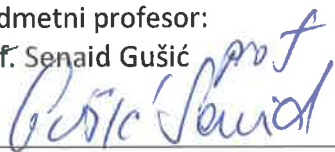


Maturski rad iz programiranja

TEMA: Izrada ukrasnog elementa

Predmetni profesor:

Prof. Senaid Gušić



Učenik:

Zaim Husomanović



---

Sarajevo 2022. Godine

Škola: Srednja škola za okoliš i drveni dizajn  
Struka: Drvoprerađivačka  
Obrazovni profil: Tehničar za obradu drveta-programer na CNC mašinama  
IV stepen

### ZADATAK ZA MATURSKI ISPIT

Kandidat: Zaim Husomanović  
Tema: Izrada ukrasnog elementa

Teze:

- Tehnički opis i namjena
- Radni postupci, faze rada (Plan operacija-operacijski list, plan stezanja obradka–baziranje po svim operacijama, plan alata-slika alata sa svim parametrima po operacijama, plan rezanja-šematski prikaz u 2D za sve operacije ili zahvate, programski list-po operaciji i ukupno)
- Sklopni crtež ili model urađen u Auto Cad-u i Solid Worksu
- Radionički crtež urađen u Auto Cad-u i Solid Worksu
- Programski list pomoćnih programa iz Mach 3 ako ima
- Programski list glavnog programa izrađen pomoću SOLID Cam-a sa 3D simulacijom
- Zaključak

NAPOMENA: Crteže uraditi u Auto CAD-u 2011 snimiti a SolidWorks-u i Solid CAM u 2014 na CD-u i isprintati

Sarajevo: Decembar 2021 god.  
Kandidat: Zaim Husomanović






*Zaim H.*

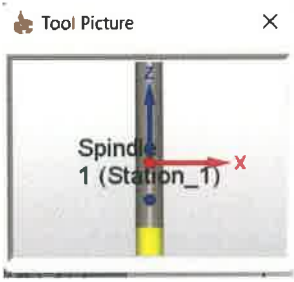
Mentor: Prof. Senaid Gušić

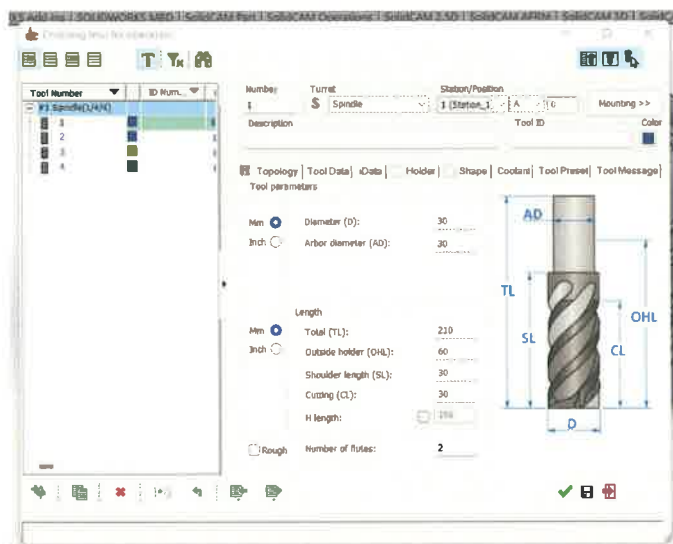
*prof. Senaid Gušić*

 Organizacija: SSODD Sarajevo	<h1>OPERACIJSKI LIST</h1>		Karakteristične tačke	Mašine		M	
				Obratka		W	
				Referentna		R	
				Početna		B	
Naziv dijela: Izrada ukrasnog elementa	Materijal: Hrast	Dimenzije 200x200x400					
Mašina:		CNC GLODALICA					
Operacija Zahvat br:	Naziv operacije/zahvata	Alat i pribor	Režim obrade		Dodatak za obradu $\delta$ (mm)	Broj prolaza i -	Glavno vrijeme $T_g$ (min)
			n(min <sup>-1</sup> )	S(mm/min)			
1	Glodanje	Glogalica	3500	4000		1	0:05:53:43
2	Glodanje	Glogalica	3500	4000		1	1:13:17:32
3	Glodanje	Glogalica	3500	4000		1	0:08:19:51
4	Poliranje	Alat za poliranje	3500	4000		1	2:22:44:46
5	Poliranje	Alat za poliranje	3500	4000		1	0:00:08:16
						List: 3	
						Listova: 33	
Izradio: Zaim Husomanović		Datum: 1.6.2022		Pregledao: Senaid Gušić			





 Organizacija: SSODD Sarajevo	<h1>OPERACIJSKI LIST</h1>		Karakteristične tačke	Mašine		M	
				Obratka		W	
				Referentna		R	
				Početna		B	
Naziv dijela: Izrada ukrasnog elementa	Materijal: Hrast	Dimenzije 200x200x400					
Mašina:		CNC GLODALICA					
Operacija Zahvat br:	Naziv operacijezahvata	Alat i pribor	Režim obrade		Dodatak za obradu δ(mm)	Broj prolaza i -	Glavno vrijeme T <sub>g</sub> (min)
			n(min <sup>-1</sup> )	S(mm/min)			
6	Glodanje	Glogalica	3500	4000		1	0:08:17:41
7	Glodanje	Glogalica	3500	4000		1	2:22:55:01
8	Glodanje	Glogalica	3500	4000		1	0:00:08:48
9	Poliranje	Alat za poliranje	3500	4000		1	0:07:39:05
10	Poliranje	Alat za poliranje	3500	4000		1	6:05:47:10
						List: 4	
						Listova: 33	
Izradio: Zaim Husomanović		Datum: 1.6. 2022		Pregledao: Senaid Gušić			

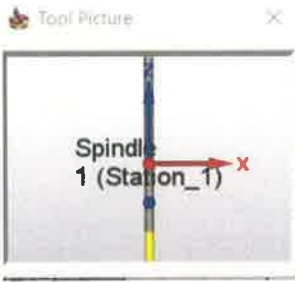
 SSODD u Sara Naziv dijela: Izrada ukrasnog elementa	<b>PLAN ALATA</b>  <b>Operacija br: 1</b>	Karakteristične tačke	Mašine		<b>M</b>
			Obradka		<b>W</b>
			Referentna		<b>R</b>
			Početna		<b>B</b>
Mašina: Cnc glodalica	Obradak: 200x200x400	Materijal: Hrast			

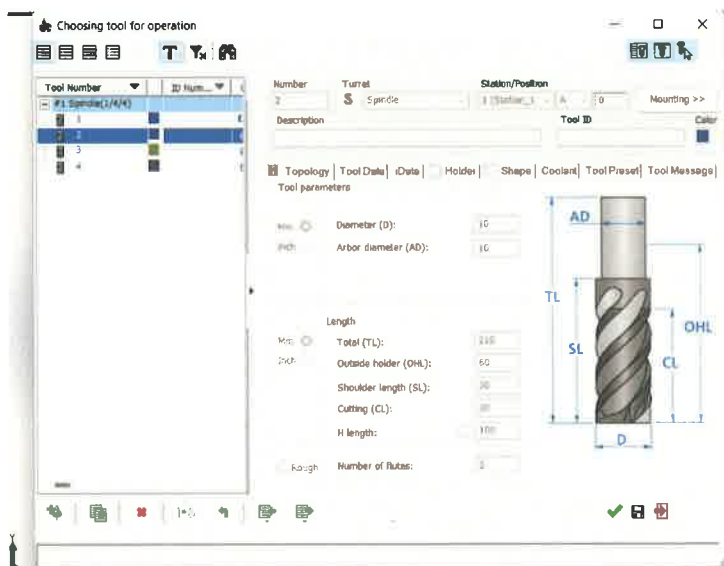
Alat	Naziv: Glogalica	Slika-skica 	Korekcioni broj:01	0.1
	Broj:npr T01 <i>Naziv Alata</i>		X ofset	0
	Radijus: 30		Y ofset	-
	Postojanost alata: Npr.4 h		Z ofset	0







		List: 5
		Listova: 33
Izradio: Zaim Husomanović	Datum: <i>1.6.2022</i>	Pregledao: Senaid Gušić <i>[Signature]</i>


 SSODD u Sara Naziv dijela: Izrada ukrasnog elementa	<b>PLAN ALATA</b>  <b>Operacija br: 2, 3, 6,9</b>	Karakteristične tačke	Mašine		<b>M</b>
			Obradka		<b>W</b>
			Referentna		<b>R</b>
			Početna		<b>B</b>
Mašina: Cnc glodalica	Obradak: 200x200x400	Materijal: Hrast			

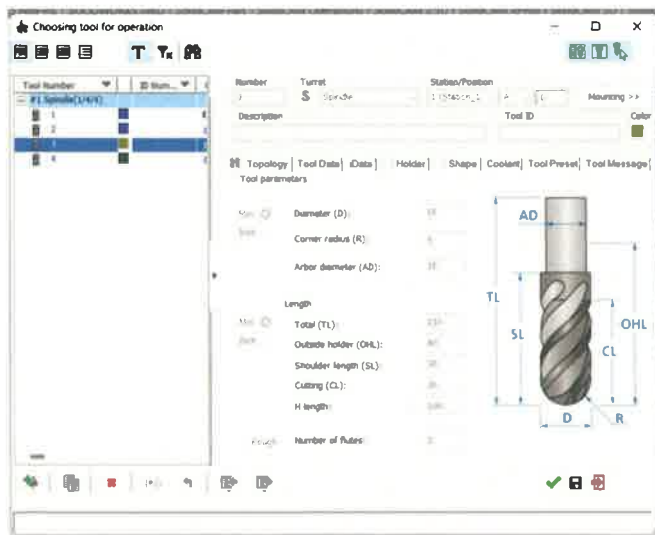
Alat	Naziv: Glogalica	Slika-skica 	Korekcioni broj:01	0.1
	Broj:npr T02		X ofset	0
	Radijus: 10		Y ofset	-
	Postojanost alata: Npr.4 h		Z ofset	0








			List: 6
			Listova: 33
Izradio: Zaim Husomanović	Datum: 1.6.2022	Pregledao: Senaid Gušić	

 SSODD u Sara Naziv dijela: Izrada ukrasnog elementa	<b>PLAN ALATA</b>  <b>Operacija br: 4, 7, 10</b>	Karakteristične tačke	Mašine		<b>M</b>
			Obradka		<b>W</b>
			Referentna		<b>R</b>
			Početna		<b>B</b>
Mašina: Cnc glodalica	Obradak: 200x200x400	Materijal: Hrast			

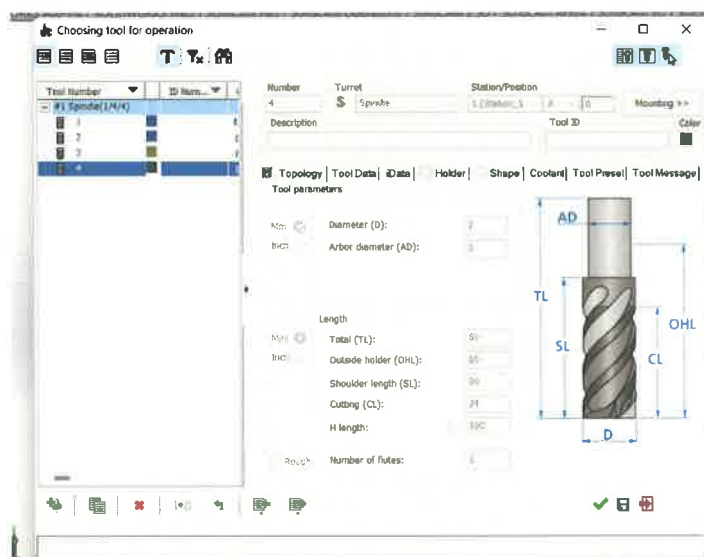
Alat	Naziv: Alat za poliranje	Slika-skica 	Korekcioni broj:01	0.1
	Broj:npr T03		X ofset	0
	Radijus: 10		Y ofset	-
	Postojanost alata: Npr.4 h		Z ofset	0




		List: 7
		Listova:33
Izradio: Zaim Husomanović	Datum: 1.6.2022	Pregledao: Senajd Gušić

 SSODD u Sara Naziv dijela: Izrada ukrasnog elementa	<b>PLAN ALATA</b>  <b>Operacija br: 5, 8</b>	Karakteristične tačke	Mašine		<b>M</b>
			Obradka		<b>W</b>
			Referentna		<b>R</b>
			Početna		<b>B</b>
Mašina: Cnc glodalica	Obradak: 200x200x400	Materijal: Hrast			

Alat	Naziv: Glogalica	Slika-skica 	Korekcioni broj:01	0.1
	Broj:npr T04		X ofset	0
	Radijus: 2		Y ofset	-
	Postojanost alata: Npr.4 h		Z ofset	0



		List: 8
		Listova: 33
Izradio: Zaim Husomanović	Datum: 1.6. 2022	Pregledao: Senaid Gušić 





SSODD u  
Sarajevu

Naziv dijela:  
Izrada  
ukrasnog  
elementa

## PLAN REZANJA

### Operacija br:1

Mašpina:CN  
C glodalica

Obradak  
200x200x400

Karakterističn  
e tačke

Mašine



M

Obradka



W

Referentna



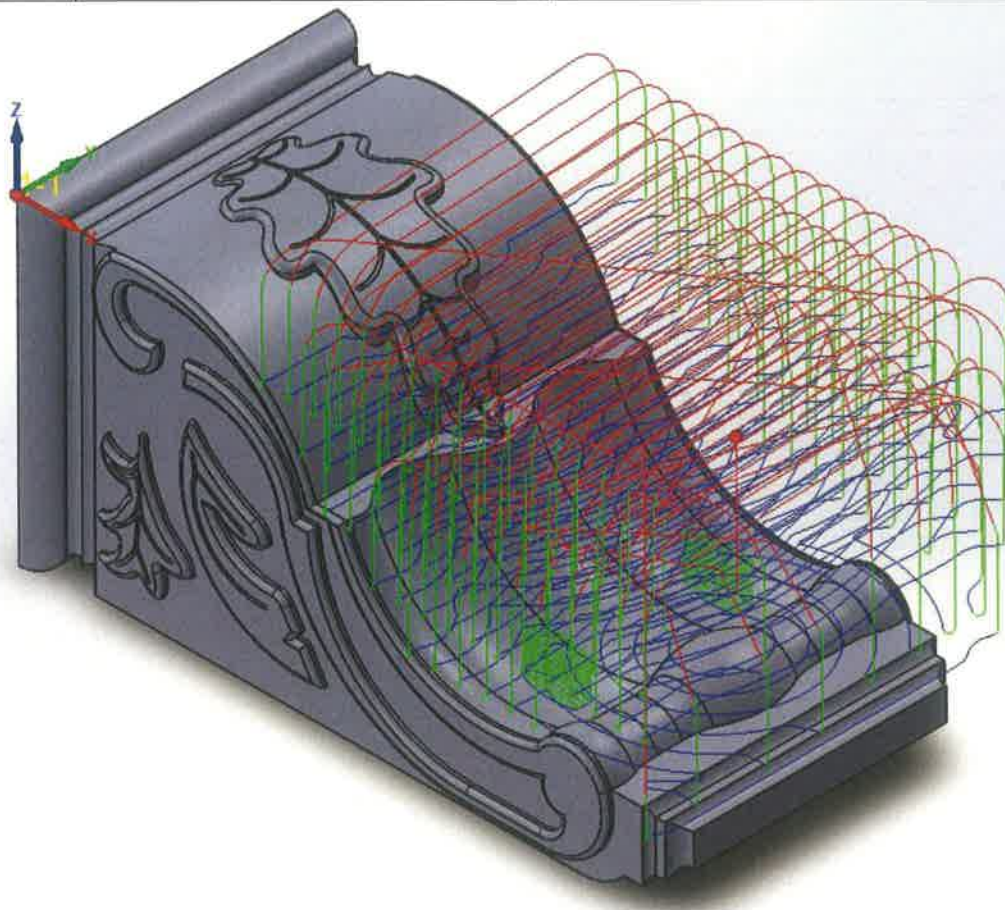
R

Početna



B

Materijal: Hrast



List: 9

Listova: 33

Izradio: Zaim  
Husomanović

Datum:

1.6.2022

Pregledao: Senaid Gušić

*Senaid Gušić*



SSODD u  
Sarajevu

Naziv dijela:  
Izrada  
ukrasnog  
elementa

## PLAN REZANJA

### Operacija br:2

Mašpina:CN  
C glodalica

Obradak  
200x200x400

Karakterističn  
e tačke

Mašine



M

Obradka



W

Referentna



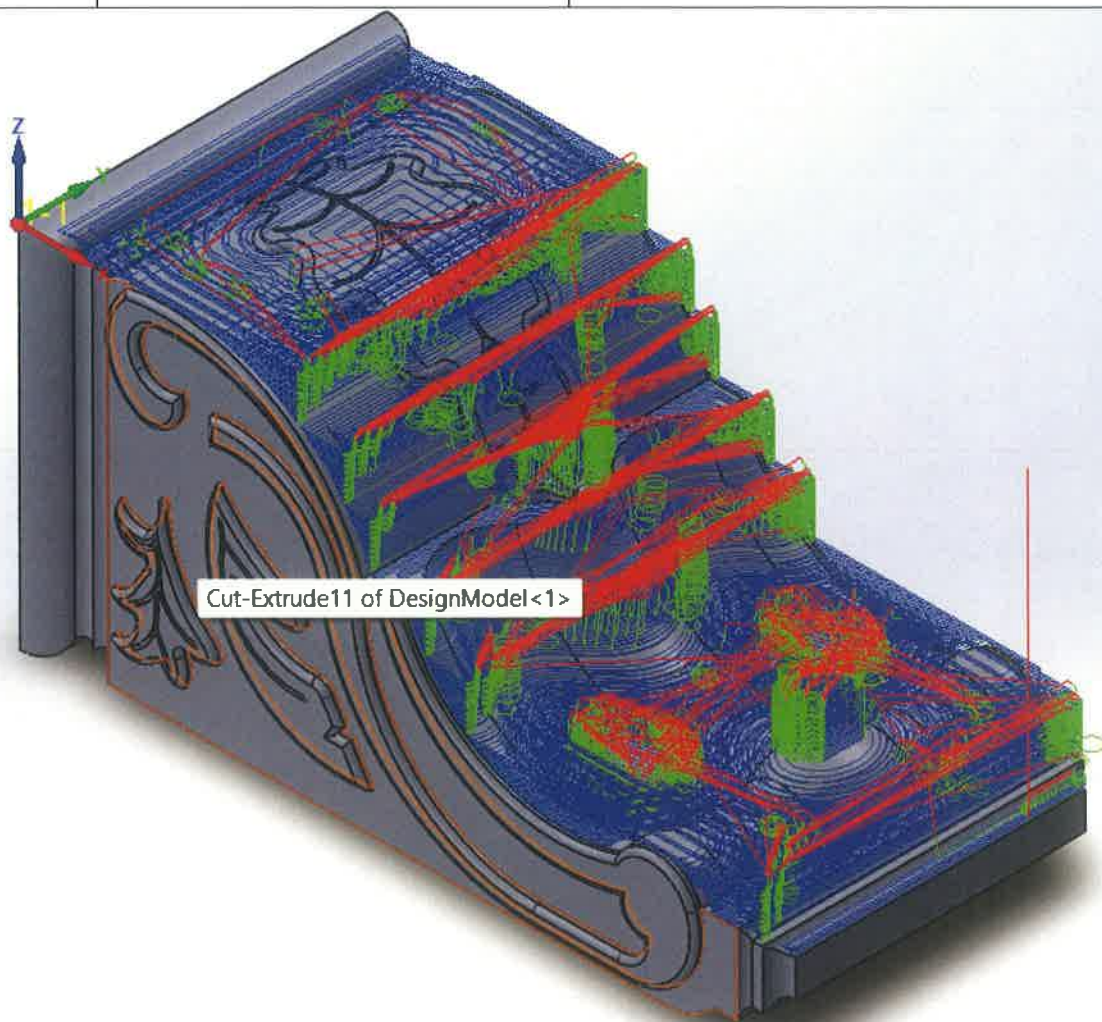
R

Početna



B

Materijal: Hrast



List: 10






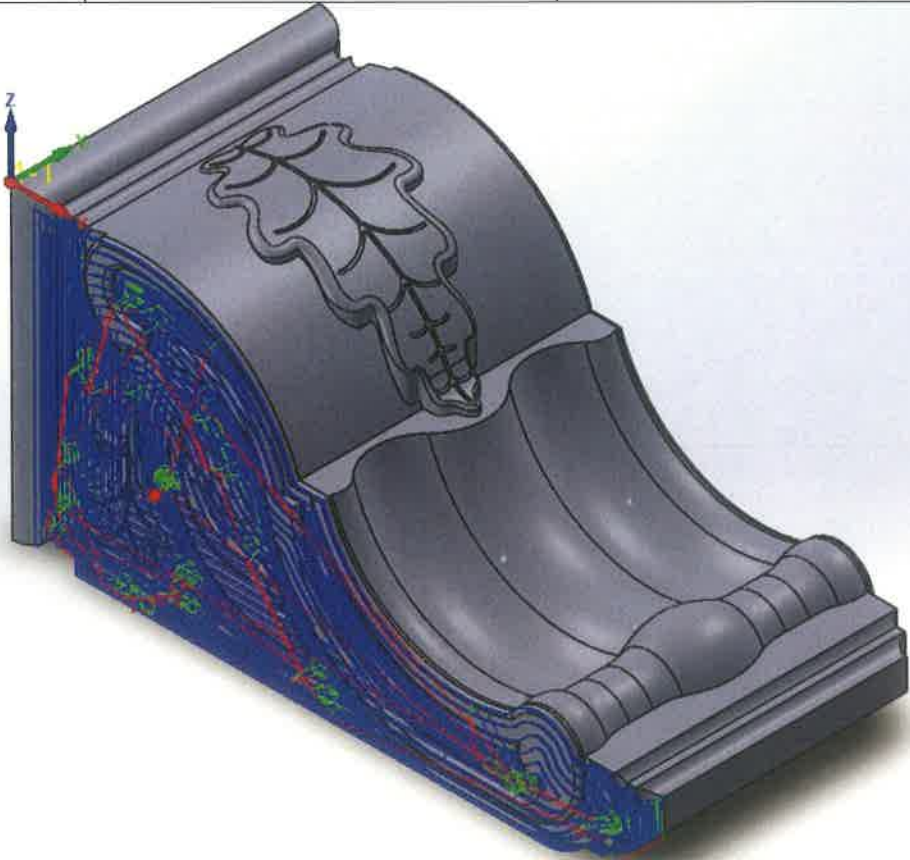
Listova: 33

Izradio: Zaim  
Husomanović






Datum:

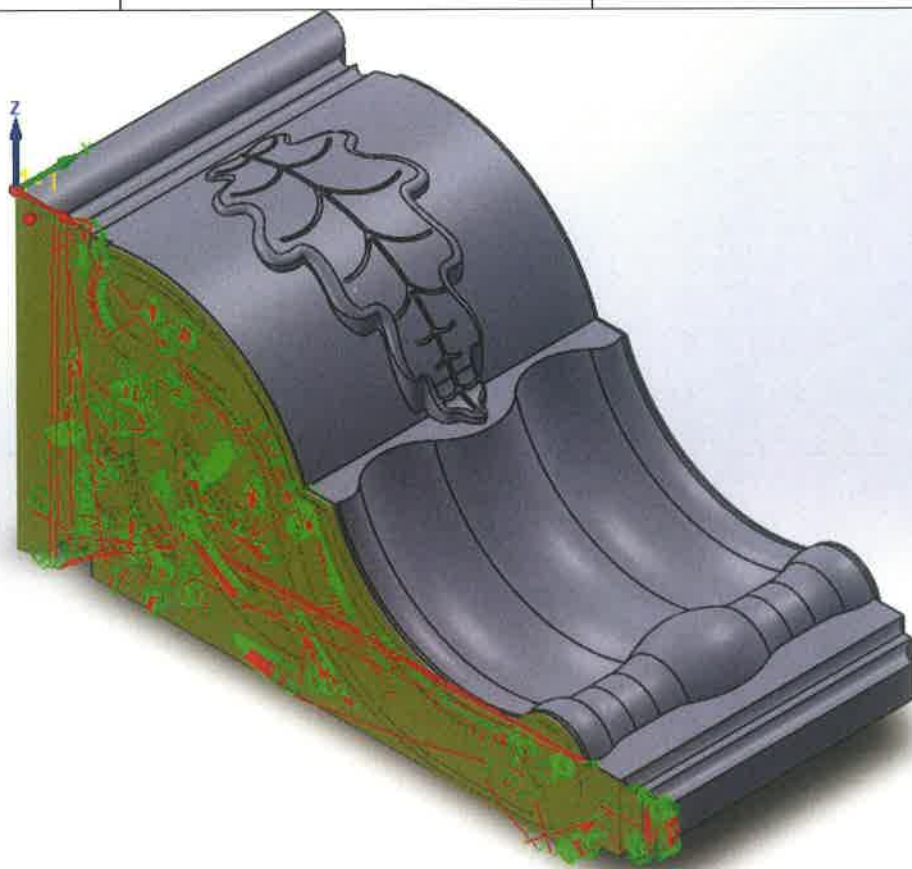
1.6.2022


Pregledao: Senaid Gušić

	<h1>PLAN REZANJA</h1>	Karakteristične tačke	Mašine		M	
SSODD u Sarajevu			Obradka		W	
Naziv dijela: Izrada ukrasnog elementa			<h2>Operacija br:3</h2>	Referentna		R
				Početna		B
Mašpina: CN C glodalica	Obradak 200x200x400	Materijal: Hrast				
						
					List: 11	
					Listova: 33	
Izradio: Zaim Husomanović	Datum: 1.6.2022	Pregledao: Senaid Gušić				



<div></div> <div>SSODD u Sarajevu</div>	<b>PLAN REZANJA</b>	Karakteristične tačke	Mašine		M
	<b>Operacija br:4</b>		Obradka		W
			Referentna		R
			Početna		B
Mašpina:CN C glodalica	Obradak 200x200x400	Materijal: Hrast			



		List: 12
		Listova: 33
Izradio: Zaim Husomanović	Datum: 1.6. 2022	Pregledao: Senaid Gušić 

	<h1>PLAN REZANJA</h1>	Karakteristične tačke	Mašine		M	
SSODD u Sarajevu			Obradka		W	
Naziv dijela: Izrada ukrasnog elementa			<h2>Operacija br:5</h2>	Referentna		R
				Početna		B
Mašpina: CN C glodalica	Obradak 200x200x400	Materijal: Hrast				
<div style="display: flex; justify-content: space-around;">   </div>						
					List: 13	
					Listova: 33	
Izradio: Zaim Husomanović	Datum: 1.6.2022	Pregledao: Senaid Gušić 				



SSODD u  
Sarajevu

Naziv dijela:  
Izrada  
ukrasnog  
elementa

## PLAN REZANJA

**Operacija br:6**

Karakterističn  
e tačke

Mašine



M

Obradka



W

Referentna



R

Početna

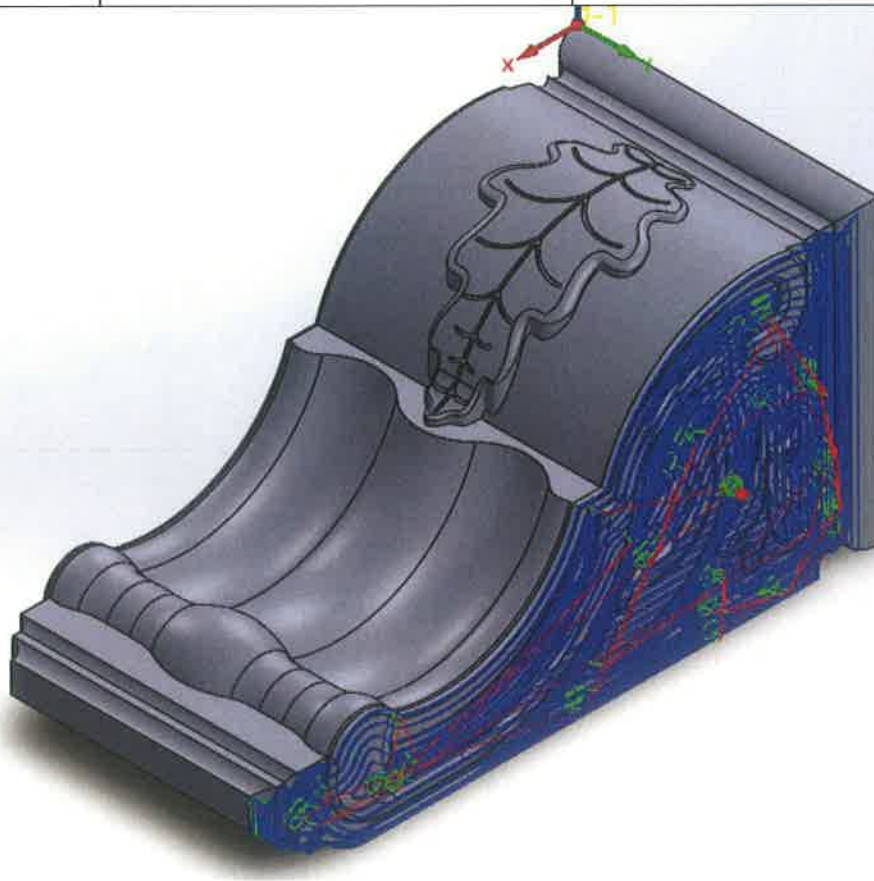


B

Mašpina:CN  
C glodalica

Obradak  
200x200x400

Materijal: Hrast



List: 14

Listova: 33

Izradio: Zaim  
Husomanović

Datum:

1.6.2022

Pregledao: Senaid Gušić



SSODD u  
Sarajevu

Naziv dijela:  
Izrada  
ukrasnog  
elementa

## PLAN REZANJA

**Operacija br:7**

Karakterističn  
e tačke

Mašine



M

Obradka



W

Referentna



R

Početna

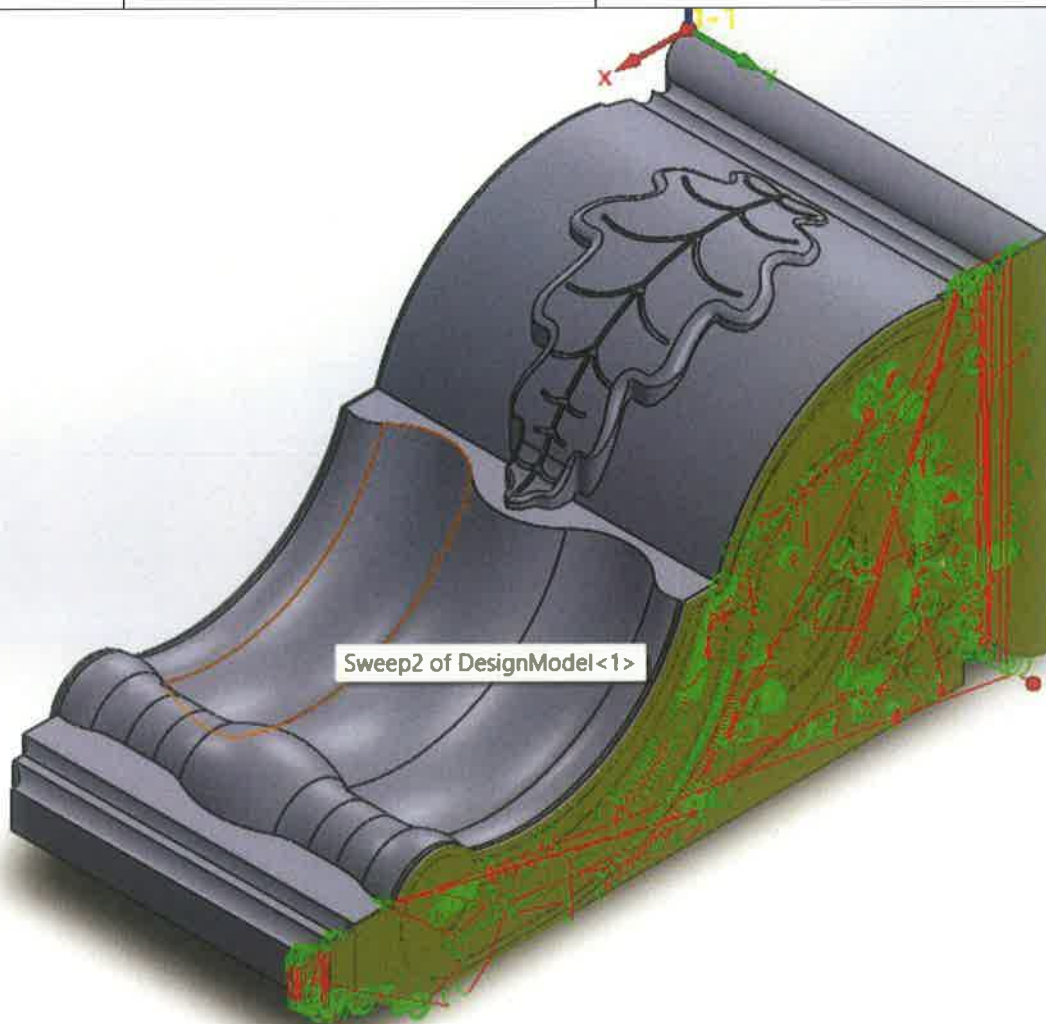


B

Mašpina:CN  
C glodalica

Obradak  
200x200x400

Materijal: Hrast



List: 15

Listova: 33

Izradio: Zaim  
Husomanović

Datum:

1.6. 2022

Pregledao: Senaid Gušić



SSODD u  
Sarajevu

Naziv dijela:  
Izrada  
ukrasnog  
elementa

## PLAN REZANJA

**Operacija br:8**

Karakterističn  
e tačke

Mašine



M

Obradka



W

Referentna



R

Početna

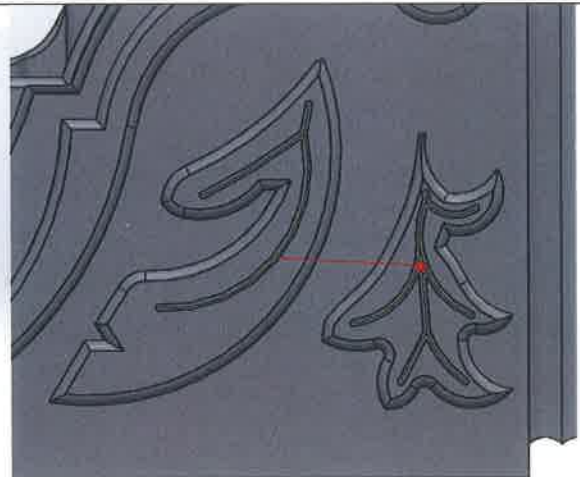


B

Mašpina:CN  
C glodalica

Obradak  
200x200x400

Materijal: Hrast



List: 16

Listova: 33





Izradio: Zaim  
Husomanović






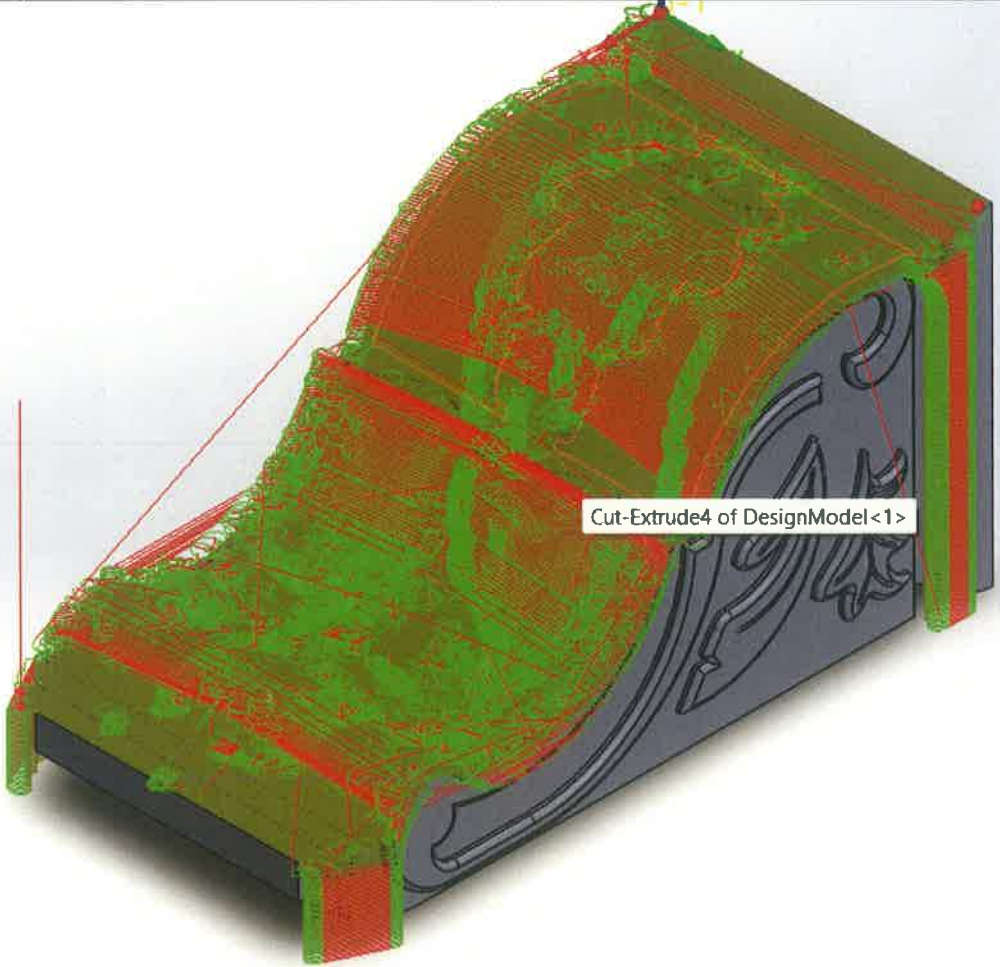

Datum:

1.6.2022

Pregledao: Senaid Gušić



	<h1>PLAN REZANJA</h1>	Karakteristične tačke	Mašine		M
SSODD u Sarajevu			Obradka		W
Naziv dijela: Izrada ukrasnog elementa			Referentna		R
Mašpina: CN C glodalica	Obradak 200x200x400	Materijal: Hrast			
					
					List: 17
					Listova: 33
Izradio: Zaim Husomanović	Datum: 1.6. 2022	Pregledao: Senaid Gušić			

 SSODD u Sarajevu Naziv dijela: Izrada ukrasnog elementa	<b>PLAN REZANJA</b>	Karakteristične tačke	Mašine		M
	<b>Operacija br:10</b>		Obradka		W
			Referentna		R
			Početna		B
Mašpina:CN C glodalica	Obradak 200x200x400	Materijal: Hrast			
					
					List: 18
					Listova: 33
Izradio: Zaim Husomanović	Datum: 1.6.2022	Pregledao: Senaid Gušić 			

 <p>Organizacija: SSODD SARAJEVU</p> <p>Naziv dijela: Izrada ukrasnog elementa</p>	<h1>PLAN STEZANJA</h1>		Karakteristične tačke	Mašine		M
				Obradka		W
				Referentna		R
				Početna (teorijski vrh alata)		B
Mašina	CNC GLODALICA					
Priprema sirovog materijala	Materijal	Dimenzije				
	Hrast	200x200x400				
Stezni pribor	Naziv	Oznaka	<h2>OPERACIJA BR 1, 2, 9, 10</h2>			
	Škrip					
						
					List: 19	
					Listova: 33	
Izradio: Kalamujić Nađa		Datum: 1-6-2022		Pregledao: Mehmed Mehmedović 		



Organizacija: SSODD  
SARAJEVU

Naziv dijela: Izrada  
ukrasnog elementa

## PLAN STEZANJA

Karakteristične  
tačke

Mašine



**M**

Obradka



**W**

Referentna



**R**

Početna (teorijski  
i vrh alata)



**B**

Mašina

CNC GLODALICA

Priprema sirovaca

Materijal

Dimenzije

Hrast

200x200x400

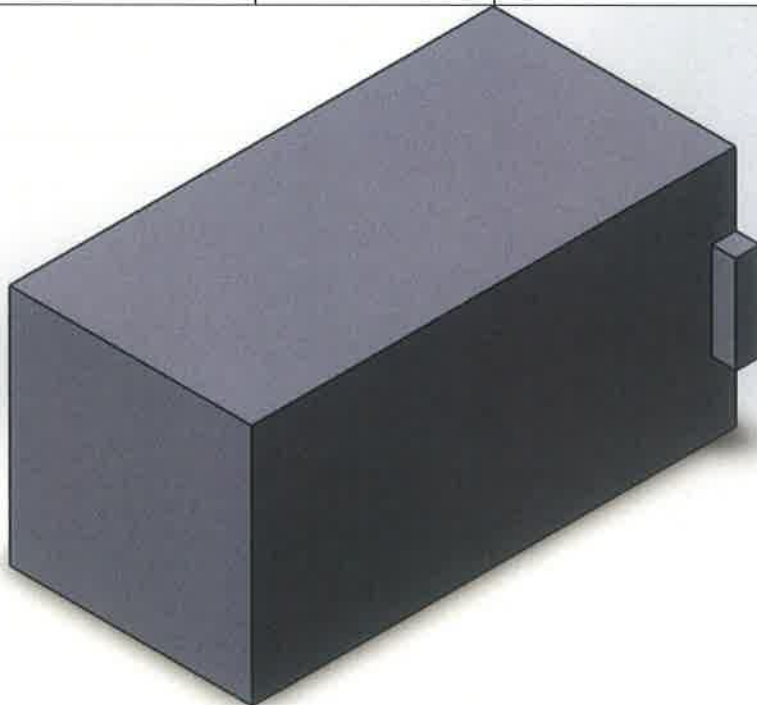
Stezni pribor

Naziv

Oznaka

Škrip

**OPERACIJA BR  
3, 4, 5, 6, 7, 8**



List: 20

Listova: 33

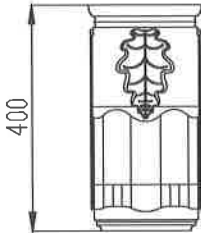
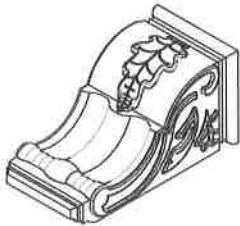
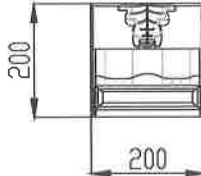

Izradio: Kalamujić Nađa

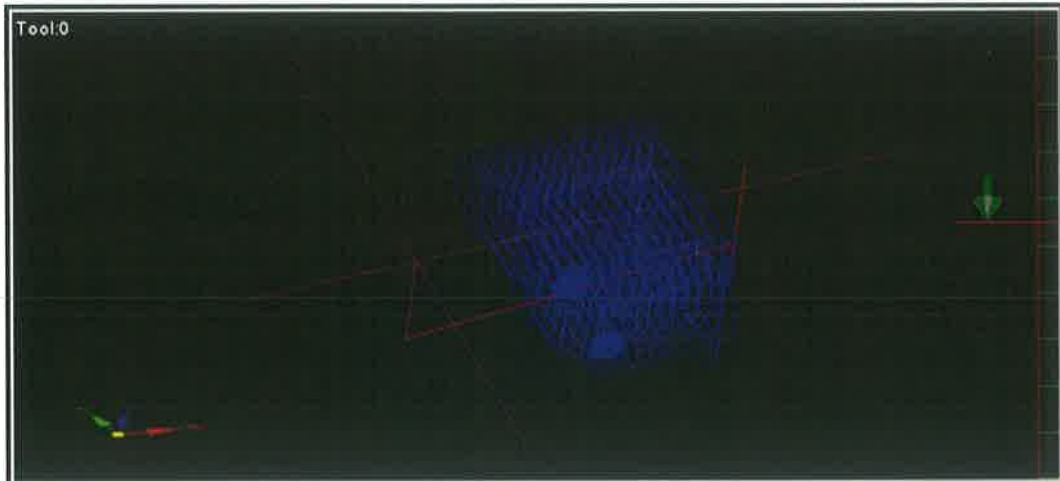
Datum:

1.6.2022

Pregledao: Mediha Mehmedović.

*Mediha Mehmedović*

4				3				2				1							
F																			
E																			
<div><div></div><div></div></div>																			
D																			
<div><div></div><div></div></div>																			
C																			
B																			
A																			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR ANGULAR				FINISH:				DEBURR AND BREAK SHARP EDGES				DO NOT SCALE DRAWING				REVISION			
												Srednja škola za okoliš i drveni dizajn							
DRAWN				NAME				SIGNATURE				DATE				TITLE:			
CHK'D				Zaim Husononovic				Sernald Gullik				29.5.2022.				Izrada ukrasnog elementa			
APPV'D				Zaim Husononovic				Sernald Gullik				29.5.2022.							
MFG																			
QA																			
												MATERIAL:				DWG. NO.			
												Hrast				maturski UKRASN. ELEMENT			
																A4			
												WEIGHT:				SCALE: 1:10			
																SHEET 1 OF 1			
4				3				2				1							



%

N100 (COMPENSATION-WEAR)

N102 (REV-0.70)

N104 (MAY-04-2022-1:32:21PM)

N106 (TOOL 1 - DIA 30.)

N1 G90 G17 G40 G80 G00

N108 M06 T1 ( )

N110 (HSR-HMP-target)

N112 G00 G54 G90 X417.7207 Y30.3259 S4000 M03

.....

N19090 G01 X395.7864 Y-4.6545 Z-149.2145

N19092 X396.4153 Y-5.0292 Z-148.4825

N19094 X396.6455 Y-5.1663 Z-147.4825

N19096 Z-124.4825

N19098 Z62. F12700.

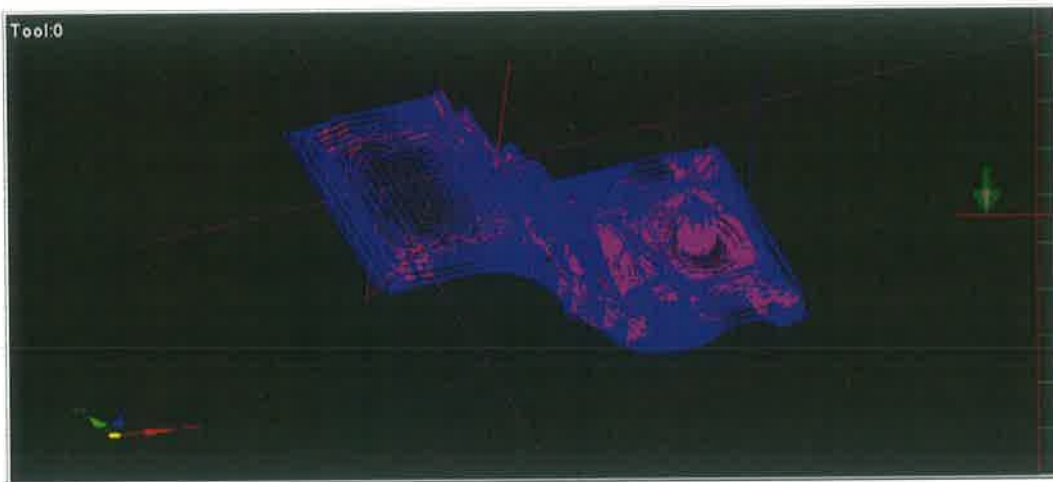
N19100 M05

N19106 G90

N19108 M06 T1

N19110 M30

%



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N100 (COMPENSATION-WEAR)

N102 (REV-0.70)

N104 (MAY-04-2022-1:33:00PM)

N106 (TOOL 2 - DIA 10.)

N1 G90 G17 G40 G80 G00

N108 M06 T2 ( )

N110 (HSR-RestR-target)

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N80632 Y147.4561

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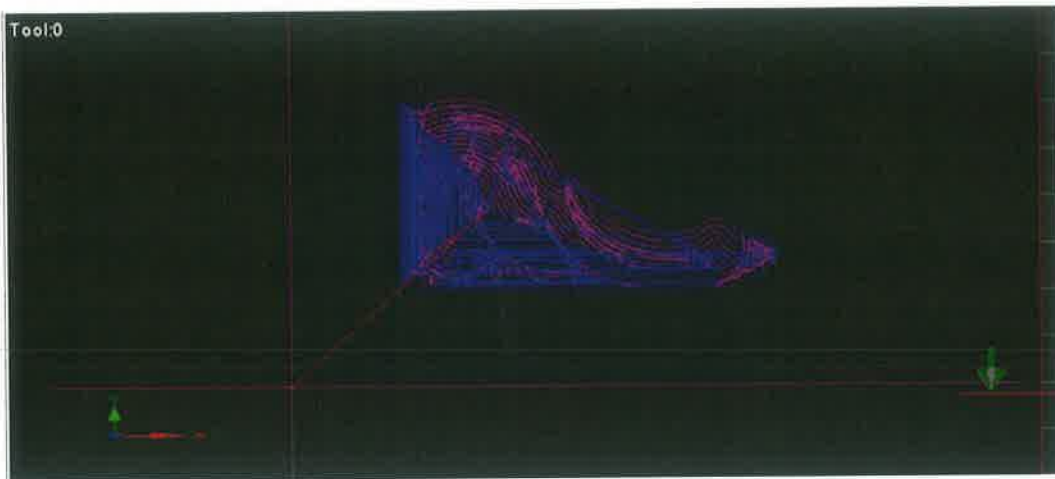
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N80648 M06 T2

N80650 M30

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N100 (COMPENSATION-WEAR)

N102 (REV-0.70)

N104 (MAY-04-2022-1:33:25PM)

N106 (TOOL 2 - DIA 10.)

N1 G90 G17 G40 G80 G00

N108 M06 T2 ( )

N110 (HSR-RestR-target-1)

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N114 G43 H2 Z120.

\*\*\*\*\*

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N14842 Z12. F12700.

N14844 M05

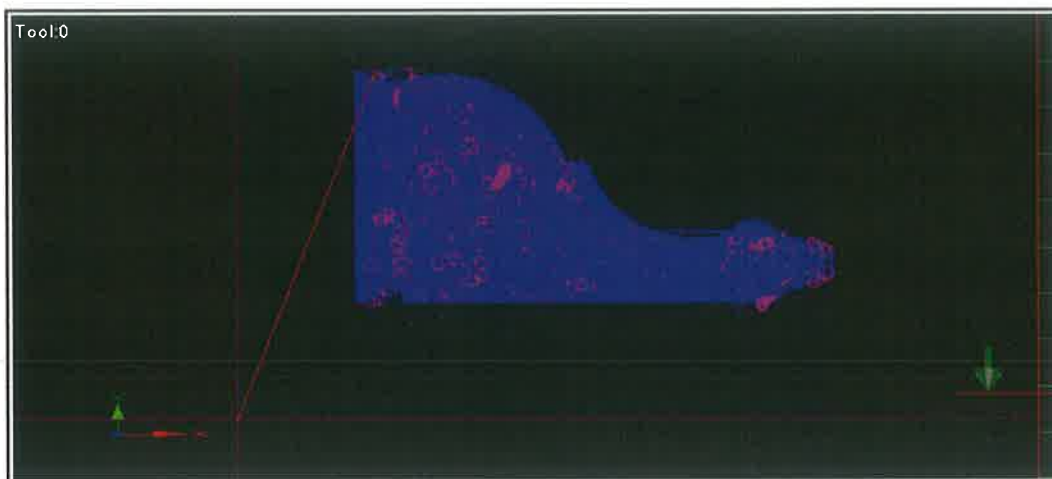
N14850 G90

N14852 M06 T2

N14854 M30

%





%

N100 (COMPENSATION-WEAR)

N102 (REV-0.70)

N104 (MAY-04-2022-1:34:40PM)

N106 (TOOL 3 - DIA 10.)

N1 G90 G17 G40 G80 G00

N108 M06 T3 ( )

N110 (HSM-HMC-target)

N112 G00 G55 G90 X18.7295 Y198.1729 S4000 M03

\*\*\*\*

N790440 X31.4674 Y184.8267 Z-7.3184

N790442 X31.2969 Y184.9107 Z-6.9689

N790444 X31.1918 Y184.9624 Z-6.5887

N790446 X31.1563 Y184.9799 Z-6.1928

N790448 Z10. F12700.

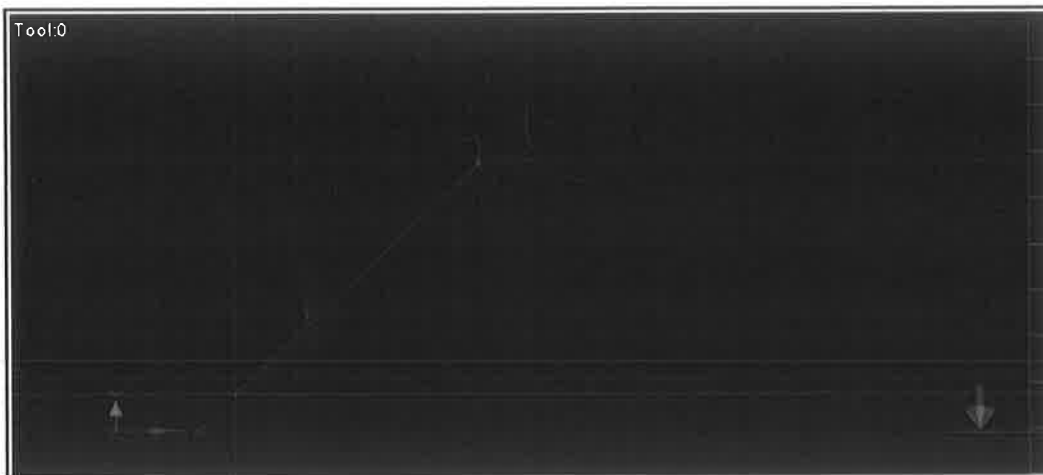
N790450 M05

N790456 G90

N790458 M06 T3

N790460 M30

%



%

N100 (COMPENSATION-WEAR)

N102 (REV-0.70)

N104 (MAY-04-2022-1:35:27PM)

N106 (TOOL 4 - DIA 2.)

N1 G90 G17 G40 G80 G00

N108 M06 T4 ( )

N110 (P-contour4)

\*\*\*\*\*

N208 X107.3824 Y104.316 I1.7761 J2.4178

N210 G01 X105.9036 Y111.8929

N212 X107.4805 Y103.8138

N214 G02 X107.4574 Y102.5566 I-2.9444 J-0.5747

N216 G03 X116.3288 Y65.7615 I41.0071 J-9.58

N218 G00 Z25.

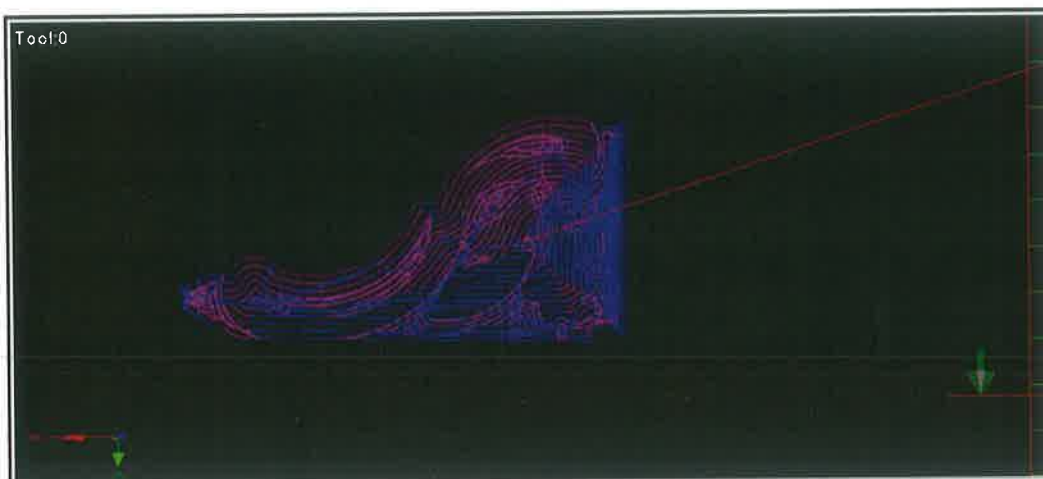
N220 M05

N226 G90

N228 M06 T4

N230 M30

%



%

N100 (COMPENSATION-WEAR)

N102 (REV-0.70)

N104 (MAY-04-2022-1:36:18PM)

N106 (TOOL 2 - DIA 10.)

N1 G90 G17 G40 G80 G00

N108 M06 T2 ( )

N110 (HSR-RestR-target-4)

N112 G00 G56 G90 X103.8078 Y113.1006 S4000 M03

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N14634 G02 X401.4745 Y156.7806 I1.2251 J-0.2483 F2000.

N14636 G01 X402.4545 Y156.5819 Z-19.0556

N14638 X403.172 Y156.4365 Z-18.3235

N14640 X403.4346 Y156.3832 Z-17.3235

N14642 Z12. F12700.

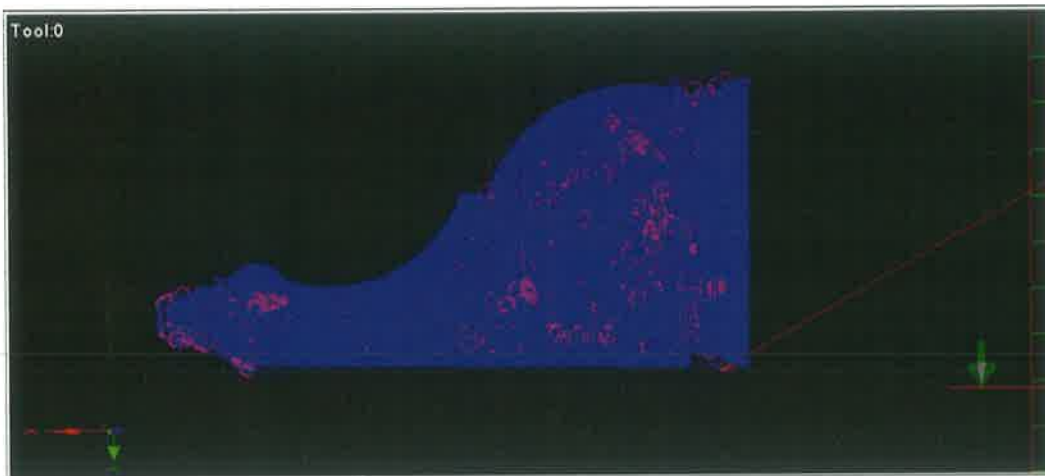
N14644 M05

N14650 G90

N14652 M06 T2

N14654 M30

%



%

N100 (COMPENSATION-WEAR)

N102 (REV-0.70)

N104 (MAY-04-2022-1:36:53PM)

N106 (TOOL 3 - DIA 10.)

N1 G90 G17 G40 G80 G00

N108 M06 T3 ( )

N110 (HSM-HMC-target-1)

N112 G00 G56 G90 X18.7104 Y201.725 S4000 M03

....

N782782 X187.8051 Y88.1882 Z-3.0968

N782784 X187.8918 Y88.0372 Z-2.7589

N782786 X187.9451 Y87.9443 Z-2.3942

N782788 X187.9631 Y87.913 Z-2.0158

N782790 Z10. F12700.

N782792 M05

N782798 G90

N782800 M06 T3

N782802 M30

%

Tool:0

%

N100 (COMPENSATION-WEAR)

N102 (REV-0.70)

N104 (MAY-04-2022-1:38:10PM)

N106 (TOOL 4 - DIA 2.)

N1 G90 G17 G40 G80 G00

N108 M06 T4 ( )

N110 (P-contour8)

....

N210 G03 X108.8291 Y97.7311 I89.7322 J-179.7665

N212 G02 X107.26 Y98.3316 I-0.5906 J0.8069

N214 X151.1607 Y149.0482 I41.2045 J8.6918

N216 G03 X116.3288 Y134.2385 I-2.6962 J-42.0248

N218 G00 Z25.

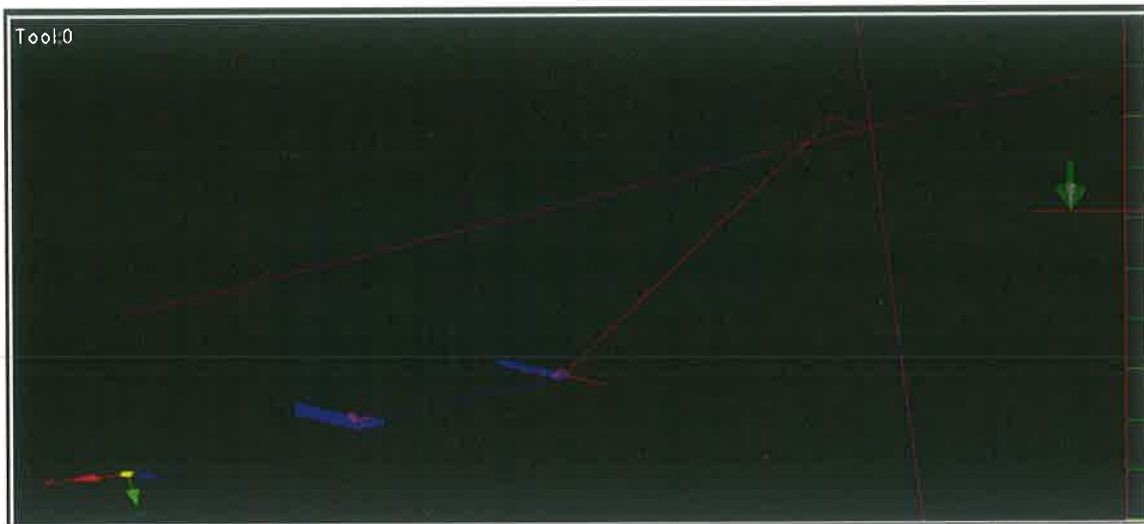
N220 M05

N226 G90

N228 M06 T4

N230 M30

%



%

N100 (COMPENSATION-WEAR)

N102 (REV-0.70)

N104 (MAY-04-2022-1:38:32PM)

N106 (TOOL 2 - DIA 10.)

N1 G90 G17 G40 G80 G00

N108 M06 T2 ( )

N110 (HSR-RestR-target-2)

\*\*\*\*

N52298 G03 X400.01 Y181.1461 I-0.1319 J0.4038

N52300 G01 Y197.6955

N52302 G03 X398.76 Y198.9455 I-1.25 J0. F2000.

N52304 G18 X396.76 Z-198. I0. K2.

N52306 G01 Z12. F12700.

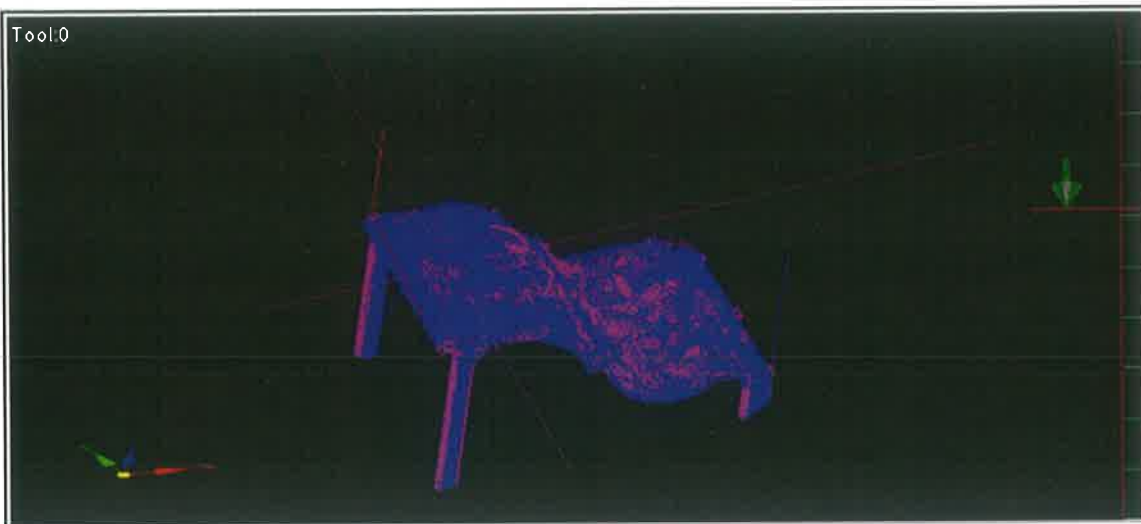
N52308 M05

N52314 G90

N52316 M06 T2

N52318 M30

%



%

N100 (COMPENSATION-WEAR)

N102 (REV-0.70)

N104 (MAY-04-2022-1:38:52PM)

N106 (TOOL 3 - DIA 10.)

N1 G90 G17 G40 G80 G00

N108 M06 T3 ( )

N110 (HSM-HMC-target-2)

N112 G00 G54 G90 X15.8196 Y207.0901 S4000 M03

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N1794564 X406.4496 Y18.3322 Z-156.7005

N1794566 X406.5386 Y18.3776 Z-156.3472

N1794568 X406.5686 Y18.3929 Z-155.9817

N1794570 Z10. F12700.

N1794572 M05

N1794578 G90






N1794580 M06 T3

N1794582 M30

%

*table data*

ToolTable

Tool	Description	Diameter(D)	Height (H)	Diam. Wear	HeightWear
0	Ref. Tool	0.000000	0.000000	0.000000	0.000000
 1	Empty	30.000000	210.000000	0.000000	0.000000
 2	Empty	10.000000	210.000000	0.000000	0.000000
 3	Empty	10.000000	210.000000	0.000000	0.000000
 4	Empty	2.000000	80.000000	0.000000	0.000000
 5	Empty	0.000000	0.000000	0.000000	0.000000

All Tool Entries are in your default setup measurement units regardless of G20/G1 modes.

Apply

OK



Sarajevo 2022. godine

Komentar nastavnika:

Tobako dosta uočeno dužine alata uočeno  
korekcijski. Konrad uži mobilizirao do tog  
pravo radotku.

Zbog slabosti geometriji daju jedan  
ocjenu 4.5.

Ocjena Maturuskog rada:

~~1.5~~ 4.5  
odlično (5).

Potpis ispitne komisije:

Predsjednik:

Ispitivač:

Član:

Mehmedović Mediha