

CD 22847A

COTM650  
14/3



**CARRS STAINLESS STEELS**  
A Division of ELG Haniel Metals Ltd.  
Wadsley Bridge, Sheffield, S6 1LL, England

Telephone: 0114 285 5966  
Fax No.: 0114 205 4502  
Website: <http://www.elgcarrs.co.uk>  
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Purchaser - Beseller - Artibler ASA Alloys Div of CSM ULC 20 Challenger Crescent Shrewsbury Park Alberta T8H 2R1 Canada		Inspection Certificate Abnahmeprotokoll Certificat de reception DIN 50049 3.1 EN 10204		Cert No. Zeugnis Nr. Cert No. 133154		Date Datum Date 04/02/13	
Customer Order No. Kundenbestell-Nr. No de Commande Client P020593		Product Description - Beschreibung des Erzeugnisses - Description du Produit 13in Dia. x 8900lbs Electric Melt & Vacuum Degassed Stainless Steel Solution Annealed Forged ASTM A192/ASTM A479 316 Nace MR0175:2003					
Qty Order No. Umsatz-Nr. none Comm. No. 49086		Weight W138263/00					

**Chemical Analysis - Chemische Analyse - Analyse Chimique**

Cast No. Schmelznummer No de Coudre	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Co	N
CD22847A	.023	.53	1.59	.034	.010	16.75	2.09	10.47	.35	.19	.062

**Heat Treatment - Wärmebehandlung - Traitement Thermique**

Solution annealed @ 1060 C for 5 hours & Water Quenched

**Mechanical Properties - Mechanische Eigenschaften - Caracteristiques Mechanique**

Test No. Prüf-Nr. No. d'essai	Test dimension Probendimension Dimension	Proof Stress Streckgrenze Limite d'Elasticite 0.2%	Tensile strength Zugfestigkeit Resistance à la traction	Elong % Bruchdehnung Allongement % L0-5D 4D	Red of Area % Bruchminderungsgrad Striction %	Impact Kerbschlagzähigkeit Resilience	Hardness Härte Dureté
230841	355MM	284 MPa	545 MPa	64 %	76 %	247 J	136 HB
230841	355MM	262 MPa	545 MPa	66 %		251 J	RT

**Remarks - Bemerkungen - Remarques**

Ultrasonically tested and found satisfactory  
Inter-crystalline corrosion test to ASTM A262 E satisfactory  
Inter-crystalline corrosion test to BS EN ISO 3651-2 Satisfactory  
Grain size to ASTM E112 - 1  
Hardness = 77 Rockwell B  
Macrostructure see attached sheet.



Certificate No. FM 12615



RWG  
Reg No 04 701 6568

The material detailed has been manufactured and tested in accordance with the Quality Assurance system ISO 9001:2008 and the requirements of the specification/ order.

Signed: *C. Ryall*



Chris Ryall - Quality Manager  
Approved signatory for  
ELG Carrs Stainless Steels

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# Special Testing Ltd.

## Metallurgical Investigation Section

Mechanical Testing, Metallography  
Corrosion and Failure Investigation Specialists

Bacon Lane, Sheffield S9 3NH  
Tel : 0114 244 1061  
Fax : 0114 244 0444 (Works)  
Fax : 0114 244 5566 (Admin/Accounts)



### TEST REPORT

Met Page No. 1 of 2

<b>CUSTOMER :</b>	CARRS SPECIAL STEELS.
<b>ADDRESS :</b>	WADSLEY BRIDGE SHEFFIELD, S6 1LL.
<b>CUSTOMER ORDER No :</b>	021242 W138263/00.
<b>STL TEST No. :</b>	M230841
<b>SAMPLE IDENTITY :</b>	355mm DIA. CAST No. CD22847A.

### TEST CONDITIONS

<b>MATERIAL SPECIFICATION :</b>	1.4404
<b>SECTION :</b>	TRANSVERSE.
<b>ETCHANT USED :</b>	HCl / H <sub>2</sub> O <sub>2</sub> .
<b>EXAMINED AT :</b>	x1 to x25.

### TEST RESULTS\*

<b>MACROSTRUCTURE* :</b>	The section examined appeared homogeneous and defect free. Date Tested : 31 / 01 / 2013
<b>SIGNED :</b>	<i>A.D. Morton</i>
	<b>DATE COMPLETED :</b> 31 / 01 / 2013
A.D. Morton (Metallurgical Laboratory Manager) - For and on behalf of Special Testing Ltd.	

\*Test Results do not in any way confer approval of the quality of manufacture of the material.

\*Opinions and interpretations expressed herein are outside our UKAS accreditation



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ROLLS ROYCE  
APPROVED LABORATORY  
Approval No 11151

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Bacon Lane, Sheffield S9 3NH

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## TEST REPORT

Met Page No. 2 of 2

CUSTOMER : CARRS SPECIAL STEELS.  
ADDRESS : WADSFLEY BRIDGE  
SHEFFIELD, S6 1LL.  
CUSTOMER ORDER No : 021242 W138263/00.  
STL TEST No. : M230841  
SAMPLE IDENTITY : 355mm DIA. CAST No. CD22847A.

TEST CONDITIONS  
SPECIFICATION : 1.4404  
SECTION : TRANSVERSE.  
ETCHANT USED : HCl / H<sub>2</sub>O<sub>2</sub>  
EXAMINED AT : x100.

TEST RESULTS\*  
GRAIN SIZE :  
ASTM E112: 2010  
(COMPARISON METHOD).  
Range - 0 to 2.  
Average - 1.  
Date Tested : 31 / 01 / 2013  
SIGNED : *A.D. Morton*  
DATE COMPLETED : 31 / 01 / 2013  
A.D. Morton (Metallurgical Laboratory Manager) - For and on behalf of Special Testing Ltd.

\*Test Results do not in any way confer approval of the quality of manufacture of the material.



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