



// BUILDING PRODUCTS • RIGID PVC • HYBRID RUNNER • AUTOMATION

# One PVC part instead of two — and a cell built to run it.

A building-products manufacturer needed a molder willing to run rigid PVC on a five-foot part with a 0.093-inch wall. API consolidated their two-piece assembly into one molding in a larger mold fed by an eight-drop hybrid hot/cold-runner system — then built the automated cell, with six-axis robotic removal, that produces it.

ILLUSTRATION OF AN AUTOMATED MOLDING CELL — NOT A PHOTOGRAPH OF THE API PLANT

**2 → 1**

MOLDED PIECES  
PER COMPONENT

**5 ft**

PART LENGTH • 0.093 IN WALL  
±1/8 IN STRAIGHT OVER 60 IN

**8 drops**

HOT MANIFOLD TO COLD RUNNERS  
4 CAVITIES • 1,200-TON PRESS

**1 cell**

PRESS • SIX-AXIS ROBOT •  
CONVEYOR • DUAL GRANULATORS

## // THE SITUATION

**A building-products manufacturer needed a molder that would run rigid PVC.**

A national building-products manufacturer was looking for a molder that would run rigid PVC — a material most shops decline — and brought the part to Autronic Plastics.

The component is an exterior-grade rigid-PVC frame section 5 feet long, 5 inches wide, and 3/8 inch tall, with a 0.093-inch wall, ribs at two-thirds of that, and under two pounds of material spread over a 60-inch flow path. Their incumbent molders produced it as an assembly: two shorter moldings joined in a secondary operation — two parts to mold and handle, a joint to control and inspect, and an assembly step standing between the press and the box on every unit, every shift.

## // THE CHALLENGE

**Rigid PVC, five feet of flow, and a hot manifold.**

PVC's processing window is narrow. Not hot enough and the part will not fill; slightly too hot, or too long in the barrel, and the resin degrades — releasing hydrochloric acid that attacks ordinary screws, barrels, and tool steels. Add five feet of flow through a 0.093-inch wall, ribs thinner still, and ±1/8 inch of straightness over 60 inches, and one gate cannot do the job: the part needs multiple gates along its length — a hot manifold.

Almost no molder runs PVC through a hot runner. API does, with a hybrid system: an eight-drop hot manifold feeding cold sub-runners in a four-cavity mold on a 1,200-ton press. The hardest part is keeping the manifold in a tight thermal band — monitored continuously, serviced on schedule — so the resin never degrades in the runner system. Twenty-five years of molding PVC alongside engineering resins is why the part came here.

## // PROGRAM SNAPSHOT

### INDUSTRY

Building products (exterior-grade)

### MATERIAL

Rigid PVC — molded at API for 25 years

### PART

60 × 5 × 3/8 in • 0.093 in wall • under 2 lb • ±1/8 in over 5 ft

### TOOLING

4-cavity hybrid mold, 8 hot drops to cold runners • API tool room

### PRESS & CELL

1,200-ton Haitian • six-axis robot • conveyor • dual granulators

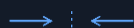
## From a two-piece assembly to one molded part

FIG. 01 • SCHEMATIC, NOT A CUSTOMER DRAWING

### // BEFORE — PRIOR MOLDERS

**2 molded pieces**

Secondary assembly operation



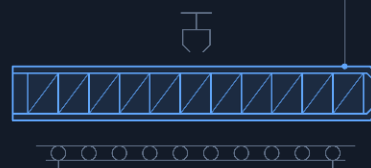
Assembly joint

TWO MOLDINGS • JOINED AFTER MOLDING

### // AFTER — API

**1 molded rigid-PVC part**

No joint, no assembly



Six-axis robot removal, conveyor

FULL 5 FT • ONE SHOT • LARGER MOLD • 8 DROPS

Before: an assembly of two shorter molded pieces joined in a secondary operation. After: a single five-foot rigid-PVC molding — no joint, no assembly — filled through an eight-drop hybrid hot/cold-runner mold in a larger tool, removed by a six-axis robot, and transferred by conveyor.



// WHAT API CHANGED

## Three decisions, made under one roof.

### 01 — Part consolidation

#### Two pieces became one molding.

API's engineers re-designed the component as a single rigid-PVC part — the full five feet in one shot, from a larger mold. No joint to inspect, no second piece to mold, store, and marry up; the assembly step disappeared from the process rather than being automated.

### 02 — Hybrid hot/cold runner

#### A mold engineered around PVC and length.

An eight-drop hot manifold feeds cold sub-runners in a four-cavity mold, so each five-foot part fills in balance from more than one gate without a runner the size of the part. Most molders will not run PVC through a manifold — it must be held in a tight thermal band and serviced on schedule so the resin never degrades. Built in API's own tool room, the mold is maintained there for the life of the program.

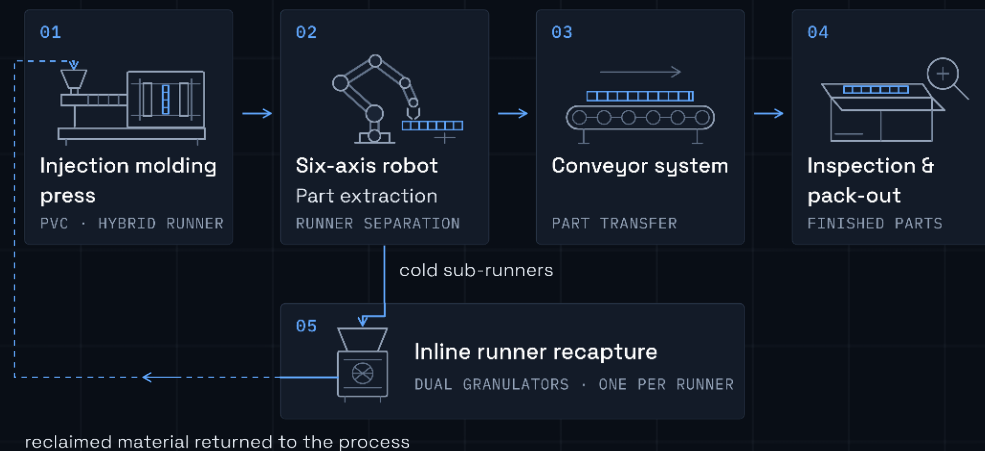
### 03 — An automated cell

#### Robot, conveyor, and inline runner recapture.

A six-axis robot extracts each shot and separates the cold sub-runners. Parts ride a conveyor to inspection and pack-out; the runners feed a dual granulating system — one grinder per runner stream — and return to the process instead of leaving the cell as scrap.

### The automated cell

FIG. 02 • PROCESS SCHEMATIC



Press with hybrid hot/cold-runner tooling, six-axis extraction with sub-runner separation, conveyor transfer, then inspection and pack-out. The cold sub-runners take the lower loop: dual inline granulators, one per runner stream, reclaimed into the process.

// WHAT IT DELIVERED

## Fewer parts, fewer steps, one repeatable path.

- ✓ **One part number where there were two**  
Simpler bill of materials, simpler inventory, and no joint to qualify or inspect.
- ✓ **Repeatable handling, shift after shift**  
Robotic extraction and conveyor transfer give every part the same path from mold to box, in a plant that runs three shifts.
- ✓ **A secondary operation removed**  
The assembly station, its handling, and its scrap stream are gone from the process — not just moved.
- ✓ **Runner mass minimized, the rest reclaimed**  
The hot manifold removes most of the runner; the remaining cold sub-runners are granulated inline, one grinder per stream, not scrapped or trucked offline.

**Where this applies.** Rigid PVC and other corrosive or flame-retardant resins, including programs moving from FR-ABS or FR-polycarbonate to PVC; long, thin-walled parts that call for multi-gate hot-runner tooling; two-piece assemblies that should be one molding; high-volume building-products programs that need robotic extraction, conveyor transfer, or secondary operations designed out — molded in Central Islip, New York.

// START A CONVERSATION

### Have a PVC part, or a two-piece assembly that should be one?

Send the print, a 3D model, or a sample part. An API engineer reviews every inquiry — material, tooling, and automation together. Confidential information has been handled under non-disclosure practice since 1953.

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