Mastercam Setup Sheet Report

GENERIC HAAS 3 - AXIS VMC

GENERAL INFORMATION

PROJECT NAME:		
CUSTOMER NAME:		
PROGRAMMER:		
DRAWING:		REVISION:
DATE:	Thursday, February 23, 2023	
TIME:	9:48 AM	

C:\USERS\WESTONSHAKESPEAR\DOWNLOADS\WSHAKESPEAR_MILL LESSON 6.EMCAM

COMMENTS

STOCK:	YES
SHAPE:	Box
SIZE:	4.5, 4.5, 0.5
RADIUS:	NA
LENGTH:	
AXIS:	NA
FILE:	
IDN:	NA

C:\USERS\WESTONSHAKESPEAR\DOCUMENTS\MY

CYCLE TIME:	0 HOURS, 7 MINUTES, 36 SECONDS

OPERATION LIST

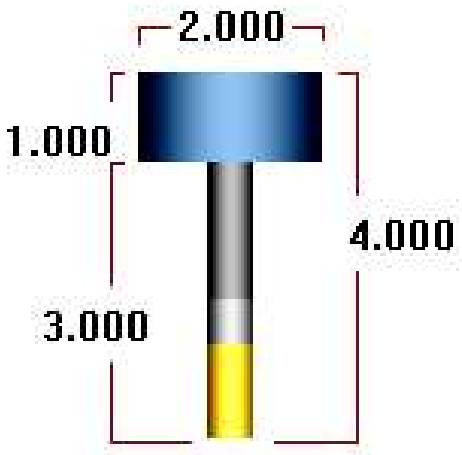
OPERATION INFO ***3 - 2D High Speed (2D Area Mill)***

CYCLE TIME:	0 HOURS, 1 MINUTES, 59 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	49.0 inch/min
CLEARANCE PLANE:	0.125
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	-0.125
STOCK TO LEAVE:	0.0 0.02
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/2 FLAT ENDMILL***

TYPE:	Flat endmill
NUMBER:	1
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	1
DIAMETER OFFSET:	1
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0131	SFM: 300.0
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:01:59



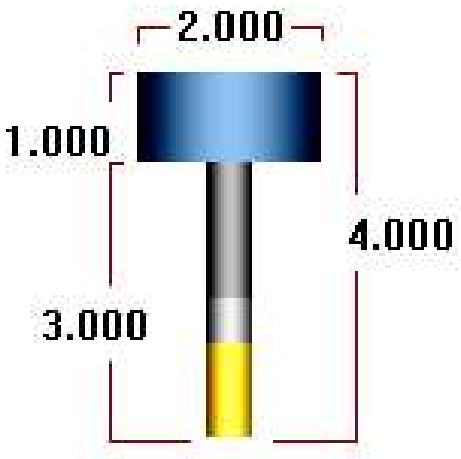
OPERATION INFO ***4 - 2D High Speed (2D Area Mill)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 19 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	49.0 inch/min
CLEARANCE PLANE:	0.125
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	-0.375
STOCK TO LEAVE:	0.0 0.02
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/2 FLAT ENDMILL***

TYPE:	Flat endmill
NUMBER:	1
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	1
DIAMETER OFFSET:	1
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0131	SFM: 300.0
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:19



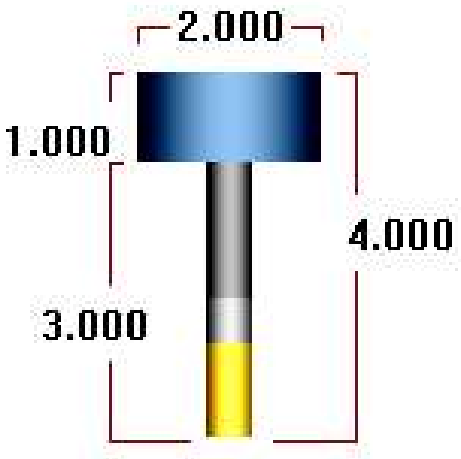
OPERATION INFO ***5 - 2D High Speed (2D Area Mill)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 19 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	49.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	-0.375
STOCK TO LEAVE:	0.0 0.02
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/2 FLAT ENDMILL***

TYPE:	Flat endmill
NUMBER:	1
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	1
DIAMETER OFFSET:	1
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0131	SFM: 300.0
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:19



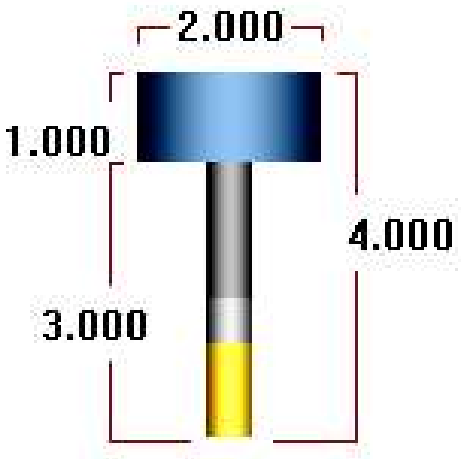
OPERATION INFO ***6 - 2D High Speed (2D Area Mill)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 23 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	49.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	-0.45
STOCK TO LEAVE:	0.0 0.02
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/2 FLAT ENDMILL***

TYPE:	Flat endmill
NUMBER:	1
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	1
DIAMETER OFFSET:	1
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0131	SFM: 300.0
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:23



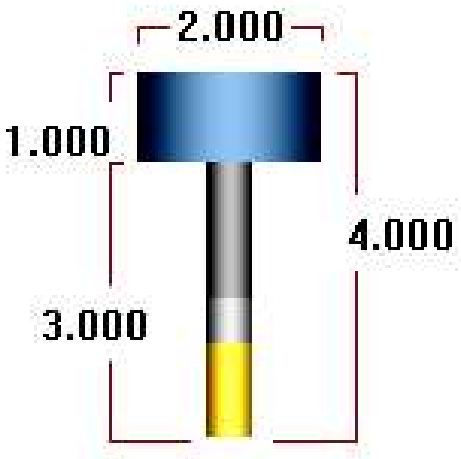
OPERATION INFO ***7 - Pocket (Standard)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 8 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	60.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	-0.125
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/2 FLAT ENDMILL***

TYPE:	Flat endmill
NUMBER:	1
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	1
DIAMETER OFFSET:	1
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0131	SFM: 300.0
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:08



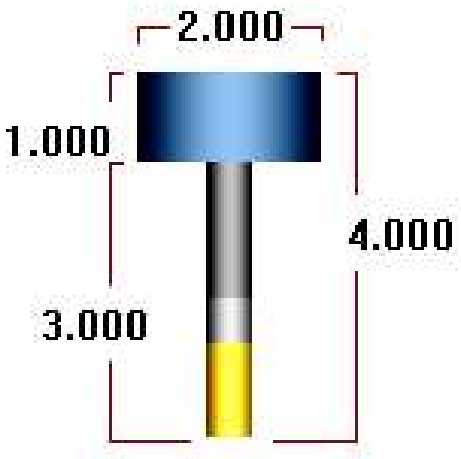
OPERATION INFO ***8 - Pocket (Standard)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 4 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	60.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	-0.375
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/2 FLAT ENDMILL***

TYPE:	Flat endmill
NUMBER:	1
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	1
DIAMETER OFFSET:	1
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0131	SFM: 300.0
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:04



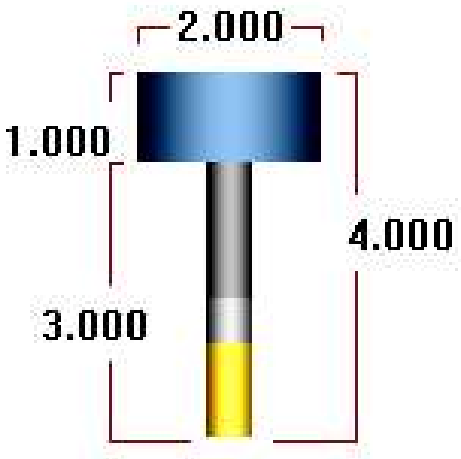
OPERATION INFO ***9 - Pocket (Standard)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 4 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	60.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	-0.375
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/2 FLAT ENDMILL***

TYPE:	Flat endmill
NUMBER:	1
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	1
DIAMETER OFFSET:	1
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0131	SFM: 300.0
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:04



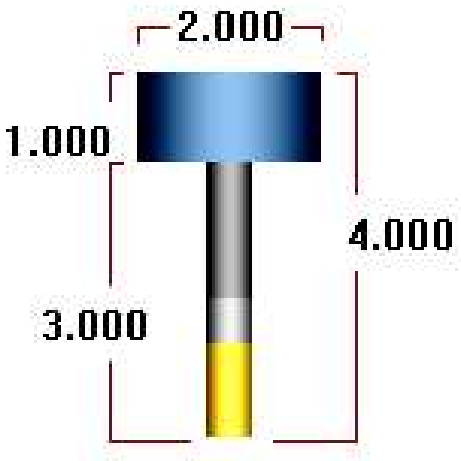
OPERATION INFO ***10 - Pocket (Standard)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 3 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	60.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	-0.45
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/2 FLAT ENDMILL***

TYPE:	Flat endmill
NUMBER:	1
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	1
DIAMETER OFFSET:	1
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0131	SFM: 300.0
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:03



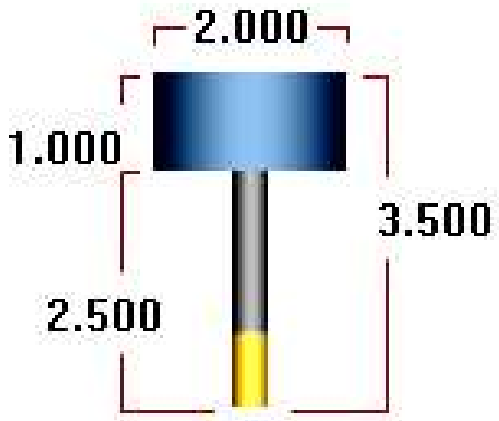
OPERATION INFO ***11 - 2D High Speed (2D Dynamic Mill)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 21 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	49.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	1.0
FEED PLANE:	0.05
DEPTH:	-0.5
STOCK TO LEAVE:	0.0 0.02
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***3/8 FLAT ENDMILL***

TYPE:	Flat endmill
NUMBER:	2
DIAMETER:	0.375
CORNER RADIUS:	0.0
LENGTH OFFSET:	2
DIAMETER OFFSET:	2
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0011	SFM: 139.9869
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:21



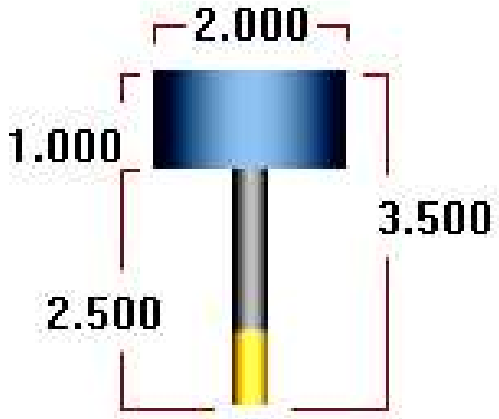
OPERATION INFO ***12 - Contour (2D)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 44 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	60.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	-0.5
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***3/8 FLAT ENDMILL***

TYPE:	Flat endmill
NUMBER:	2
DIAMETER:	0.375
CORNER RADIUS:	0.0
LENGTH OFFSET:	2
DIAMETER OFFSET:	2
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0011	SFM: 139.9869
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:44



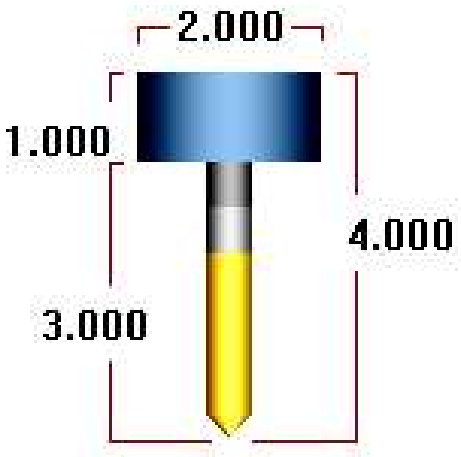
OPERATION INFO ***13 - Contour (2D chamfer)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 38 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	49.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	0.0
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/2 SPOTDRILL***

TYPE:	Spot drill
NUMBER:	3
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	3
DIAMETER OFFSET:	3
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.001	SFM: 69.8953
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:38



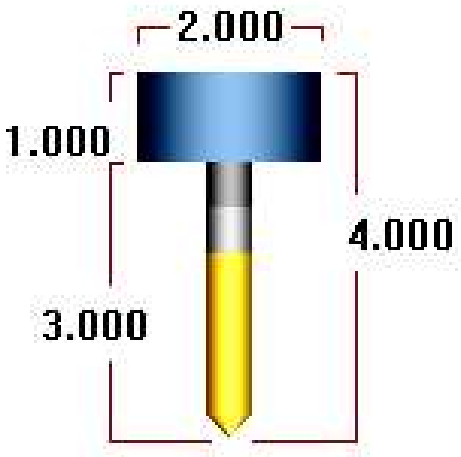
OPERATION INFO ***14 - Contour (2D chamfer)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 13 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	49.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	0.0
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/2 SPOTDRILL***

TYPE:	Spot drill
NUMBER:	3
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	3
DIAMETER OFFSET:	3
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.001	SFM: 69.8953
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:13



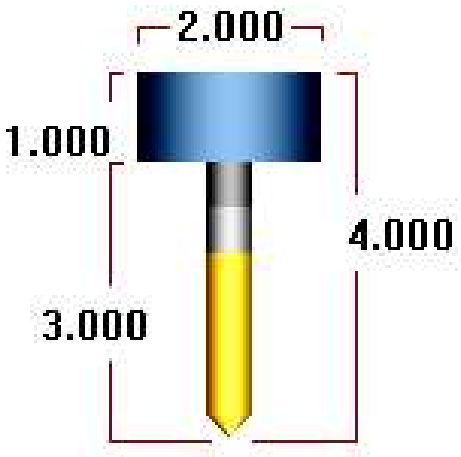
OPERATION INFO ***15 - Drill/Counterbore***

CYCLE TIME:	0 HOURS, 0 MINUTES, 2 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	49.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.125
DEPTH:	-0.0988
STOCK TO LEAVE:	0.0
COMP TO TIP:	NO
WORK OFFSET:	0

TOOL INFO ***1/2 SPOTDRILL***

TYPE:	Spot drill
NUMBER:	3
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	3
DIAMETER OFFSET:	3
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.001	SFM: 69.8953
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:02



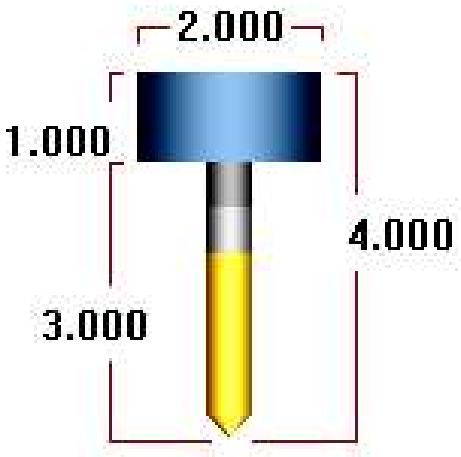
OPERATION INFO ***16 - Drill/Counterbore***

CYCLE TIME:	0 HOURS, 0 MINUTES, 2 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	49.0 inch/min
CLEARANCE PLANE:	2.125
RETRACT PLANE:	0.125
FEED PLANE:	0.125
DEPTH:	-0.1925
STOCK TO LEAVE:	0.0
COMP TO TIP:	NO
WORK OFFSET:	0

TOOL INFO ***1/2 SPOTDRILL***

TYPE:	Spot drill
NUMBER:	3
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	3
DIAMETER OFFSET:	3
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.001	SFM: 69.8953
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:02



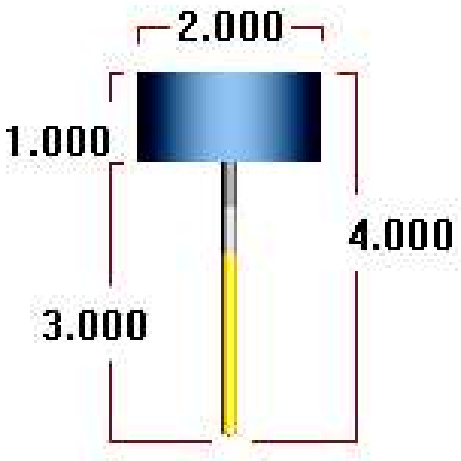
OPERATION INFO ***17 - Peck Drill***

CYCLE TIME:	0 HOURS, 0 MINUTES, 39 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	6621 RPM
FEEDRATE:	19.0703 inch/min
CLEARANCE PLANE:	0.25
RETRACT PLANE:	0.125
FEED PLANE:	0.125
DEPTH:	-0.45
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***3/16 DRILL***

TYPE:	Drill
NUMBER:	4
DIAMETER:	0.1875
CORNER RADIUS:	0.0
LENGTH OFFSET:	4
DIAMETER OFFSET:	4
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.0014	SFM: 69.9935
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:39



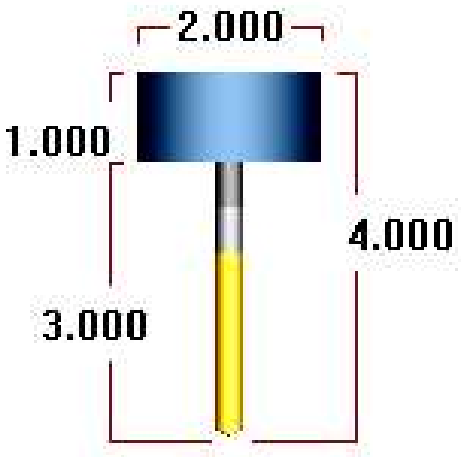
OPERATION INFO ***18 - Drill/Counterbore***

CYCLE TIME:	0 HOURS, 0 MINUTES, 50 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	855 RPM
FEEDRATE:	4.2442 inch/min
CLEARANCE PLANE:	0.25
RETRACT PLANE:	0.125
FEED PLANE:	0.125
DEPTH:	-0.0625
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***5/16 DRILL***

TYPE:	Drill
NUMBER:	5
DIAMETER:	0.3125
CORNER RADIUS:	0.0
LENGTH OFFSET:	5
DIAMETER OFFSET:	5
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.0025	SFM: 69.9444
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:50



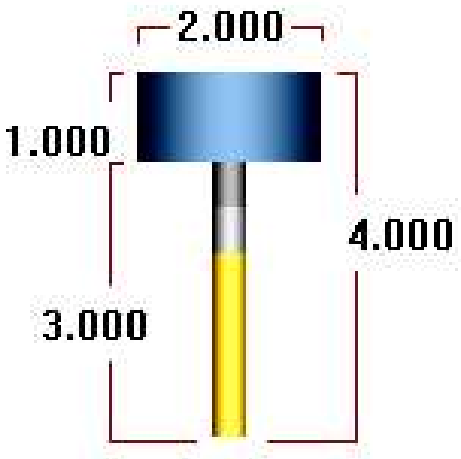
OPERATION INFO ***19 - Tap***

CYCLE TIME:	0 HOURS, 0 MINUTES, 33 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	178 RPM
FEEDRATE:	11.125 inch/min
CLEARANCE PLANE:	0.25
RETRACT PLANE:	0.125
FEED PLANE:	0.125
DEPTH:	0.0
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***3/8-16 TAPRH***

TYPE:	Right-hand tap
NUMBER:	6
DIAMETER:	0.375
CORNER RADIUS:	0.0
LENGTH OFFSET:	6
DIAMETER OFFSET:	6
MATERIAL:	Carbide
NUMBER OF FLUTES:	1
FPT: 0.0625	SFM: 17.4738
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:33



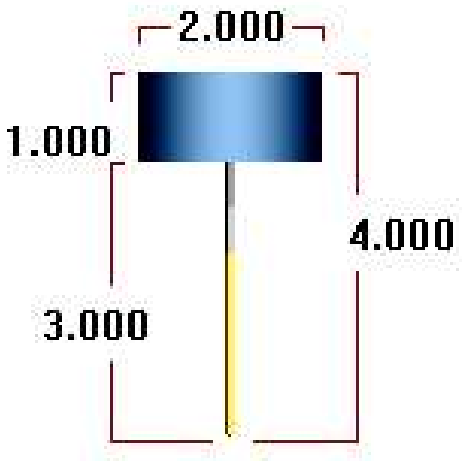
OPERATION INFO ***20 - Contour (2D)***

CYCLE TIME:	0 HOURS, 0 MINUTES, 6 SECONDS
COMMENT:	

PROGRAM NUMBER:	33012
SPINDLE SPEED:	4966 RPM
FEEDRATE:	39.0 inch/min
CLEARANCE PLANE:	2.0
RETRACT PLANE:	0.125
FEED PLANE:	0.05
DEPTH:	-0.02
STOCK TO LEAVE:	0.0
COMP TO TIP:	YES
WORK OFFSET:	0

TOOL INFO ***1/8 SPOTDRILL***

TYPE:	Spot drill
NUMBER:	7
DIAMETER:	0.125
CORNER RADIUS:	0.0
LENGTH OFFSET:	7
DIAMETER OFFSET:	7
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.0002	SFM: 69.9935
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:06

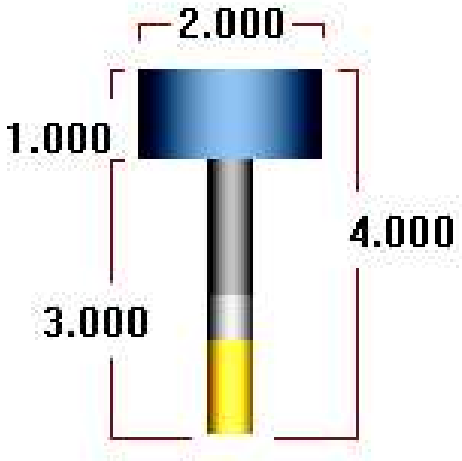


TOOL LIST

Sorted: NO

TOOL INFO ***1/2 FLAT ENDMILL***

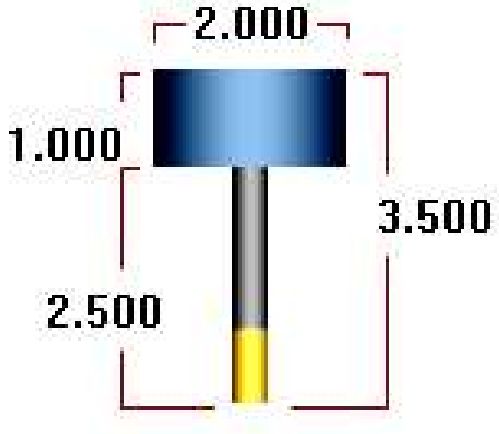
TYPE:	Flat endmill
NUMBER:	1
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	1
DIAMETER OFFSET:	1
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0131	SFM: 300.0
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:03:24



USED BY OPERATION:	# 3	3 - 2D High Speed (2D Area Mill)
USED BY OPERATION:	# 4	4 - 2D High Speed (2D Area Mill)
USED BY OPERATION:	# 5	5 - 2D High Speed (2D Area Mill)
USED BY OPERATION:	# 6	6 - 2D High Speed (2D Area Mill)
USED BY OPERATION:	# 7	7 - Pocket (Standard)
USED BY OPERATION:	# 8	8 - Pocket (Standard)
USED BY OPERATION:	# 9	9 - Pocket (Standard)
USED BY OPERATION:	# 10	10 - Pocket (Standard)

TOOL INFO ***3/8 FLAT ENDMILL***

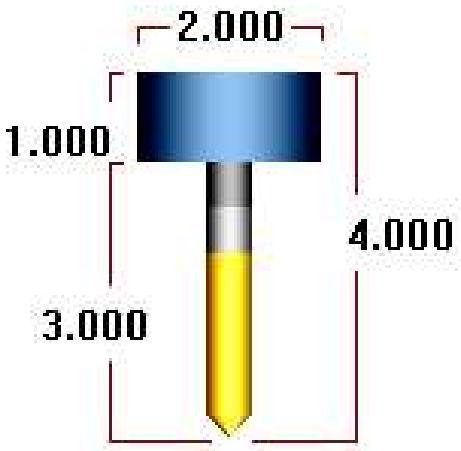
TYPE:	Flat endmill
NUMBER:	2
DIAMETER:	0.375
CORNER RADIUS:	0.0
LENGTH OFFSET:	2
DIAMETER OFFSET:	2
MATERIAL:	HSS
NUMBER OF FLUTES:	4
FPT: 0.0011	SFM: 139.9869
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:01:05



USED BY OPERATION:	# 11	11 - 2D High Speed (2D Dynamic Mill)
USED BY OPERATION:	# 12	12 - Contour (2D)

TOOL INFO ***1/2 SPOTDRILL***

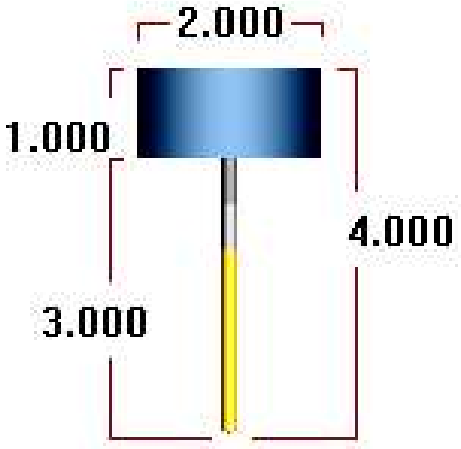
TYPE:	Spot drill
NUMBER:	3
DIAMETER:	0.5
CORNER RADIUS:	0.0
LENGTH OFFSET:	3
DIAMETER OFFSET:	3
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.001	SFM: 69.8953
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:56



USED BY OPERATION:	# 13	13 - Contour (2D chamfer)
USED BY OPERATION:	# 14	14 - Contour (2D chamfer)
USED BY OPERATION:	# 15	15 - Drill/Counterbore
USED BY OPERATION:	# 16	16 - Drill/Counterbore

TOOL INFO ***3/16 DRILL***

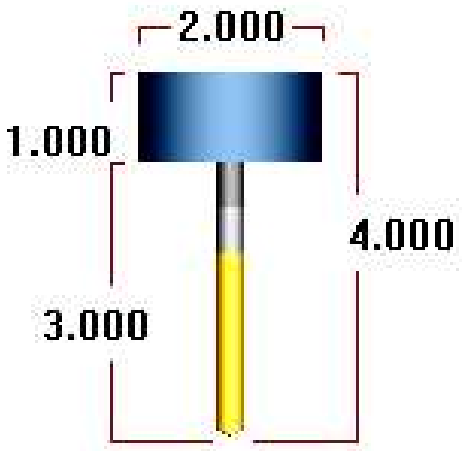
TYPE:	Drill
NUMBER:	4
DIAMETER:	0.1875
CORNER RADIUS:	0.0
LENGTH OFFSET:	4
DIAMETER OFFSET:	4
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.0014	SFM: 69.9935
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:39



USED BY OPERATION:	# 17	17 - Peck Drill

TOOL INFO ***5/16 DRILL***

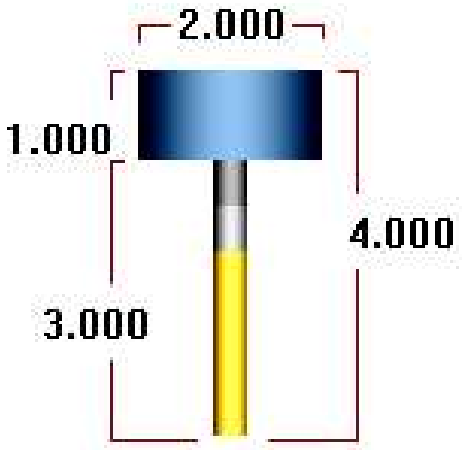
TYPE:	Drill
NUMBER:	5
DIAMETER:	0.3125
CORNER RADIUS:	0.0
LENGTH OFFSET:	5
DIAMETER OFFSET:	5
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.0025	SFM: 69.9444
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:50



USED BY OPERATION: # 18 18 - Drill/Counterbore

TOOL INFO ***3/8-16 TAPRH***

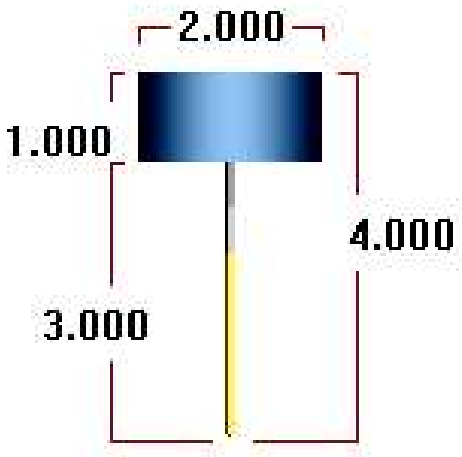
TYPE:	Right-hand tap
NUMBER:	6
DIAMETER:	0.375
CORNER RADIUS:	0.0
LENGTH OFFSET:	6
DIAMETER OFFSET:	6
MATERIAL:	Carbide
NUMBER OF FLUTES:	1
FPT: 0.0625	SFM: 17.4738
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:33



USED BY OPERATION: # 19 19 - Tap

TOOL INFO ***1/8 SPOTDRILL***

TYPE:	Spot drill
NUMBER:	7
DIAMETER:	0.125
CORNER RADIUS:	0.0
LENGTH OFFSET:	7
DIAMETER OFFSET:	7
MATERIAL:	HSS
NUMBER OF FLUTES:	2
FPT: 0.0002	SFM: 69.9935
MFG CODE:	
ASSEMBLY:	
HOLDER:	Default Holder
TIME:	00:00:06



USED BY OPERATION:	# 20	20 - Contour (2D)

WORK OFFSETS

OFFSET INFO

NUMBER: 0 PLANE: Top ORIGIN: 0.0, 0.0, 0.0

USED BY OPERATION:	# 3	3 - 2D High Speed (2D Area Mill)
USED BY OPERATION:	# 4	4 - 2D High Speed (2D Area Mill)
USED BY OPERATION:	# 5	5 - 2D High Speed (2D Area Mill)
USED BY OPERATION:	# 6	6 - 2D High Speed (2D Area Mill)
USED BY OPERATION:	# 7	7 - Pocket (Standard)
USED BY OPERATION:	# 8	8 - Pocket (Standard)
USED BY OPERATION:	# 9	9 - Pocket (Standard)
USED BY OPERATION:	# 10	10 - Pocket (Standard)
USED BY OPERATION:	# 11	11 - 2D High Speed (2D Dynamic Mill)
USED BY OPERATION:	# 12	12 - Contour (2D)
USED BY OPERATION:	# 13	13 - Contour (2D chamfer)
USED BY OPERATION:	# 14	14 - Contour (2D chamfer)
USED BY OPERATION:	# 15	15 - Drill/Counterbore
USED BY OPERATION:	# 16	16 - Drill/Counterbore
USED BY OPERATION:	# 17	17 - Peck Drill
USED BY OPERATION:	# 18	18 - Drill/Counterbore
USED BY OPERATION:	# 19	19 - Tap
USED BY OPERATION:	# 20	20 - Contour (2D)