

## Design & Development Plan

Design Package No :

2L-DP1920-03

Package Start date.:

08-06-2019

Customer. :	2L Engineers	Work Order.:(if any)	2L19-002(PO)	Valve Type. :	Category-A, Butterfly Valve
Size. :	DN150 (NPS 6)	Pressure Class.:	Derated Valve at 10 Bar	Bore. :	Bore, Will be selected on the basis of calculations performed in format No.2L-D&D-03, Rev-01
Operation. :	Gear Operated	End Connection. :	Flanged End		
Design Specification / Standards. :	API 609, 8th Edition Feb 2016, Errata April 2017	Inspection Testing Standards. :	API 598, 10th Edition Oct-2016	Drilling / End Connection Standard. :	ASME B16.5 - 2017
Material - Body / Bonnet / Cover / Flap / Ball. :	ASTM A216 Gr. WCB	Trim Material. :	ASTM A479 TP 304	Face to Face as per Standard. :	56mm, As per Table 2, API 609, 8th Edition Errata 2017
Unidirectional / Bidirectional. :	Bi-Directional	Overlay / Hard facing. :	Not Required	Dead-End Service:	Not Applicable
Reference Specification. :	Refer Format No: 2L-D&D-02-609, Rev-00				
Legal & any other if applicable requirements:	<ul style="list-style-type: none"> <li>• API 609, 8th Edition Feb 2016, Errata April 2017</li> <li>• As Per List of Statutory &amp; Regulatory Requirements 2L/MGMT/18, Rev-00.</li> <li>• Result of Risk Assessment – As Per Risk Assessment &amp; Mitigation 2L-MGMT-21, Rev-00 (Design)</li> </ul>				

Stages	Activities		DURATION																								Responsible Person	Status	
			Jun-19				Jul-19				Aug-19				Sep-19				Oct-19				Nov-19						
			6				7				8				9				10				11						
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4							
Design Input	Client's Purchase Order, if any / Input Sheet cum data sheet	P																									Marketing Manager	-	
		A																											
	Contract Review Sheet / WO	P																									Marketing Manager	Completed 6/6/19	
		A																											
	Master list of External Orgin Standards	P																									MR	Completed 6/6/19	
		A																											
	Design & Development Planning	P																									Design Engineer	Completed 08/06/2019	
		A																											
	Risk Analysis Results	P																										MR	Completed 6/6/19
		A																											
	Method, Assumptions and Formula Sheet	P																										Design Engineer	Completed 08/06/19
		A																											
Customer Supplied Documents Related to Design	P																										Marketing Manager	-	
	A																												
Historical Performance & other Information derived from previous similar Designs	P																										Design Engineer	-	
	A																												

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Stages	Activities		DURATION																				Responsible Person	Status				
			Jun-19				Jul-19				Aug-19				Sep-19				Oct-19						Nov-19			
			6				7				8				9				10						11			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4						
Design Input	Referred Resources & Work Environment Management	P																								Manager Operations	Completed # 2/12/19	
	A																											
Design Input Review	Review of Design Inputs	P																								Design Engineer	Completed 14/06/19 Apati	
	A																											
Design Outputs	Design Calculations	P																								Design Engineer	Completed 14/06/19 Apati	
	A																											
	Bill of Material	P																							Design Engineer	Completed 20/06/19 Apati		
	A																											
	Design Acceptance Criteria (DAC)	P																								Design Engineer	Completed 08/06/19 Apati	
	A																											
	Critical Components / Products / Activities	P																								Design Engineer	Completed 09/06/19 Apati	
	A																											
	Machining Drawings	P																								Design Engineer	Completed 14/06/19 Apati	
	A																											
	Casting Drawings	P																								Design Engineer	Completed 14/06/19 Apati	
	A																											
	GA Drawings (Assembly Drawings)	P																								Design Engineer	Completed 20/6/19 Apati	
	A																											
	Material Specification Sheets	P																								Design Engineer	Completed 08/06/19 Apati	
		A																										
		Quality Assurance Plan for Incoming Products	P																							Quality Manager	Completed 26/6/19 mmp	
		A																										
		Quality Assurance Plan for In-process Inspection	P																							Quality Manager	Completed 08/6/19 mmp	
		A																										
		Quality Assurance Plan for Final Inspection and Testing	P																							Quality Manager	Completed 08/6/19 mmp	
		A																										
		Work Instructions	P																								Relevant Department	Available # 2/6/19
		A																										
		Procedures	P																								Relevant Department	Available # 2/6/19
		A																										
	Installation & Maintenance Manual	P																								Design Engineer	Completed 27/07/19 Apati	
		A																										
	Name plate for Valve	P																								Design Engineer	Completed 14/06/19 Apati	
		A																										

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Stages	Applicable	Activities		DURATION																												Responsible Person	Status
				Jun-19				Ju-19				Aug-19				Sep-19				Oct-19				Nov-19									
				6				7				8				9				10				11									
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4						
Design Output Review		Review of Design Output	P				X	X																				Design Engineer	Completed 25/6/19 April				
Design Changes & Modifications		Design Changes and Modifications	P																									Design Engineer	Completed no changes 02/06/19 April				
		Evaluation of Effect of changes in Design	P																									Design Engineer	Completed no changes 02/06/19 April				
			A																														
			A																														
Design Verification		Verification of Design	P				X	X																				Design Engineer	Completed 26/6/19 April				
Design Verification Final Review		Review of Design Verification	P				X	X																				Design Manager	Completed 26/6/19 April				
			A																														
Design Validation		Casting / Forging Inspection Report	P													X	X	X	X	X	X	X	X					Quality Engineer	Completed 25/10/19 Smoothy				
		In-Process Insepction Report	P														X	X	X	X	X	X	X					Quality Engineer	Completed 17/10/19 @				
		Final Inspection Report	P																								Quality Engineer	Completed 19.10.19 Huang					
		Assembly Report	P																								Operations Manager	OK 13/10/19					
		Final Inspection Checklist	P																								Quality Manager	Completed 19/10/19 m-ign					
			A																														
	API 6D / API 609 Related inspection (Examples) Applicable	✓	Body / Gover MTC	P																								Quality Engineer	Completed 24/09/19 Bantley				
				A																													
✓		Disc MTC	P																								Quality Engineer	Completed 17/09/19 Bantley					
			A																														
X		Fastners MTC	P																								Quality Engineer	—					
			A																														
✓		Stem MTC	P																								Quality Engineer	Completed 17/9/19 Bantley					
			A																														
✓		Visual Examination	P																								Quality Engineer	Completed 19.10.19 Huang					
			A																														
✓	Dimensional Check	P																								Quality Engineer	Completed 19.10.19 Huang						
		A																															
✓	Antistatic Test	P																								Quality Engineer	Completed 19.10.19 Huang						
		A																															
✓	Torque Test	P																								Quality Engineer	Completed 19.10.19 Huang						
		A																															

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				Jun-19				Jul-19				Aug-19				Sep-19				Oct-19						Nov-19			
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				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4						
API 6D / API 609 Related inspection (Examples) Applicable	X	Firesafe Test	P																								Quality Engineer	—	
			A																								Quality Engineer	Completed 19.10.19	
	✓	Hydro Shell Test	P																								Quality Engineer	Completed 19.10.19	
			A																								Quality Engineer	Completed 19.10.19	
	✓	Hydro Seat - 1st Side	P																								Quality Engineer	Completed 19.10.19	
			A																								Quality Engineer	Completed 19.10.19	
	✓	Hydro Seat - 2st Side	P																								Quality Engineer	Completed 19.10.19	
			A																								Quality Engineer	Completed 19.10.19	
	X	Low pressure - Seat Test - Hydro	P																								Quality Engineer	—	
			A																								Quality Engineer	—	
	✓	Low pressure - Seat Test - Air	P																								Quality Engineer	Completed 19.10.19	
			A																								Quality Engineer	Completed 19.10.19	
	X	Seat Test - Gas	P																								Quality Engineer	—	
			A																								Quality Engineer	—	
X	Back Seat Test	P																								Quality Engineer	—		
		A																								Quality Engineer	—		
X	Cavity Relief Test	P																								Quality Engineer	—		
		A																								Quality Engineer	—		
X	Block & Bleed Test	P																								Quality Engineer	—		
		A																								Quality Engineer	—		
X	Drain & Vent Test	P																								Quality Engineer	—		
		A																								Quality Engineer	—		
X	Sealant Line Test	P																								Quality Engineer	—		
		A																								Quality Engineer	—		
Design Validation result check	Review of Design Validation for completion	P																								Quality Manager	Completed 22/10/19		
		A																								Quality Manager	Completed 22/10/19		
Final Approval of Design after	Final Approval of Design, after validation	P																								Manager Operations	Completed 23/10/19		
		A																								Manager Operations	Completed 23/10/19		

Preparation and approval of plan will be prior to start of Design and on completion of each stage, the actual date will be updated by Design Engineer

Prepared by	<i>Raghu</i>	P an Approved by:	<i>Aditya</i>
Design Engineer	8-6-2019	Design Engineer	09/06/19 Aditya.Rathi

#### Legend

P. : Planned  
A. : Actual