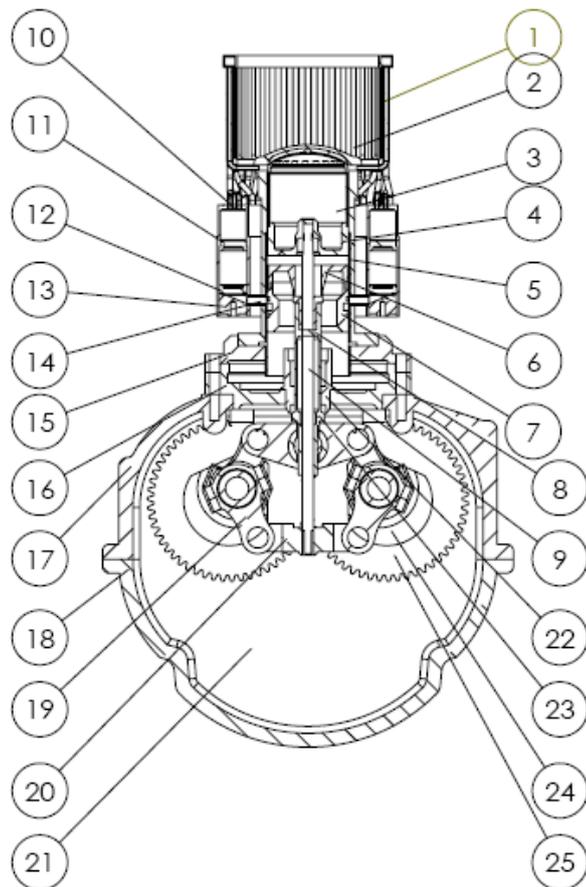


**ภาคผนวก จ****แบบชิ้นส่วนหลักของเครื่องยนต์เตอลิง**

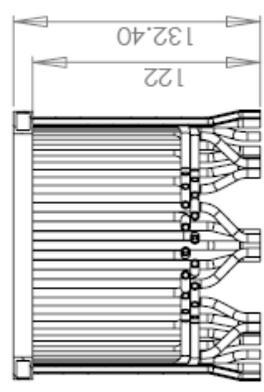
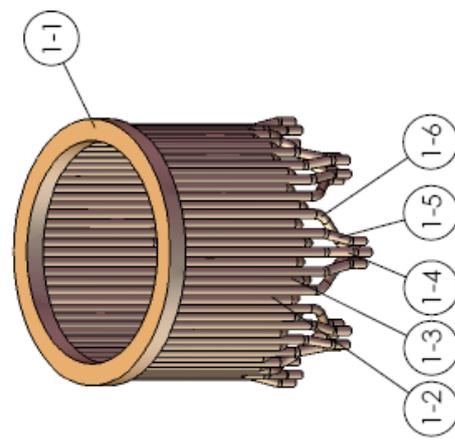
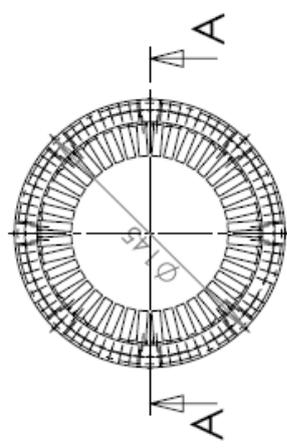
แบบ ภาพประกอบ และชิ้นส่วนหลักของเครื่องยนต์เตอลิง แสดงตามแบบ หมายเลข

1-14 ดังนี้



25	Gear	2
24	Crank Shaft	2
23	Piston Yoke	1
22	Displace Yoke Sleeve	1
21	Back Cap	1
20	Displacer Yoke	1
19	Connecting Rod	6
18	Base Bottom	1
17	Base Top	1
16	Housing Bottom	1
15	Housing Top	1
14	Compression end-duct	8
13	Cooler End Cap	8
12	Cooler-Base	8
11	Cooler-Top Cap	8
10	Cooler-Regenerator Cartridge	8
9	Displacer Rod	1
8	Piston Rod	1
7	Piston-Bottom	1
6	Piston-Top	1
5	Cylinder Liner	1
4	Displacer Piston-Bottom	1
3	Displacer Piston-Top	1
2	Cylinder	1
1	Heater	1
<b>No.</b>	<b>Part Name</b>	<b>Piece</b>

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH:		DEBUR AND BREAK SHARP EDGES		REVISION	
						ME. Dept. Thammasat U.	
						TITLE:  Assy Beta Stirling Engine	
DRAWN Phongsin Dh.		SIGNATURE		DATE		DWG NO. <b>Beta-01</b>	
CHKD						A4	
APPVD						SCALE 1:4	
				MATERIAL: <b>Stainless Steel</b>		SHEET 1 OF 1	
				WEIGHT:			



Section A-A

1-6	Heater-Tube shape E	16
1-5	Heater-Tube shape D	16
1-4	Heater-Tube shape C	8
1-3	Heater-Tube shape B	40
1-2	Heater-Tube shape A	40
1-1	Heater-Header	1
<b>No.</b>	<b>Part Name</b>	<b>Piece</b>

UNLESS OTHERWISE SPECIFIED, FINISH DIMENSIONS ARE IN MILLIMETERS. DECIMALS ARE TO NEAREST TOLERANCES: LINEAR: ANGULAR:

REVISION

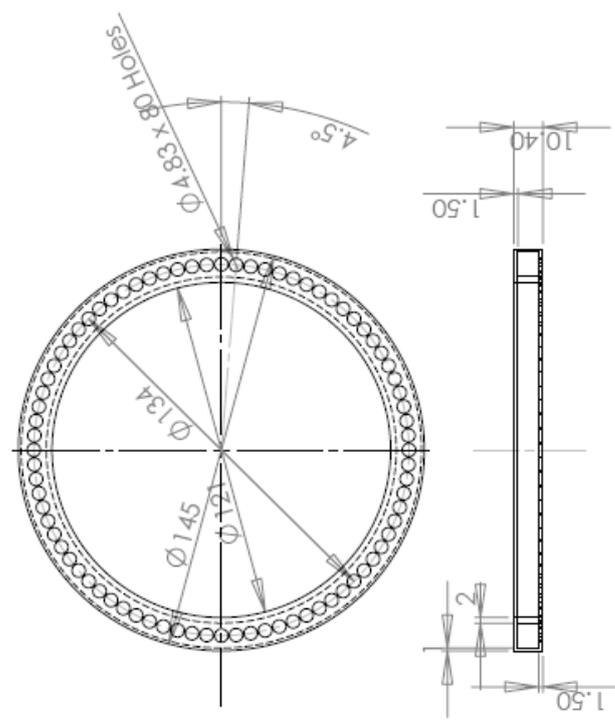
ME Dept. Thammasat U.

NAME	Phongsin Dh.	SIGNATURE	DATE
DRAWN			
CHECK			
APP'D			
MATERIAL: Stainless Steel			
DWG NO. Beta-01-Heater			
SCALE: 1:3			
SHEET 1 OF 1			

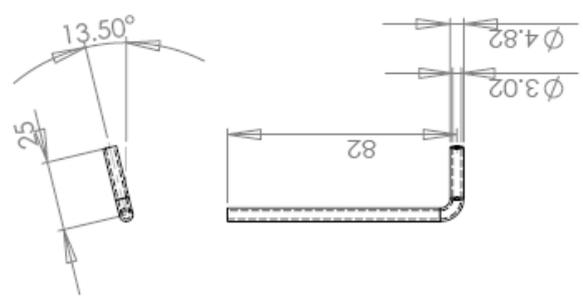
TITLE: Assy. Heater

A4

1-1 Heater Header

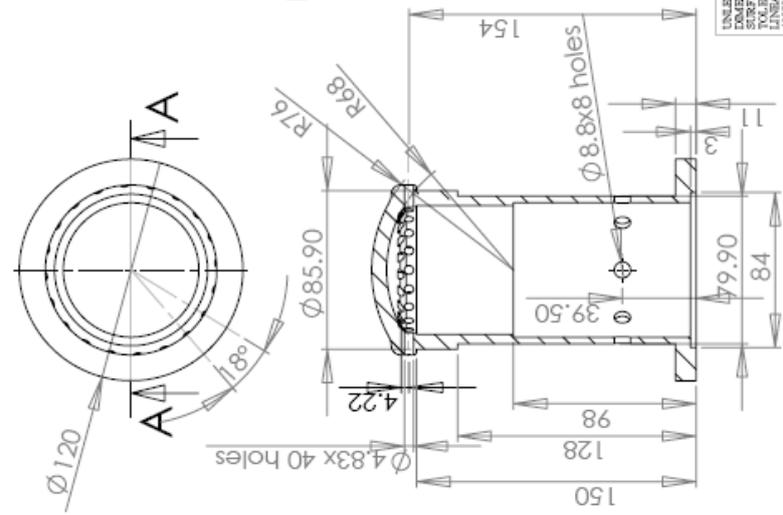


1-2 Heater -Tube ShapeA

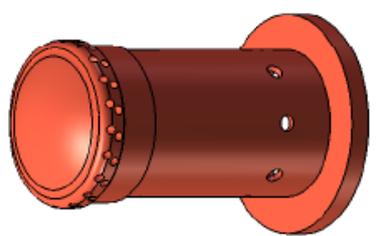
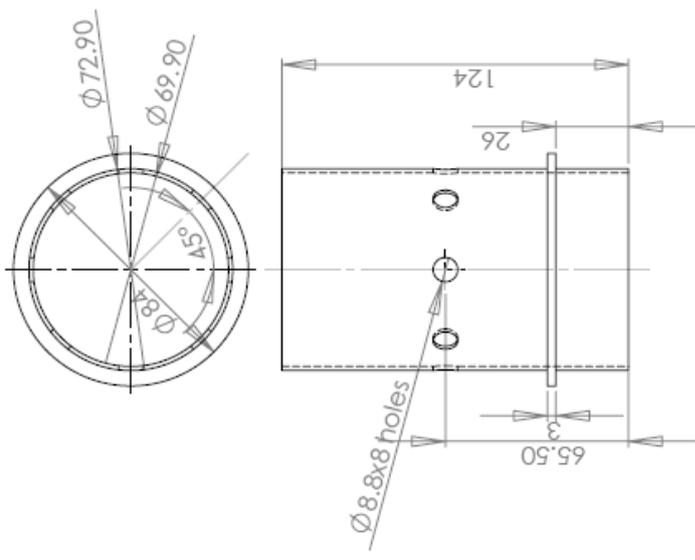


UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS		FINISH		DEBURR AND BREAK SHARP EDGES		REVISION	
TOLERANCES:		DRAWN		NAME		ME Dept. Thammasat U.	
LINEAR:		Phongshin Dh.		SIGNATURE		Heater Header, Tube Shape A	
ANGULAR:		CHKD		DATE		Beta-02-Heater Header	
		APPRD		MATERIAL:		A4	
				Stainless Steel			
				WEIGHT:		SCALE: 1:2	
						SHEET 1 OF 1	

2. Cylinder

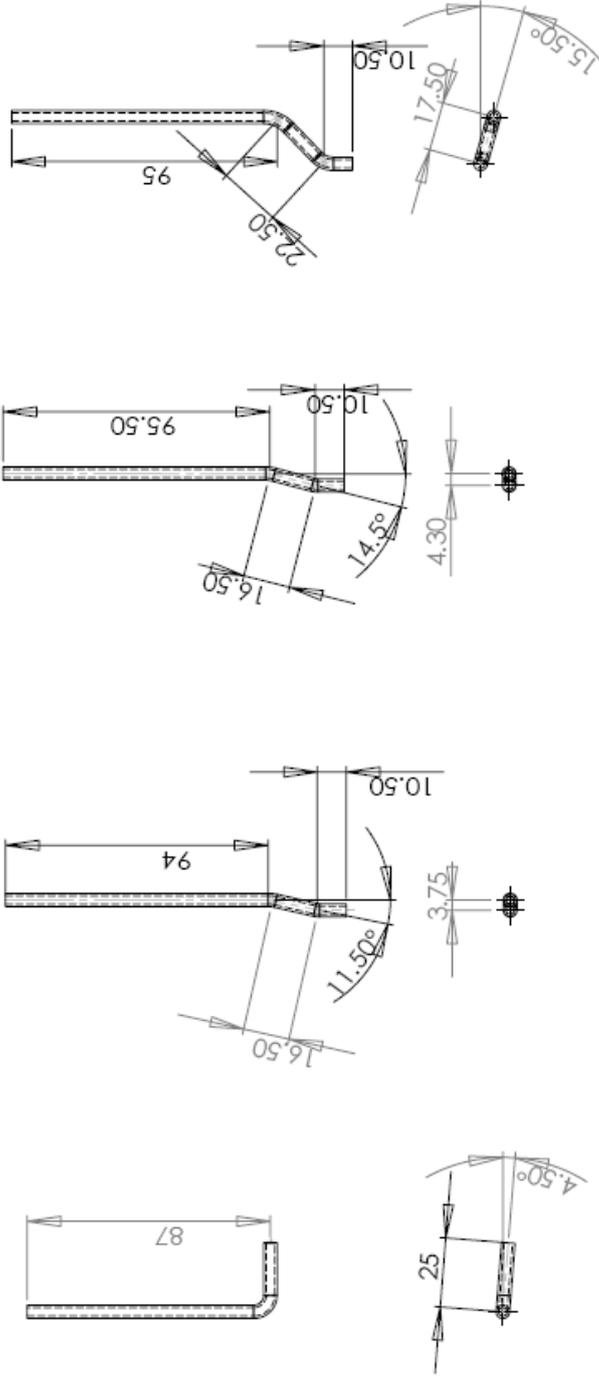


5. Cylinder liner



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS		FINISH:		DEFUR AND		REVISION	
TOLERANCES:		SKETCHES:		BREAK SHARP			
LINEAR:		SIGNATURE		EDGES			
ANGULAR:		DATE					
DRAWN	NAME	DWG NO.	MATERIAL:	TITLE:			
CHEK	Plungin Dn	Beta-04-Cylinder	Stainless Steel	ME Dept. Thammasat U.			
APPR				Cylinder & Cylinder Liner			
				Beta-04-Cylinder			
				A4			
				SCALE: 1:1			
				SHEET 1 OF 1			

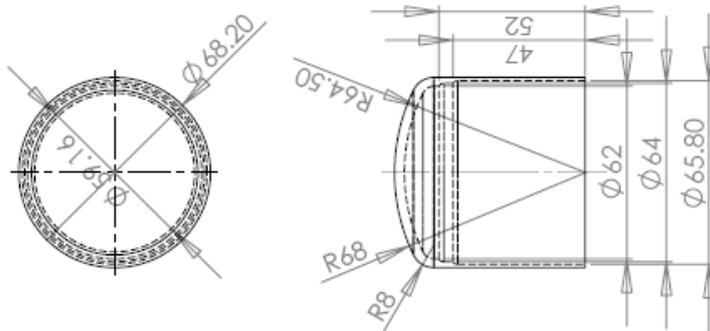
1-3 Heater - Tube Shape B      1-4 Heater - Tube Shape C      1-5 Heater - Tube Shape D      1-6 Heater - Tube Shape E



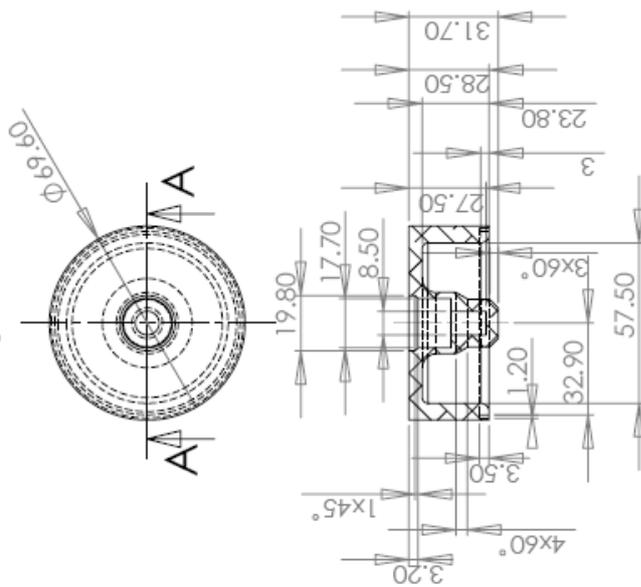
All Tube Inner Diameter = 3.02  
Outer Diameter = 4.83

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS TOLERANCES: LINEAR: ANGULAR:		FINISH:		DEBUR AND BREAK SHARP EDGES		REVISION	
NAME	SIGNATURE	DWG				TITLE:	
DRAWN	Phongsin Dh.					ME Dept. Thammasat U.	
CHECKD						Heater-Tube Shape B,C,D,E	
APPROV						Beta-03-Heater Tube	
						DWG NO.	A4
						MATERIAL:	Stainless Steel
						SCALE:1:2	SHEET 1 OF 1

3. Displacer top

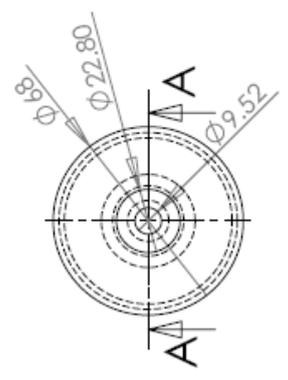


4. Displacer bottom

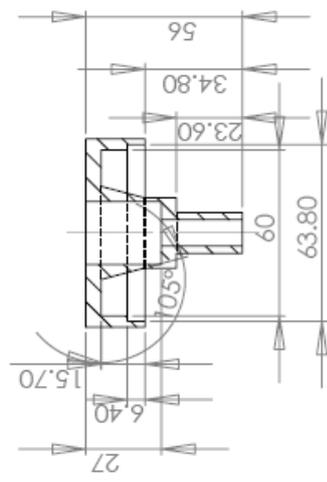
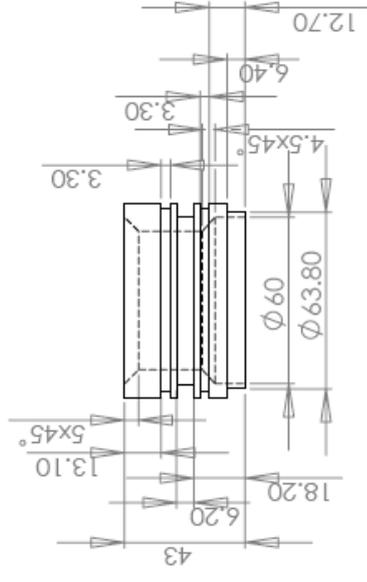
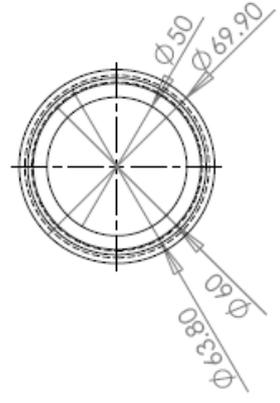


UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS		FINISH:		DEBUR AND BREAK SHARP EDGES		REVISION	
SURFACE FINISH:		LINEAR:		ANGULAR:		ME Dept. Thammasat U.	
DRAWN	NAME	SIGNATURE	DATE	TITLE:			
CHECK	Phongsin Dh.			Displacer top & bottom			
APPVD				DWG NO. Beta-05-Displacer			
				MATERIAL: Stainless Steel			
				SCALE: 1:1			
				SHEET 1 OF 1			

6. Piston -Top



7. Piston -Bottom

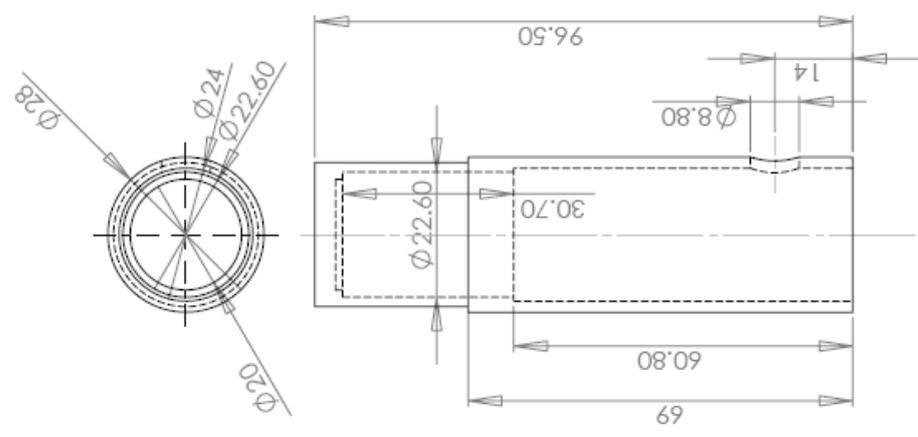


Section A-A

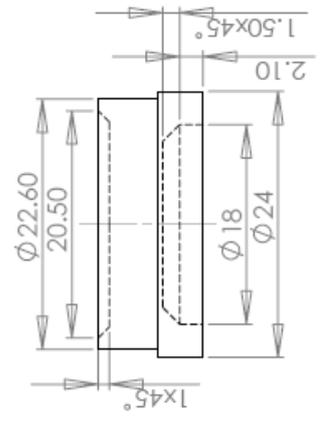
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS		FINISH		REVISION			
TOLERANCES:		BREAK SHARP EDGES					
LINEAR:							
ANGULAR:							
DRAWN	NAME	SIGNATURE	DWG	ME Dept. Thammasat U.			
CHECK	Phongsin Dh.					Piston Top& Bottom	
APPROV							
	MATERIAL: Stainless Steel			A4			
	WEIGHT:			SCALE: 1:1			
	SHEET: 1 OF 1						



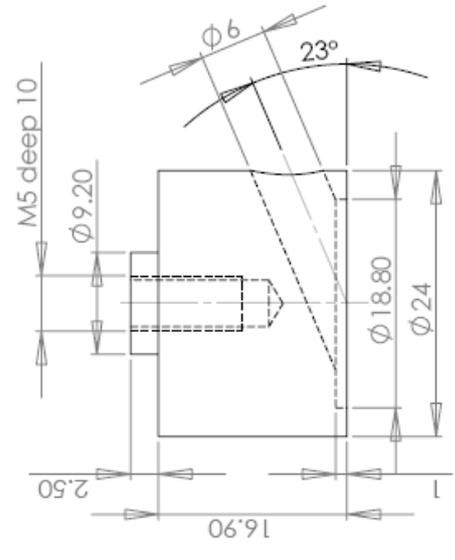
10. Cooler Regenerator Cartridge



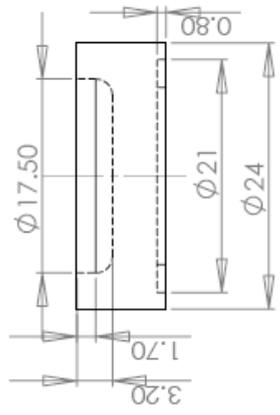
11. Cooler Top Cap



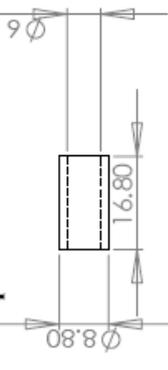
13. Cooler End Cap



12. Cooler Base

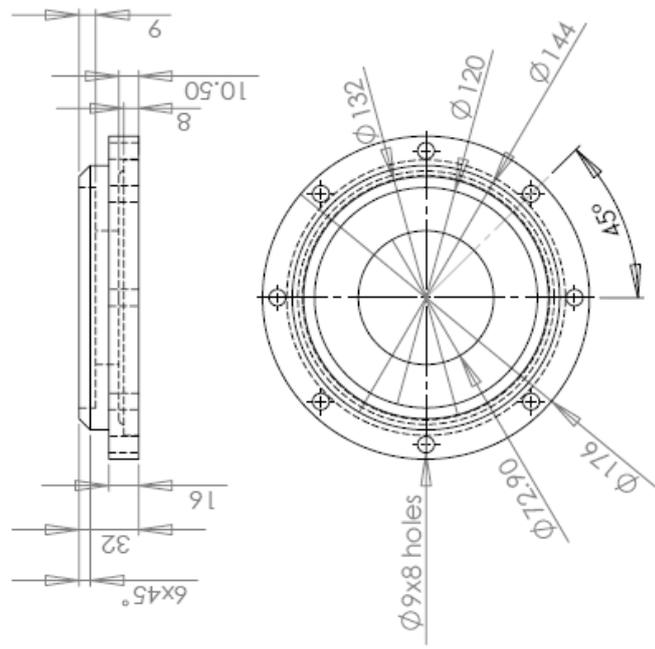


14. Compression End Duct

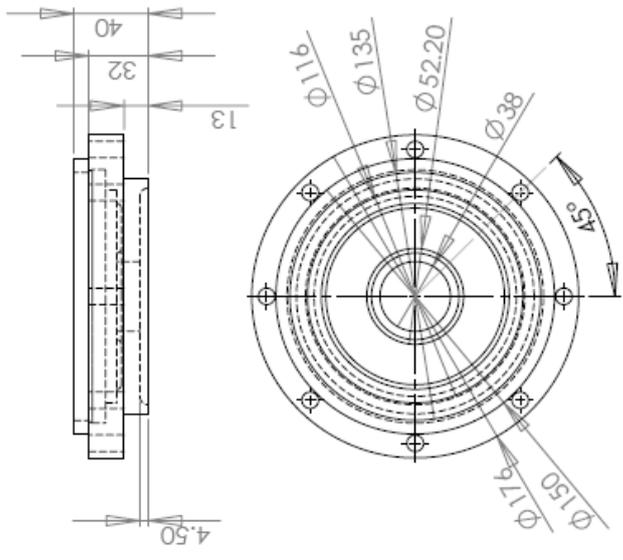


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH		DIEB AND BREAK SHARP EDGES		REVISION	
DRAWN	NAME	SIGNATURE	DATE			ME Dept. Thammasat U.	
CHECKD	Phongsin Dh.					Cooler-Regenerator	
APPROV						Beta-08-Cooler Regen	
				MATERIAL: Stainless Steel		A4	
				WEIGHT:		SCALE: 1:2	
						SHEET 1 OF 1	

15. Housing Top



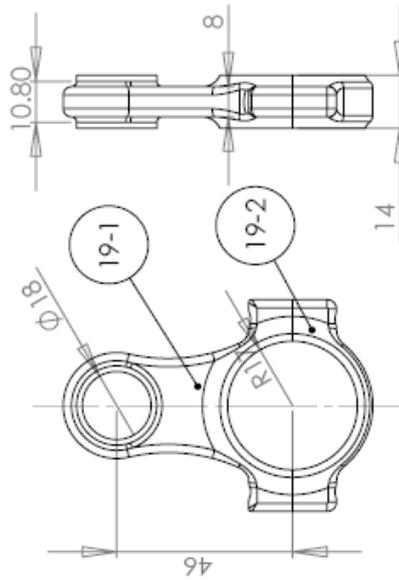
16. Housing Bottom



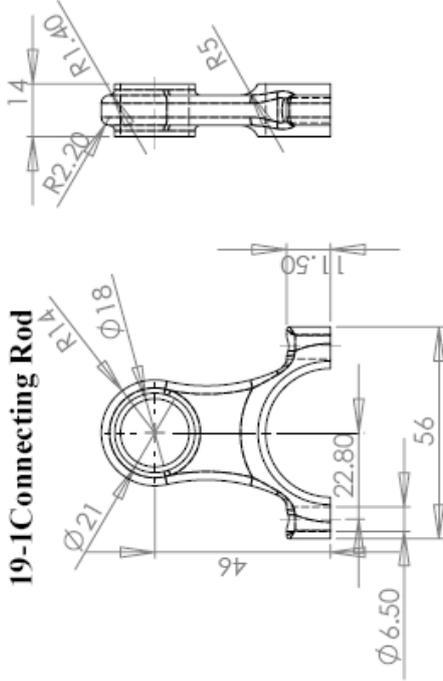
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS		FINISH		DIEBAND		REVISION	
DIMENSIONS ARE IN MILLIMETERS		DIMENSIONS ARE IN MILLIMETERS		BREAK SHARP EDGES			
TOLERANCES		TOLERANCES					
LINEAR		LINEAR					
ANGULAR		ANGULAR					
DRAWN	NAME	SIGNATURE	DATE				
CHECK	Phongshin Dhl.						
APPVD							
				MATERIAL: Stainless Steel			
				SCALE: 1:2			
				SHEET 1 OF 1			
ME Dept. Thammasat U.							
TITLE: Housing Top & Bottom							
				DWG NO. Beta-09-Housing			
				A4			



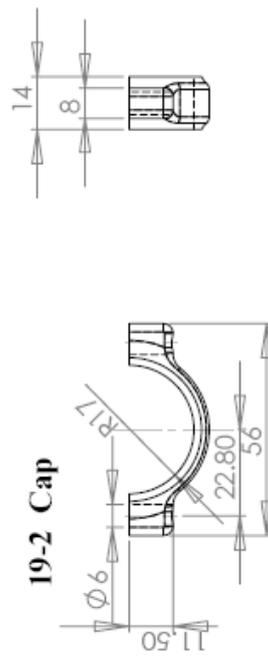
### 19. Connecting Rod Assy



### 19-1 Connecting Rod

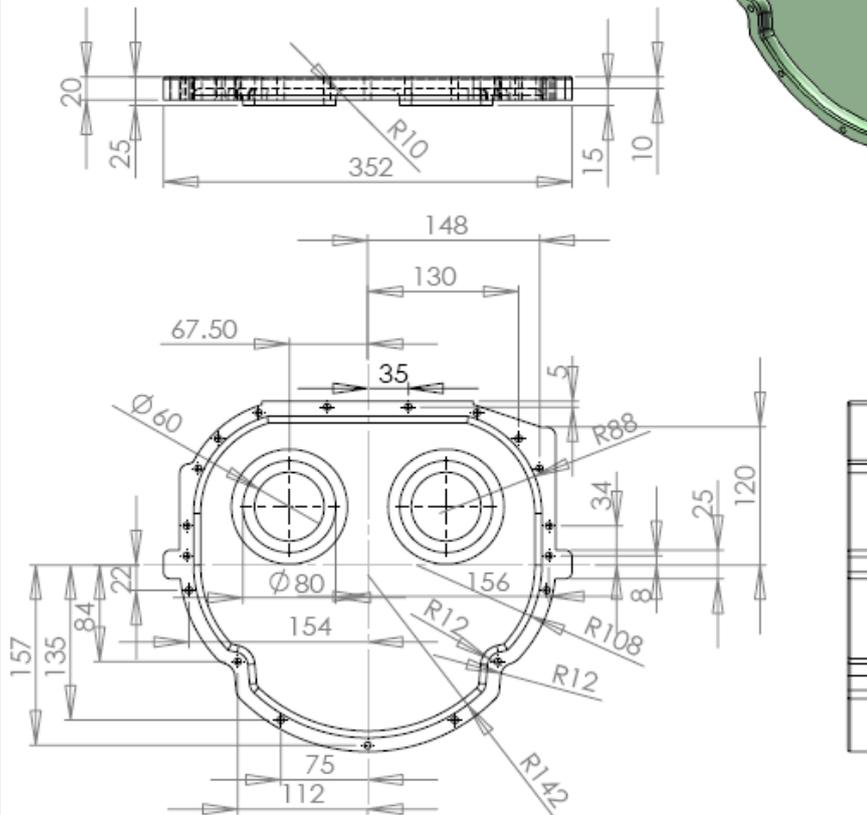
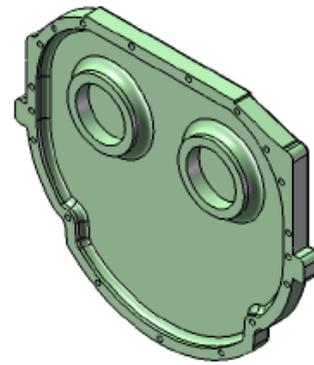


### 19-2 Cap



FINISHES OF HERETOFORE SPECIFIED DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. SURFACE FINISH TO ALL DIMENSIONS ANGULAR.		FINISH:		DEFECT AND BREAK SHARP EDGES		REVISION	
NAME	SIGNATURE	DATE					
DRAWN	Phongsin Dh.					ME Dept. Thammasat U.	
CHECKD						TITLE: Connecting Rod	
APPVD						DWG NO.	A4
						MATERIAL: Stainless Steel	

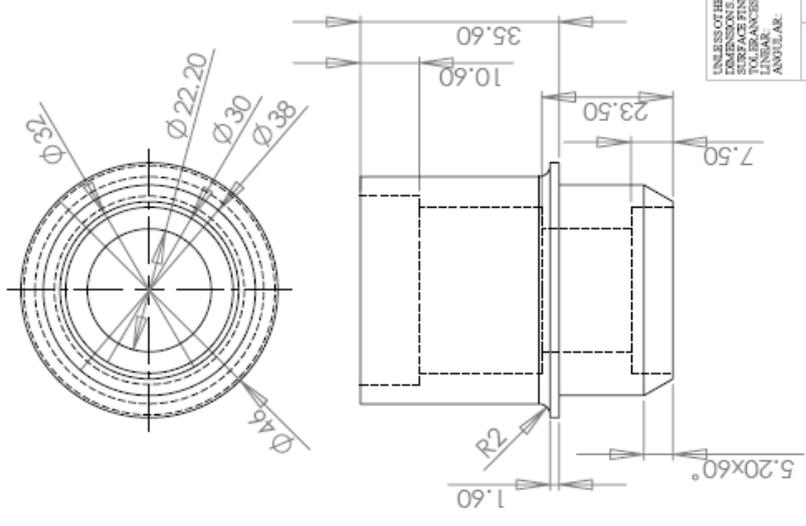
21. Back Cap



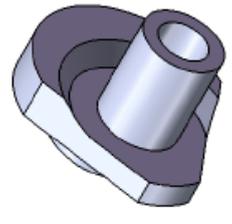
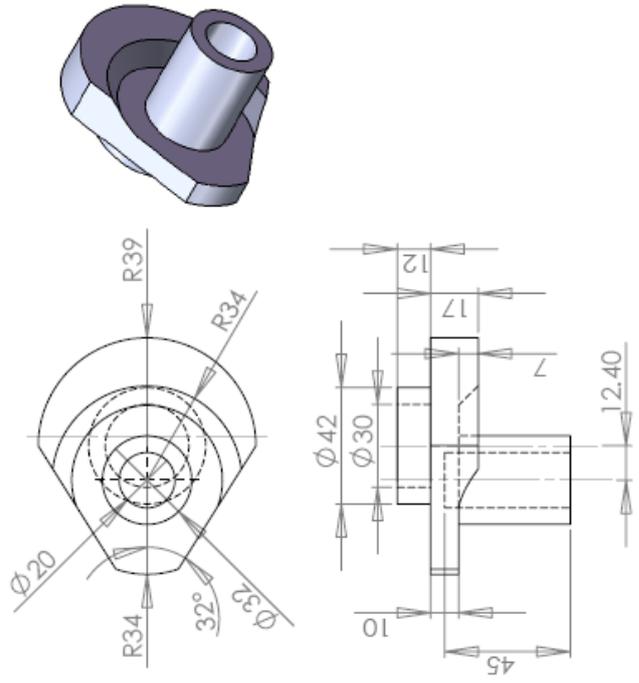
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:		DEBUR AND BREAK SHARP EDGES		REVISION	
								ME. Dept. Thammasat U.	
DRAWN Phongsin Ch.				SIGNATURE		DATE		TITLE: Back Cap	
CHKD									
APPVD									
				MATERIAL: Stainless Steel		DWG NO. Beta-12-Cap		A4	
				WEIGHT:		SCALE: 1:5		SHEET 1 OF 1	



22. Displacer Yoke Sleeve



24. Crank Shaft



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS		FINISH		DEBUR AND BREAK SHARP EDGES		REVISION	
SURFACE FINISH:						ME Dept. Thammasat U.	
TOLERANCES:						TITLE:	
LINEAR:						Disp' Yoke Sleeve , Crank Shaft	
ANGULAR:						DWG NO. A4	
NAME	SIGNATURE	DATE	MATERIAL:	Beta-14-crank shaft			
DRAWN Phongsin Dh.			Steel				
CHECKD							
APPROV							
			WEIGHT:	SCALE: 1:2			
				SHEET 13 OF 13			