

Road to Waste Recovery

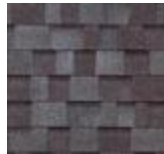
The Challenges of a new Manufacturing Plant

Trinke Vaughan
Senior Environmental and Safety Leader
Joplin Mineral Wool Plant

Owens Corning at a Glance



Owens Corning at a Glance



- Founded in 1938, an industry leader in glass fiber insulation, roofing and glass fiber reinforcements
- 2016 sales: \$5.7 billion
- 17,000 employees in 33 countries
- Fortune[®] 500 company for 63 consecutive years
- Component of Dow Jones Sustainability World Index
- 100% HRC Corporate Equality Index for 13 consecutive years
- 3 Distinct Divisions



Insulation



- Residential and commercial building and industrial insulation solutions
- Full line of fiberglass, foam and mineral wool products and systems

Composite Solutions

- World-leading producer of glass-fiber reinforcement materials for composites
- Serves diverse customers in the building and construction, transportation, wind energy, consumer and industrial markets across the globe



Roofing and Asphalt



- Serves new construction and residential repair and remodeling markets
- Specialty, architectural and traditional laminate shingles and three-tab shingles offer a style and color for every home

Sustainability at Owens Corning



Driving to be a net-positive company

1. Operations sustainability
2. Product and supply chain sustainability
3. Innovation and collaboration to deliver energy efficiency and durable material solutions at scale
4. Employee safety, health and engagement and community vitality

*Continuously shrinking our environmental footprint, and
Exponentially growing our positive handprint*

Doing our best to walk the walk



- Owens Corning is one of the largest users of recycled glass in the world, using over 1 billion pounds annually of curbside consumer containers and pre-consumer recycled glass.

- World Headquarters, located in Toledo Ohio, has the single largest solar parking lot installation in the Midwest



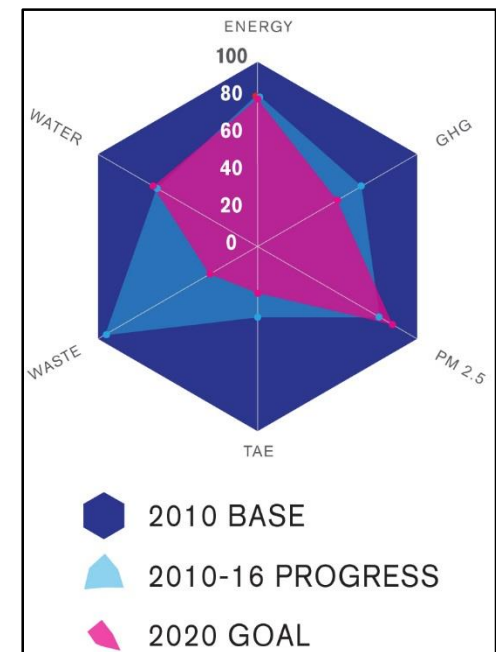
- Thermafiber Mineral Wool utilizes a minimum 70% recycled content makeup for raw material



Owens Corning 2020 Goals



Environmental Footprint	2020 Goal	2010 - 2016 Progress
Energy (Primary)	20% intensity reduction	18% intensity reduction
Energy (Consumed)	No intensity goal	17% intensity reduction
Greenhouse Gas GHG	50% intensity reduction	35% intensity reduction
Fine Particulate Matter (PM2.5)	15% intensity reduction	23% intensity reduction
Toxic Air Emissions (TAE)	75% intensity reduction	61% intensity reduction
Waste to Landfill	70% intensity reduction	5% intensity reduction
Water Consumption	35% intensity reduction	37% intensity reduction



Joplin Mineral Wool Plant



- Located in Joplin, on the Missouri / Kansas border
- 117 Acre Site
- Currently 122 employees (160 within a year)

Previous site owners

- Old Rock Distillery Company: 1911 - 1939
 - Bourbon Whiskey, peak output: 35 bbls/day
- Ozark Mountain Distilling Company
 - 1946- largest distillery west of the Mississippi
- Doane Products Co.: 1954-2006
 - Feedstock and pet food
- Mars Petcare: 2006 to 2013

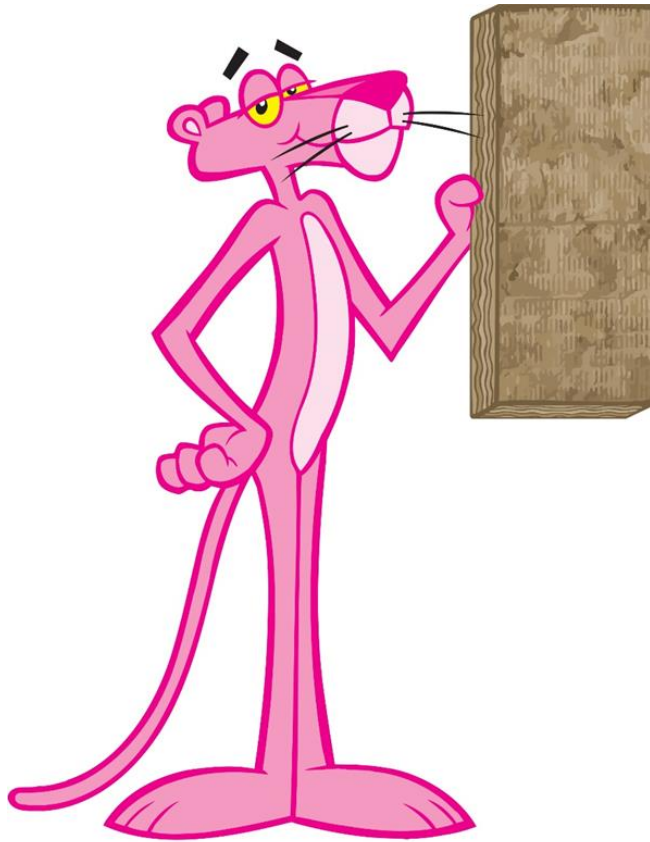


What is Mineral Wool?



Insulation made from melted, fiberized rocks

- Excellent sound absorption, fire resistant, high-temperature stable, water resistant
- Non-combustible, inorganic, mold resistant
- Uses: Ceiling tiles, cubical walls, fire stopping, steam lines, boiler insulation, hydroponics
- Installed in 6 of the 12 tallest buildings in the world, including One World Trade Center in NYC



Joplin's Solid Waste Streams



- Rock Fines (slag and coke)
- Iron – generated from cleaning out the furnace
- Shot – mixture of melted rock and fibers
- Sand
- Used mineral wool filters
- Residual ash from pollution control equipment
- De-dusting dust
- Under spec finished goods



Slag: waste product from iron ore separation

Losses through the process



Yard Loss – Good rocks, could be sold or re-used.

Furnace Losses – Moisture and volatile losses cannot be recycled. Iron could be collected and sold. Pit losses cannot be recycled. Fly ash from exhaust treatment cannot be recycled, but could be sold if a buyer is found.

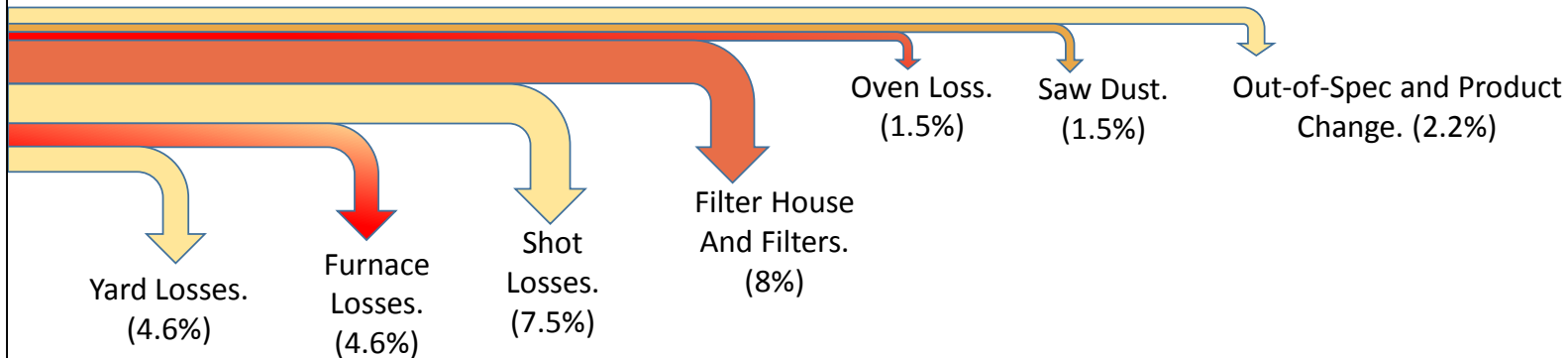
Shot Loss – Trialing a process to make bricks to be re-used in the process.

Filter House Losses – Currently not recycling or re-using

Oven Loss – Small part can be added to Shot Loss and bricked. Most is exhaust and cannot be recycled.

Saw Dust – Currently not recycling or re-using

Out of Spec Product – Could be re-introduced if equipment were provided. Could be bricked if permit would allow.



Challenges of Waste Reduction / Recycling



- New to the area/region
 - Sourcing vendors / service
- New Facility / Industry
 - Extra waste generated prior to stabilization...”working out the kinks”
 - Understanding our waste streams and potential outlets for recycling/re-purposing
- Limitations due to environmental permit restrictions
- Current binder recipe makes it difficult to recycle mineral wool

Where we are winning

- Exploring Briquetting
 - Use our shot waste: re-melt and form into bricks to be re-introduced into the furnace
- Alternative Binder Recipe – more environmentally friendly
- Outreach
 - Green Team
 - Plant-wide recycling program
 - Nature trail
 - Pursuing Wildlife Habitat Council Certification



Thank you!

