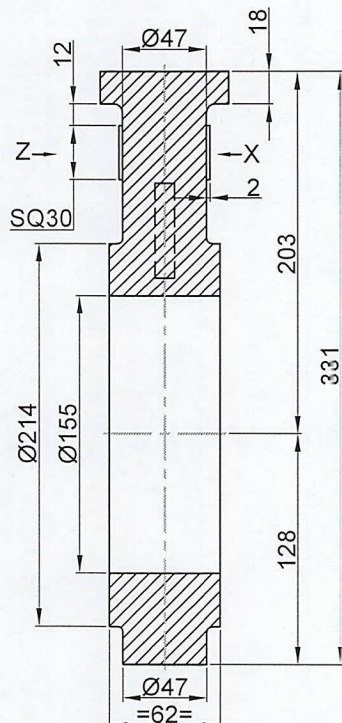
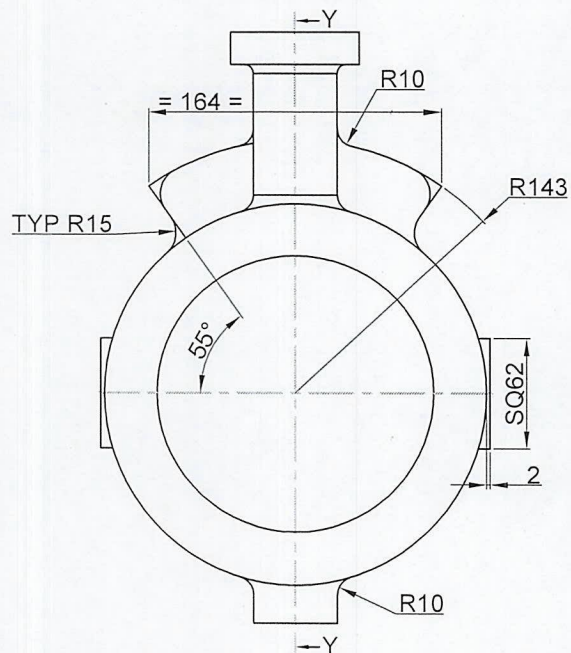


TOP VIEW



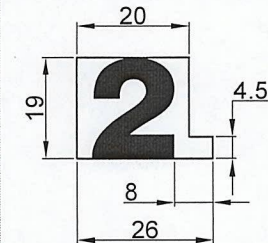
SECTION-YY

DN150/6"

PROVISION FOR  
MATERIAL GRADE

LETTER HEIGHT 10mm &  
RAISED TO 2mm.

DETAIL-X



DETAIL-Z

# NOTE

- @ ADD PROPER CONTRACTION ALLOWANCE.
- @ PROVIDE 1.5°-3° DRAFT ANGLE, AND UNSPECIFIED RADII ARE 1.5mm. USE

CASTING DRAWING

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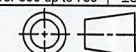
## GENERAL NOTES:

- All dimensions are in mm, Unless otherwise specified
- Dimensions shown are including machining allowance
- Provide suitable contraction allowance
- Casting must be free from colds, shrinkage, blow holes and sand inclusion
- For sand casting provide draft 2 max
- For investment casting unspecified all corners R1, fillets R1

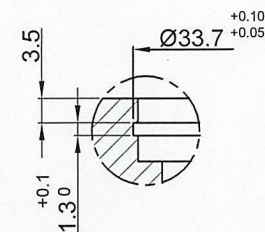
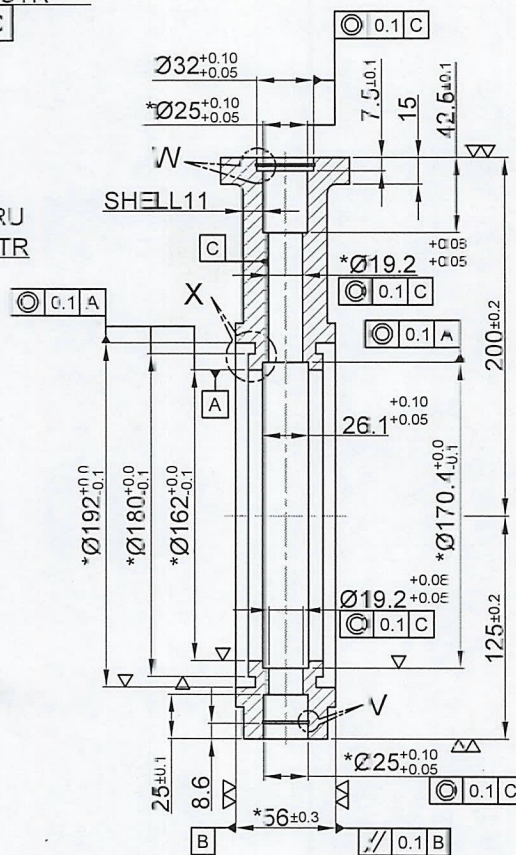
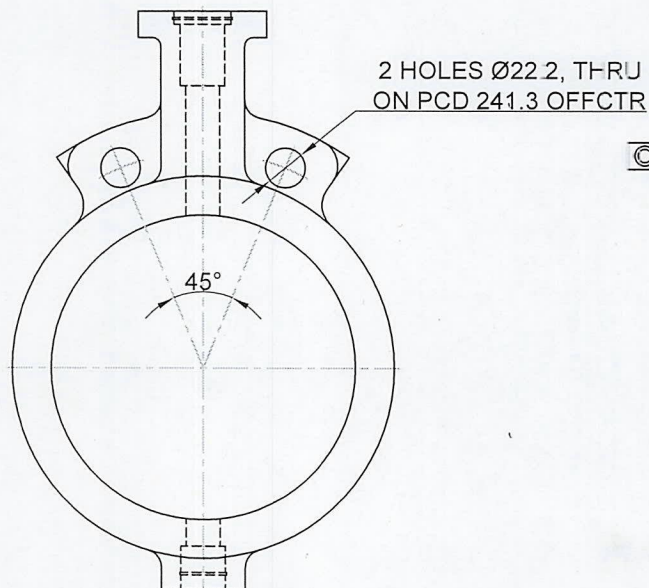
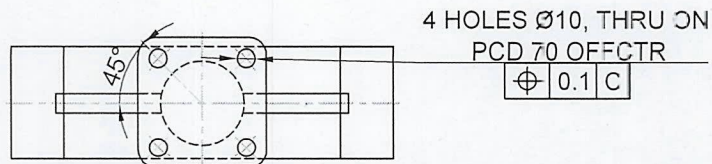
DRAWN :	R.K.	18/06/2019
CHECKED :	A.P.	19/06/2019
APPROVED :	A.P.	19/06/2019
Investment Casting (IS -11166-1993, Class-2)	Sand Casting (IS -4897-1994, Class-1A)	
Nominal Length	Tolerance	Nominal Length
up to 6	±0.10	up to 6
Over 6 up to 10	±0.12	Over 6 up to 10
Over 10 up to 18	±0.20	Over 10 up to 18
Over 18 up to 30	±0.30	Over 18 up to 30
Over 30 up to 80	±0.45	Over 30 up to 80
Over 80 up to 180	±0.60	Over 80 up to 180
Over 180 up to 300	±1.00	Over 180 up to 300
Over 300 up to 500	±2.00	Over 300 up to 500

TITLE :	BODY DN150(NPS6)
PRODUCT :	BUTTERFLY VALVE
CLASS :	150
PART No :	201
MATERIAL :	AS PER BOM
WEIGHT :	12.5 Kg
DRG.No :	015001BFNWCWT201XXXXI
Rev :	00

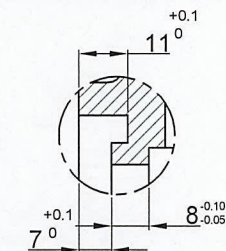
Scale : NTS



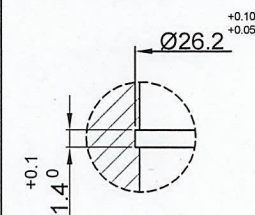
2L Engineers



DETAIL-W



DETAIL-X



DETAIL-V

MACHINING DRAWING

Note: \* Critical Dimensions to be maintained as per drawing.

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GENERAL NOTES:

1. All dimensions are in mm, Unless otherwise specified
2. Remove all burrs and sharp edges
3. Dimensions showed in bracket ( ) only for reference
4. For any Doubts and Clarification, contact Design

▽ Machining to 6.3µm to 3.2µm Ra  
▽▽ Fine machining to 3.2µm to 1.6µm Ra  
▽▽▽ Grinding/Burnishing to 0.8µm to 0.4µm Ra  
▽▽▽▽ Lap to 0.2µm to 0.1µm Ra

DRAWN : R.K. 18/06/2019  
CHECKED : A.P. 19/06/2019  
APPROVED : A.P. 19/06/2019

TITLE :  
BODY DN150(NPS6)

General Tolerances as per ISO 2768

Linear Dimension		Angular Dimension	
Nominal Length	Tolerance	Nominal Length	Tolerance
0.5 up to 3	±0.1	up to 10	±1°
Over 3 up to 6	±0.1	Over 10 up to 50	±0°30'
Over 6 up to 30	±0.2	Over 50 up to 120	±0°20'
Over 30 up to 120	±0.3	Over 120 up to 400	±0°10'
Over 120 up to 400	±0.5	Over 400	±0°5'
Over 400 up to 1000	±0.8		
Over 1000 up to 2000	±1.2		
Over 2000 up to 4000	±2.0		

PRODUCT : BUTTERFLY VALVE  
CLASS : 150

PART No : 201

MATERIAL : AS PER BOM

WEIGHT : 8 Kg

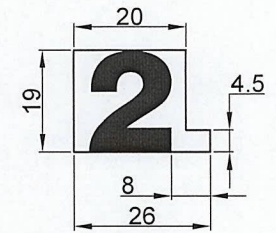
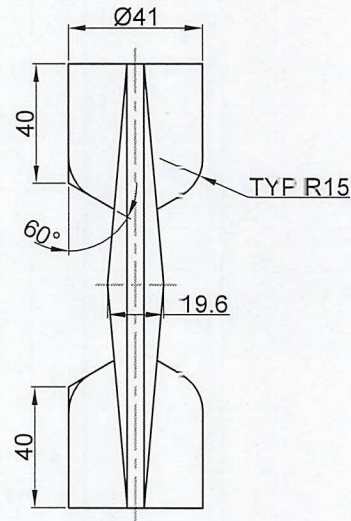
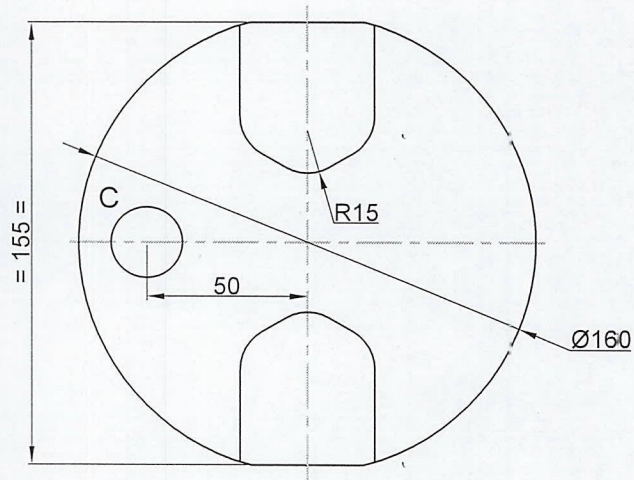
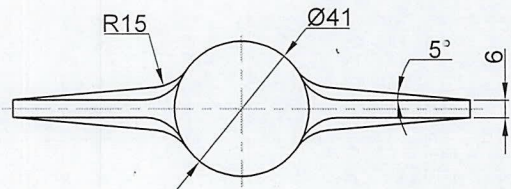
DRG.No : Rev : 00

015001BFNWCWT201XXXZS

Scale : NTS



2L Engineers



DN150/6"

PROVISION FOR  
MATERIAL GRADE

LETTER HEIGHT 10mm &  
RAISED TO 2mm.

DETAIL-C

#### NOTE

- @ ADD PROPER CONTRACTION ALLOWANCE.
- @ PROVIDE 1.5°-3° DRAFT ANGLE, AND UNSPECIFIED RADII ARE 1.5mm. USE

CASTING DRAWING

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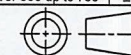
#### GENERAL NOTES:

- All dimensions are in mm, Unless otherwise specified
- Dimensions shown are including machining allowance
- Provide suitable contraction allowance
- Casting must be free from coldset, shrinkage, blow holes and sand inclusion
- For sand casting provide draft 2° max
- For investment casting unspecified all corners R1, fillets R1

DRAWN :	R.K	18/06/2019
CHECKED :	A.P	19/06/2019
APPROVED :	A.P	19/06/2019
Investment Casting (IS -11136-1993, Class-2)	Sand Casting (IS -4897-1994, Class-1A)	
Nominal Length	Tolerance	Nominal Length
up to 3	±0.10	up to 6
Over 3 up to 10	±0.12	Over 6 up to 10
Over 10 up to 18	±0.20	Over 10 up to 18
Over 18 up to 30	±0.30	Over 18 up to 30
Over 30 up to 80	±0.45	Over 30 up to 80
Over 80 up to 180	±1.30	Over 80 up to 180
Over 180 up to 300	±1.70	Over 180 up to 300
Over 300 up to 500	±2.00	Over 300 up to 500
Over 500 up to 750	±3.00	Over 500 up to 750

TITLE :	DISC DN150(NPS 6)
PRODUCT :	BUTTERFLY VALVE
CLASS :	150
PART No :	210
MATERIAL :	AS PER BOM
WEIGHT :	2.5 Kg
DRG.No :	015001BFNWCWT210XXXXX
Rev :	00

Scale : NTS



2L Engineers

5

4

3

2

1

A

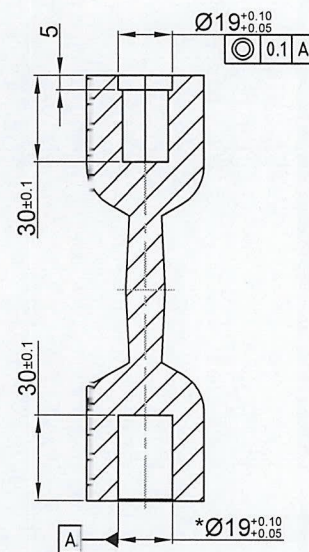
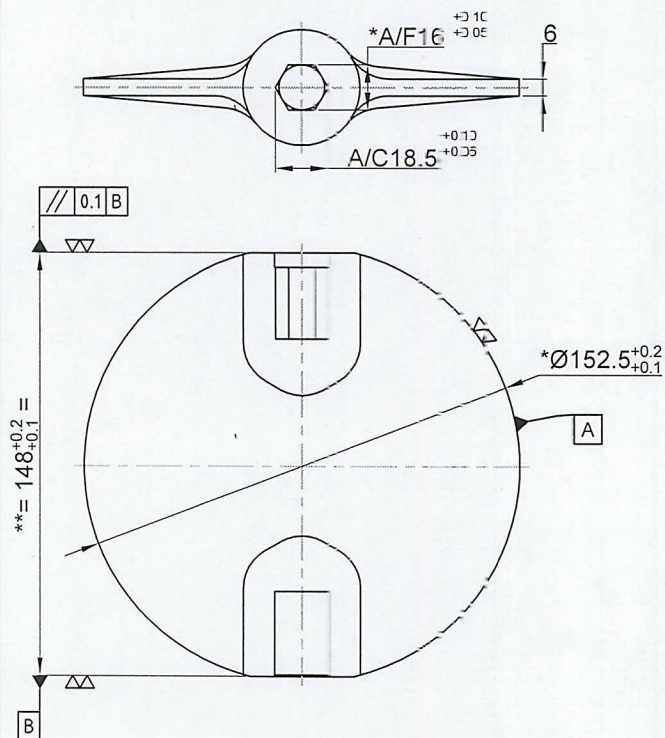
A

B

B

C

C



Note: \* Critical Dimensions to be maintained as per drawing.

MACHINING DRAWING

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Machining to 6.3µm to 3.2µm Ra  
Fine machining to 3.2µm to 1.6µm Ra  
Grinding/Burnishing to 0.8µm to 0.4µm Ra  
Lap to 0.2µm to 0.1µm Ra

DRAWN : R.K. 18/06/2019  
CHECKED : A.P. 19/06/2019  
APPROVED : A.P. 19/06/2019

TITLE :  
**DISC DN150(NPS 6)**

PRODUCT : BUTTERFLY VALVE  
CLASS : 150

PART No : 210  
MATERIAL : AS PER BOM

WEIGHT : 1.5 Kg  
DRG.No : Rev : 00

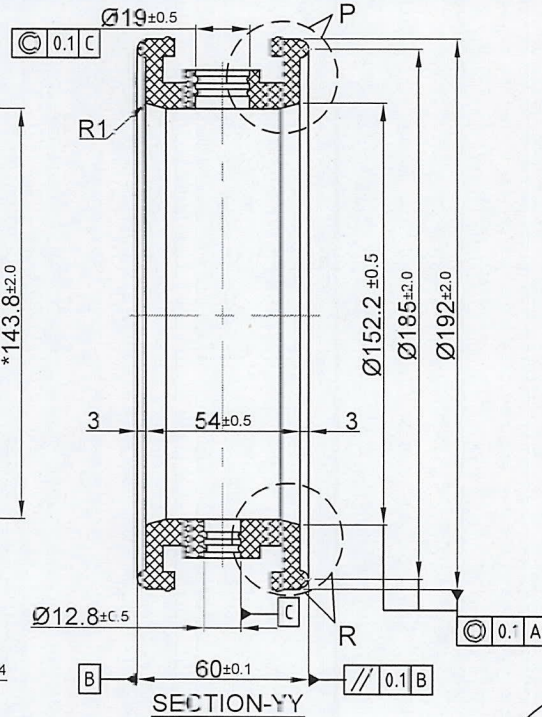
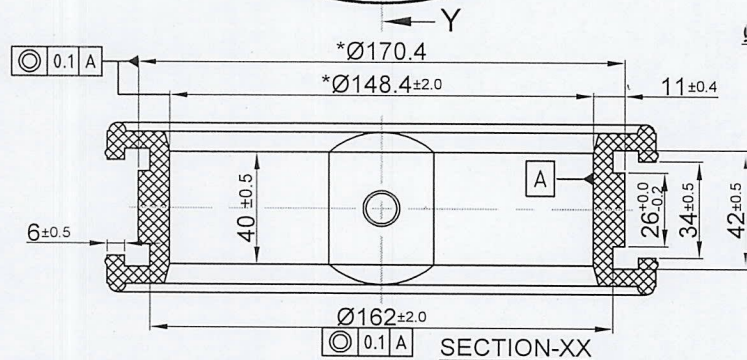
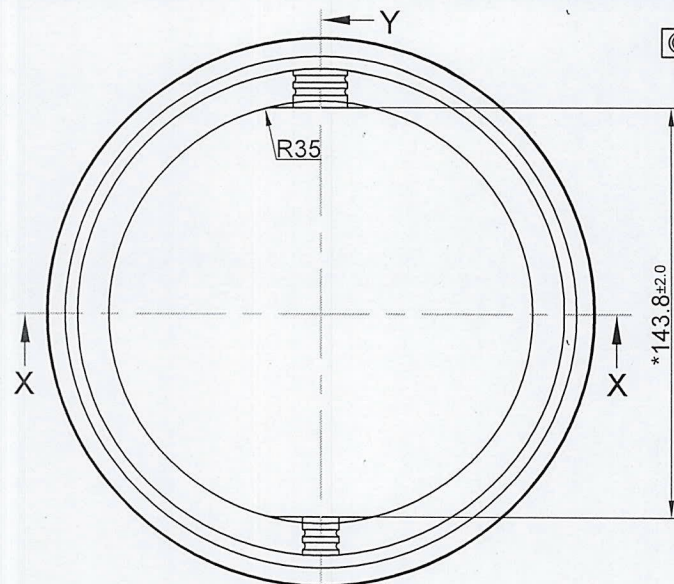
015001BFNWCWT210XXXZS

Linear Dimension		Angular Dimension	
Nominal Length	Tolerance	Nominal Length	Tolerance
0.5 up to 3	±0.1	up to 10	±1°
Over 3 up to 6	±0.1	Over 10 up to 50	±0°30'
Over 6 up to 30	±0.2	Over 50 up to 120	±0°20'
Over 30 up to 120	±0.3	Over 120 up to 400	±0°10'
Over 120 up to 400	±0.5	Over 400	±0°5'
Over 400 up to 1000	±0.8		
Over 1000 up to 2000	±1.2		
Over 2000 up to 4000	±2.0		

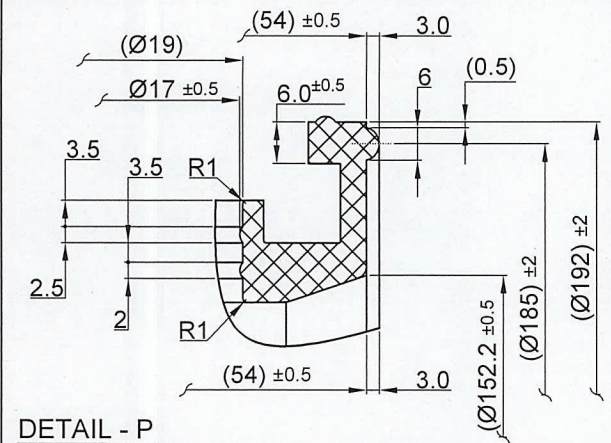
Scale : NTS



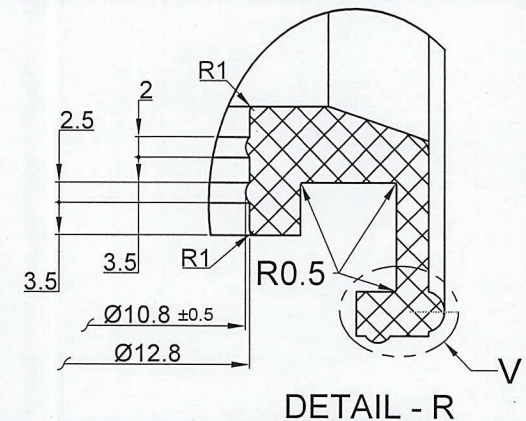
Rev No.	Zone	DCN No.	Description	Approved Date



DETAIL - V



Note: \* Critical Dimensions to be maintained as per drawing.



DETAIL - R

\* Critical Dimensions MACHINING DRAWING

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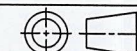
machining to 6.3µm to 3.2µm Ra  
Fine machining to 3.2µm to 1.6µm Ra  
Grinding/Burnishing to 0.8µm to 0.4µm Ra  
lap to 0.2µm to 0.1µm Ra

DRAWN :	R.K	18/06/2019
CHECKED :	A.P	19/06/2019
APPROVED :	A.P	19/06/2019

General Tolerances as per ISO 2768

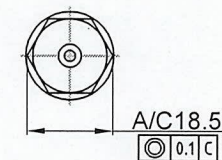
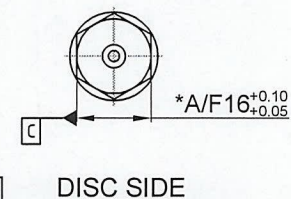
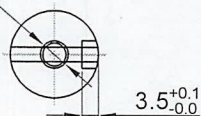
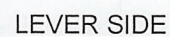
Linear Dimension	Angular Dimension
Nominal Length	Tolerance
0.3 up to 3	±0.1
Over 3 up to 6	±0.1
Over 6 up to 30	±0.2
Over 30 up to 120	±0.3
Over 120 up to 400	±0.5
Over 400 up to 1000	±0.8
Over 1000 up to 2000	±1.2
Over 2000 up to 4000	±2.0

Scale : NTS

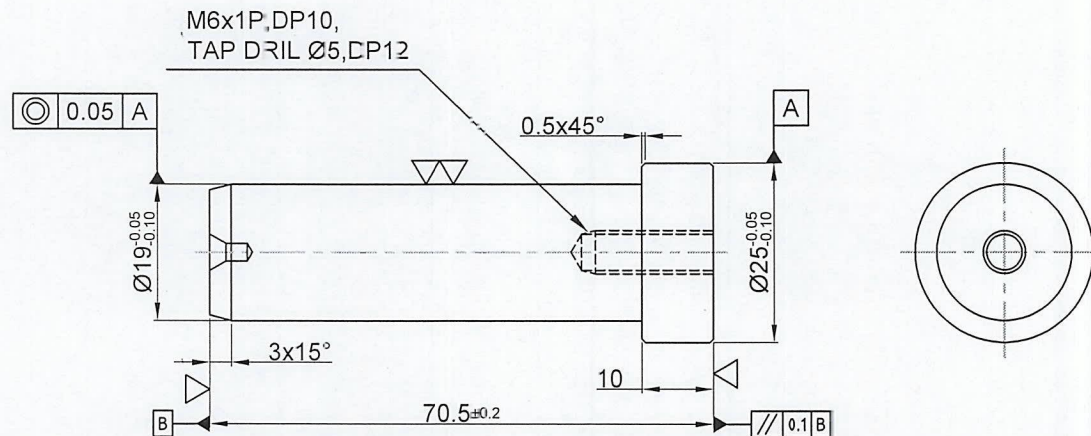


TITLE :	SLEEVE DN150(NPS6)
PRODUCT :	BUTTERFLY VALVE
CLASS :	150
PART No :	215
MATERIAL :	AS PER BOM
WEIGHT :	0.5 Kg
DRG.No :	015001BFNWCWT215XXXZT
Rev :	00

2L Engineers



## MACHINING DRAWING



Note: \* Critical Dimensions to be maintained as per drawing.

MACHINING DRAWING

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GENERAL NOTES:

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2. Remove all burrs and sharp edges
3. Dimensions showed in bracket ( ) only for reference
4. For any Doubts and Clarification, contact Design

▽ Machining to 6.3µm to 3.2µm Ra  
▽▽ Fine machining to 3.2µm to 1.6µm Ra  
▽▽▽ Grinding/Furnishing to 0.8µm to 0.4µm Ra  
▽▽▽▽ Lap to 0.2µm to 0.1µm Ra

DRAWN: R.K. 18/06/2019

CHECKED: A.P. 19/06/2019

APPROVED: A.P. 19/06/2019

TITLE: LOWER STEM DN150(NPS6)

PRODUCT: BUTTERFLY VALVE

CLASS: 150

PART No: 213

MATERIAL: AS PER BOM

WEIGHT: 70 g

DRG.No: Rev: 00

015001BFNWCWT213XXXZB

General Tolerances as per ISO 2768

Linear Dimension		Angular Dimension	
Nominal Length	Tolerance	Nominal Length	Tolerance
0.5 up to 3	±0.1	up to 10	±1°
Over 3 up to 3	±0.1	Over 10 up to 50	±0°30'
Over 6 up to 30	±0.2	Over 50 up to 120	±0°20'
Over 30 up to 120	±0.3	Over 120 up to 400	±0°10'
Over 120 up to 400	±0.5	Over 400	±0°5'
Over 400 up to 1000	±0.8		
Over 1000 up to 2000	±1.2		
Over 2000 up to 4000	±2.0		

Scale: NTS



2L Engineers

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1

A

A

B

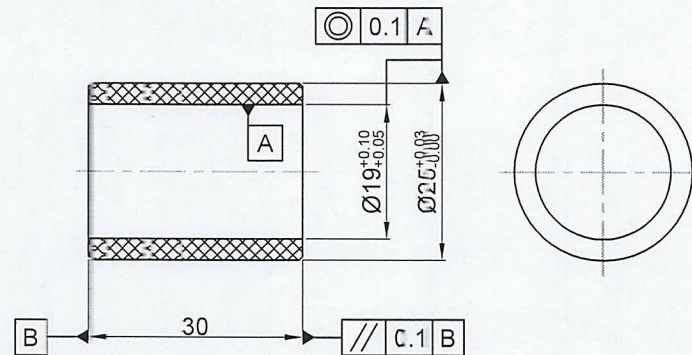
B

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D



## MACHINING DRAWING

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## GENERAL NOTES:

1. All dimensions are in mm, Unless otherwise specified
2. Remove all burrs and sharp edges
3. Dimensions showed in bracket ( ) only for reference
4. For any Doubts and Clarification, contact Design



Machining to 6.3µm to 3.2µm Ra  
Fine machining to 3.2µm to 1.6µm Ra  
Grinding/Burnishing to 0.8µm to 0.4µm Ra  
Lap to 0.2µm to 0.1µm Ra

DRAWN : R.K. 18/06/2019

CHECKED : A.P. 19/06/2019

APPROVED : A.P. 19/06/2019

TITLE :

BUSH BEARING DN150(NPS6)

PRODUCT : BUTTERFLY VALVE

CLASS : 150

PART No : 227

MATERIAL : AS PER BOM

WEIGHT : 30 g

DRG.No : Rev : 00

015001BFNWCWT227XXXZB

Scale : NTS



2L Engineers

Rev  
No.

Zone

DCN  
No.

Description

Approved  
Date

5

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A

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B

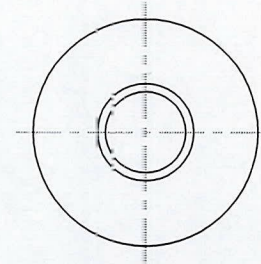
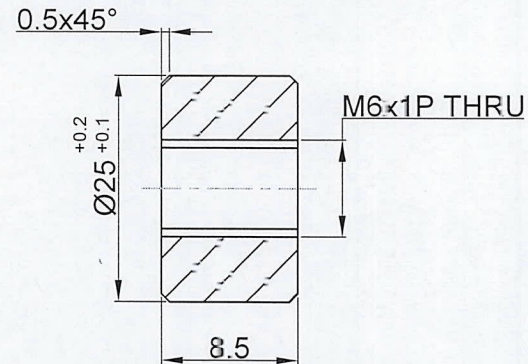
B

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D



## MACHINING DRAWING

Rev No.	Zone	DCN No.	Description	Approved Date	<p>THIS DOCUMENT CONTAINS INFORMATION WHICH IS PROTECTED BY COPYRIGHT AND IS CONFIDENTIAL TO 2L ENGINEERS - HUBBALLI. IT SHOULD NOT BE COPIED OR DISCLOSED (IN WHOLE OR IN PART) TO PARTIES OTHER THAN THE RECIPIENT WITHOUT THE EXPRESS WRITTEN PERMISSION OF 2L ENGINEERS AUTHORIZED PERSONNEL</p> <p><u>GENERAL NOTES:</u></p> <p>1. All dimensions are in mm, Unless otherwise specified</p> <p>2. Remove all burrs and sharp edges</p> <p>3. Dimensions showed in bracket ( ) only for reference</p> <p>4. For any Doubts and Clarification, contact Design</p> <p> </p> <p>           Machining to 6.3µm Ra            Fine machining to 3.2µm to 1.6µm Ra            Grinding/Burnishing to 0.8µm to 0.4µm Ra            Lap to 0.3µm to 0.1µm Ra         </p>	DRAWN : R.K.	18/06/2019	TITLE :																																							
						CHECKED : A.P. <i>Aradhya</i>	19/06/2019	LOWER STEM BUSH DN150(NPS6)																																							
					APPROVED : A.P. <i>Aradhya</i>	19/06/2019	PRODUCT : BUTTERFLY VALVE																																								
					General Tolerances as per ISO 2768		CLASS : 150																																								
					<table border="1"> <thead> <tr> <th colspan="2">Linear Dimension</th> <th colspan="2">Angular Dimension</th> </tr> <tr> <th>Nominal Length</th> <th>Tolerance</th> <th>Nominal Length</th> <th>Tolerance</th> </tr> </thead> <tbody> <tr> <td>0.3 up to 3</td> <td>±0.1</td> <td>up to 10</td> <td>±1°</td> </tr> <tr> <td>Over 3 up to 6</td> <td>±0.1</td> <td>Over 10 up to 50</td> <td>±0°30'</td> </tr> <tr> <td>Over 6 up to 30</td> <td>±0.2</td> <td>Over 50 up to 120</td> <td>±0°20'</td> </tr> <tr> <td>Over 30 up to 120</td> <td>±0.3</td> <td>Over 120 up to 400</td> <td>±0°10'</td> </tr> <tr> <td>Over 120 up to 400</td> <td>±0.5</td> <td>Over 400</td> <td>±0°5'</td> </tr> <tr> <td>Over 400 up to 1000</td> <td>±0.8</td> <td></td> <td></td> </tr> <tr> <td>Over 1000 up to 2000</td> <td>±1.2</td> <td></td> <td></td> </tr> <tr> <td>Over 2000 up to 4000</td> <td>±2.0</td> <td></td> <td></td> </tr> </tbody> </table>		Linear Dimension		Angular Dimension		Nominal Length	Tolerance	Nominal Length	Tolerance	0.3 up to 3	±0.1	up to 10	±1°	Over 3 up to 6	±0.1	Over 10 up to 50	±0°30'	Over 6 up to 30	±0.2	Over 50 up to 120	±0°20'	Over 30 up to 120	±0.3	Over 120 up to 400	±0°10'	Over 120 up to 400	±0.5	Over 400	±0°5'	Over 400 up to 1000	±0.8			Over 1000 up to 2000	±1.2			Over 2000 up to 4000	±2.0			PART No : 262
Linear Dimension		Angular Dimension																																													
Nominal Length	Tolerance	Nominal Length	Tolerance																																												
0.3 up to 3	±0.1	up to 10	±1°																																												
Over 3 up to 6	±0.1	Over 10 up to 50	±0°30'																																												
Over 6 up to 30	±0.2	Over 50 up to 120	±0°20'																																												
Over 30 up to 120	±0.3	Over 120 up to 400	±0°10'																																												
Over 120 up to 400	±0.5	Over 400	±0°5'																																												
Over 400 up to 1000	±0.8																																														
Over 1000 up to 2000	±1.2																																														
Over 2000 up to 4000	±2.0																																														
							MATERIAL : AS PER BOM																																								
							WEIGHT : 15 g																																								
							DRG.No : <span style="float: right;">Rev : 00</span>																																								
							015001BFNWCWT262XXXZB																																								
					Scale : NTS																																										

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2

1

A

A

B

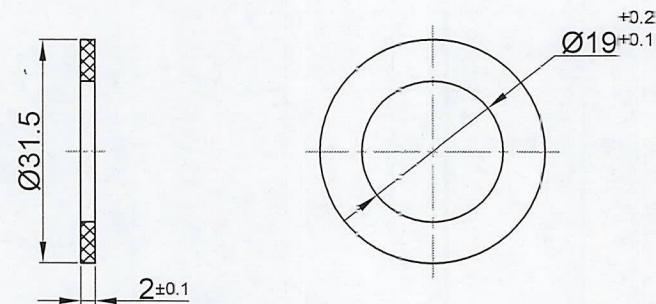
B

C

C

D

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## MACHINING DRAWING

Rev No.	Zone	DCN No.	Description	Approved Date	<p>THIS DOCUMENT CONTAINS INFORMATION WHICH IS PROTECTED BY COPY RIGHT AND IS CONFIDENTIAL TO 2L ENGINEERS - HUBBALLI. IT SHOULD NOT BE COPIED OR DISCLOSED IN WHOLE OR IN PART TO PARTIES OTHER THAN THE RECIPIENT WITHOUT THE EXPRESS WRITTEN PERMISSION OF 2L ENGINEERS AUTHORIZED PERSONNEL.</p> <p><u>GENERAL NOTES:</u></p> <p>1. All dimensions are in mm, Unless otherwise specified</p> <p>2. Remove all burrs and sharp edges</p> <p>3. Dimensions showed in bracket ( ) only for reference</p> <p>4. For any Doubts and Clarification, contact Design</p> <p>▽ Machining to 6.3µm to 3.2µm Ra ▽▽ Fine machining to 3.2µm to 1.6µm Ra ▽▽▽ Grinding/Burnishing to 0.8µm to 0.4µm Ra ▽▽▽▽ up to 0.2µm to 0.1µm Ra</p>	DRAWN : R.K. 18/06/2019	TITLE :																																			
						CHECKED : A.P. 19/06/2019	STEM RETAINER DN150(NPS6)																																			
						APPROVED : A.P. 19/06/2019	PRODUCT : BUTTERFLY VALVE																																			
						General Tolerances as per ISO 2768		CLASS : 150																																		
<table border="1"> <thead> <tr> <th colspan="2">Linear Dimension</th> <th colspan="2">Angular Dimension</th> </tr> <tr> <th>Nominal Length</th> <th>Tolerance</th> <th>Nominal Length</th> <th>Tolerance</th> </tr> </thead> <tbody> <tr> <td>Over 3 up to 6</td> <td>±0.1</td> <td>up to 10</td> <td>±1°</td> </tr> <tr> <td>Over 6 up to 30</td> <td>±0.1</td> <td>Over 10 up to 50</td> <td>±0°30'</td> </tr> <tr> <td>Over 30 up to 120</td> <td>±0.2</td> <td>Over 50 up to 120</td> <td>±0°20'</td> </tr> <tr> <td>Over 120 up to 400</td> <td>±0.3</td> <td>Over 120 up to 400</td> <td>±0°10'</td> </tr> <tr> <td>Over 400 up to 1000</td> <td>±0.5</td> <td>Over 400</td> <td>±0°5'</td> </tr> <tr> <td>Over 1000 up to 2000</td> <td>±0.8</td> <td></td> <td></td> </tr> <tr> <td>Over 2000 up to 4000</td> <td>±1.2</td> <td></td> <td></td> </tr> <tr> <td>Over 4000 up to 6000</td> <td>±2.0</td> <td></td> <td></td> </tr> </tbody> </table>		Linear Dimension		Angular Dimension		Nominal Length	Tolerance	Nominal Length	Tolerance	Over 3 up to 6	±0.1	up to 10	±1°	Over 6 up to 30	±0.1	Over 10 up to 50	±0°30'	Over 30 up to 120	±0.2	Over 50 up to 120	±0°20'	Over 120 up to 400	±0.3	Over 120 up to 400	±0°10'	Over 400 up to 1000	±0.5	Over 400	±0°5'	Over 1000 up to 2000	±0.8			Over 2000 up to 4000	±1.2			Over 4000 up to 6000	±2.0			PART No : 205
Linear Dimension		Angular Dimension																																								
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		MATERIAL : AS PER BOM																																								
		WEIGHT : 10 g																																								
		DRG.No : 015001BFNWCWT205XXXZP																																								
		Rev : 00																																								
Scale : NTS		2L Engineers																																								

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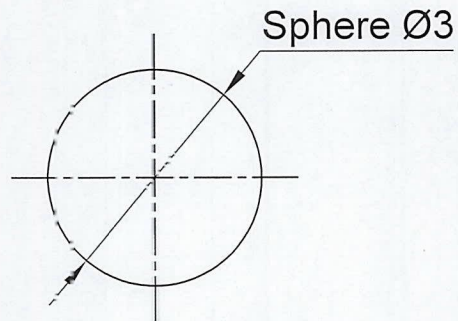
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MACHINING DRAWING




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Machining to 6.3µm to 3.2µm Ra  
 Fine machining to 3.2µm to 1.6µm Ra  
 Grinding/Burnishing to 0.8µm to 0.4µm Ra  
 Lap to 0.2µm to 0.1µm Ra

DRAWN :	A P 	18.06.2019	
CHECKED :	R K 	19.06.2019	
APPROVED :	R K 	19.06.2019	
General Tolerances as per ISO 2768			
Linear Dimension		Angular Dimension	
Nominal Length	Tolerance	Nominal Length	Tolerance
0.5 up to 3	±0.1	up to 10	±1°
Over 3 up to 6	±0.1	Over 10 up to 50	±0°30'
Over 6 up to 30	±0.2	Over 50 up to 120	±0°20'
Over 30 up to 120	±0.3	Over 120 up to 400	±0°10'
Over 120 up to 400	±0.5	Over 400	±0°5'
Over 400 up to 1000	±0.8		
Over 1000 up to 2000	±1.2		
Over 2000 up to 4000	±2.0		

TITLE :	Ball (Antisatic)
PRODUCT :	Butterfly Valve
CLASS :	-
PART No :	203
MATERIAL :	As per BOM
WEIGHT :	-
DRG.No :	Rev : 00
015001BFNWCWT203XXXZB	

Scale : NTS



2L Engineers

Rev  
No.

Zone

DCN  
No.

Description

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Date

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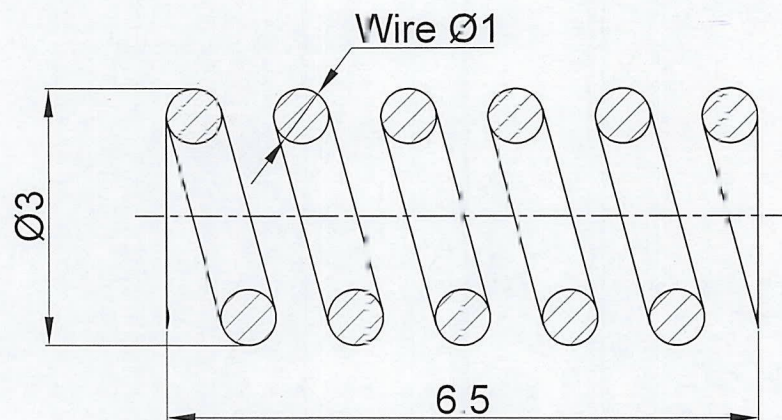
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DRAWN : A P 18.06.2019

CHECKED : R K 19.06.2019

APPROVED : R K 19.06.2019

General Tolerances as per ISO 2768

Linear Dimension		Angular Dimension	
Nominal Length	Tolerance	Nominal Length	Tolerance
0.5 up to 3	±0.1	up to 10	±1°
Over 3 up to 30	±0.1	Over 10 up to 50	±0°30'
Over 30 up to 30	±0.2	Over 50 up to 120	±0°20'
Over 30 up to 120	±0.3	Over 120 up to 400	±0°10'
Over 120 up to 400	±0.5	Over 400	±0°5'
Over 400 up to 1000	±0.8		
Over 1000 up to 2000	±1.2		
Over 2000 up to 4000	±2.0		

TITLE :

Spring (Antisatic)

PRODUCT : Butterfly Valve

CLASS : -

PART No : 239

MATERIAL : As per BOM

WEIGHT : -

DRG.No : Rev : 00

015001BFNWCWT239XXXZB

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Rev No.

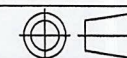
Zone

DCN No.

Description

Approved Date

Scale NTS



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**2L Engineers**API  
LICENSE  
& LOGOAPI 609A E8  
BUTTERFLY VALVE

Product Code/Catalogue : 1A-1-W	
Size (NPS).	: DN150 (NPS 6)
ASME Body Pressure Class.	: #150
Design STD.	: API 609 Category A
M.O.P @ MAX TEMP.	: 8 Bar @ 120°C
M.O.P @ MIN TEMP.	: 10 Bar @ -20°C TO 38°C
Max Diff Pressure	: 10 Bar (De-rated)
Face to Face dim.	: API 609 ( Table 2 )
End Connection.	: ASME B16.5 #150
Body/Closure/Material Gr.:	Body / Disc WCB / CF8
Trim/Stem/Pin/Fastners.	Trim / Stem / Fastners SS304 / SS304 / B7,2H
Seat/Seal (Body + Seat).	Seat / Seal EPDM / Nitrile
Valve Serial No.	: 19BFVI 001P
Month & Year of MFG.	:

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Ø3 THRU

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NOTE : THICKNESS 0.5mm

**2L Engineers**API  
LICENSE  
& LOGOAPI 609B E8  
BUTTERFLY VALVE

Product Code / Catalogue: 2A-1-W	
Size (NPS).	: DN250 (NPS 10)
Pressure Class.	: #150
Design STD.	: API 609 Category B
M.O.P @ MAX TEMP.	: 13.8 Bar @ 200°C
M.O.P @ MIN TEMP.	: 19.7 Bar @ -29 TO 38°C
Face to Face dim.	: API 609 ( Table 3A )
End Connection.	: ASME B16.5 #150
Body/Closure/Material Gr.:	Body / Disc WCB / WCB
Trim/Stem/Pin/Fastners.	Trim / Stem / Fastners SS304 / SS304 / B7,2H
Seat/Seal.	Seat / Seal PTFE / Graphite
Valve Serial No.	: 19BFVI 002P
Month & Year of MFG.	:

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DRAWN :	R.K.	18/06/2019
CHECKED :	A.P.	19/06/2019
APPROVED :	A.P.	19/06/2019

TITLE :

**NAME PLATE**

PRODUCT : BUTTERFLY VALVE

CLASS : 150

PART No : 241

MATERIAL : AS PER BOM

WEIGHT : -

DRG.No : Rev : 00

0150022FNTSFE241XXXZP

Scale : NTS

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No.

Description

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