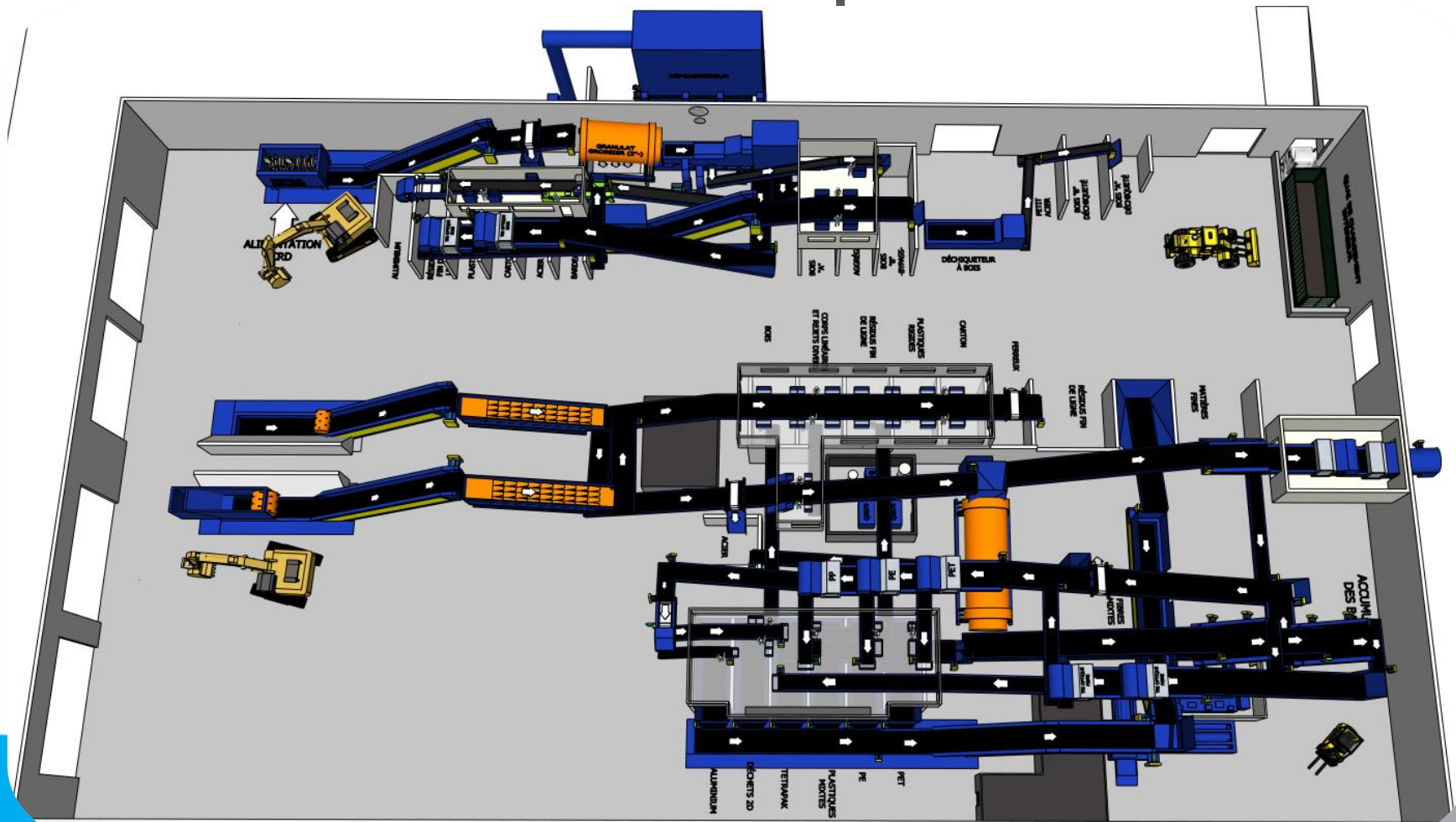
Optical sorters do the sorting, QC is made by people in HVAC rooms

Valoris – Diversion rates

- **C&D : 89 – 92%**
- **MSW : 35 - 55%**
- **Commercial: 50 - 85%**
- Diverted materials:
  - Fines, recyclables and organic fraction.
  - No Fuel/Energy production

The excavator removes the large contaminants prior to feeding the Bag Opener

Valoris – Overall process



Conclusion

- Material conditioning is key
- Automate separation as much as possible
- QC rather than sorting
- Current limitations: next technology

THANK YOU