



# Automatic Cutting Path Tracking

**Plasma-Cutting Robot System**

It involves instantly melting the workpiece using high-energy plasma, and then cutting it by blowing high-pressure gas.



6.5 mm thick H-beam: High-speed cutting

## Reasons to choose plasma cutting

### Thick plate cutting

### "Operating Costs, Productivity, Quality"

- Can be introduced with lower investment compared to lasers
- High **productivity** through high-speed cutting
- Smooth and straight cut surfaces

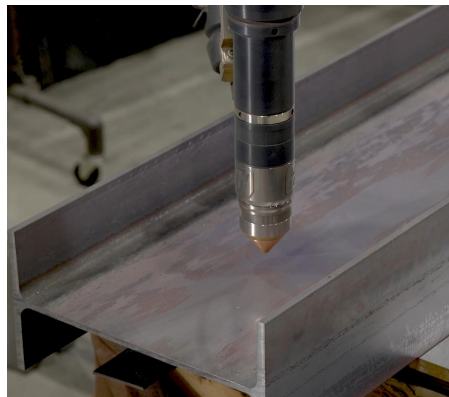
Want to automate plasma cutting to boost **productivity**...

1. Difficult to set cutting conditions
2. Difficult to operate robots and cutting processes
3. Difficulty adapting to workpiece misalignment

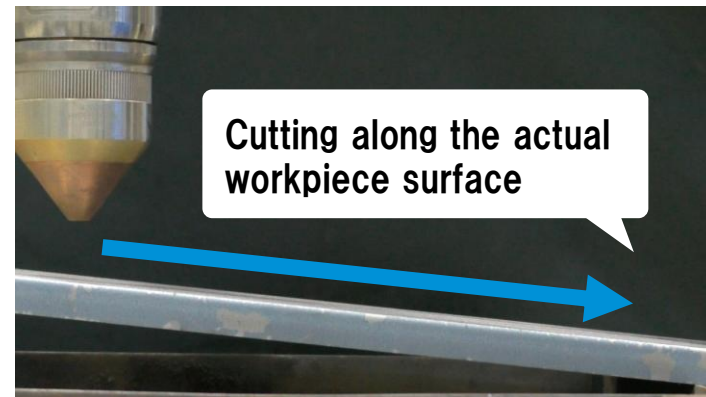
▶ **Plasma cutting robots provide support**



1. Automatic cutting condition setting



2. Automatically Execute Start Operation



3. Height control compensates for misalignment

## 1. Simple Condition Setting

The screenshot shows the 'AS 溶接開始' (AS Welding Start) window. The '溶接機' (Welder) is set to '1:WID01' and 'PlasmaXPR'. The '条件ファイルID' (Condition File ID) is '0'. The '加工方法' (Processing Method) is '切断' (Cutting). The '材質' (Material) is '軟鋼' (Mild Steel). The 'プロセスID' (Process ID) is '1153'. The '板厚' (Plate Thickness) is '30mm'. The '速度' (Speed) is '2837 mm/m'. The '電流' (Current) is '170A'. The '電圧' (Voltage) is '130V'. The 'ガス' (Gas) is 'O2/Air'. The 'シールド' (Shield) is '77psi'. The 'ヒースガス' (Heating Gas) is '45psi'. The 'ロボット動作番号' (Robot Action Number) is '0'. The 'トーチ保護' (Torch Protection) is '無効' (Invalid). The 'ランタウナー保護' (Lantern Protection) is '無効' (Invalid).

Below the settings, there is a table of recommended conditions:

プロセスID	ガス種	板厚(mm)	電流	カテゴリ	最小コンソール
1153	O2/Air	13mm	170A	1	Core
1202	O2/N2	13mm	300A	3	Core
1254	O2/Air	13mm	220A	1	Core
1105	O2/Air	14mm	130A	2	Core
1153	O2/Air	14mm	170A	1	Core
1202	O2/N2	14mm	300A	3	Core
1251	O2/Air	14mm	220A	1	Core
1105	O2/Air	15mm	130A	2	Core
1153	O2/Air	15mm	170A	1	Core
1201	O2/Air	15mm	300A	1	Core
1251	O2/Air	15mm	220A	1	Core
1105	O2/Air	16mm	130A	2	Core
1153	O2/Air	16mm	170A	1	Core
1201	O2/Air	16mm	300A	1	Core
1251	O2/Air	16mm	220A	1	Core
1105	O2/Air	17mm	130A	2	Core

At the bottom, there is a note: '推奨値 - 170A - O2/Air - 切断 (Core, WtOptMx)'.

Over a dozen types of processing conditions

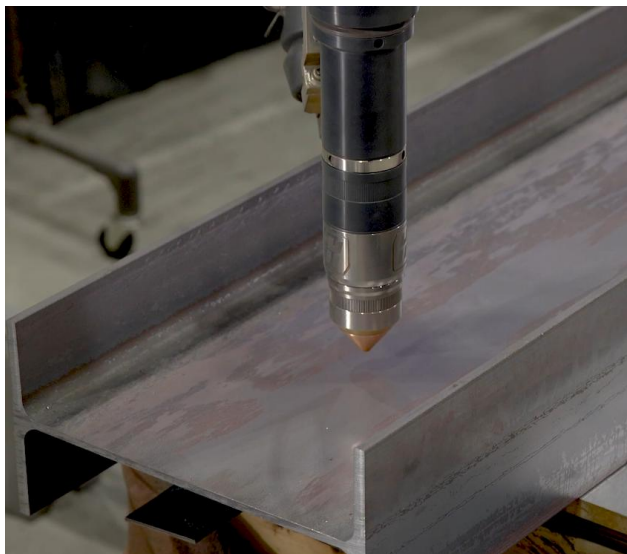
Recommended conditions are displayed for each plate thickness, Automatically input complex processing conditions

Select plate thickness and finish condition (category)  
▶ Setting complete !

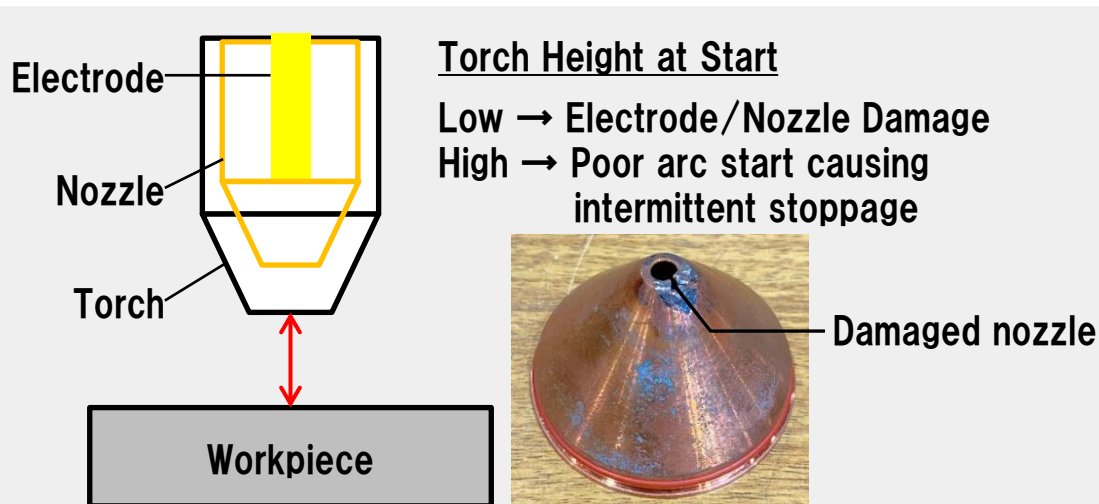
Category 1: Optimal balance of cost and performance  
Category 2: High-quality finish  
Category 3: Fast Cutting Speed

## 2. Start Operation Generation Function

Automatic generation from ignition to pilot hole and main cut initiation



Start Operation Generation Function



**Extended service life of consumables •  
Reduction of short-circuit stops**

## 3. Height Control Function

Automatically adjusts torch height in real time based on workpiece position

Plasma cutting

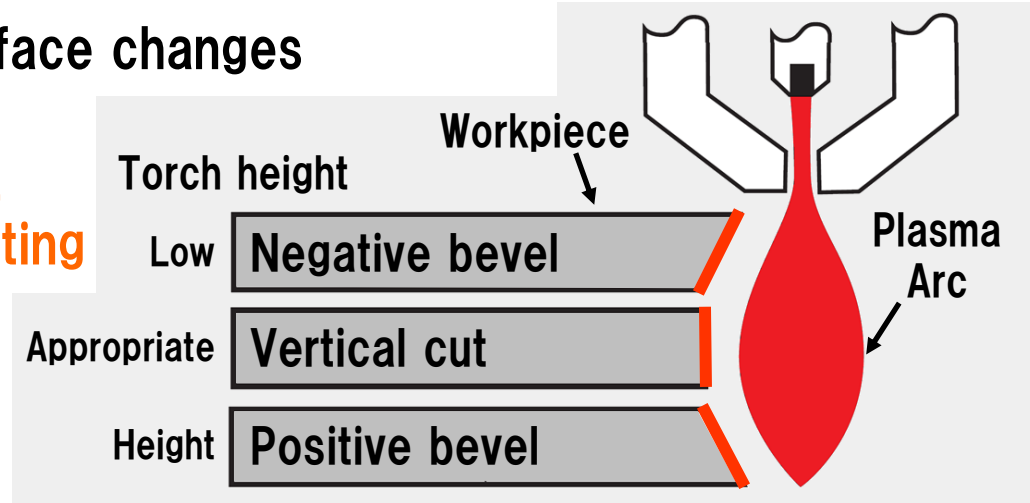
The shape (angle) of the cut surface changes with torch height

Maintain a constant torch height

► Essential for high-quality cutting



Achieves a clean cut surface



Cutting surface when torch height changes

# Demonstration: Plasma Cutting of Thick Plates



**Bevel Cutting**



**Marking**

**Workpiece**

**Material: Mild Steel  
(SS400, Black Skin)  
Plate Thickness: 12 mm**



**Daihen's plasma cutting robot system achieves improved cutting productivity.**



DAIHEN