

CNC programming and toolpath generation

Automatically generates optimized CNC toolpaths from design files, validates material specifications, and sends machine-ready G-code to production equipment. This reduces programming time by 75% and minimizes material waste through intelligent nesting and cutting optimization.

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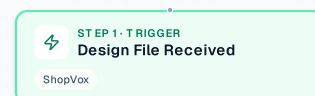


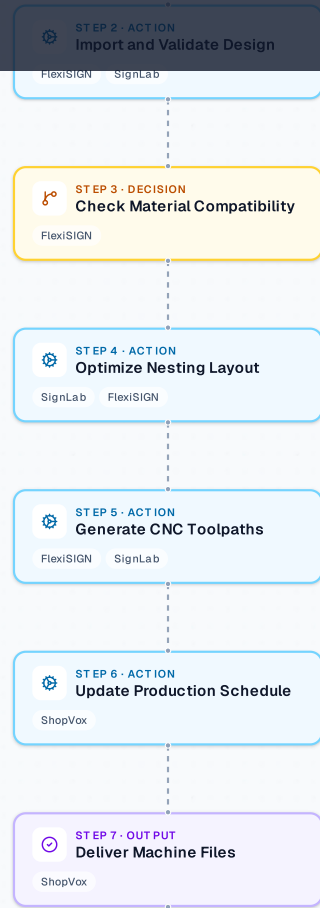
WORKFLOW TRIGGER

Design file uploaded to production queue in ShopVox

Visual Flow

Each node represents an automated step. Connections show how data and decisions move through the workflow.





Step-by-Step Breakdown

Detailed explanation of each automated stage in the workflow.

1

⚡ TRIGGER

Design File Received

Production order with design specifications is submitted through the shop management system. File format and job requirements are captured for

2

 ACTION

Import and Validate Design

Design file is automatically imported into CNC software and validated for manufacturing compatibility. Vector paths, dimensions, and material requirements are verified.

FlexiSIGN

SignLab

3

 DECISION

Check Material Compatibility

System evaluates if the design specifications match available material thickness and cutting capabilities. Routes to manual review if incompatible materials are detected.

FlexiSIGN

4

 ACTION

Optimize Nesting Layout

Multiple job pieces are automatically arranged on material sheets to maximize usage and minimize waste. Cutting sequence is optimized for efficiency and tool wear.

SignLab

FlexiSIGN

5

 ACTION

Generate CNC Toolpaths

AI Business OS

Cutting paths, feed rates, and tool selections are automatically calculated based on material type and design complexity. G-code is generated with safety margins and quality settings.

FlexiSIGN

SignLab

6

 ACTION

Update Production Schedule

Estimated cutting time and material usage are calculated and sent back to the shop management system. Production queue is automatically updated with job status.

ShopVox

7

 OUTPUT

Deliver Machine Files

Optimized G-code files are automatically transferred to the designated CNC machine queue. Operator receives cut sheet with material specifications and setup instructions.

ShopVox



Outputs

- Optimized G-code files for CNC machines

- Material nesting layouts with waste calculations

AI Business OS

- Production time estimates and job scheduling updates



Key Metrics

- Material utilization percentage
- Programming time reduction
- Toolpath optimization score



Tools & Integrations

- ShopVox
- FlexiSIGN
- SignLab

AI Business OS

Actionable AI implementation strategies for business leaders ready to transform their operations.

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