

Recovery of Container Glass At Material Recovery Facilities



**Resource Management
Companies**

Residential Single Stream Mixed Broken Glass

Glass camouflaged by larger size material



Mixed Broken Glass Percentage

Mixed broken glass comprises approximately 15% - 20% of the total stream by weight.

Mixed Broken Glass Value

Low or negative value as raw material (3-mix)



RMC's (negative) Experience with Mixed Broken Glass (prior to 2005)

- Only one market for 3-Mix Glass when two local markets merged.....tipping fee per ton increased shortly after
- Cost escalation to \$100k per month for 1 facility
- Inability of 3rd party to handle volume produced
 - *On site backlog of 15,000 tons accumulated over a period of time*

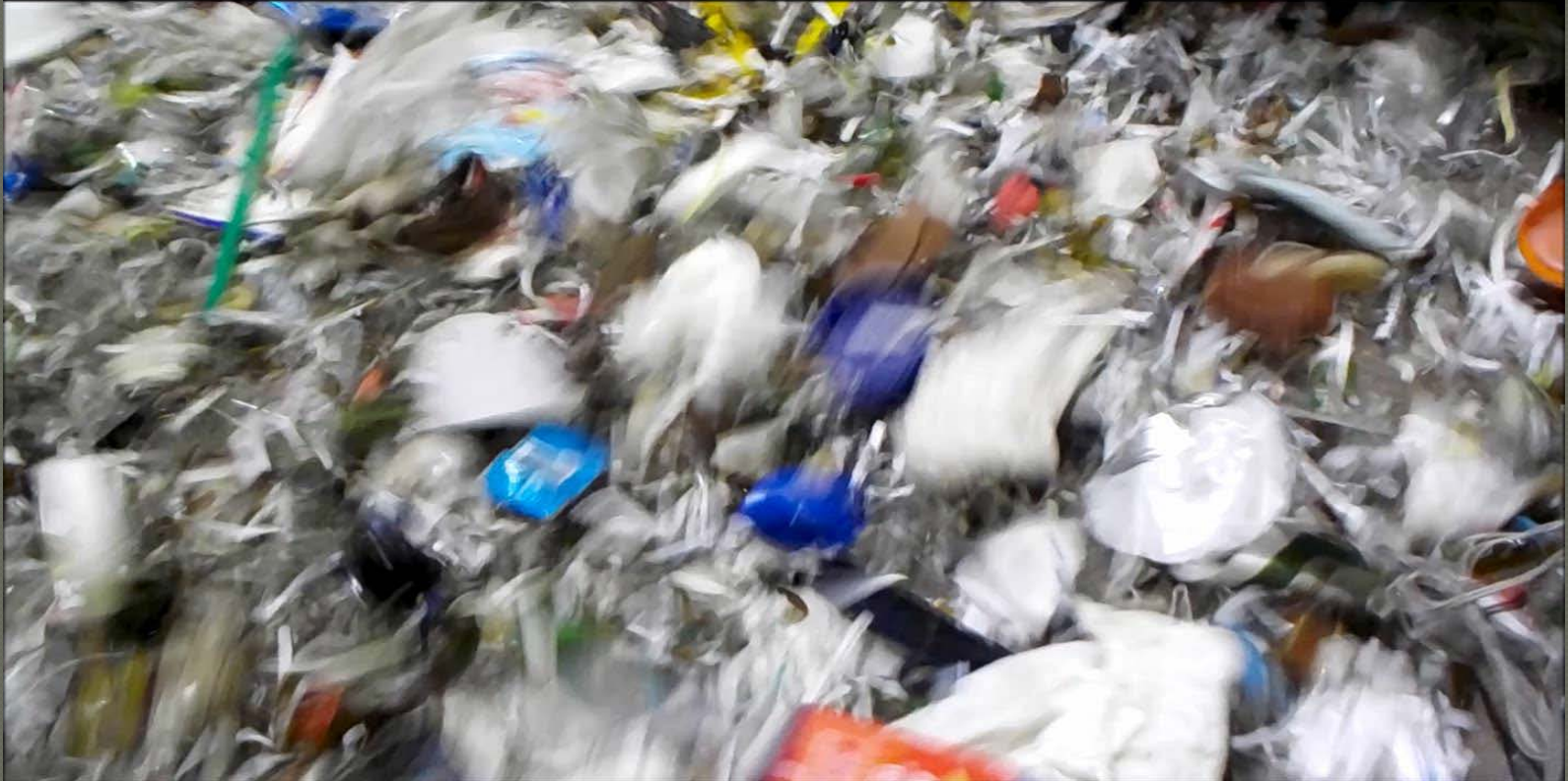
RMC's (positive) Experience with Mixed Broken Glass (post 2005)

- Ability to market processed glass to multiple markets
- No backlog of 3mix glass on site
- Relative higher market value when achieving economies of scale

Mixed Broken Glass Recovery

- 3-Mix delivered as recyclable
 - **-\$15 to -\$20 per ton ***
- ** Secondary Materials Pricing, March, 2016*
- Quality of 3-Mix dependent on MRF process
- Distance to end market locations varies

Shredded Paper With Glass



Small Object Fraction With Glass



Small Fraction With Exposed Glass



Glass Presentation



Glass Cascade



Current Markets for RMC Cullet

Furnace ready bottle cullet for sale to bottle plants



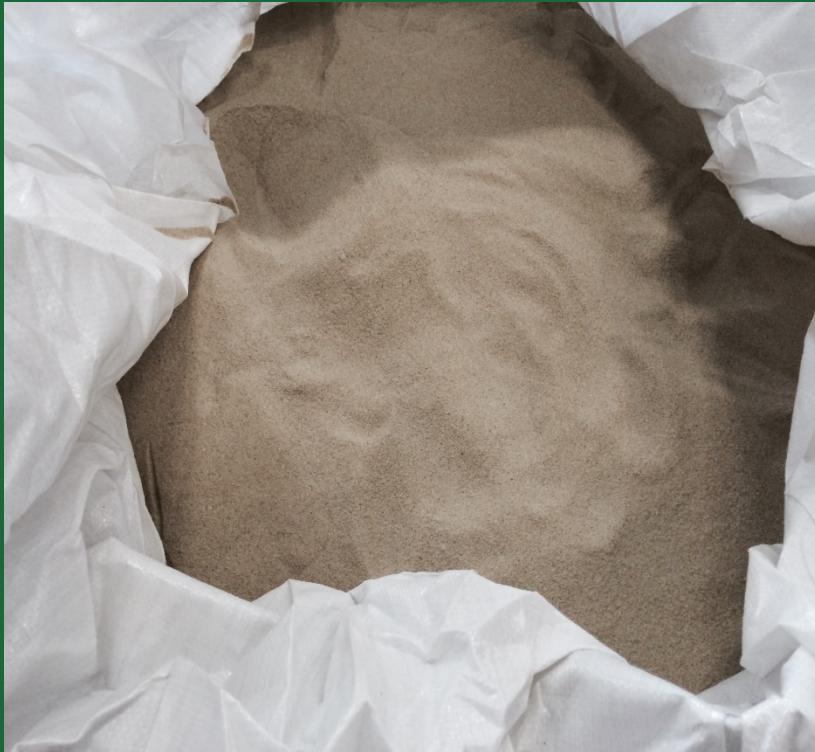
Current Markets for RMC Cullet

Minus 12 mesh finely ground cullet for sale to insulation manufacturers



Current Markets for RMC Cullet

Finely ground and screened cullet for sale to sandblast media distributors



Processing Glass in a MRF Setting: Optical Sorting Challenges

Capital intensive

- Need high volume

Costly to maintain

- Glass is abrasive

Demanding specs

- Ceramics intolerance



Processing Glass in a MRF Setting: Fine Grind Challenges

Technically challenging

- Daily lab testing
- Low moisture, low LOI
 - Incoming is 15-20% organic
 - Product spec. is 1/5 of 1%

Resource Management Companies Certificate of Analysis 9/26/14

Supplier Name: Resource Management Companies
Name of Material: Mixed Bottle Cullet
Contact Name and Phone Number: Jonathan Tigchelaar
708-425-8565

Test Results (Physical):	US Sieve No.	Specification	Actual
	+12:	10.0% max. Cumulative	0.13%
	+40:	None	59.63%
	+100:	None	90.09%
	+200:	85.0% min. cumulative	99.02%
	Moisture:	.50% maximum	0.01%

Test Results (Contamination):	Specification	Actual
Total Organics:	0.15% maximum	0.14%

Purchase Specification
Number: RB-360-02
P.O. Number: S16060-1
Material Number: 909556
Expiration Date of Material: N/A

Processing Glass in a MRF Setting: Operating Cost Challenges

Energy intensive (Gas and Electricity)



Container Glass Recycling Sustainability

Sustain mixed broken glass as a recyclable commodity & and develop regional solutions if possible.

