



Water Conservation at Grede – St. Cloud

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Driven to DiscoverSM

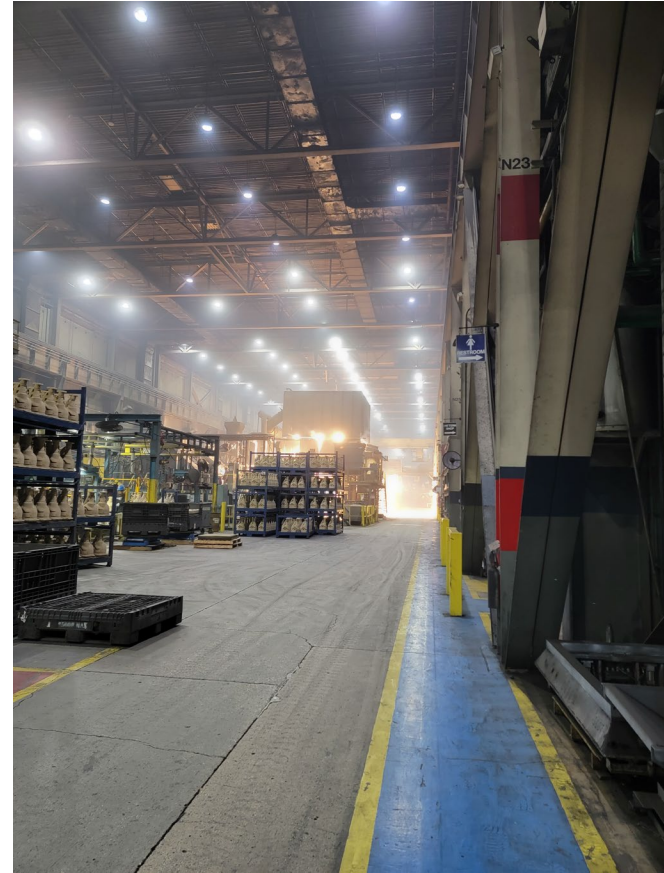
Company Background



- Saint Cloud, MN
- 350,000-square-foot facility
- 360 employees
- Multiple grades of ductile iron

Incentives to Change

- **Committing to sustainability**
 - Gold Flag 2022 award
 - IATF certificate
 - ISO 14001 certificate
- **Engaging in continuous improvement**
- **Reducing cost**



Casting Process

- Step 1: Preparing sand



Prepare
sand



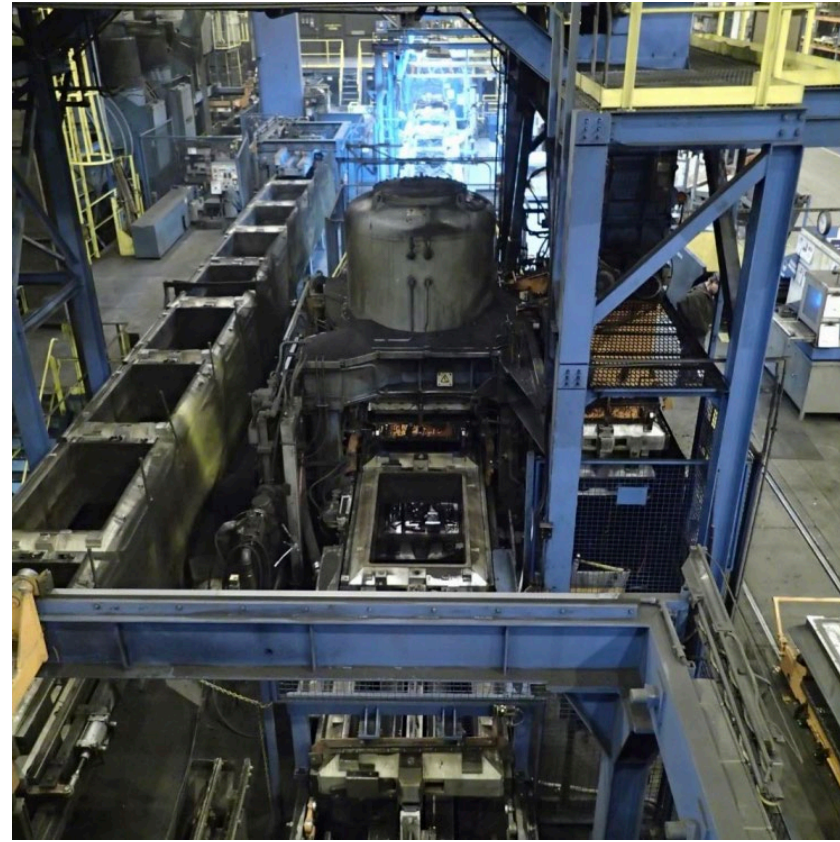
Casting Process

- Step 2: Making cores and molds



Prepare
sand

Core &
mold



Casting Process

- Step 3: Melting and pouring metals



Prepare
sand

Core &
mold

Melt &
pouring

Casting Process

- Step 4: Cooling and shakeout



Prepare
sand

Core &
mold

Melt &
pouring

Cool &
shake-out

Casting Process

- Step 5: Cleaning and inspecting



Prepare
sand

Core &
mold

Melt &
pouring

Cool &
shake-out

Clean &
inspect

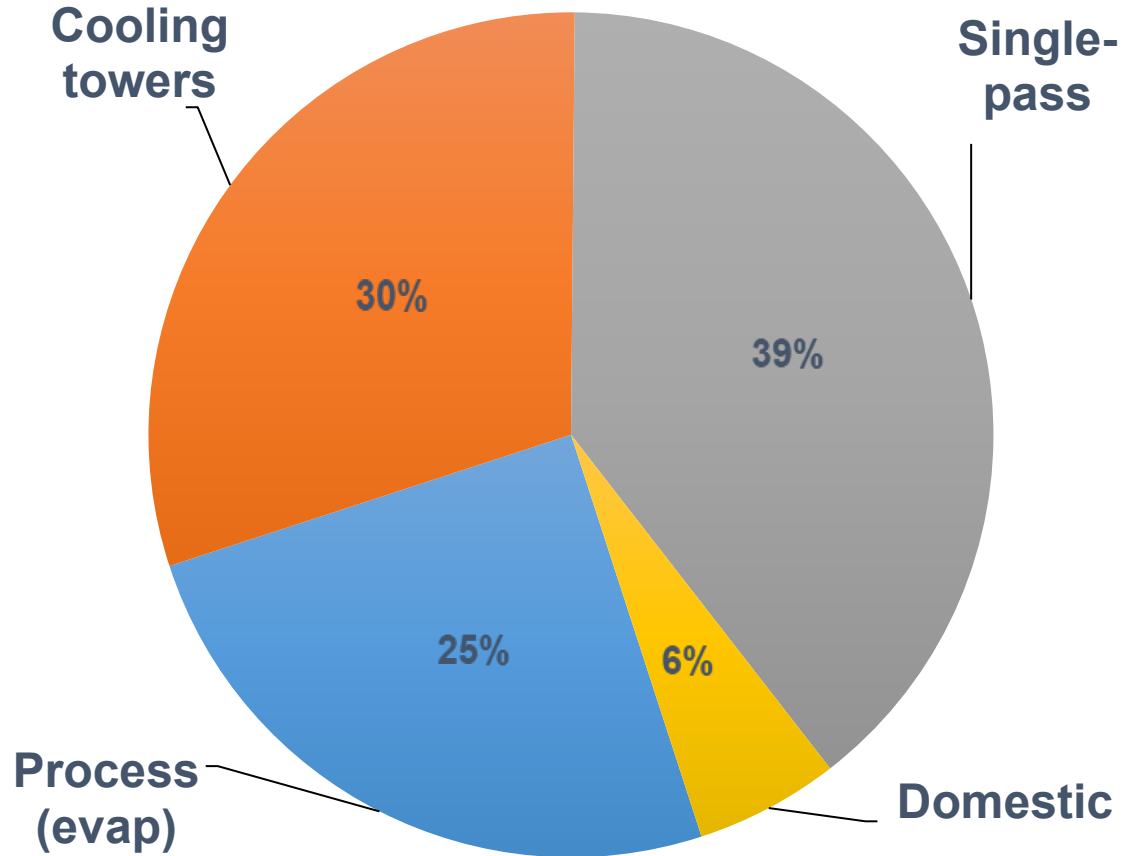
Water Mapping

- Collected consumption data
- Did research
- Interacted with supervisors, staff, and contractors
- Identified uses of water
- Created water distribution and balance diagrams
- Identified water reduction solutions



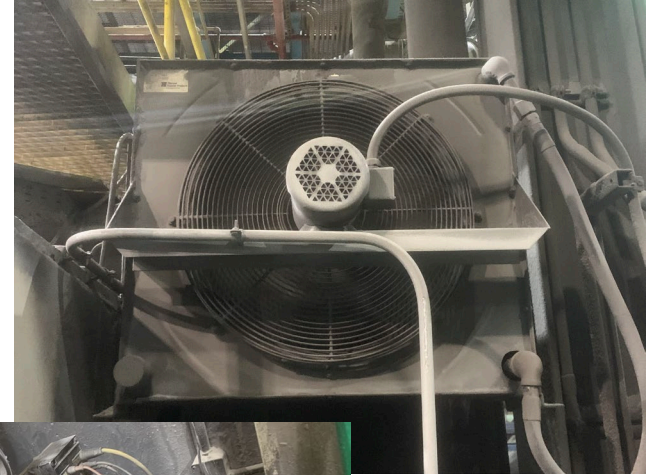
Water Mapping

- 39 million gallons used
- 11.5 million gallons of process and domestic water
- 26.5 million gallons of opportunity



Core Machine

- Replace water-cooling unit with a fan/ air-cooling
- Conserve 1,500,000 gallons of water
- Save \$13,000 per year
- Wait until December for implementation



Core Machine

- Turn off on weekends until implementation
- Conserve 250,000 gallons of water
- Project to save \$4,000 until December or \$1,000 a month
- Assign shut down to intendant on last shift



Impactor

- Replace water-cooling unit with a cooling fan
- 1,400,000 gallons of water
- \$11,000 per year



Solutions

Recommendation	Annual water reduction	Total cost	Annual savings	Payback period	Status
Air-cooling unit for Core machine	1,500,000-gal	\$2,500	\$13,000	2.5 months	Implementing
Air-cooling units for Impactor	1,400,000-gal	\$2,500	\$11,000	2.6 months	Implementing
Turn off L40	250,000-gal	\$0	\$4,000	0 months	Implemented
Deduct meters on cooling towers	8,000,000-gal deducted from bills	\$3,000	\$32,000	1.5 months	Recommended
Heat exchanger for 15-ton furnace & N. Kloster	2,875,000-gal	\$30,000	\$23,000	16 months	Recommended

Solutions

Recommendation	Annual water reduction	Total cost	Annual savings	Payback period	Status
Send water S. Kloster to sand room	1,900,000-gal	TBD	\$15,000	TBD	Recommended
Cooling tower for BMD hydraulics cooling	5,800,000-gal	TBD	\$45,500	TBD	Recommended
Replace 4 cooling towers with 4 heat exchangers	11,000,000-gal	TBD	\$90,000	TBD	Recommended

Personal Benefits

- Hands-on experience
- Problem solving & business management skills
- Make a difference
- Casting knowledge

