



## Tool Life Testing

### SIO Case Study # 1 : ROBODRILL – ROBODRILL Continuous Drilling

ROBODRILL Continuous Drilling # 1							
Machine		ROBODRILL α-D14MiB5 (FANUC)					
Coolant		Water Soluble					
Tool		AD-4D φ6.1 (OSG)					
Process Notes		Outer coolant nozzles only, hole depth 30 mm					
Workpiece		F-S55C (406)					
SIO	RPM (min <sup>-1</sup> )	Feed Rate (mm/min)	Cut per tooth (mm/rad)	Tool Life (mm)	Drilling Process	Evaluation	
Without SIO <small>(Client's original process conditions)</small>	2700	377	0.07	69,000	Step	-	
<b>With SIO</b>	3500	565	0.16	116,000	Non-step (continuous)	Excellent	
Rate of Improvement		1.3 times	1.5 times	2.3 times	1.7 times		

Note: Even after increasing speed and feed rates from baseline tool life was improved by **1.7 times**.

### SIO Case Study # 2 : ROBODRILL – ROBODRILL Continuous Drilling

ROBODRILL Continuous Drilling # 2							
Machine		ROBODRILL α-D14MiB5 (FANUC)					
Coolant		Water Soluble					
Tool		EX-SUS-GDS φ6.0 (OSG)					
Process Notes		Outer coolant nozzles only, hole depth 25 mm					
Workpiece		SS400 (280 x150 x25)					
SIO	RPM (min <sup>-1</sup> )	Feed Rate (mm/min)	Cut per tooth (mm/rad)	Number of holes before failure	Tool Life (mm)	Evaluation	
Without SIO <small>(Client's original process conditions)</small>	1900	560	0.19	-	-	-	
Without SIO	3800	1120	0.38	88	2200	-	
<b>With SIO</b>	3800	1120	0.38	645	16125	Excellent	
Rate of Improvement		2 times	2 times	2 times	7.32 times	7.32 times	

Note: Tool life improved over **7 times** baseline and process conditions also improved (better productivity)