Base Load Power Hub (BLPH)

EQUIPMENT MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX - TRANSITION PIECE FLANGE

Document Number: 1724000344-QC-LIS-00013

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
2	08/08/2025	Accepted for Construction (AFC)	Ainhoa Lasa	Ainhoa Lasa	Urtzi Landa
1	17/06/2025	Issue for Review (IFR)	Ainhoa Lasa	Ainhoa Lasa	Urtzi Landa
0	09/05/2024	Issue for Review (IFR)	Ainhoa Lasa	Ainhoa Lasa	Urtzi Landa

GRI Flanges Iraeta

FIHI Forging Industry S.L.



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Revision / Change Log

Rev.	Description
0	Issue for Review (IFR)
1	Issue for Review (IFR)
2	Accepted for Construction (AFC)

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GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

QUALITY CERTIFICATE / CERTIFICADO CALIDAD

EN10204 3.2

Nº Certificado: Certificate Nº:	040000373956_06	**Fecha:** Date:	10.05.2024	**Nº Cert. Ensayo:** Test Cert. Nº:	FIHI024415
Cliente: Customer:	ROSETTI MARINO S.P.A.	**Nº Pedido:** Order Nº:	1724000344 123A90A	**Nº Albarán:** Delivery Note Nº:	200147404/10
Nº Plano Cliente: Customer Drawing Nº:	123A90-DDL-ST-DD-90083			**Cod. Artículo:** Article Code:	2022215
Material: Material:	EN10025-3-S420NL	**Trat. Térmico:** Heat Treatment:	H5-0379 NORMALIZADO (+N) NORMALIZED (+N)	**Estado Suministro:** Delivery Condition:	MECANIZADO MACHINED

Cantidad Quantity	Descripción Artículos Articles description	Nº Colada Heat Nº	(1)Ref. Probeta(2) (1)Testing Piece Ref.(2)	Observaciones Observations
1	5888 - LAM-7000x6350X280-ST-DD-90083-R2 Ref. Brida (Flange) M-2022215 L/SN-1399936 Ref. Aro (Ring) M-5018780 L/SN-1397272	466767	(EP)374560-L (M)	

(1) TIPO PROBETA/*Type:* -EP: TOCHO/*End Piece* -R: ARANDELA/*Ring* -C: CUPÓN/*Coupon*

(2) SITUACIÓN/*Location:* -M: MATERIAL BASE/*Base Material* -W: SOLDADURA/*Welding* -H: ZAT/*HAZ*

COMPOSICIÓN QUÍMICA (%) / CHEMICAL COMPOSITION (%)

Ref. Probeta *Testing Piece Ref.*	(3)	C	Si	Mn	P	S	Nb	V	Al (4)	Ti	Cr	Ni	Mo	Cu	N	B	O	CEV (5)
466767	L	0,1470	0,3200	1,3300	0,0130	0,0090	0,0030	0,0720	0,0290	0,0048	0,1100	0,0700	0,0200	0,1200	0,0098	-	-	0,4220
(EP)374560-L (M)	P	0,1590	0,3200	1,2700	0,0120	0,0090	0,0020	0,0670	0,0210	0,0040	0,1100	0,0600	0,0160	0,1100	0,0081	-	-	0,4220

(3) L = ANÁLISIS DE COLADA/ *Laddle Analysis*
P = ANÁLISIS DE PRODUCTO/ *Product Analysis*

(4)Si la cantidad de elementos fijadores del N es suficiente (Nb:0.015-0.06% o V: 0.02-0.12%), la cantidad mínima de Al no aplica (material acorde a EN10025/EN10028/EN10273) /The minimum value for aluminium does not apply if other N binding elements are present in sufficient quantity (Nb: 0.015-0.06% or V: 0.02-0.12%). (Materials according to EN10025/EN10028/EN10273)

(5) CEV% (EN-10025-1) = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15

CARACTERÍSTICAS MECÁNICAS / TAMAÑO GRANO - MECHANICAL PROPERTIES / GRAIN SIZE

Ref. Probeta *Testing Piece Ref.*	Ensayo de Tracción *Tensile Test* (ISO 6892-1)				Estricción (%) *Reduction of Area (%)* (EN 10164)			Resistencia al Impacto KV2 *Impact Strength KV2* (ISO 148-1)				Dureza *Hardness*	Tamaño de Grano *Grain Size*
	(6)	Resist. Tracción *Tensile Strength* Rm MPa	Límite Elástico *Yield Strength* ReH MPa	Alargamiento *Elongation* Lo=5d A %	(6)	Valores Unitarios *Unitary values* %	Media *Average* %	(6)	Valores Unitarios *Unitary Values* J	Media *Average* J	Temp./ *Temp.* °C	HBW (ISO 6506-1)	(ASTM E-112)
(EP)374560-L (M)	L	505	366	35,6	Z	66-67-67	67	L	143-131-135	136	-40	-	-
								T	63-64-33	53,33	-40		

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 13/05/2024

(6) ORIENTACIÓN / *Orientation:* -T: TRANSVERSAL/*Transversal* -L: LONGITUDINAL/*Longitudinal* -Z: SENTIDO DEL ESPESOR/*Through thickness.*

DECLARACIÓN DE CONFORMIDAD *DECLARATION OF CONFORMITY:*

LOS PRODUCTOS INCLUIDOS EN EL PRESENTE DOCUMENTO SON CONFORMES CON LOS REQUISITOS DEL PEDIDO DE CLIENTE Y CON LOS DE LA(S) NORMA(S) DEL MATERIAL ARRIBA REFERIDO(S)

The product herein in this document has been made and tested in accordance with the requirements of the above mentioned order and standard.

VALIDADO POR
VALIDATED BY:

Departamento de Calidad:
Quality department:

Nora Lasa

D.Herrera
13/May/2024

BUREAU VERITAS 2400 2400-CPR-20220126

UKCA

CE 2451 2451-CPR-EN10025-2014.0001

FIHI Forging Industry S.L.

Environmental recommendations related to the product: At GRI Renewables we understand caring for the environment as a responsible management model in collaboration with our stakeholders, therefore, and with the aim of reducing the environmental impact of our activity and, therefore,of our production chain, we recommend to our clients and to all the parties involved in our life cycle, carry out a correct segregation and treatment of the waste generated, prioritizing its minimization, reuseand recycling, in accordance with the applicable legislation.

GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

Declaration of performance

The manufacturer

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa) SPAIN

declares herewith, that the construction product

Flanges produced by hot rolled products of structural steel according to EN 10025-1

with serial number

M-2022215 L-1399936

produced in factory

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa) SPAIN

fulfills the requirements of the following EU-directive/s and harmonized specifications:

- **EN 10025-1**
- **EU 305**
- **EN 1090-1**
- **EN 1090-2 EXC 4**

The notified body/ies:

- **UKAS CPR: certified by TWI Certification Ltd /Notified body No. 2400 / Certificate No. 2400-CPR-20220126**
- **CE CPR: certified by DVS ZERT / Notified body No.2451 / Certificate No. 2451-CPR-EN10025-2014.0001.006**

And with customers specifications and drawings according to Purhase Order 1724000344

DRAWING	SPECIFICATION
123A90-DDL-ST-DD-90083-R2	123A90-DDL-ST-SP-90118 Document Class: 2 Rev.1, SPC-PRO-01Rev.2024-00, 123A90-DDL-ST-SP-90118_IFA REV.02 (05032024)

The performance of the products above is in conformity with the set of declared performance/s. This declaration of performance is issued in accordance with Regulation (EU) No 305/2011/EU and Construction products (amendment etc.) (EU exit) Regulations 2020, UK statutory instrument 2020, under the sole responsibility of the manufacturer identified above.

Zestoa, 10.05.2024

FIHI FORGING INDUSTRY S.L

FIHI Forging Industry S.L.

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2024

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa) SPAIN

Business ID /C.I.F.
B75225946

www.grupoiraeta.com
Tel. +34 943 147 645
Fax. +34 943 897 029

Information is marked as Restricted and belongs to GRI.

GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

CE UKCA

2451 2400

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa)
SPAIN
08 - 22
2451-CPR-EN10025-2014.0001.006
2400-CPR-20220126

EN 10025-1
Hot rolled products of structural steels

Intended uses:	Building constructions or civil engineering
Tolerances on dimensions and shape:	Welded parts EN 10029 Class A
Elongation:	Normalized Steel EN 10025-3 S420NL
Tensile strength	
Yield strength	
Impact strength	
Weldability	
Durability:	NPD.
Regulated substance:	NPD.

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 10 / 2024

Information is marked as Restricted and belongs to GRI.

GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

CE & UKCA Marking used for Inspection Certificates according to EN 10204

CE

2451

2451-CPR-EN10025-2014.0001.006

UK CA

2400

2400-CPR-20220126

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13/05/2024

FIHI FORGING INDUSTRY S.L
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Information is marked as Restricted and belongs to GRI.

ACCIAIERIE BERTOLI SAFAU
ABSOLUTE STEEL QUALITY
ACCIAIERIE BERTOLI SAFAU SpA
Via Buttrio n.28 - Frazione Cargnacco - 33050 Pozzuolo del Friuli (UD)
Tel. +39 0432 613211 - Fax +39 0432 613209 - www.absacciai.it

CERTIFICATO DI COLLAUDO

Inspection Certificate 3.1/Certificat de reception 3.1/
Abnahmeprufzeugnis 3.1

N.	291974 / 1
Data	08.06.2021
COLATA N. Heat-Couée-Schmelze	466767
Pag.	1 / 1

CLIENTE Customer-Client-Besteller	FIHI FORGING INDUSTRY S.L.	ORDINE Order-Commande-Bestellung	4500252451
PROFILO Shape-Section-Profili	CONTINUOUS CAST ROUND BARS , 600 MM -	STATO DI FORNITURA SupplyCondition-Etat de livraison	UNTREATED
ACCIAIO Steel-Acier-Stahl	S420	COMESSA/POS Sales Order/Pos:	1075944/10

CAPITOLATO ABS: Technical Specification: ABS

CAPITOLATO DI ANALISI: Material Specification: FORJAS IRAETA SP_FIR_DP_01_03_R0 03/09/2020

CAPITOLATO DI FORNITURA: Technical Delivery Requirements:

COMPOSIZIONE CHIMICA DI COLATA %

CAST ANALYSIS % - COMPOSITION CHIMIQUE DE COULEE % - SCHMELZE CHEMISCHE ANALYSE %

	C	Mn	Si	P	S	Cr	Ni	Mo	Al (T)	Cu	Sn	Ti
Min		1,00							0,015			
Max	0,200	1,70	0,60	0,025	0,010	0,30	0,80	0,10	0,300	0,55	0,100	0,0500
Colata/Heat	0,147	1,33	0,32	0,013	0,009	0,11	0,07	0,02	0,029	0,12	0,006	0,0048
	B (T)	V	Nb	As	Ca	Sb	Co	O/ppm	H/ppm	N/ppm	C EQ. LONG FORMULA	H1 TUNDISH
Min												
Max	0,0008	0,200	0,050	0,100	0,1000	0,100	0,300	20,00	2,00	250	0,460	2,0
Colata/Heat	0,0001	0,072	0,003	0,004	0,0014	0,001	0,009	8,00	0,70	98	0,422	1,7

COMPOSIZIONE CHIMICA SOLIDO%

CHEMICAL ANALYSIS II % - COMPOSITION CHIMIQUE II % - CHEMISCHE ZUSAMMENSETZUNG II %

	C	Mn	Si	P	S	Cr	Ni	Mo	Al (T)	Cu	Sn	Ti
Min												
Max												
Colata/Heat	0,145	1,34	0,32	0,013	0,009	0,11	0,07	0,02	0,029	0,12	0,006	0,0046
	B (T)	V	Nb	As	Ca	Sb	Co	C Eq. Formula				
Min												
Max												
Colata/Heat	0,0001	0,069	0,003	0,004	0,0014	0,001	0,009	0,421				

CARATT. MECCANICHE

MECHANICAL PROPERTIES - CARACTERISTIQUES MECANIQUE - MECHANISCHE EIGSNSCHAFTER

TRATTAMENTO TERMICO HEAT TREATMENT

NOTE

ANTIMIX 100 %

TEST CERTIFICATE ISSUED ACCORDING TO: EN 10204/3.1

"NO WELDING REPAIRS"

COUNTRY OF ORIGIN : ITALY

VACUUM DEGASSED STEEL .

ELECTRIC ARC FURNACE STEEL .

FINE GRAIN STEEL .

FULLY KILLED .

- Material free from lead, mercury, cadmium and hexavalent chromium (dir. 2000/53/CE - dir. 2011/65/UE as amended)
- Material with radioactivity not exceeding 0,1Bq/g (d.lgs. 230/1995 as amended)

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2021

CONTROLLO QUALITA'

QUALITY CONTROL - CONTROLE DE QUALITE - QUALITATSSTEILE

Company with a management system certified by IGQ to
ISO 9001 and IATF 16949

Verif.:Omar Tonetti

FIHI
Forging Industry S.L.

Certificado de Inspección 3.1

LINCOLN ELECTRIC
THE WELDING EXPERTS

Línea productos **FCAW**
Producto **OUTERSHIELD MC420NP-H**
Tamaño (mm) **1,6**
Item No. **943317**
Lote **P1FC226195**

Clasificación **AWS A5.28 E70C-G-H4**
ISO 17632-A T 38 Z Z M M21 2 H5

Pedido Cliente **4500326667**
Nuestra Orden **818890832**
Cantidad **1800.0 KG**
Cliente **FIHI FORGING INDUSTRY S.L.**

BARRIO CHIRIBOGA S/N
CESTONA 20740
España

Análisis Químico(%) According to EN10204 3.1

C	Si	Mn	P	S	Cr	Ni	Mo	Nb	Cu	V	Ti	Al
0.045	0.53	0.86	0.010	0.013	0.04	2.75	0.01	0.11	0.03	<0.01	0.010	<0.001

Sn	Pb	Zr	N
0.010	<0.001	<0.001	0.010

Propiedades mecánicas, Metal Depositado According to EN10204 3.1

Tensile testing

Cond.	Temp. °C	ReL MPa	Rm MPa	A5 %
PWHT 4.0h@900°C	21	381	543	30

Impact testing

Cond.	Temp °C	Impac J
PWHT 4.0h@900°C	-50	150

Diffusible hydrogen According to EN10204 3.1

HDM as Manufactured
2.7 ml/100g

Observaciones

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13./05./2024

14/06/2023

El producto arriba mencionado ha sido fabricado, controlado y suministrado en cumplimiento con el Sistema de aseguramiento de Calidad certificado según ISO 9001.

Compañia
Lincoln Electric Iberia S.L.
CTRA. LAUREA MIRO 396-398
08980 SAINT FELIU DE LLOBREGAT
Spain

Impreso por
R.Polaczek
POSITION:
Quality & R&D Manager

Impreso por
Por **David Jodra**
Cargo **Operation Manager**
Consultant
Fecha **13/JUN/2023**

Cert.número
02077715
ZEU_LOWALLOY, 1

METRODE
SPECIAL ALLO

GRI Flonges Iraeta

FIHI FORGING INDUSTRY, S.L.

Certificado de tratamiento térmico
Heat treatment certificate

Nº CERTIFICADO / CERTIFICATE Nº	H5-0379

HORNO / FURNACE:	HO-05	Nº HORNADA / TREATMENT Nº:	H5-0379	MATERIAL / MATERIAL:	Aro
FECHA INICIO / STARTING DATE:	01/05/2024 23:13:00	FECHA FINAL / FINISHING DATE:	02/05/2024 17:53:09	PESO / WEIGHT [Kg]:	79175
PERMANENCIA REAL / REAL HOLDING TIME [min]:	429	PERMANENCIA PREVISTA / SCHEDULED HOLDING TIME [min]:	420	MAYOR ESPESOR / MAX. THICKNESS [mm]:	305

DESCRIPCIÓN MATERIAL MATERIAL DESCRIPTION	BATCH	ESPESOR (mm) / THICKNESS (mm)
M5018400 C/482504 (UND 2)	B-373312	240
M5018400 C/482505 (UND 3)	B-373311	240
M5018780 C/466767 (UND 1)(PROB 1)	B-374560	305
320x105x1400 C/466767(UND 2) (PROB 1)	L-1392810	105
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0

FIHI FORGING INDUSTRY, S.L. certifica que el material detallado en el presente documento, ha sido sometido al tratamiento térmico según la especificación que se detalla en este documento

FIHI FORGING INDUSTRY, S.L. certifies that the detailed material of this document has been treated according the especification below referenced.

ESPECIFICACIÓN DE TRATAMIENTO TÉRMICO / SPECIFICATION FOR HEAT TREATMENT	Normalizado según / Normalized according IN_FIR_PT_04/10/24

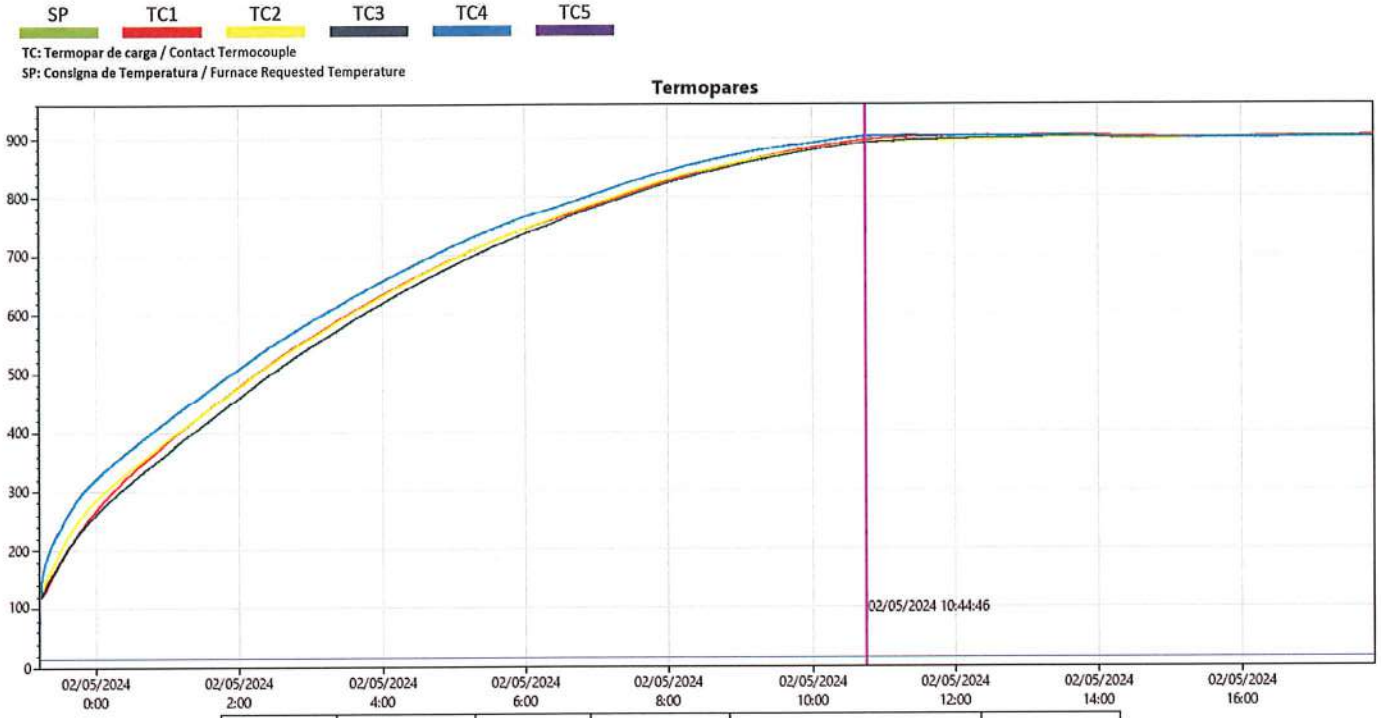
FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13./05./2024

FIHI Forging Industry S.L.

FIHI FORGING INDUSTRY, S.L.	Certificado de tratamiento térmico Heat treatment certificate

Nº CERTIFICADO / CERTIFICATE Nº	H5-0379

GRÁFICO DE TRATAMIENTO / TREATMENT CHART



REF.TC1	94321-12	REF.TC2	94321-24	REF.TC3	94321-1
REF.TC4	94321-11	REF.TC5	NO APLICA	REF. LASER OPTICO	

Conformidad de Tratamiento Termico

Conformity of Heat Treatment

Nombre de responsable / Responsible: Jesús Arruti

OBSERVACIONES	

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13/05/2024

FIHI Forging Industry S.L.

GRI Forges Iraeta FIHI FORGING INDUSTRY, S.L.	Certificado de tratamiento térmico Heat treatment certificate

Nº CERTIFICADO / CERTIFICATE Nº	H5-0379

						M5018400	(5)						
						M5018780	(1)*						
						M5018778	(2)**						
						1392810**	C/466767						
						1395442	C/482505						
					TC4>>>	1395443	C/482505						
					TC3>>>	1395445	C/482504						
						1395444	C/482505						
					TC2>>>	1395446	C/482504						
					TC1>>>	1397272*	C/466767						

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13/05/2024

FIHI Forging Industry S.L.

FIHI FORGING INDUSTRY, S.L.

Bº Txiriboga, s/n
20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024415

FECHA DE EMISIÓN / DATE OF ISSUE:		09/05/2024
CLIENTE	Nombre	FIHI Forging Industry, S.L.
	Dirección	Bº Txiriboga, s/n 20740 Zestoa (Gipuzkoa) SPAIN Tel: +34 943 147 645
PEDIDO / ORDER		P24415
FECHA DE RECEPCIÓN / DATE OF RECEIPT		07/05/2024
REFERENCIA / REFERENCE		B-374560
MATERIAL ENSAYADO / TESTED MATERIAL:		M5018780 C/466767

BUREAU VERITAS
BUREAU VERITAS
09 MAY 2024

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09/05/2024

Information is marked as General and belongs to GRI

FIHI FORGING INDUSTRY, S.L.

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20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

GRI Flanges Iraeta

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024415

CARACTERÍSITCAS MECÁNICAS / MECHANICAL PROPERTIES

Fecha / Date	Referencia /Reference	Sentido-ubicación/ Direction-location	Ensayo de tracción / Tensile test				
			Temperatura/ Temperature (ºC)	Diámetro/ Diameter (mm)	R_{eH} / U.Y.S. (MPa)	Rm / T.S. (MPa)	A/ Elongation (%)
09/05/2024	B-374560	Longitudinal	21	10.01	366	505	35.6

Ensayo realizado según / Test carried out according to UNE-EN 6892-1:2020 Met. B y/and IN_FIR_LB_01_07

Fecha/ Date	Referencia/ Reference	Sentido-ubicación/ Direction-location	Ensayo de flexión por choque / Charpy Impact test			
			Energía absorbida / Absorbed Energy , KV_2 (J)			
			Temperatura/ Temperature (ºC)	Probeta / Specimen 1	Probeta / Specimen 2	Probeta / Specimen 3
09/05/2024	B-374560	Longitudinal	-40	143	131	135
		Transversal	-40	63	64	33

Ensayo realizado según / Test carried out according to UNE-EN ISO 148-1:2017 y/ and IN_FIR_LB_01_06

Fecha / Date	Referencia / Reference	Ensayo de tracción en sentido del espesor / through thickness tensile test (Z)			
		Temperatura / Temperature (ºC)	Probeta / Specimen	Diámetro / Diameter (mm)	Estricción / Area reduction (%)
09/05/2024	B-374560	22	1	9.98	66
		22	2	10.05	67
		22	3	10.05	67

Ensayo realizado según / Test carried out according to UNE-EN ISO 6892-1:2020 Met.B, UNE-EN 10164:2019 y/ and IN_FIR_LB_01_07

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09/05/2024

BUREAU VERITAS

Information is marked as General and belongs to GRI

FIHI FORGING INDUSTRY, S.L.

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Tel: +34 943 147645
Fax: +34 943 148059

GRI Flanges Iraeta

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024415

ANALISIS QUÍMICO / CHEMICAL ANALYSIS

Fecha / Date	Referencia / Reference	Composición / Composition (%)						
		C	Si	Mn	P	S	Cr	Mo
09/05/2024	B-374560	0.159	0.32	1.27	0.012	0.009	0.11	0.016
	C/466767*	0.147	0.32	1.33	0.013	0.009	0.11	0.02
Fecha / Date	**Referencia / Reference**	**Ni**	**Cu**	**V**	**Al**	**Nb**	**Ti**	**N**
09/05/2024	B-374560	0.06	0.11	0.067	0.021	0.002	0.004	0.0081
	C/466767*	0.07	0.12	0.072	0.029	0.003	0.0048	0.0098

Ensayo realizado según / Test carried out according to IN_FIR_LB_01_01 y/and IN_FIR_LB_01_04

Fecha / Date	Referencia / Reference	Parámetros calculados / Calculated parámeters	
		C_{EQ} (1) (C_{EQ}= C + Mn/6 + (Cr+Mo+V)/5 + (Ni+Cu)/15) (%)	C_{ET} (2) (C_{ET}= C + (Mn+Mo)/10 + (Cr+Cu)/20 + Ni/40) (%)
09/05/2024	B-374560	0.422	N/A
	C/466767*	0.422	

(1) Parámetro calculado según / Calculated parameter according to EN-10025-1:2006

(2) Parámetro calculado según / Calculated parameter according to EN-1011-2:2001

BUREAU VERITAS

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09/05/2024

Information is marked as General and belongs to GRI

FIHI FORGING INDUSTRY, S.L.

Bº Txiriboga, s/n
20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024415

OBSERVACIONES / COMMENTS

*Datos proporcionados por el proveedor / Data provided by supplier

FIRMA / SIGNATURE

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09/05/2024

[X] Witness [ ] Review
MAY 16 24
BUREAU VERITAS

Forging Industry S.L.

Cristina Iparraguirre

Responsable de laboratorio /

Laboratory responsible

Los resultados de este informe sólo afectan a las muestras sometidas a ensayo.
Está prohibida la reproducción total o parcial de este informe sin el consentimiento escrito de FIHI Forging Industry, S.L.
The results of this report refer only to the tested samples
The total or partial reproduction of this report is not allowed unless written permission of FIHI Forging Industry, S.L.

Information is marked as General and belongs to GRI

GRI Flanges Iraeta

FIHI FORGING INDUSTRY S.L

INFORME DE INSPECCIÓN POR ULTRASONIDOS Y VISUAL
ULTRASONIC AND VISUAL INSPECTION REPORT

Nº de Serie /Serial Nº:	OF::	5888	M:	2022215	L:	1399936	**Cliente** / Customer:	Rosetti Marino
							Plano Cliente / Customer Drawing:	ST-DD-90083-R2
Descripción / Description:	FLANGE							

Nombre del técnico / Name of the technician:	OIER ECEIZA	**Nivel** / Level:	2
Organización de inspección / Examination organization:	FIHI FORGING INDUSTRY S.L.	**Nº Certificado** / Certificate No.:	E-A-007398-UT-MS-1

Identificación del equipo de inspección / Identification of used equipment:				OLYMPUS - EPOCH			
Identificación de bloque de referencia empleado / Identification of used reference block (s)							
V1-No.:	12545	**V2-No.:**	50434-20398	**TIF-Block No.:**	FI-UT-BI	**Other:**	
Verificación de palpadores / Probe check		☒ OK	☐ NO OK	**Acoplante** / Couplant:		ACEITE / OIL	

Información palpadores utilizados (tipo, nº identificación, frecuencia y ángulo real de salida del palpador / Information of used probes (type, ID number, frecuency and the probes angle

Palpador / Probe	Tipo Palpador / Probe type	Nº Identificación / Id. No.	Frec. ángulo / Freq angle	Palpador / Probe	Tipo Palpador / Probe type	Nº Identificación / Id. No.	Frec. ángulo / Freq angle
Probe "A"	B4S	57746	4 Mhz / 0 °	Probe "B"	DL4R	1481248	4 Mhz /0 °
Probe "C"	SWB45-2	58414-53756	2 Mhz /45°	Probe "D"	SWB70 -2	58416-54064	2 Mhz / 70 °
Probe "E"				Probe "F"			

Normas a aplicar / Standards to be apply

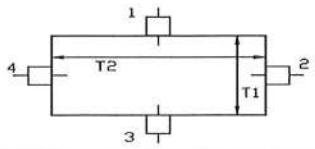
Criterio de aceptación material base / Base material aceptance criteria	Criterio de aceptación Soldadura / Welds aceptance criteria	Criterio de aceptación inspección visual / Visual inspections acceptance criteria
EN 10308 clase 3	ISO 17640-B	ISO 17637
	ISO 11666 clase 2	EN 5817-B

Ganancia empleada para el nivel de referencia y valores usados para la corrección por perdidas por transferencia / Gain setting for reference level and values used for transfer corrections

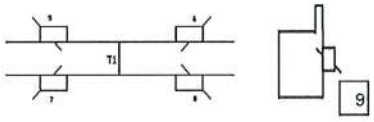
	A:	B:	C:	D:	E:	F:
ID Palpador / Probe ID						
Método de ajuste / Method settings (*)	3	3	1	1		
Campo aplicación / Setting range	300 mm	300 mm	300 mm	300 mm	mm	mm
Nivel de referencia / Setting reference	(dia) 2 mm	(dia) 2 mm	(dia) 3 mm	(dia) 3 mm	(dia) mm	(dia) mm
Ajuste de la base / Basic set.-ref curve	dB	dB	36 dB	39 dB	dB	dB
Corrección perdida transferencia /Transfer correction	dB	dB	2 dB	2 dB	dB	dB
Ganancia adicional para la inspección / Extra gain for scanning	dB	dB	14 dB	14 dB	dB	dB
TOTAL	dB	dB	52 dB	55 dB	dB	dB

(*) Método de ajuste de la sensibilidad: 1- taladros laterales 2- Taladros de fondo plano 3- Curvas distancia amplitud (DAC)
(*) Method for setting of the sensitivity: 1 Side drilled holes 2- Flat bottom holes 3- Distance gain size (DGS)

Posición para la inspección de defectos longitudinales y laminación / Scanning position for longitudinal defects and lamination



Posición para la inspección de soldaduras / Scanning position for weldings inspection



Extension del examen / Extent of examination

Tipo de insp. / Type of insp. (2)	Espesor 1 / Thickness 1	Espesor 2 / Thickness 2	Palpador – Posición palpador / Probe- probe position	Área de inspección/ Inspection area
2	120-280 mm	mm	C5/C6 - C7/C8 - D5/D6 - D7/D8 - C9 / D9	100%
3	120-280 mm	325 mm	A1/A2 - B1/B2	100%
	mm	mm		%
	mm	mm		%

2) Tipo de inspección: 1: Insp. de aros laminados de sección rectangular 2: Insp. de las soldaduras 3: Insp. de aro fabricado en llanta de sección rectangular
2) Type of inspection: 1: Insp. of the seamless rolled ring with rectangular cross section 2: Insp. of the weld in the steel bar 3: Insp. of the ring made out of bars with rectangular cross section

Resultado de la inspección y marcas / Result of the examination and remarks:
☒ **ACEPTABLE** / ACCEPTABLE
☐ **NO ACEPTABLE** / NOT ACCEPTABLE

Firma Inspector / Technician signature: FIHI Forging Industry S.L.

Fecha / Date: 8/05/2024

Responsable de NDT y supervisor / NDT responsible and supervisor:
Urtzi Landa : E - A - 004708 - UT - 2 - MS - 2

Firma supervisor / Supervisor Signature: FIHI Forging Industry S.L.

F_FIR_IP_01_01_01_R0
FECHA REV. DOC.: 06/03/2023

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 10/05/2024

GRI Flanges Iraeta

FIHI FORGING INDUSTRY SL

INFORME DE INSPECCIÓN POR MT y VT
INSPECTION REPORT OF MT AND VT

Nº de Serie /Serial Nº:	OF: 5888	M: 2022215	L: 1399936	**Cliente** / Customer: Rosetti Marino
				NºPlano Cliente / Customer Drawing Nº: ST-DD-90083-R2
Descripción / Description:	FLANGE			

INFORME DE INSPECCIÓN POR PARTÍCULAS MAGNÉTICAS
MAGNETIC TESTING INSPECTION REPORT

Normativa / Standard: ISO 23278 2x / ISO 17638				**Preparación superficial** / Surface finish: Mecanizado/ Machined			
Partículas Magnéticas / Magnetic particles: NEGRAS / BLACK		**Fabricante** / Manufacturer: CGM		**Referencia** / Reference: LK31 - 355		**Color** / Colour: NEGRO / BLACK	
Aparato utilizado / Type of machine: YUGO ELECTROMAGNETICO / YOKE ELECTROMAGNETIC		**Fabricante** / Manufacturer: YUKE MAGIFLUS		**Modelo** / Model: TWIST 230		**Nº Serie** / Serial number: A : 903823 VOLT : 280428	
Método de limpieza / Method of cleaning: DESENGRASADO DEGREASED	**Laca de contraste** / Strip film contrast: SI YES		**Secuencia magnetización** / Sequence of magnetization: CONTINUO CONTINUE		**Temperatura de la pieza** / Piece temperatura: 10 - 50 °C		
Iluminación / Ilumination: NATURAL NATURAL	**Duración de la magnetización** / Duration of Magnetization: 5 - 10 sg		**Corriente de magnetización** / Flow of magnetization: ALTERNA ALTERNATE		**Intensidad (kv)** / Strenght: 3,8 K/A		
Luxómetro (lux) / Luxometer (lux): > 500 LUX	**Relación L/D** / Relation L/D: N.A	**Amperio –Vuelta** / Ampere-lap: N.A	**Distancia Polos (mm)** / Distance Poles: 150 - 250		**Fuerza Izado (Kg)** / Lifting Power: 4,5		
Material de contacto / Type of contact: ACERO STEEL	**Desmagnetización** / Demagnetization: NO PRECISA NOT NECESSARY		**Inspección al 100% de la zona de la soldadura + ZAT** Inspection of the 100% of the Weld area + HAZ				

Resultado / Results: ☒ ACEPTABLE / ACCEPTABLE ☐ NO ACEPTABLE / NOT ACCEPTABLE	**Observaciones** / Observations:		
Operador / Operator: OIER ECEIZA E-A-007398-MT-2-S-1	**Nivel** / Level: 2	**Firma** / Signature: FIHI Forging Industry S.L.	
Supervisor / Supervisor: URTZI LANDA : E - A - 004708 - MT - 2 - S - 2	**Nivel** / Level: 2	**Firma** / Signature: FIHI Forging Industry S.L.	**Fecha** / Date: 10/05/2024

INFORME DE INSPECCIÓN VISUAL
VISUAL TESTING INSPECTION REPORT

Normativa / Standard: ISO 5817-B / ISO 17637		**Periodo de inspección** / Time of examination: DESPUES DE MECANIZAR AFTER MACHINING	
Instrumentación / Aids: REGLA / RULER (mm)			
Extensión de la inspección / Extent of examination: SOLDADURA + ZAT WELD + HAZ		**Condiciones superficiales** / Surface conditions: MECANIZADO MACHINED	
Resultado / Results: ☒ ACEPTABLE / ACCEPTABLE ☐ NO ACEPTABLE / NOT ACCEPTABLE	**Observaciones** / Observations:		
Operador / Operator: OIER ECEIZA E-A-007398-VT-2-S-1	**Nivel** / Level: 2	**Firma** / Signature: FIHI Forging Industry S.L.	
Supervisor / Supervisor: URTZI LANDA : E - A - 004708 - VT - 2 - MS - 2	**Nivel** / Level: 2	**Firma** / Signature: FIHI Forging Industry S.L.	**Fecha** / Date: 10/05/2024

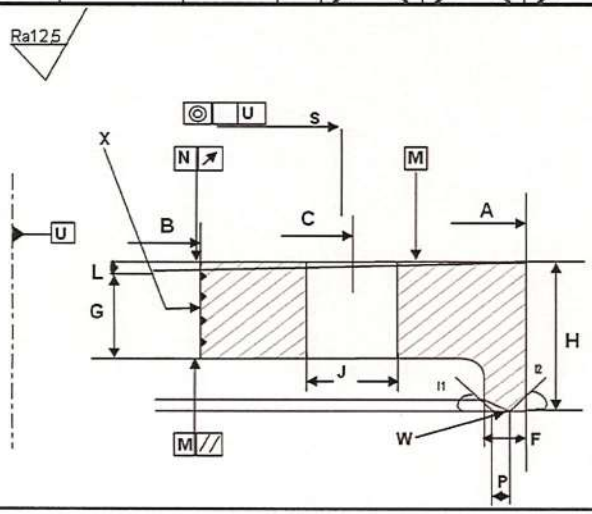
FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 10 / 05 / 2024

FIHI FORGING INDUSTRY, S.L.	**Registro de Control Dimensional Brida en "L"** *Register of Dimentional Control Flange in "L"*	

Nº de albarán/ *Delivery note:* 200147404/10 | **Nº Colada/** *Heat Nº:* 466767 | F_FIR_PT_05_02_R0 14/11/2019

Nº de plano/*Item nº:* 123A90-DDL-ST-DD-90083 | **Cód.Material/***Material code:* 2022215 | **Nº de piezas/***Qty.:* 1 UN

				Ø Exter. *Outside Ø* A	Ø Inter. *Inside Ø* B	Ø Entrecen. *Hole Circle Ø* C	Esp.Cuello *Neck width* F	Altura Ala *Thickness ins.* G	Alt. Pieza *Height* H	Angulo Chaflan(°) *Chamfer angle(°)* I1	 I2	Ancho talón *Bead width* P	Ø Agujeros *Hole diameter* J	Nº Agujeros *Holes Nº* K1	Dis.Pared ext. *Outside wall distance* 	Conicidad *Tilt* L	Paralelism *Parallelism* M	Planitud *Flatness* N	Rugosida *Roughness* Ra	Muesca *Marcs* W	Marca alineam. *Align. marc* X
		COTAS mm		7000,00	6350,00	6681,00	75,00	120,00	280,00	15,00	15,00	5,00	70,00	156	124,50	N.A.	0,00	0,00	N.A.	N.A.	
		TOLERANCIAS *Tolerances*		+ 2,00 - 2,00	+ 2,00 - 2,00	+ 2,00 - 2,00	+ 1,00 - 0,00	+ 0,00 - 5,00	+ 2,00 - 1,00	+ 1,00 - 1,00	+ 1,00 - 1,00	+ 1,00 - 1,00	+ 0,50 - 0,50	+ 0 - 0	+ 2,25 - 2,25	+ N.A. - N.A.	+ 0,50 - 0,00	+ 2,00 - 0,00	N.A. N.A.	N.A. N.A.	0 0
Nº Operario *Worker Nº*	Nº Brida *Flange Nº*	FECHA *Date*	Máx.	7002,00	6352,00	6683,00	76,00	120,00	282,00	16,00	16,00	6,00	70,50	156	126,75	N.A.	0,50	2,00	OK/ NO OK	OK/ NO OK/ *NA	
			Mín.	6998,00	6348,00	6679,00	75,00	115,00	279,00	14,00	14,00	4,00	69,50	156	122,25	N.A.	0,00	0,00			
126 72 521	1399936	10.05.2024	0°	7001,58	6349,70	6681,10	75,73	119,19	281,54	15,00	15,00	4,73	70,05	156	125,21		0,50	0,22			OK
			90°	7001,83	6349,95	6681,28	75,50	119,40	281,70			4,63	70,01		125,02						
			180°				75,90	118,90	281,20			4,78	69,93		125,31						
			270°				75,84	119,29	281,62			4,68	70,05		125,03						
			0°																		
			90°																		
			180°																		
			270°																		



Observaciones/ *Remarks:*

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 13/05/2024

Aceptado por el Departamento de Calidad

Nombre/ *Name:*
Nora Lasa

Firma y Sello/ *Signature and stamp:*

FIHI Forging Industry S.L.

Fecha/ *Date:*
10.05.2024

GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

QUALITY CERTIFICATE / CERTIFICADO CALIDAD

EN10204 3.2

Nº Certificado: Certificate Nº:	040000374468_06	**Fecha:** Date:	13.05.2024	**Nº Cert. Ensayo:** Test Cert. Nº:	FIHI024426
Cliente: Customer:	ROSETTI MARINO S.P.A.	**Nº Pedido:** Order Nº:	1724000344 123A90A	**Nº Albarán:** Delivery Note Nº:	200147415/10
Nº Plano Cliente: Customer Drawing Nº:	TEST COUPON			**Cod. Artículo:** Article Code:	2022233
Material: Material:	EN10025-3-S420NL	**Trat. Térmico:** Heat Treatment:	H5-0379 NORMALIZADO (+N) NORMALIZED (+N)	**Estado Suministro:** Delivery Condition:	MECANIZADO MACHINED

Cantidad Quantity	Descripción Artículos Articles description	Nº Colada Heat Nº	(1)Ref. Probeta(2) (1)Testing Piece Ref.(2)	Observaciones Observations
1	TEST COUPON -320x105x1400 (S420NL)-NL0S Ref. Test Cupón (Test Coupon) M-2022233 L/SN-1400646	466767	(EP)1392810-L (M) (T1)1392810(M) (T2)1392810 (M)	

(1) TIPO PROBETA/*Type:* -EP: TOCHO/*End Piece* -R: ARANDELA/*Ring* -C: CUPÓN/*Coupon*

(2) SITUACIÓN/*Location:* -M: MATERIAL BASE/*Base Material* -W: SOLDADURA/*Welding* -H: ZAT/*HAZ*

COMPOSICIÓN QUÍMICA (%) / CHEMICAL COMPOSITION (%)

Ref. Probeta *Testing Piece Ref.*	(3)	C	Si	Mn	P	S	Nb	V	Al (4)	Ti	Cr	Ni	Mo	Cu	N	B	O	CEV (5)
466767	L	0,1470	0,3200	1,3300	0,0130	0,0090	0,0030	0,0720	0,0290	0,0048	0,1100	0,0700	0,0200	0,1200	0,0098	-	-	0,4220
(EP)1392810-L (M)	P	0,1610	0,3100	1,2800	0,0120	0,0100	0,0020	0,0680	0,0210	0,0040	0,1100	0,0600	0,0160	0,1100	0,0058	-	-	0,4260

(3) L = ANÁLISIS DE COLADA/ *Laddle Analysis*
P = ANÁLISIS DE PRODUCTO/ *Product Analysis*

(5) CEV% (EN-10025-1) = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15

(4)Si la cantidad de elementos fijadores del N es suficiente (Nb:0.015-0.06% o V: 0.02-0.12%), la cantidad mínima de Al no aplica (material acorde a EN10025/EN10028/EN10273) /The minimum value for aluminium does not apply if other N binding elements are present in sufficient quantity (Nb: 0.015-0.06% or V: 0.02-0.12%). (Materials according to EN10025/EN10028/EN10273)

CARACTERÍSTICAS MECÁNICAS / TAMAÑO GRANO - MECHANICAL PROPERTIES / GRAIN SIZE

Ref. Probeta *Testing Piece Ref.*	Ensayo de Tracción *Tensile Test* (ISO 6892-1)				Estricción (%) *Reduction of Area (%)* (EN 10164)			Resistencia al Impacto KV2 *Impact Strength KV2* (ISO 148-1)				Dureza *Hardness*	Tamaño de Grano *Grain Size*
	(6)	Resist. Tracción *Tensile Strength* Rm MPa	Límite Elástico *Yield Strength* ReH MPa	Alargamiento *Elongation* Lo=5d A %	(6)	Valores Unitarios *Unitary values* %	Media *Average* %	(6)	Valores Unitarios *Unitary Values* J	Media *Average* J	Temp./ *Temp.* °C	HBW (ISO 6506-1)	(ASTM E-112)
(EP)1392810-L (M)	L	519	357	32,2	Z	66-63-63	64	L	167-139-144 -	150 -	-40	-	-
(T1)1392810 (M)	-	-	-	-	-	-	-	T1	53-64-71 -	63 -	-40	-	-
(T2)1392810 (M)	-	-	-	-	-	-	-	T2	54-49-47 -	50 -	-40	-	-

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 13 / 05 / 2024

(6) ORIENTACIÓN / *Orientation:* -T: TRANSVERSAL/*Transversal* -L: LONGITUDINAL/*Longitudinal* -Z: SENTIDO DEL ESPESOR/*Through thickness.*

DECLARACIÓN DE CONFORMIDAD *DECLARATION OF CONFORMITY:*

LOS PRODUCTOS INCLUIDOS EN EL PRESENTE DOCUMENTO SON CONFORMES CON LOS REQUISITOS DEL PEDIDO DE CLIENTE Y CON LOS DE LA(S) NORMA(S) DEL MATERIAL ARRIBA REFERIDO(S)

The product herein in this document has been made and tested in accordance with the requirements of the above mentioned order and standard.

VALIDADO POR
VALIDATED BY:

Departamento de Calidad:
Quality department:

Nora Lasa

BUREAU VERITAS
D.Herrera-Davila
13/May/2024

UK CA 2400
2400-CPR-20220126

CE 2451
2451-CPR-EN10025-2014.0001

FIHI Forging Industry S.L.

Environmental recommendations related to the product: At GRI Renewables we understand caring for the environment as a responsible management model in collaboration with our stakeholders, therefore, and with the aim of reducing the environmental impact of our activity and, therefore,of our production chain, we recommend to our clients and to all the parties involved in our life cycle, carry out a correct segregation and treatment of the waste generated, prioritizing its minimization, reuseand recycling, in accordance with the applicable legislation.

FIHI FORGING INDUSTRY, S.L.

Declaration of performance

The manufacturer

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa) SPAIN

declares herewith, that the construction product

Test coupons produced by hot rolled products of structural steel according to EN 10025-1 with serial number

M-2022233 L-1400646

produced in factory

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa) SPAIN

fulfills the requirements of the following EU-directive/s and harmonized specifications:

- **EN 10025-1**
- **EU 305**
- **EN 1090-1**
- **EN 1090-2 EXC 4**

The notified body/ies:

- **UKAS CPR: certified by TWI Certification Ltd /Notified body No. 2400 / Certificate No. 2400-CPR-20220126**
- **CE CPR: certified by DVS ZERT / Notified body No.2451 / Certificate No. 2451-CPR-EN10025-2014.0001.006**

And with customers specifications and drawings according to Purhase Order 1724000344

DRAWING	SPECIFICATION
TEST CUPÓN	123A90-DDL-ST-SP-90118 Document Class: 2 Rev.1, SPC-PRO-01Rev.2024-00, 123A90-DDL-ST-SP-90118_IFA REV.02 (05032024)

The performance of the products above is in conformity with the set of declared performance/s. This declaration of performance is issued in accordance with Regulation (EU) No 305/2011/EU and Construction products (amendment etc.) (EU exit) Regulations 2020, UK statutory instrument 2020, under the sole responsibility of the manufacturer identified above.

Zestoa, 13.05.2024
FIHI FORGING INDUSTRY S.L

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13./05./2024

FIHI Forging Industry S.L.

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa) SPAIN

Business ID /C.I.F.
B75225946

www.grupoiraeta.com
Tel. *+34 943 147 645*
Fax. *+34 943 897 029*

Information is marked as Restricted and belongs to GRI.

GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

CE 2451

UKCA 2400

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa)
SPAIN
08 - 22
2451-CPR-EN10025-2014.0001.006
2400-CPR-20220126

EN 10025-1
Hot rolled products of structural steels

Intended uses:	Building constructions or civil engineering
Tolerances on dimensions and shape:	Welded parts EN 10029 Class A
Elongation:	Normalized Steel EN 10025-3 S420NL
Tensile strength	
Yield strength	
Impact strength	
Weldability	
Durability:	NPD.
Regulated substance:	NPD.

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2024

Information is marked as Restricted and belongs to GRI.

GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

CE & UKCA Marking used for Inspection Certificates according to EN 10204

CE

2451

2451-CPR-EN10025-2014.0001.006

UK CA

2400

2400-CPR-20220126

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13/05/2024

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa) SPAIN

Business ID /C.I.F.
B75225946

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Fax. *+34 943 897 029*

Information is marked as Restricted and belongs to GRI.

ACCIAIERIE BERTOLI SAFAU
ABSOLUTE STEEL QUALITY

ACCIAIERIE BERTOLI SAFAU SpA
Via Buttrio n.28 - Frazione Cargnacco - 33050 Pozzuolo del Friuli (UD)
Tel. +39 0432 613211 - Fax +39 0432 613209 - www.absacciai.it

CERTIFICATO DI COLLAUDO

Inspection Certificate 3.1/Certificat de reception 3.1/
Abnahmeprufzeugnis 3.1

N.	291974 / 1
Data	08.06.2021
COLATA N. Heat-Couée-Schmelze	466767
Pag.	1 / 1

CLIENTE Customer-Client-Besteller	FIHI FORGING INDUSTRY S.L.	ORDINE Order-Commande-Bestellung	4500252451
PROFILO Shape-Section-Profili	CONTINUOUS CAST ROUND BARS , 600 MM -	STATO DI FORNITURA SupplyCondition-Etat de livraison	UNTREATED
ACCIAIO Steel-Acier-Stahl	S420	COMESSA/POS Sales Order/Pos:	1075944/10

CAPITOLATO ABS: Technical Specification: ABS

CAPITOLATO DI ANALISI: Material Specification: FORJAS IRAETA SP_FIR_DP_01_03_R0 03/09/2020

CAPITOLATO DI FORNITURA: Technical Delivery Requirements:

COMPOSIZIONE CHIMICA DI COLATA %

CAST ANALYSIS % - COMPOSITION CHIMIQUE DE COULEE % - SCHMELZE CHEMISCHE ANALYSE %

	C	Mn	Si	P	S	Cr	Ni	Mo	Al (T)	Cu	Sn	Ti
Min		1,00							0,015			
Max	0,200	1,70	0,60	0,025	0,010	0,30	0,80	0,10	0,300	0,55	0,100	0,0500
Colata/Heat	0,147	1,33	0,32	0,013	0,009	0,11	0,07	0,02	0,029	0,12	0,006	0,0048
	B (T)	V	Nb	As	Ca	Sb	Co	O/ppm	H/ppm	N/ppm	C EQ. LONG FORMULA	H1 TUNDISH
Min												
Max	0,0008	0,200	0,050	0,100	0,1000	0,100	0,300	20,00	2,00	250	0,460	2,0
Colata/Heat	0,0001	0,072	0,003	0,004	0,0014	0,001	0,009	8,00	0,70	98	0,422	1,7

COMPOSIZIONE CHIMICA SOLIDO%

CHEMICAL ANALYSIS II % - COMPOSITION CHIMIQUE II % - CHEMISCHE ZUSAMMENSETZUNG II %

	C	Mn	Si	P	S	Cr	Ni	Mo	Al (T)	Cu	Sn	Ti
Min												
Max												
Colata/Heat	0,145	1,34	0,32	0,013	0,009	0,11	0,07	0,02	0,029	0,12	0,006	0,0046
	B (T)	V	Nb	As	Ca	Sb	Co	C Eq. Formula				
Min												
Max												
Colata/Heat	0,0001	0,069	0,003	0,004	0,0014	0,001	0,009	0,421				

CARATT. MECCANICHE

MECHANICAL PROPERTIES - CARACTERISTIQUES MECANIQUE - MECHANISCHE EIGSNSCHAFTER

TRATTAMENTO TERMICO HEAT TREATMENT

NOTE

ANTIMIX 100 %

TEST CERTIFICATE ISSUED ACCORDING TO: EN 10204/3.1

"NO WELDING REPAIRS"

COUNTRY OF ORIGIN : ITALY

VACUUM DEGASSED STEEL .

ELECTRIC ARC FURNACE STEEL .

FINE GRAIN STEEL .

FULLY KILLED .

- Material free from lead, mercury, cadmium and hexavalent chromium (dir. 2000/53/CE - dir. 2011/65/UE as amended)
- Material with radioactivity not exceeding 0,1Bq/g (d.lgs. 230/1995 as amended)

CONTROLLO QUALITA'

QUALITY CONTROL - CONTROLE DE QUALITE - QUALITATSSTEILE

Company with a management system certified by IGQ to
ISO 9001 and IATF 16949

Verif.:Omar Tonetti

FRANCESCO PARISE
GNGINEX Inspector on behalf of: ROSSETTI MARINO

W ☐

R ☑

DATE: 13 / 05 / 2024

FIHI
Forging Industry S.L.

FIHI FORGING INDUSTRY, S.L.	Certificado de tratamiento térmico Heat treatment certificate

Nº CERTIFICADO / CERTIFICATE Nº	H5-0379

HORNO / FURNACE:	HO-05	Nº HORNADA / TREATMENT Nº:	H5-0379	MATERIAL / MATERIAL:	Aro
FECHA INICIO / STARTING DATE:	01/05/2024 23:13:00	FECHA FINAL / FINISHING DATE:	02/05/2024 17:53:09	PESO / WEIGHT [Kg]:	79175
PERMANENCIA REAL / REAL HOLDING TIME [min]:	429	PERMANENCIA PREVISTA / SCHEDULED HOLDING TIME [min]:	420	MAYOR ESPESOR / MAX. THICKNESS [mm]:	305

DESCRIPCIÓN MATERIAL MATERIAL DESCRIPTION	BATCH	ESPESOR (mm) / THICKNESS (mm)
M5018400 C/482504 (UND 2)	B-373312	240
M5018400 C/482505 (UND 3)	B-373311	240
M5018780 C/466767 (UND 1)(PROB 1)	B-374560	305
320x105x1400 C/466767(UND 2) (PROB 1)	L-1392810	105
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0

FIHI FORGING INDUSTRY, S.L. certifica que el material detallado en el presente documento, ha sido sometido al tratamiento térmico según la especificación que se detalla en este documento

FIHI FORGING INDUSTRY, S.L. certifies that the detailed material of this document has been treated according the especification below referenced.

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2024

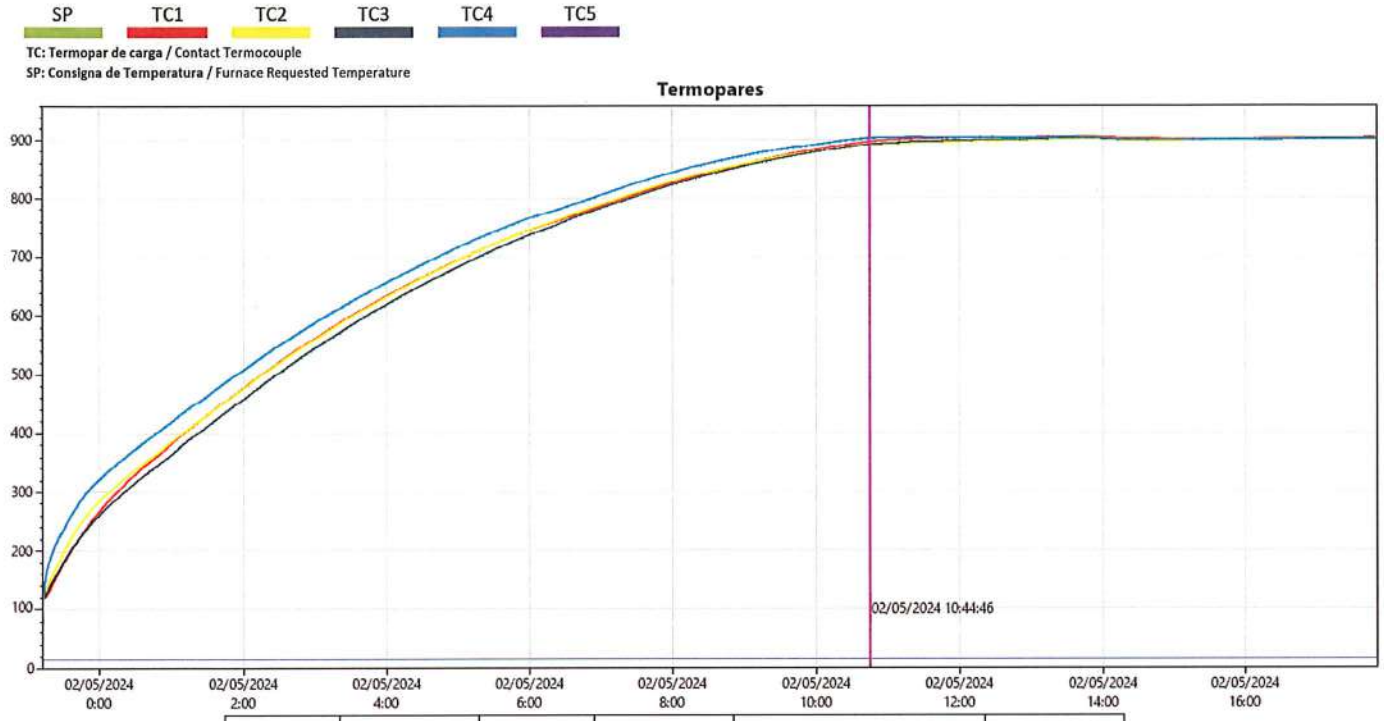
ESPECIFICACIÓN DE TRATAMIENTO TÉRMICO / SPECIFICATION FOR HEAT TREATMENT	Normalizado según / Normalized according IN_FIR_PT_04/10/24

FIHI Forging Industry S.L.

FIHI FORGING INDUSTRY, S.L.	Certificado de tratamiento térmico Heat treatment certificate

Nº CERTIFICADO / CERTIFICATE Nº	H5-0379

GRÁFICO DE TRATAMIENTO / TREATMENT CHART



REF.TC1	94321-12	REF.TC2	94321-24	REF.TC3	94321-1
REF.TC4	94321-11	REF.TC5	NO APLICA	REF. LASER OPTICO	

Conformidad de Tratamiento Termico

Conformity of Heat Treatment

Nombre de responsable / Responsible: Jesús Arruti

OBSERVACIONES	

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2024

FIHI Forging Industry S.L.

GRI Forges Iraeta FIHI FORGING INDUSTRY, S.L.	Certificado de tratamiento térmico Heat treatment certificate

Nº CERTIFICADO / CERTIFICATE Nº	H5-0379

						M5018400	(5)						
						M5018780	(1)*						
						M5018778	(2)**						
						1392810**	C/466767						
						1395442	C/482505						
					TC4>>>	1395443	C/482505						
					TC3>>>	1395445	C/482504						
						1395444	C/482505						
					TC2>>>	1395446	C/482504						
					TC1>>>	1397272*	C/466767						

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2024

FIHI Forging Industry S.L.

FIHI FORGING INDUSTRY, S.L.

Bº Txiriboga, s/n
20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

GRI Flanges Iraeta

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024426

FECHA DE EMISIÓN / DATE OF ISSUE:		09/05/2024
CLIENTE	Nombre	FIHI Forging Industry, S.L.
	Dirección	Bº Txiriboga, s/n 20740 Zestoa (Gipuzkoa) SPAIN Tel: +34 943 147 645
PEDIDO / ORDER		P24426
FECHA DE RECEPCIÓN / DATE OF RECEIPT		08/05/2024
REFERENCIA / REFERENCE		L-1392810
MATERIAL ENSAYADO / TESTED MATERIAL:		M5018778 C/466767

Witness / Review
D. Javier Dávila
09 MAY 2024
BUREAU VERITAS

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09/05/2024

Information is marked as General and belongs to GRI

FIHI FORGING INDUSTRY, S.L.

Bº Txiriboga, s/n
20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024426

CARACTERÍSITCAS MECÁNICAS / MECHANICAL PROPERTIES

Fecha / Date	Referencia /Reference	Sentido-ubicación/ Direction-location	Ensayo de tracción / Tensile test				
			Temperatura/ Temperature (ºC)	Diámetro/ Diameter (mm)	R_{eH}/ U.Y.S. (MPa)	Rm / T.S. (MPa)	A/ Elongation (%)
09/05/2024	L-1392810	Longitudinal	21	10.04	357	519	32.2

Ensayo realizado según / Test carried out according to UNE-EN 6892-1:2020 Met. B y/and IN_FIR_LB_01_07

Fecha/ Date	Referencia/ Reference	Sentido-ubicación/ Direction-location	Ensayo de flexión por choque / Charpy Impact test			
				Energía absorbida / Absorbed Energy , KV_2 (J)		
			Temperatura/ Temperature (ºC)	Probeta / Specimen 1	Probeta / Specimen 2	Probeta / Specimen 3
09/05/2024	L-1392810	Longitudinal	-40	167	139	144
		Transversal (¼ espesor)	-40	53	64	71
		Transversal (½ espesor)	-40	54	49	47

Ensayo realizado según / Test carried out according to UNE-EN ISO 148-1:2017 y/ and IN_FIR_LB_01_06

Fecha / Date	Referencia / Reference	Ensayo de tracción en sentido del espesor / through thickness tensile test (Z)			
		Temperatura / Temperature (ºC)	Probeta / Specimen	Diámetro / Diameter (mm)	Estricción / Area reduction (%)
09/05/2024	L-1392810	22	1	9.95	66
		22	2	10.05	63
		22	3	9.98	63

Ensayo realizado según / Test carried out according to UNE-EN ISO 6892-1:2020 Met.B, UNE-EN 10164:2019 y/ and IN_FIR_LB_01_07

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09/05/2024

Bureau Veritas Iberia S.L. 9 MAY 2024

Information is marked as General and belongs to GRI

FIHI FORGING INDUSTRY, S.L.

Bº Txiriboga, s/n
20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

GRI Flanges Iraeta

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024426

ANALISIS QUÍMICO / CHEMICAL ANALYSIS

Fecha / Date	Referencia / Reference	Composición / Composition (%)						
		C	Si	Mn	P	S	Cr	Mo
09/05/2024	L-1392810	0.161	0.31	1.28	0.012	0.010	0.11	0.016
	C/466767*	0.147	0.32	1.33	0.013	0.009	0.11	0.02
Fecha / Date	**Referencia / Reference**	**Ni**	**Cu**	**V**	**Al**	**Nb**	**Ti**	**N**
09/05/2024	L-1392810	0.06	0.11	0.068	0.021	0.002	0.004	0.0058
	C/466767*	0.07	0.12	0.072	0.029	0.003	0.0048	0.0098

Ensayo realizado según / Test carried out according to IN_FIR_LB_01_01 y/and IN_FIR_LB_01_04

Fecha / Date	Referencia / Reference	Parámetros calculados / Calculated parámeters	
		C_{EQ} (1) (C_{EQ}= C + Mn/6 + (Cr+Mo+V)/5 + (Ni+Cu)/15) (%)	C_{ET} (2) (C_{ET}= C + (Mn+Mo)/10 + (Cr+Cu)/20 + Ni/40) (%)
09/05/2024	L-1392810	0.426	N/A
	C/466767*	0.422	

(1) Parámetro calculado según / Calculated parameter according to EN-10025-1:2006

(2) Parámetro calculado según / Calculated parameter according to EN-1011-2:2001

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09/05/2024

Witness
09 MAY 2024
BUREAU VERITAS

Information is marked as General and belongs to GRI

FIHI FORGING INDUSTRY, S.L.

Bº Txiriboga, s/n
20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024426

OBSERVACIONES / COMMENTS

*Datos proporcionados por el proveedor / Data provided by supplier

FIRMA / SIGNATURE

Witness

09 MAY 2024

FIHI Forging Industry S.L.

Cristina Iparraguirre

Responsable de laboratorio /

Laboratory responsible

FRANCESCO PARISE
ENGIVEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09.05.2024

Los resultados de este informe sólo afectan a las muestras sometidas a ensayo.
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The results of this report refer only to the tested samples
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F_FIR_LB_01_19_01_R2
Fecha rev. Formato: 06/06/2023

Information is marked as General and belongs to GRI

GRI Flanges Iraeta

FIHI FORGING INDUSTRY S.L

INFORME DE INSPECCIÓN POR ULTRASONIDOS Y VISUAL
ULTRASONIC AND VISUAL INSPECTION REPORT

Nº de Serie /Serial Nº:	OF::		M:	2022233	L:	1400646	Cliente / Customer:	ROSETTI MARINO S.P.A
							Plano Cliente / Customer Drawing:	TEST COUPON
Descripción / Description:	FLANGE							

Nombre del técnico / Name of the technician:	URTZI LANDA	Nivel / Level:	2
Organización de inspección / Examination organization:	FIHI FORGING INDUSTRY S.L.	Nº Certificado / Certificate No.:	E-A-004708-UT-2-MS-2

Identificación del equipo de inspección / Identification of used equipment:				OLYMPUS - EPOCH			
Identificación de bloque de referencia empleado / Identification of used reference block (s)							
V1-No.:	12545	V2-No.:	50434-20398	TIF-Block No.:	FI-UT-BI	Other:	
Verificación de palpadores / Probe check		☒ OK	☐ NO OK	Acoplante / Couplant:		ACEITE / OIL	

Información palpadores utilizados (tipo, nº identificación, frecuencia y ángulo real de salida del palpador / Information of used probes (type, ID number, frecuency and the probes angle

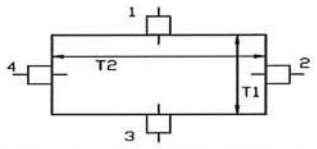
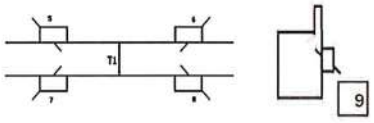
Palpador / Probe	Tipo Palpador / Probe type	Nº Identificación / Id. No.	Frec. ángulo / Freq angle	Palpador / Probe	Tipo Palpador / Probe type	Nº Identificación / Id. No.	Frec. ángulo / Freq angle
Probe "A"	B4S	57746	4 Mhz / 0 °	Probe "B"	DL4R	1370104	4 Mhz /0 °
Probe "C"	SWB45-2	58414-52386	2 Mhz /45°	Probe "D"	SWB70 -2	58416-51812	2 Mhz / 70 °
Probe "E"				Probe "F"			

Normas a aplicar / Standards to be apply		
Criterio de aceptación material base / Base material aceptance criteria	Criterio de aceptación Soldadura / Welds aceptance criteria	Criterio de aceptación inspección visual / Visual inspections acceptance criteria
EN 10308 clase 3		

Ganancia empleada para el nivel de referencia y valores usados para la corrección por perdidas por transferencia / Gain setting for reference level and values used for transfer corrections

ID Palpador / Probe ID	A:	B:	C:	D:	E:	F:
Método de ajuste / Method settings (*)	3	3	1	1		
Campo aplicación / Setting range	300 mm	300 mm	300 mm	300 mm	mm	mm
Nivel de referencia / Setting reference	(dia) 2 mm	(dia) 2 mm	(dia) 3 mm	(dia) 3 mm	(dia) mm	(dia) mm
Ajuste de la base / Basic set.-ref curve	dB	dB	dB	dB	dB	dB
Corrección perdida transferencia /Transfer correction	dB	dB	2 dB	2 dB	dB	dB
Ganancia adicional para la inspección / Extra gain for scanning	dB	dB	14 dB	14 dB	dB	dB
TOTAL	dB	dB	dB	dB	dB	dB

(*) Método de ajuste de la sensibilidad: 1- taladros laterales 2- Taladros de fondo plano 3- Curvas distancia amplitud (DAC)
(*) Method for setting of the sensitivity: 1 Side drilled holes 2- Flat bottom holes 3- Distance gain size (DGS)

Posición para la inspección de defectos longitudinales y laminación / Scanning position for longitudinal defects and lamination	Posición para la inspección de soldaduras / Scanning position for weldings inspection
	

Extension del examen / Extent of examination

Tipo de insp. / Type of insp. (2)	Espesor 1 / Thickness 1	Espesor 2 / Thickness 2	Palpador – Posición palpador / Probe- probe position	Área de inspección/ Inspection area
2	100 mm	mm	C5/C6 - C7/C8 - D5/D6 - D7/D8 - C9 / D9	100%
3	100 mm	320 mm	A1/A2 - B1/B2	100%
	mm	mm		%
	mm	mm		%

2) Tipo de inspección: 1: Insp. de aros laminados de sección rectangular 2: Insp. de las soldaduras 3: Insp. de aro fabricado en llanta de sección rectangular
2) Type of inspection: 1: Insp. of the seamless rolled ring with rectangular cross section 2: Insp. of the weld in the steel bar 3: Insp. of the ring made out of bars with rectangular cross section

Resultado de la inspección y marcas / Result of the examination and remarks:	Firma Inspector / Technician signature:	Fecha / Date:
☒ ACEPTABLE / ACCEPTABLE ☐ NO ACEPTABLE / NOT ACCEPTABLE	FIHI Forging Industry S.L.	12.04.2024
Responsable de NDT y supervisor / NDT responsible and supervisor: Urtzi Landa : E - A - 004708 - UT - 2 - MS - 2	Firma supervisor / Supervisor Signature: FIHI Forging Industry S.L.	

F_FIR_IP_01_01_01_R0
FECHA REV. DOC.: 06/03/2023

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2024

GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

QUALITY CERTIFICATE / CERTIFICADO CALIDAD

EN10204 3.2

Nº Certificado: Certificate Nº:	040000374469_06	**Fecha:** Date:	13.05.2024	**Nº Cert. Ensayo:** Test Cert. Nº:	FIHI024426
Cliente: Customer:	ROSETTI MARINO S.P.A.	**Nº Pedido:** Order Nº:	1724000344 123A90A	**Nº Albarán:** Delivery Note Nº:	200147415/10
Nº Plano Cliente: Customer Drawing Nº:	TEST COUPON			**Cod. Artículo:** Article Code:	2022233
Material: Material:	EN10025-3-S420NL	**Trat. Térmico:** Heat Treatment:	H5-0379 NORMALIZADO (+N) NORMALIZED (+N)	**Estado Suministro:** Delivery Condition:	MECANIZADO MACHINED

Cantidad Quantity	Descripción Artículos Articles description	Nº Colada Heat Nº	(1)Ref. Probeta(2) (1)Testing Piece Ref.(2)	Observaciones Observations
1	TEST COUPON -320x105x1400 (S420NL)-NL0S Ref. Test Cupón (Test Coupon) M-2022233 L/SN-1400647	466767	(EP)1392810-L (M) (T1)1392810 (M) (T2)1392810 (M)	

(1) TIPO PROBETA/*Type:* -EP: TOCHO/*End Piece* -R: ARANDELA/*Ring* -C: CUPÓN/*Coupon*

(2) SITUACIÓN/*Location:* -M: MATERIAL BASE/*Base Material* -W: SOLDADURA/*Welding* -H: ZAT/*HAZ*

COMPOSICIÓN QUÍMICA (%) / CHEMICAL COMPOSITION (%)

Ref. Probeta *Testing Piece Ref.*	(3)	C	Si	Mn	P	S	Nb	V	Al (4)	Ti	Cr	Ni	Mo	Cu	N	B	O	CEV (5)
466767	L	0,1470	0,3200	1,3300	0,0130	0,0090	0,0030	0,0720	0,0290	0,0048	0,1100	0,0700	0,0200	0,1200	0,0098	-	-	0,4220
(EP)1392810-L (M)	P	0,1610	0,3100	1,2800	0,0120	0,0100	0,0020	0,0680	0,0210	0,0040	0,1100	0,0600	0,0160	0,1100	0,0058	-	-	0,4260

(3) L = ANÁLISIS DE COLADA/ *Laddle Analysis*
P = ANÁLISIS DE PRODUCTO/ *Product Analysis*

(4)Si la cantidad de elementos fijadores del N es suficiente (Nb:0.015-0.06% o V: 0.02-0.12%), la cantidad mínima de Al no aplica (material acorde a EN10025/EN10028/EN10273) /The minimum value for aluminium does not apply if other N binding elements are present in sufficient quantity (Nb: 0.015-0.06% or V: 0.02-0.12%). (Materials according to EN10025/EN10028/EN10273)

(5) CEV% (EN-10025-1) = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15

CARACTERÍSTICAS MECÁNICAS / TAMAÑO GRANO - MECHANICAL PROPERTIES / GRAIN SIZE

Ref. Probeta *Testing Piece Ref.*	Ensayo de Tracción *Tensile Test* (ISO 6892-1)				Estricción (%) *Reduction of Area (%)* (EN 10164)			Resistencia al Impacto KV2 *Impact Strength KV2* (ISO 148-1)				Dureza *Hardness*	Tamaño de Grano *Grain Size*
	(6)	Resist. Tracción *Tensile Strength* Rm MPa	Límite Elástico *Yield Strength* ReH MPa	Alargamiento *Elongation* Lo=5d A %	(6)	Valores Unitarios *Unitary values* %	Media *Average* %	(6)	Valores Unitarios *Unitary Values* J	Media *Average* J	Temp./ *Temp.* °C	HBW (ISO 6506-1)	(ASTM E-112)
(EP)376008-L (M)	L	519	357	32,2	Z	66-63-63	64	L	167-139-144 -	150 -	-40	-	-
(T1)1392810 (M)	-	-	-	-	-	-	-	T1	53-64-71 -	63 -	-40	-	-
(T2)1392810 (M)	-	-	-	-	-	-	-	T2	54-49-47 -	50 -	-40	-	-

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 13 / 05 / 2024

(6) ORIENTACIÓN / *Orientation:* -T: TRANSVERSAL/*Transversal* -L: LONGITUDINAL/*Longitudinal* -Z: SENTIDO DEL ESPESOR/*Through thickness.*

DECLARACIÓN DE CONFORMIDAD *DECLARATION OF CONFORMITY:*

LOS PRODUCTOS INCLUIDOS EN EL PRESENTE DOCUMENTO SON CONFORMES CON LOS REQUISITOS DEL PEDIDO DE CLIENTE Y CON LOS DE LA(S) NORMA(S) DEL MATERIAL ARRIBA REFERIDO(S)

The product herein in this document has been made and tested in accordance with the requirements of the above mentioned order and standard.

VALIDADO POR
VALIDATED BY:

Departamento de Calidad:
Quality department:

Nora Lasa

D.Herrera-Dávila
13/May/2024

BUREAU VERITAS 2400-CPR-20220126

UKCA 2400

CE 2451

2451-CPR-EN10025-2014.0001

FIHI Forging Industry S.L.

Environmental recommendations related to the product: At GRI Renewables we understand caring for the environment as a responsible management model in collaboration with our stakeholders, therefore, and with the aim of reducing the environmental impact of our activity and, therefore,of our production chain, we recommend to our clients and to all the parties involved in our life cycle, carry out a correct segregation and treatment of the waste generated, prioritizing its minimization, reuseand recycling, in accordance with the applicable legislation.

GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

Declaration of performance

The manufacturer

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa) SPAIN

declares herewith, that the construction product

Test coupons produced by hot rolled products of structural steel according to EN 10025-1 with serial number

M-2022233 L-1400647

produced in factory

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa) SPAIN

fulfills the requirements of the following EU-directive/s and harmonized specifications:

- **EN 10025-1**
- **EU 305**
- **EN 1090-1**
- **EN 1090-2 EXC 4**

The notified body/ies:

- **UKAS CPR: certified by TWI Certification Ltd /Notified body No. 2400 / Certificate No. 2400-CPR-20220126**
- **CE CPR: certified by DVS ZERT / Notified body No.2451 / Certificate No. 2451-CPR-EN10025-2014.0001.006**

And with customers specifications and drawings according to Purhase Order 1724000344

DRAWING	SPECIFICATION
TEST CUPÓN	123A90-DDL-ST-SP-90118 Document Class: 2 Rev.1, SPC-PRO-01Rev.2024-00, 123A90-DDL-ST-SP-90118_IFA REV.02 (05032024)

The performance of the products above is in conformity with the set of declared performance/s. This declaration of performance is issued in accordance with Regulation (EU) No 305/2011/EU and Construction products (amendment etc.) (EU exit) Regulations 2020, UK statutory instrument 2020, under the sole responsibility of the manufacturer identified above.

Zestoa, 13.05.2024
FIHI FORGING INDUSTRY S.L

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2024

FIHI Forging Industry S.L.

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa) SPAIN

Business ID /C.I.F.
B75225946

www.grupoiraeta.com
Tel. *+34 943 147 645*
Fax. *+34 943 897 029*

Information is marked as Restricted and belongs to GRI.

GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

CE UKCA

2451 2400

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
20740 Zestoa (Gipuzkoa)
SPAIN
08 - 22
2451-CPR-EN10025-2014.0001.006
2400-CPR-20220126

EN 10025-1
Hot rolled products of structural steels

Intended uses:	Building constructions or civil engineering
Tolerances on dimensions and shape:	Welded parts EN 10029 Class A
Elongation:	
Tensile strength	
Yield strength	Normalized Steel EN 10025-3 S420NL
Impact strength	
Weldability	
Durability:	NPD.
Regulated substance:	NPD.

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13./05./2024

Information is marked as Restricted and belongs to GRI.

GRI Flanges Iraeta

FIHI FORGING INDUSTRY, S.L.

CE & UKCA Marking used for Inspection Certificates according to EN 10204

2451

2451-CPR-EN10025-2014.0001.006

2400

2400-CPR-20220126

FIHI FORGING INDUSTRY S.L
Meagako errepidea, 10
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FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2024

Information is marked as Restricted and belongs to GRI.

ACCIAIERIE BERTOLI SAFAU
ABSOLUTE STEEL QUALITY
ACCIAIERIE BERTOLI SAFAU SpA
Via Buttrio n.28 - Frazione Cargnacco - 33050 Pozzuolo del Friuli (UD)
Tel. +39 0432 613211 - Fax +39 0432 613209 - www.absacciai.it

CERTIFICATO DI COLLAUDO

Inspection Certificate 3.1/Certificat de reception 3.1/
Abnahmeprufzeugnis 3.1

N.	291974 / 1
Data	08.06.2021
COLATA N. Heat-Couiée-Schmelze	466767
Pag.	1 / 1

CLIENTE Customer-Client-Besteller	FIHI FORGING INDUSTRY S.L.	ORDINE Order-Commande-Bestellung	4500252451
PROFILO Shape-Section-Profili	CONTINUOUS CAST ROUND BARS , 600 MM -	STATO DI FORNITURA SupplyCondition-Etat de livraison	UNTREATED
ACCIAIO Steel-Acier-Stahl	S420	COMESSA/POS Sales Order/Pos:	1075944/10

CAPITOLATO ABS: Technical Specification: ABS

CAPITOLATO DI ANALISI: Material Specification: FORJAS IRAETA SP_FIR_DP_01_03_R0 03/09/2020

CAPITOLATO DI FORNITURA: Technical Delivery Requirements:

COMPOSIZIONE CHIMICA DI COLATA %

CAST ANALYSIS % - COMPOSITION CHIMIQUE DE COULEE % - SCHMELZE CHEMISCHE ANALYSE %

	C	Mn	Si	P	S	Cr	Ni	Mo	Al (T)	Cu	Sn	Ti
Min		1,00							0,015			
Max	0,200	1,70	0,60	0,025	0,010	0,30	0,80	0,10	0,300	0,55	0,100	0,0500
Colata/Heat	0,147	1,33	0,32	0,013	0,009	0,11	0,07	0,02	0,029	0,12	0,006	0,0048
	B (T)	V	Nb	As	Ca	Sb	Co	O/ppm	H/ppm	N/ppm	C EQ. LONG FORMULA	HI TUNDISH
Min												
Max	0,0008	0,200	0,050	0,100	0,1000	0,100	0,300	20,00	2,00	250	0,460	2,0
Colata/Heat	0,0001	0,072	0,003	0,004	0,0014	0,001	0,009	8,00	0,70	98	0,422	1,7

COMPOSIZIONE CHIMICA SOLIDO%

CHEMICAL ANALYSIS II % - COMPOSITION CHIMIQUE II % - CHEMISCHE ZUSAMMENSETZUNG II %

	C	Mn	Si	P	S	Cr	Ni	Mo	Al (T)	Cu	Sn	Ti
Min												
Max												
Colata/Heat	0,145	1,34	0,32	0,013	0,009	0,11	0,07	0,02	0,029	0,12	0,006	0,0046
	B (T)	V	Nb	As	Ca	Sb	Co	C Eq. Formula				
Min												
Max												
Colata/Heat	0,0001	0,069	0,003	0,004	0,0014	0,001	0,009	0,421				

CARATT. MECCANICHE

MECHANICAL PROPERTIES - CARACTERISTIQUES MECANIQUE - MECHANISCHE EIGSNSCHAFTER

TRATTAMENTO TERMICO HEAT TREATMENT

NOTE

ANTIMIX 100 %

TEST CERTIFICATE ISSUED ACCORDING TO: EN 10204/3.1

"NO WELDING REPAIRS"

COUNTRY OF ORIGIN : ITALY

VACUUM DEGASSED STEEL .

ELECTRIC ARC FURNACE STEEL .

FINE GRAIN STEEL .

FULLY KILLED .

- Material free from lead, mercury, cadmium and hexavalent chromium (dir. 2000/53/CE - dir. 2011/65/UE as amended)
- Material with radioactivity not exceeding 0,1Bq/g (d.lgs. 230/1995 as amended)

CONTROLLO QUALITA'

QUALITY CONTROL - CONTROLE DE QUALITE - QUALITATSSTEILE

Company with a management system certified by IGQ to
ISO 9001 and IATF 16949

Verif.:Omar Tonetti

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO

W ☐
R ☑
DATE: 13./05./2021

FIHI
Forging Industry S.L.

GRI Flonges Iraeta FIHI FORGING INDUSTRY, S.L.	Certificado de tratamiento térmico Heat treatment certificate

Nº CERTIFICADO / CERTIFICATE Nº	H5-0379

HORNO / FURNACE:	HO-05	Nº HORNADA / TREATMENT Nº:	H5-0379	MATERIAL / MATERIAL:	Aro
FECHA INICIO / STARTING DATE:	01/05/2024 23:13:00	FECHA FINAL / FINISHING DATE:	02/05/2024 17:53:09	PESO / WEIGHT [Kg]:	79175
PERMANENCIA REAL / REAL HOLDING TIME [min]:	429	PERMANENCIA PREVISTA / SCHEDULED HOLDING TIME [min]:	420	MAYOR ESPESOR / MAX. THICKNESS [mm]:	305

DESCRIPCIÓN MATERIAL MATERIAL DESCRIPTION	BATCH	ESPESOR (mm) / THICKNESS (mm)
M5018400 C/482504 (UND 2)	B-373312	240
M5018400 C/482505 (UND 3)	B-373311	240
M5018780 C/466767 (UND 1)(PROB 1)	B-374560	305
320x105x1400 C/466767(UND 2) (PROB 1)	L-1392810	105
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0

FIHI FORGING INDUSTRY, S.L. certifica que el material detallado en el presente documento, ha sido sometido al tratamiento térmico según la especificación que se detalla en este documento

FIHI FORGING INDUSTRY, S.L. certifies that the detailed material of this document has been treated according the especification below referenced.

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2024

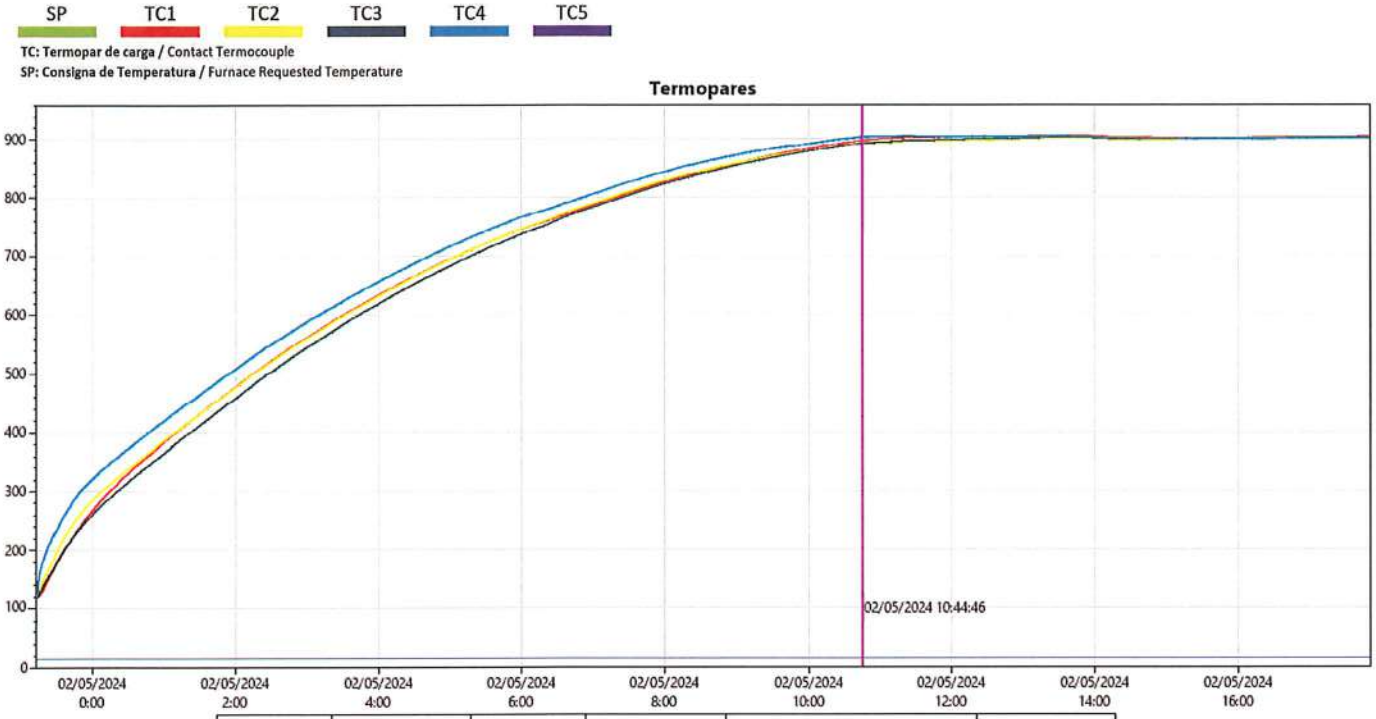
ESPECIFICACIÓN DE TRATAMIENTO TÉRMICO / SPECIFICATION FOR HEAT TREATMENT	Normalizado según / Normalized according IN_FIR_PT_04/10/24

FIHI Forging Industry S.L.

FIHI FORGING INDUSTRY, S.L.	Certificado de tratamiento térmico Heat treatment certificate

Nº CERTIFICADO / CERTIFICATE Nº	H5-0379

GRÁFICO DE TRATAMIENTO / TREATMENT CHART



REF.TC1	94321-12	REF.TC2	94321-24	REF.TC3	94321-1
REF.TC4	94321-11	REF.TC5	NO APLICA	REF. LASER OPTICO	

Conformidad de Tratamiento Termico

Conformity of Heat Treatment

Nombre de responsable / Responsible: Jesús Arruti

OBSERVACIONES	

FRANCESCO PARISE
ENGIVEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13/05/2024

FIHI Forging Industry S.L.

GRI Forges Iraeta FIHI FORGING INDUSTRY, S.L.	Certificado de tratamiento térmico Heat treatment certificate

Nº CERTIFICADO / CERTIFICATE Nº	H5-0379

						M5018400	(5)						
						M5018780	(1)*						
						M5018778	(2)**						
						1392810**	C/466767						
						1395442	C/482505						
					TC4>>>	1395443	C/482505						
					TC3>>>	1395445	C/482504						
						1395444	C/482505						
					TC2>>>	1395446	C/482504						
					TC1>>>	1397272*	C/466767						

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARCHINO
W ☐
R ☑
DATE: 13./05./2024.

FIHI Forging Industry S.L.

FIHI FORGING INDUSTRY, S.L.

Bº Txiriboga, s/n
20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024426

FECHA DE EMISIÓN / DATE OF ISSUE:		09/05/2024
CLIENTE	Nombre	FIHI Forging Industry, S.L.
	Dirección	Bº Txiriboga, s/n 20740 Zestoa (Gipuzkoa) SPAIN Tel: +34 943 147 645
PEDIDO / ORDER		P24426
FECHA DE RECEPCIÓN / DATE OF RECEIPT		08/05/2024
REFERENCIA / REFERENCE		L-1392810
MATERIAL ENSAYADO / TESTED MATERIAL:		M5018778 C/466767

Reviewed & Review
D. Santos Ávila
09 MAY 2024
BUREAU VERITAS

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09/05/2024

Information is marked as General and belongs to GRI

FIHI FORGING INDUSTRY, S.L.

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20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

GRI Flanges Iraeta

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024426

CARACTERÍSITCAS MECÁNICAS / MECHANICAL PROPERTIES

Fecha / Date	Referencia /Reference	Sentido-ubicación/ Direction-location	Ensayo de tracción / Tensile test				
			Temperatura/ Temperature (ºC)	Diámetro/ Diameter (mm)	R_{eH} / U.Y.S. (MPa)	Rm / T.S. (MPa)	A/ Elongation (%)
09/05/2024	L-1392810	Longitudinal	21	10.04	357	519	32.2

Ensayo realizado según / Test carried out according to UNE-EN 6892-1:2020 Met. B y/and IN_FIR_LB_01_07

Fecha/ Date	Referencia/ Reference	Sentido-ubicación/ Direction-location	Ensayo de flexión por choque / Charpy Impact test			
				Energía absorbida / Absorbed Energy , KV_2 (J)		
			Temperatura/ Temperature (ºC)	Probeta / Specimen 1	Probeta / Specimen 2	Probeta / Specimen 3
09/05/2024	L-1392810	Longitudinal	-40	167	139	144
		Transversal (¼ espesor)	-40	53	64	71
		Transversal (½ espesor)	-40	54	49	47

Ensayo realizado según / Test carried out according to UNE-EN ISO 148-1:2017 y/ and IN_FIR_LB_01_06

Fecha / Date	Referencia / Reference	Ensayo de tracción en sentido del espesor / through thickness tensile test (Z)			
		Temperatura / Temperature (ºC)	Probeta / Specimen	Diámetro / Diameter (mm)	Estricción / Area reduction (%)
09/05/2024	L-1392810	22	1	9.95	66
		22	2	10.05	63
		22	3	9.98	63

Ensayo realizado según / Test carried out according to UNE-EN ISO 6892-1:2020 Met.B, UNE-EN 10164:2019 y/ and IN_FIR_LB_01_07

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09/05/2024

BUREAU VERITAS

F_FIR_LB_01_19_01_R2
Fecha rev. Formato: 06/06/2023

Information is marked as General and belongs to GRI

FIHI FORGING INDUSTRY, S.L.

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20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

GRI Flanges Iraeta

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024426

ANALISIS QUÍMICO / CHEMICAL ANALYSIS

Fecha / Date	Referencia / Reference	Composición / Composition (%)						
		C	Si	Mn	P	S	Cr	Mo
09/05/2024	L-1392810	0.161	0.31	1.28	0.012	0.010	0.11	0.016
	C/466767*	0.147	0.32	1.33	0.013	0.009	0.11	0.02
Fecha / Date	**Referencia / Reference**	**Ni**	**Cu**	**V**	**Al**	**Nb**	**Ti**	**N**
09/05/2024	L-1392810	0.06	0.11	0.068	0.021	0.002	0.004	0.0058
	C/466767*	0.07	0.12	0.072	0.029	0.003	0.0048	0.0098

Ensayo realizado según / Test carried out according to IN_FIR_LB_01_01 y/and IN_FIR_LB_01_04

Fecha / Date	Referencia / Reference	Parámetros calculados / Calculated parámeters	
		C_{EQ} (1) (C_{EQ}= C + Mn/6 + (Cr+Mo+V)/5 + (Ni+Cu)/15) (%)	C_{ET} (2) (C_{ET}= C + (Mn+Mo)/10 + (Cr+Cu)/20 + Ni/40) (%)
09/05/2024	L-1392810	0.426	N/A
	C/466767*	0.422	

(1) Parámetro calculado según / Calculated parameter according to EN-10025-1:2006

(2) Parámetro calculado según / Calculated parameter according to EN-1011-2:2001

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☑
R ☑
DATE: 09/05/2024

Witness
09 MAY 2024
BUREAU VERITAS

Information is marked as General and belongs to GRI

FIHI FORGING INDUSTRY, S.L.

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20740 Zestoa (Gipuzkoa) SPAIN
Tel: +34 943 147645
Fax: +34 943 148059

CERTIFICADO DE ENSAYOS

INFORME NUMERO/ REPORT NUMBER:	FIHI024426

OBSERVACIONES / COMMENTS

*Datos proporcionados por el proveedor / Data provided by supplier

FIRMA / SIGNATURE

Witness
09 MAY 2024

FIHI Forging Industry S.L.

Cristina Iparraguirre

Responsable de laboratorio /

Laboratory responsible

FRANCESCO PARISE
ENGIVEX Inspector on behalf of: ROSETTI MARINO
W ☑
R ☑
DATE: 09.05.2024

Los resultados de este informe sólo afectan a las muestras sometidas a ensayo.
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The results of this report refer only to the tested samples
The total or partial reproduction of this report is not allowed unless written permission of FIHI Forging Industry, S.L.

Information is marked as General and belongs to GRI

GRI Flanges Iraeta

FIHI FORGING INDUSTRY S.L

INFORME DE INSPECCIÓN POR ULTRASONIDOS Y VISUAL
ULTRASONIC AND VISUAL INSPECTION REPORT

Nº de Serie /Serial Nº:	OF::		M:	2022233	L:	1400647	**Cliente** / Customer:	ROSETTI MARINO S.P.A
							Plano Cliente / Customer Drawing:	TEST COUPON
Descripción / Description:	FLANGE							

Nombre del técnico / Name of the technician:	URTZI LANDA	**Nivel** / Level:	2
Organización de inspección / Examination organization:	FIHI FORGING INDUSTRY S.L.	**Nº Certificado** / Certificate No.:	E-A-004708-UT-2-MS-2

Identificación del equipo de inspección / Identification of used equipment:				OLYMPUS - EPOCH			
Identificación de bloque de referencia empleado / Identification of used reference block (s)							
V1-No.:	12545	**V2-No.:**	50434-20398	**TIF-Block No.:**	FI-UT-BI	**Other:**	
Verificación de palpadores / Probe check	☒ OK	☐ NO OK		**Acoplante** / Couplant:		ACEITE / OIL	

Información palpadores utilizados (tipo, nº identificación, frecuencia y ángulo real de salida del palpador / Information of used probes (type, ID number, frecuency and the probes angle

Palpador / Probe	Tipo Palpador / Probe type	Nº Identificación / Id. No.	Frec. ángulo / Freq angle	Palpador / Probe	Tipo Palpador / Probe type	Nº Identificación / Id. No.	Frec. ángulo / Freq angle
Probe "A"	B4S	57746	4 Mhz / 0 °	Probe "B"	DL4R	1370104	4 Mhz /0 °
Probe "C"	SWB45-2	58414-52386	2 Mhz /45°	Probe "D"	SWB70 -2	58416-51812	2 Mhz / 70 °
Probe "E"				Probe "F"			

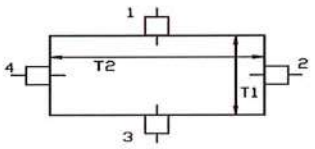
Normas a aplicar / Standards to be apply		
Criterio de aceptación material base / Base material aceptance criteria	**Criterio de aceptación Soldadura** / Welds aceptance criteria	**Criterio de aceptación inspección visual** / Visual inspections acceptance criteria
EN 10308 clase 3		

Ganancia empleada para el nivel de referencia y valores usados para la corrección por perdidas por transferencia / Gain setting for reference level and values used for transfer corrections

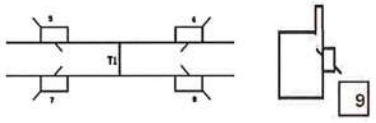
	A:	B:	C:	D:	E:	F:
ID Palpador / Probe ID						
Método de ajuste / Method settings (*)	3	3	1	1		
Campo aplicación / Setting range	300 mm	300 mm	300 mm	300 mm	mm	mm
Nivel de referencia / Setting reference	(dia) 2 mm	(dia) 2 mm	(dia) 3 mm	(dia) 3 mm	(dia) mm	(dia) mm
Ajuste de la base / Basic set.-ref curve	dB	dB	dB	dB	dB	dB
Corrección perdida transferencia /Transfer correction	dB	dB	2 dB	2 dB	dB	dB
Ganancia adicional para la inspección / Extra gain for scanning	dB	dB	14 dB	14 dB	dB	dB
TOTAL	dB	dB	dB	dB	dB	dB

(*) Método de ajuste de la sensibilidad: 1- taladros laterales 2- Taladros de fondo plano 3- Curvas distancia amplitud (DAC)
(*) Method for setting of the sensitivity: 1 Side drilled holes 2- Flat bottom holes 3- Distance gain size (DGS)

Posición para la inspección de defectos longitudinales y laminación / Scanning position for longitudinal defects and lamination



Posición para la inspección de soldaduras / Scanning position for weldings inspection



Extension del examen / Extent of examination

Tipo de insp. / Type of insp. (2)	Espesor 1 / Thickness 1	Espesor 2 / Thickness 2	Palpador – Posición palpador / Probe- probe position	Área de inspección/ Inspection area
2	100 mm	mm	C5/C6 - C7/C8 - D5/D6 - D7/D8 - C9 / D9	100%
3	100 mm	320 mm	A1/A2 - B1/B2	100%
	mm	mm		%
	mm	mm		%

2) Tipo de inspección: 1: Insp. de aros laminados de sección rectangular 2: Insp. de las soldaduras 3: Insp. de aro fabricado en llanta de sección rectangular
2) Type of inspection: 1: Insp. of the seamless rolled ring with rectangular cross section 2: Insp. of the weld in the steel bar 3: Insp. of the ring made out of bars with rectangular cross section

Resultado de la inspección y marcas / Result of the examination and remarks:
☒ **ACEPTABLE** / ACCEPTABLE
☐ **NO ACEPTABLE** / NOT ACCEPTABLE

Firma Inspector / Technician signature: FIHI Forging Industry S.L.

Fecha / Date: 12.04.2024

Responsable de NDT y supervisor / NDT responsible and supervisor:
Urtzi Landa : E - A - 004708 - UT - 2 - MS - 2

Firma supervisor / Supervisor Signature: FIHI Forging Industry S.L.

FRANCESCO PARISE
ENGINEX Inspector on behalf of: ROSSETTI MARINO
W ☐
R ☑
DATE: 13 / 05 / 2024