FROM BILLET TO BUILDING

THE LIFE OF CURTAINWALL

The construction of high-performance building envelopes is a multi-step process, starting with raw materials such as aluminum billets and glass silica, and results in prefabricated curtainwall unit assemblies that are hung from the building structure, most often the floor slabs. This process requires a network of material vendors, processors, fabricators and installers to coordinate diligently.

In the five-part video series From Billet to Building, the Advanced Technology Studio of Enclos animates each step, culminating in several installation strategies.

Part 1: Part Manufacture and Fabrication

Part 2: Float Glass

Part 3: Insulated Glass Unit

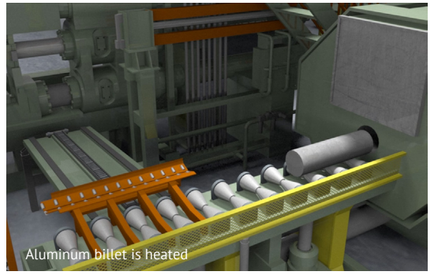
Part 4: Curtainwall Assembly

Part 5: Curtainwall Installation

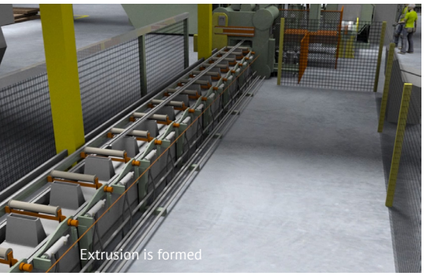
To view the animations, please visit https://vimeo.com/enclos.

Part 1:
Part Manufacture and Fabrication

- Aluminum billet to extrusion
- Extrusion stretching
- Paint treatment
- Anodizing treatment
- Part fabrication and machining

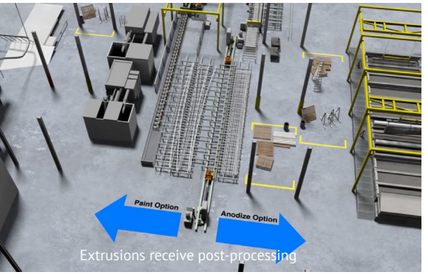

Aluminum billet is heated


Billet is pressed through custom die


Extrusion is formed


Extrusion is subjected to a controlled stretch


Extrusions are cut

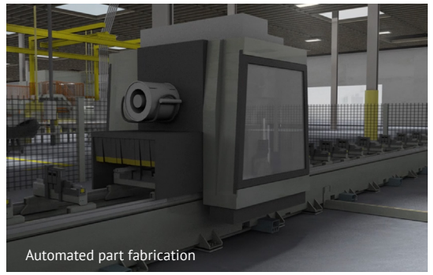


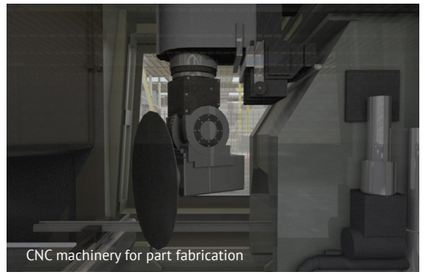
Extrusions receive post-processing


Painting line


Anodizing process

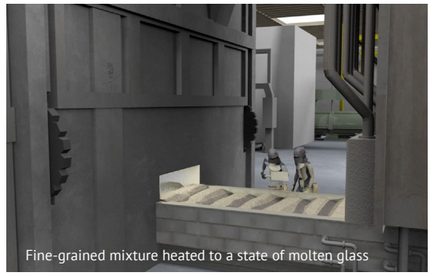

Manual part fabrication

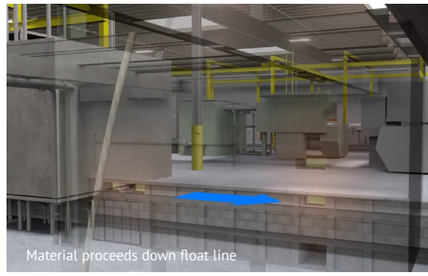

Automated part fabrication

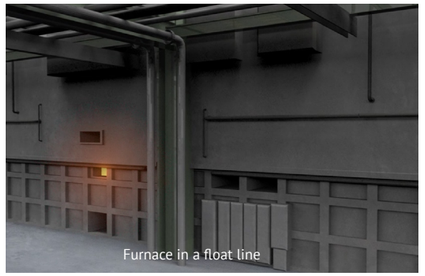

CNC machinery for part fabrication

Part 2:
Float Glass

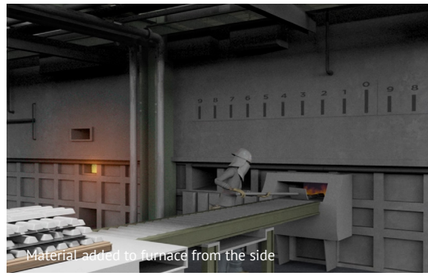
- Raw materials heated to a molten state
- Molten glass floats atop a bath of molten tin before proceeding down the float line

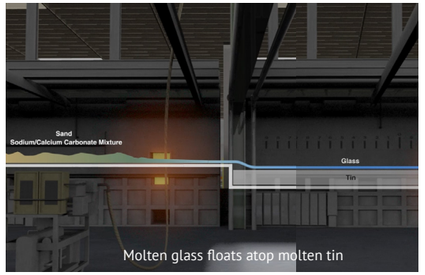

Fine-grained mixture heated to a state of molten glass


Material proceeds down float line


Furnace in a float line

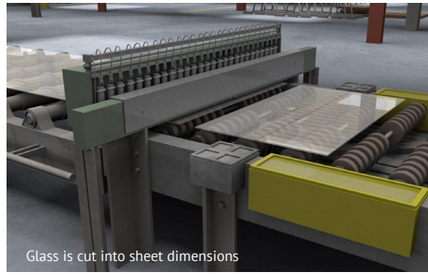

Molten tin bath


Material added to furnace from the side



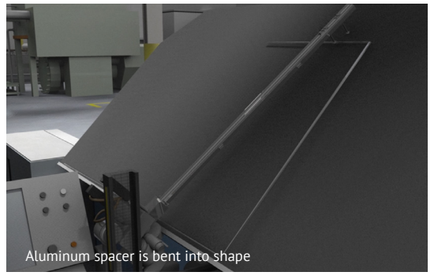
Molten glass floats atop molten tin


Glass exits furnace onto rollers in a continuous ribbon


Glass is cut into sheet dimensions

Part 3:
Insulated Glass Unit

- Aluminum spacer is bent into shape
- Spacer is filled with desiccant
- Primary seal is applied to the spacer
- Spacer is placed between two panes of glass
- Unit is then sealed along the edges


Aluminum spacer is bent into shape


Spacer is filled with desiccant


Primary seal is applied to the spacer

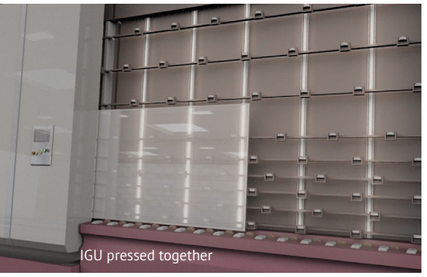

Spacer is carefully placed on first pane

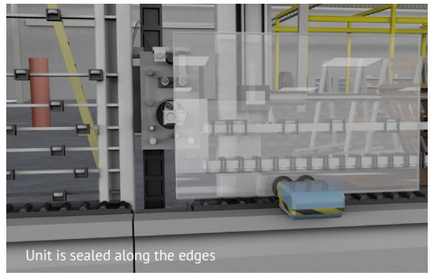

Second pane placed against spacer

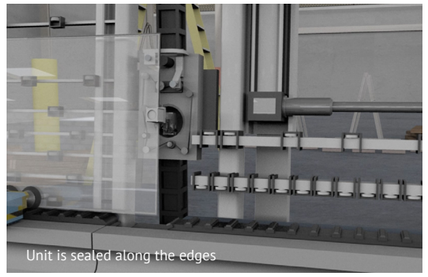

IGU is sealed into frame

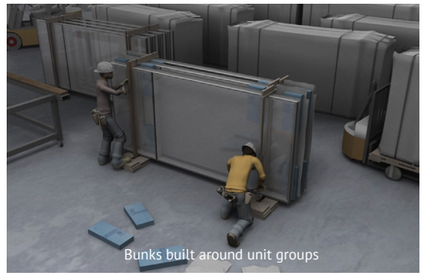

Finishing details are attached to assembly


Units are moved from assembly to bunking


IGU pressed together


Unit is sealed along the edges


Unit is sealed along the edges


Bunks built around unit groups

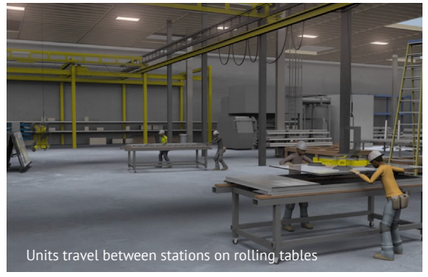

Protected bunks are placed on flatbed truck


Units are transported from shop to project site

Part 4: Curtainwall Assembly

- Insulated glass unit (IGU) installed into aluminum unit frame
- Sealant quality is carefully documented for Quality Assurance
- IGUs are sealed to the aluminum frame
- Final details attached to unit frame
- Completed units are bunked for storage while awaiting shipment to project site


Extrusions fastened into aluminum unit frame


Units travel between stations on rolling tables

Part 5: Curtainwall Installation

- Unloading of materials on-site, lifting or moving to their designated floors
- Sequence: survey & layout, anchor installation and unit installation
- Unpack and prepare units for installation
- Attachment of exterior components such as sunshades


Bunks are delivered to site and offloaded to hoist

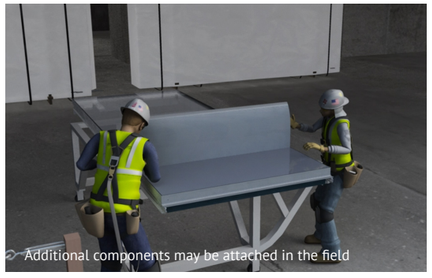

Unit bunks are lifted to their designated floors


Overhead cranes and suction cups are used


Insulated glass unit placed onto aluminum frame


Quality control of sealant


Units unpacked and prepared for install


Additional components may be attached in the field


Unit installation: floor crane method (pictured)