MATERIAL TEST CERTIFICATE

EN10204:2004 3.1

YONGJIA TONG BALL Valve Co., Ltd.

Address: Dongou Industrial Zone, Oubei Street,Yongjia County, Zhejiang Province(1st Floor Plant of Wenzhou Huajiang Industrial Co., Ltd)

Purchaser: JC VALVULAS INDIA PVT LTD	Material Specification: ASTM A182 Gr F60-Edition 2024A		NO: R24120225
Order No.: JCCMP-2425001581		Date:2025-01-05	

Chemical Composition (%)

Heat No.		C	Mn	Si	S	P	Cr	Mo	Ni	N	Forging Ratio
	Specification	≤0.03	≤2.00	≤1.00	≤0.020	≤0.030	22.0-23.0	3.00-3.50	4.5-6.5	0.14-0.20	≥3:1
SF9207F	Actual	0.021	1.748	0.358	0.0022	0.0263	22.52	3.072	4.63	0.157	4.20:1

Mechanical Property Test

Tensile Test

H.TBatch No.	Test Temp.		Tensile σb (Mpa)	Yield σs 0.2 (Mpa)	Elongation (%)	Reduction of Area (%)
	Ambient Temp.	STD	Min655	Min450	Min25	Min45
BD032412163		Actual	739	502	45	58

Impact Test

Temp. (℃)	Specimen Size	Akv			Hardness (HB)(max)
20	10*10*55	Average of Three Specimens100(J)			20,21
		Minimum of Single Specimen75(J)			
		(1)	(2)	(3)	
		237	251	249	
		Avg	245.67		
-46	10*10*55	Average of Three Specimens60(J)			
		Minimum of Single Specimen40(J)			
		(1)	(2)	(3)	
		225	210	209	
		Avg	214.67		

Heat No.	Other Test			VISUAL INSPECTION	Heat Treatment	Remarks
	PT	UT	-	ASME BPVC SECTION VIII, DIVISION.1 UF-45 & UF-46	solution treat 1040℃, 2h, Quenching below 260 ℃, water cold	-
SF9207F	Accepted	Accepted	-	Accepted		

PO.SR.No.	Drawing No.	Item Description	Qty	Heat No.
6	XQQ-250-6803 REV.1	BALL DN250 6803 ASTM A182 Gr.F60 SP-561 MDS No.JC-MDS-353Rev6	10	SF9207F

YONGJIA TONG BALL Valve Co., Ltd.
Q.A. Head: Zhongli Hu

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Q.A.

We hereby certify that the parts listed above are manufactured and inspected, tested in accordance with the requirements of material specification ASTM A182 Gr F60-Edition 2024A&JC-MDS-353 REV.6&SP-561 the material conforms to MR0175 for hardness.

Heat treatment record report
热处理记录报告

委托单位（Entrust Company）:永嘉通球阀门有限公司　　NO:TQ02412161

material trademark 材料牌号	A182 F60			Process name 工艺名称	固溶		
Equipment number 设备编号	BD1701-7	Thermocouple number 热电偶编号	70387	Recorder number 记录仪编号	18090356	Order number 炉序号	BD032412163
Procedure content 工序内容	Holding temperature 保温温度	Soaking time 保温时间 h		Cooling medium 冷却介质	Pre-quenching temperature （介质）淬前温度℃		Quenching temperature （介质）淬后温度℃
固溶	1040	2		水冷	30		39

product name 产品名称	Production number 生产编号	Description 型号规格	Quantity 数量	Heat NO. 炉号
浮动球	1YD2412004	298*200*218	10	SF9207F
试棒	1YD2412004-1	30*360	1	SF9207F
固定球	1YD2412014	180*100*147	30	SF9207F

Test item 实验项目

Mechanical property 机械性能

EMR	$\sigma_{b\ MPa}$	δ%	ψ%
AK/J/Cm²			硬度值

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Yongjia Boda machinery heat treatment co.,Ltd
永嘉县博大机械热处理有限公司

永嘉县博大机械热处理有限公司 检测专用章

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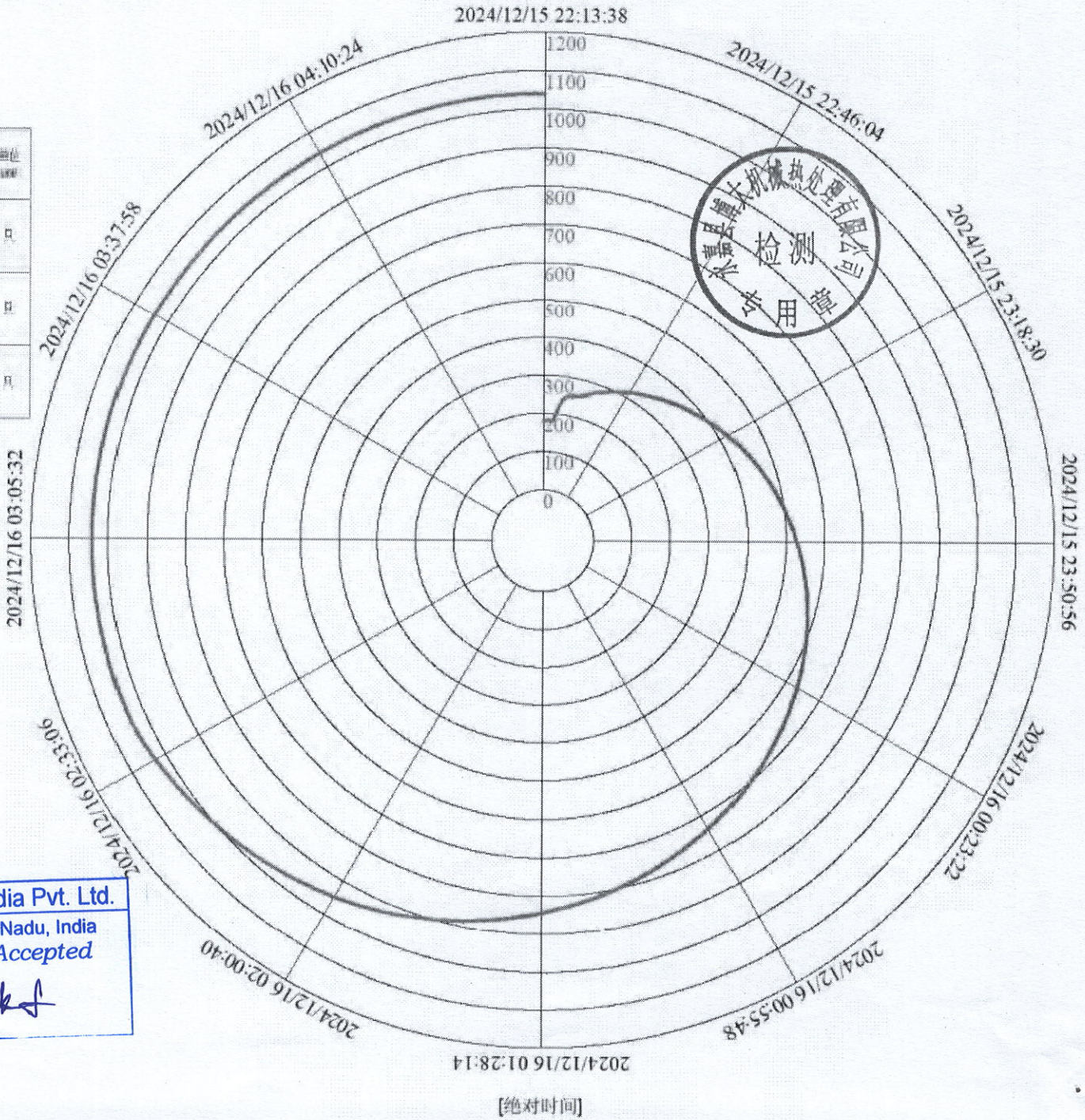
填表人：叶建玲　　审核人：方建东

日期：2024-12-16

圆图曲线打印

设备名称: 总貌
打印通道:通道02[℃]
记录间隔: 2 秒
开始时间: 2024/12/15 22:13:38
结束时间: 2024/12/16 04:42:50
数据数量: 11677

生产编号 Production number	材料牌号 material trademark	型号规格 Description	产品名称 product name	炉号 Heat NO.	批号 Order number	数量 Quantity	单位 unit
HYC2412004	A182 F60	250*200*216	法兰	3F9207F	EICC32412160	10	只
HYC2412004-1	A182 F60	50*360	试棒	3F9207F	EICC32412160	1	只
HYC2412004	A182 F60	180*100*147	堵盲法	3F9207F	EICC32412160	30	只



B.D. Head : Zhongli Hu

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MICROLAB TESTING PRIVATE LIMITED
An ISO/IEC 17025 MATERIAL TESTING LABORATORY
Accredited by NABL vide Certificate Number TC-14728
D25, Ambattur Industrial Estate, Chennai – 600058
Ph: 044-26242525/044-26244399,
Email: cre@microlabtesting.com
Web: www.microlabtesting.com

TC-14728

Test Report

TC1472825000022983F

Customer:	Report No.:	TR/24-25/7362-1
M/s. JC Valvulas India Private Limited	Report Date:	25-03-2025
No: 143, 1st Main Road, Industrial Estate, Perungudi ,City:Chennai ,600096	Customer Ref. No.:	DC2425002014
	Ref. Date	07-03-2025
	Sample Received Date:	10-03-2025
	Date Of Completion:	24-03-2025

Samples drawn by Customer

Sample Description: Test Bar, Heat No: SF9207F, Material: F60, SP-Code: SP-561, PO No: SC-2425002573

Discipline : Chemical, Group : CORROSION TESTING

PITTING CORROSION TEST (A923-METHOD-C) **Test Method : ASTM A923:2023- Method C**

Verified By: N THINESH KANNAN **Tested on : 12-03-2025 to 13-03-2025**

Test Parameters	Result
Sample preparation	All the machined surfaces of the specimen were ground finished using 120 grit paper
Test Solution	Dissolve 100 g of reagent grade ferric chloride Fecl3 6H20 in 900 ml of Distilled water
pH of test solution	1.30
Size (mm)	L:54.55 x W:25.20 x Thk:8.17
Total surface area of the specimen (dm^2)	0.4052
Initial Weight of the specimen (g)	87.0363
Start of Test	12.03.2025 (05.00 pm)
End of Test	13.03.2025 (05.00 pm)
Duration of Test (Hours)	24 Hours
Test Temperature (Degree Celcius)	24°C
Final weight of the specimen (g)	87.0358
Weight Loss (mg)	0.5000
Corrosion rate (mdd)	1.2338
Observation	Pitting not Observed at 20x magnification
Photographs	The Macro photograph is enclosed

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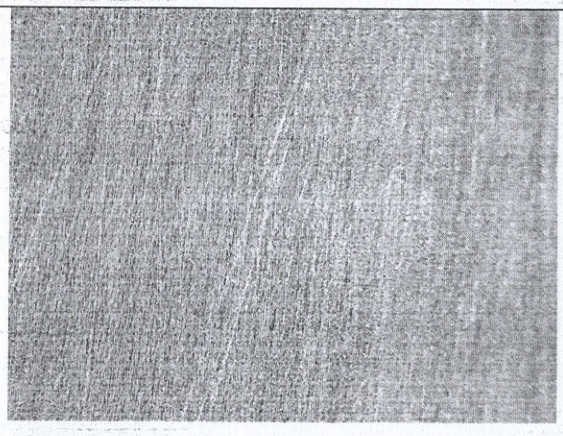
TR/24-25/7362-1 Dt- 25-03-2025



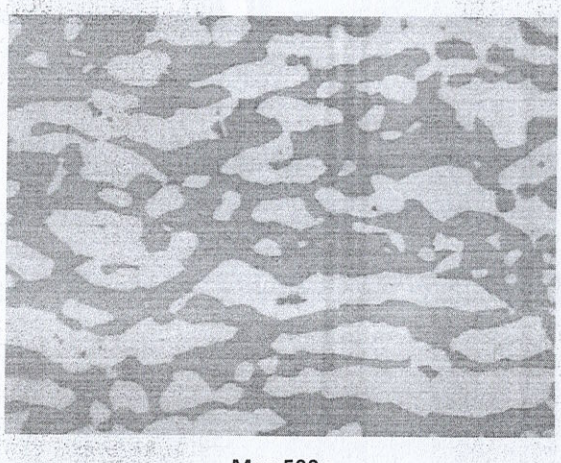
20X

Discipline : Mechanical, Group : METALLOGRAPHY TEST

MICROSTRUCTURE EXAMINATION **Test Method : ASTM A923:2022- Method A**

Verified By: KARTHIK **Tested on : 11-03-2025**

Test Parameters	Result
Mag/Etchant	500x/40% NaOH Electro Etched
Observation	Micro examination of the specimen revealed uniform ferrite and austenite phase distribution and no continuous precipitates at the grain boundaries. The structure is free from intermetallic phases (like sigma, chi, laves) & other precipitates (Nitrides) and carbides. No deleterious secondary phases. This microstructure is classified as "Unaffected structure" as per section 6.3.1 of ASTM A923 Method A & is an Acceptable microstructure.



Mag-500x

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TR/24-25/7362-1 Dt- 25-03-2025

FERRITE CONTENT TEST (30 FIELDS) **Test Method : ASTM E562:2019e1**

Verified By: KARTHIK **Tested on : 11-03-2025**

Test Parameters	Result
Mag/Etchant	100x/20% NaOH Electro Etched
Field 1%	53.0
Field 2%	52.5
Field 3%	52.0
Field 4%	53.0
Field 5%	53.5
Field 6%	52.5
Field 7%	53.0
Field 8%	52.5
Field 9%	53.0
Field 10%	53.5
Field 11%	52.0
Field 12%	52.5
Field 13%	51.0
Field 14%	51.5
Field 15%	53.0
Field 16%	52.0
Field 17%	52.5
Field 18%	53.0
Field 19%	52.5
Field 20%	53.0
Field 21%	52.5
Field 22%	51.0
Field 23%	52.0
Field 24%	52.5
Field 25%	53.5
Field 26%	53.0
Field 27%	52.5
Field 28%	53.5
Field 29%	53.0

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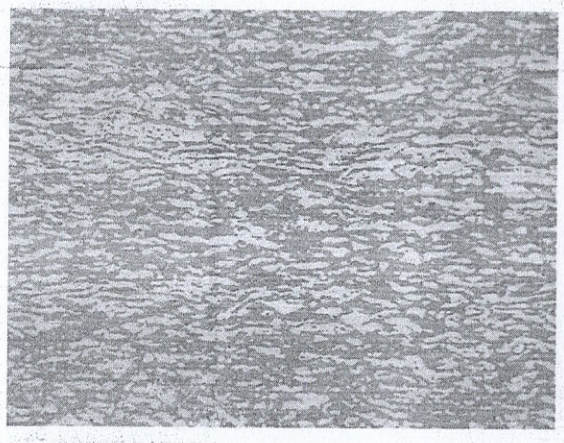
Field 30%	53.5
Average %	52.61
RA %	0.47
Volume Estimate (VV+)%	52.86
Volume Estimate (VV-)%	52.36



Mag-100x

For MICROLAB

K. Mathan Kumar
Head, Corrosion & Polymer Department

A. Karthik
Head, Metallurgy Department

Authorized Signatory

---------- **End of Test Report** ----------

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Chennai, Tamil Nadu, India
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Test Report

Customer:		
M/s. JC Valvulas India Private Limited No: 143, 1st Main Road, Industrial Estate, Perungudi ,City:Chennai ,600096	Report No.:	**TR/24-25/7362-1-2**
	Report Date:	25-03-2025
	Customer Ref. No.:	DC2425002014
	Ref. Date	07-03-2025
	Sample Received Date:	10-03-2025
	Date Of Completion:	24-03-2025

Samples drawn by Customer

Sample Description: Test Bar, Heat No: SF9207F, Material: F60, SP-Code: SP-561, PO No: SC-2425002573

Discipline : Chemical, Group : CORROSION TESTING

INTERGRANULAR CORROSION TEST (PRACTICE-C) **Test Method : ASTM A262:2015 (2021)**

Verified By: N THINESH KANNAN **Tested on : 12-03-2025 to 24-03-2025**

Test Parameters	Result	Requirement
Test Solution	Nitric Acid Test Solution	
Volume of test solution (ml/cm²)	1000	
Size (mm) and total surface area (cm²)	L:25.20 x W:21.04 x Thk:8.17 & 18.1598	
Test start date & time	12.03.2025 (05.00 pm)	
Test end date & time	24.03.2025 (09.30 am)	
Duration of Test (Hours)	240	
Period	1st 48 hours	
Initial wt.of speciman in g	33.4489	
Final wt.of speciman in g	33.4353	
Weight Loss in g	0.0136	
Corrosion rate (mils/month)	0.5604	
Period	2nd 48 hours	
Initial wt.of speciman in g	33.4353	
Final wt.of speciman in g	33.4203	
Weight Loss in g	0.0150	
Corrosion rate (mils/month)	0.6181	
Period	3rd 48 hours	
Initial wt.of speciman in g	33.4203	
Final wt.of speciman in g	33.3980	
Weight Loss in g	0.0223	
Corrosion rate (mils/month)	0.9188	

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TR/24-25/7362-1-2 Dt- 25-03-2025

Period	4th 48 hours
Initial wt.of speciman in g	33.3980
Final wt.of speciman in g	33.3704
Weight Loss in g	0.0276
Corrosion rate (mils/month)	1.1372
Period	5th 48 hours
Initial wt.of speciman in g	33.3704
Final wt.of speciman in g	33.3304
Weight Loss in g	0.0400
Corrosion rate (mils/month)	1.6482
Average Corrosion Rate (mils/month)	0.9765

4.0 max.

For MICROLAB

K. Mathan Kumar
Head, Corrosion & Polymer Department

Authorized Signatory

End of Test Report

JC Valvulas India Pvt. Ltd.
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