



Total Steel

TECHNICAL BULLETIN

1



EHSP

Field and Laboratory Testing Results

total quality total service Total Steel



Total Steel

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Web: www.totalsteel.com.au

RESULTS OF FIELD TESTS WITH EHSP

APPLICATION	ABRASIVE	COMPARED WITH	RESULTS*1
1) LOADER BUCKET SKID PLATES	GOLD	500 BHN STEEL	1.60
2) CHUTE LINERS	GRANITE	500 BHN STEEL	1.50
3) LOADER BUCKET HEEL PLATES	CONCRETE	500 BHN STEEL	1.50
4) TRUCK BODY LINER PLATES	COPPER	500 BHN STEEL	1.55
5) CRUSHER DISCHARGE HOPPER	COPPER	500 BHN STEEL	1.52
6) CRUSHER FEEDER	COPPER	500 BHN STEEL	1.53
7) CRUSHER CHUTE	COPPER	500 BHN STEEL	1.52
8) TRUCK BODY LINER PLATE	GOLD	360 BHN STEEL	3.00
9) DRAGLINE BUCKET SHROUDS	ROCK QUARRY	400 BHN STEEL	1.90
10) CRUSHER PARTS	CONTRACTOR	500 BHN STEEL	2.70
11) RIPPER TOOTH	CONTRACTOR	OVERLAY	1.12
12) TRUCK LINER PLATES	COPPER	500 BHN STEEL	1.30
13) SHOVEL BUCKET	COAL	500 BHN STEEL	1.50
14) COAL CHUTE	POWER PLANT	500 BHN STEEL	1.60
15) VIBRATORY FEEDER	GOLD	500 BHN STEEL	1.40
16) SHOVEL BUCKET	COAL	400 BHN STEEL	2.30
17) CHUTE	COPPER	500 BHN STEEL	1.40
18) SPLITTER GATE	COPPER	400 BHN STEEL	2.00
19) CRUSHER PARTS	GOLD	500 BHN STEEL	1.50
20) CHUTE	ROCK QUARRY	450 BHN STEEL	1.40

NOTE: *1 Material compared with = 1.0



AMEC ENGINEERING PTY LIMITED
A.C.N. 003 066 715

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Welshpool, W.A. 6106
Telephone (08) 9451 8000
Facsimile (08) 9458 6826

CLIENT: *TOTAL STEEL OF AUSTRALIA PTY LTD
102 KURNALL ROAD
WELSHPOOL WA 6106*

ATTENTION: *MR L FRANCIS*

ORDER NO.: *5094*

TITLE: *TESTING OF FOUR (4) STUD WELDS
- M16 STUDS/JFE CORPORATION EHSP PLATE*

REPORT: *8T15/M3*

DATE: *25 November, 1998*

NOTE: WHERE APPLICABLE, THE ITEMS EXAMINED HEREIN MAY BE DISPOSED OF AFTER A PERIOD OF 3 MONTHS FROM THE DATE OF REPORTING, UNLESS WRITTEN NOTIFICATION OF DISPOSAL REQUIREMENTS IS RECEIVED.

LABORATORY REPORT**TESTING OF FOUR (4) STUD WELDS - M16 STUDS/NKK
CORPORATION EHSP PLATE****INTRODUCTION**

Four (4) stud welds, carried out in accordance with the procedure as listed below, were received for bend testing and tension testing as specified by AS 1554.2 - 1993.

Weld Procedure:

Base plate spec	JFE Corporation EHSP (Everhard Super)
Stud spec	M16 x 45
Position	Flat
Preheat temp	150-200oC
Base plate preparation	Ground
Machine type	KOCO 1200-E
Gun type	K-22 with damper
Amp. setting	900 amps
Time setting	60 m/sec
Lift	2.0mm
Stickout	4.5mm

TEST RESULTS1.0 Bend Test

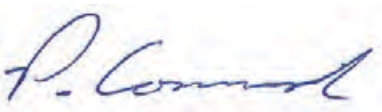
Two (2) stud welds were bent through 90° with tearing occurring through the stud shank and no fracture occurring through the weld - ACCEPTABLE

2.0 Tension Test

Two (2) studs were tested in tension by applying torque in accordance with the requirements of AS 1554.2 - 1993. Both studs fractured remote from the welds at applied torque of 420 Nm and 440 Nm - ACCEPTABLE

REMARKS

The bend and tension test results for all four (4) stud welds COMPLIED with the requirements of AS 1554.2 - 1993.



P. CORNISH
SENIOR METALLURGIST



Pioneer Construction Materials (Qld) Pty Ltd
ACN 009 679 734

Ferny Grove Quarry
PO Box 49
Ferny Hills Qld 4055

Telephone: (07) 3351 1744
Facsimile: (07) 3851 0579

TO WHOM IT MAY CONCERN

Pioneer Ferny grove Quarry commenced using EHSP steel supplied by Total Steel approximately 12 months ago. This steel is used in high wear areas of the crushing plant and on mobile equipment.

Previously, 360 BHN wear resistant steel was used in our chutes and screens with a wear life of two months. Other areas where wear resistant steel is used are liners in dump truck bodies, and as loader bucket skins.

Since changing to EHSP we have increased the life of all wearable items to approximately 5 months, thus increasing production and reducing maintenance and downtime.

Regards

A handwritten signature in blue ink, appearing to read "Kane Whitelegg".

KANE WHITELEGG
QUARRY SUPERVISOR
FERNY GROVE QUARRY



Frost
Enterprises PTY LTD

HABANA ROAD, FARLEIGH, via MACKAY
M/S 656, MACKAY QLD 4740

Phone (07) 4959 8177
Fax (07) 4959 8132

TO WHOM IT MAY CONCERN

We commenced using Total Steel's EHSP in high wear areas of our crushing plant, approximately 12 months ago.

We were previously using another wear resistant steel on our chutes and getting approximately 6 weeks use.

Since changing to EHSP the life of these chutes has increased to around 5 months, thereby reducing maintenance and downtime and increasing production.

We have also recently begun trials using EHSP on our loader buckets.

15th July 1999

Dennis Marchant
Foreman



MEMORANDUM

PO Box 1076
Kalgoorlie 6430
Phone 08 9021 0326

To Whom it May Concern

Here at the Superpit, Roche Bros have been re-lining their CAT 789 trays with JFE EHSP since 1997. This product's extreme wear resistance and ability to absorb impact has impressed.

I strongly recommend EHSP as a cost-effective alternative to conventional Q+T plates.

Yours truly

A handwritten signature in blue ink, appearing to read "Bruce Neve". The signature is fluid and cursive, with a long horizontal stroke at the end.

Bruce Neve

Leading Hand Boilermaker



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CLIENT: *TOTAL STEEL OF AUSTRALIA PTY LTD
102 KURNALL ROAD
WELSHPOOL WA 6106*

ATTENTION: *MR L FRANCIS*

ORDER NO.: *4481*

TITLE: *METALLOGRAPHIC EXAMINATION & IMPACT
TESTING OF A 16mm THICK PLATE SAMPLE
- JFE CORPORATION EHSP HEAT NO. 24844*

REPORT: *8T15/M1*

DATE: *1 July, 1998*

NOTE: WHERE APPLICABLE, THE ITEMS EXAMINED HEREIN MAY BE DISPOSED OF AFTER A PERIOD OF 3 MONTHS FROM THE DATE OF REPORTING, UNLESS WRITTEN NOTIFICATION OF DISPOSAL REQUIREMENTS IS RECEIVED.

LABORATORY REPORT

**METALLOGRAPHIC EXAMINATION & IMPACT TESTING OF A
16mm THICK PLATE SAMPLE – JFE CORPORATION EHSP HEAT
NO. 24844**

INTRODUCTION

A 16mm thick plate sample, identified as below, was received for metallographic examination and Charpy V notch impact testing at +20°C.

Plate Identification: JFE Corporation EHSP Heat No. 24844
(Everhard Super)

METALLURGICAL EXAMINATION

1.0 Metallographic Examination (Etched in 3% Nital)

Microscopic examination of a section through the plate sample showed a tempered martensitic structure with fine carbides dispersed throughout. The carbides were oriented longitudinally and were at times situated in localised bands randomly distributed through the section (figs 1-3). Measurement of the carbides using a graticule eyepiece showed the particle lengths to range from approximately 0.5-10 microns with nominal particle widths of 0.5-1 micron.

2.0 Charpy V Notch Impact Testing

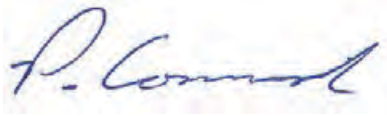
A set of Charpy V notch impact specimens were removed longitudinally from the plate and prepared and tested in accordance with AS 1544.2 - 1989. The results obtained were as follows:

Specimen Identification	Specimen Size (mm)	Test Temperature (°C)	Absorbed Energy (Joules)
A/B/C	10 x 10	20	29/28/26

LABORATORY REPORT

REMARKS

The results showed the plate to exhibit a uniform tempered martensitic microstructure, consistent with a quenched and tempered abrasion resistant plate, with a dispersion of fine carbides throughout. The presence of the fine carbides would be expected to provide increased abrasion resistance.

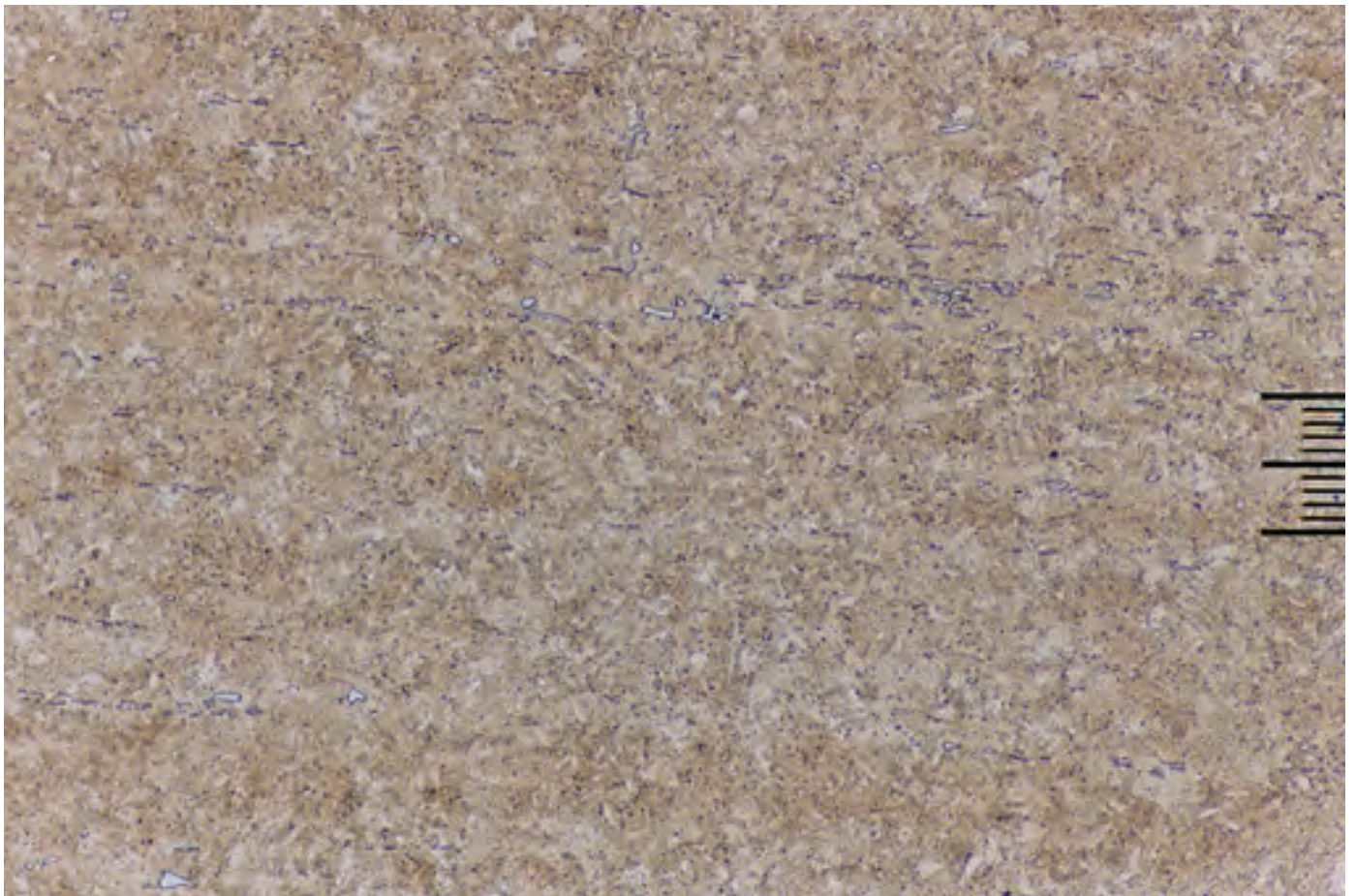
A handwritten signature in blue ink, appearing to read "P. Cornish".

P. CORNISH
SENIOR METALLURGIST

LABORATORY REPORT

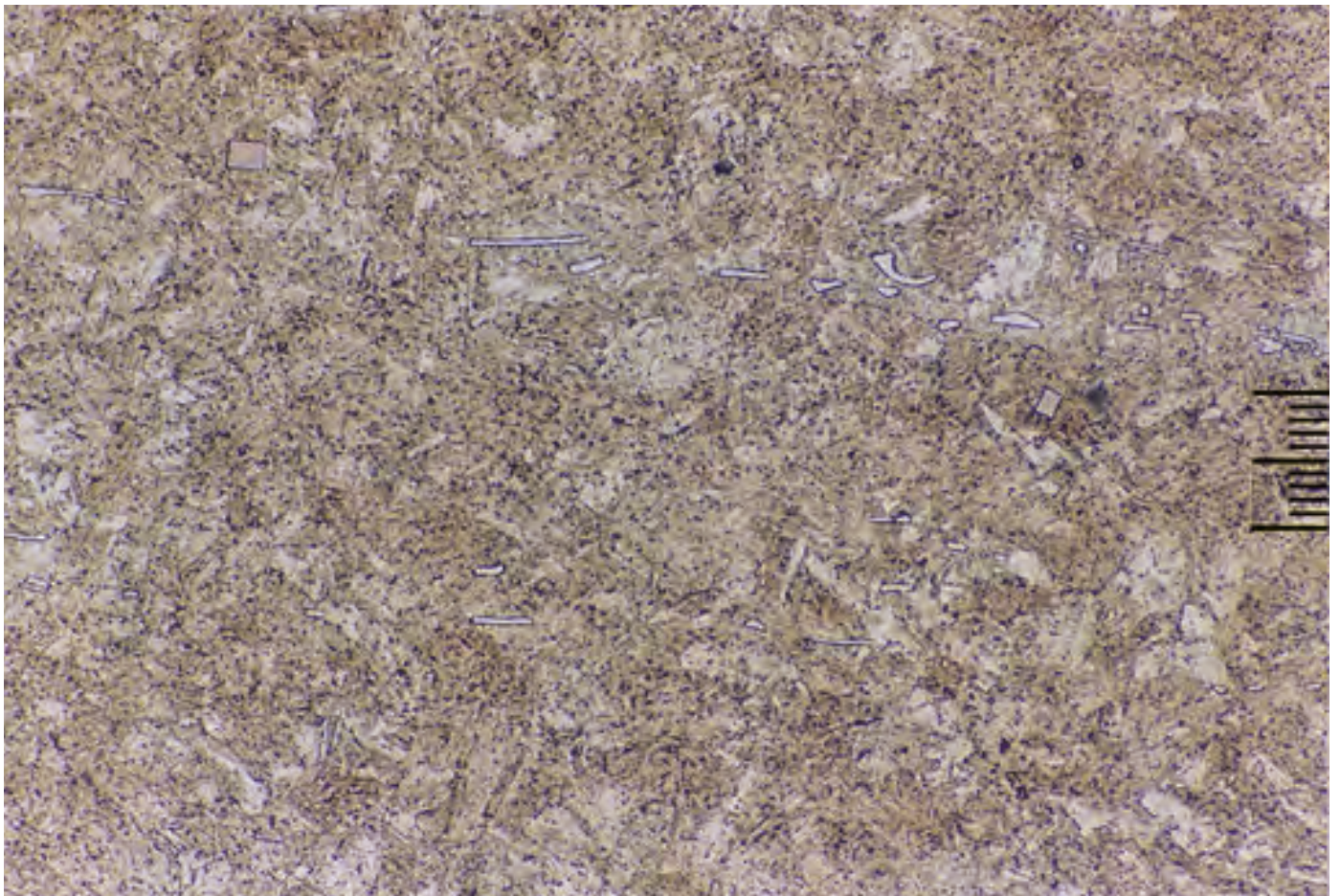
FIGURE 1

Showing the microstructure through the EHSP plate sample with the visible dispersion of fine, longitudinally oriented white carbides.
(Microscope Magnification x200, Full Scale 50 microns)



LABORATORY REPORT**FIGURE 2**

Showing the microstructure through the EHSP plate sample with the visible dispersion of fine, longitudinally oriented white carbides.
(Microscope Magnification x500, Full Scale 20 microns)

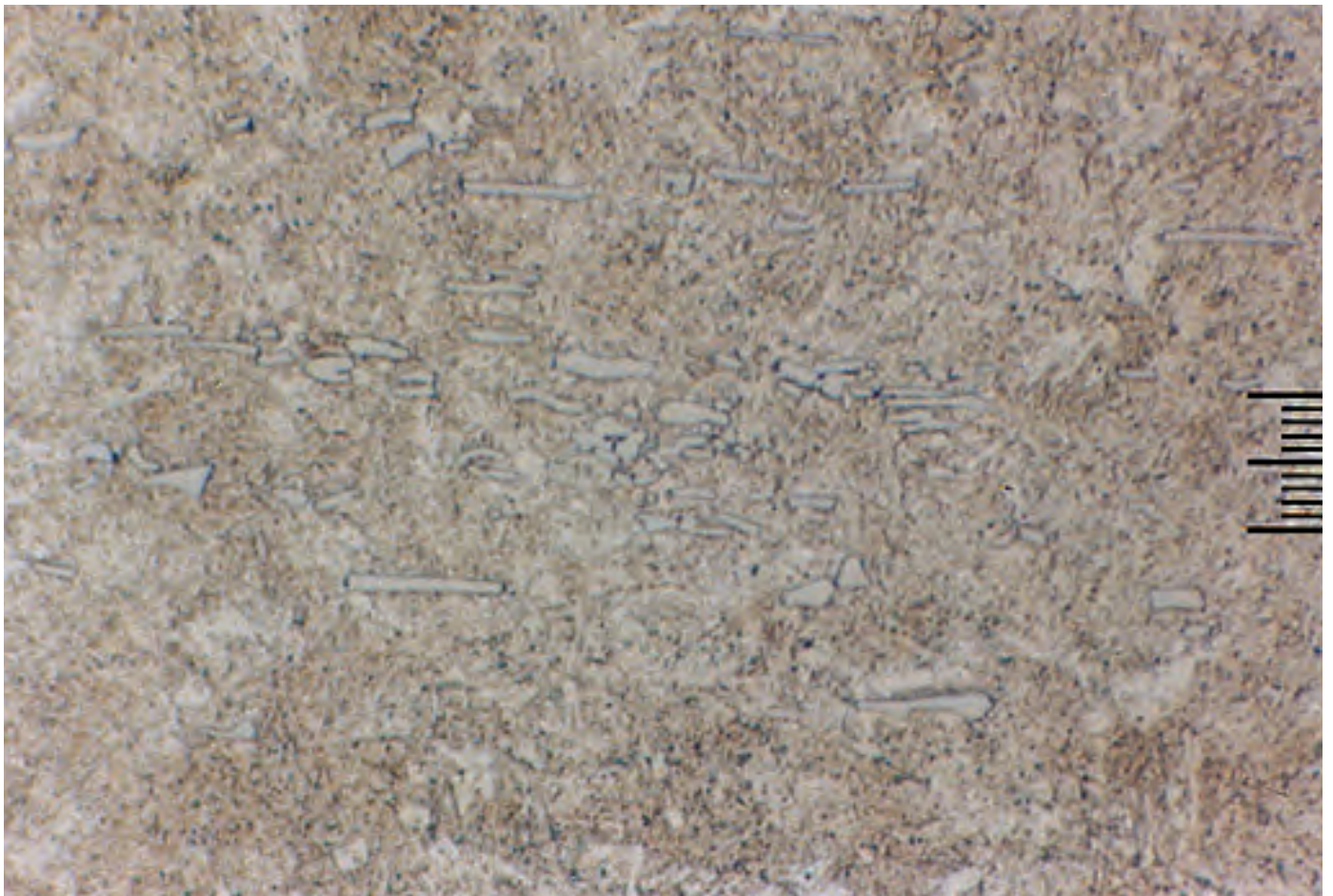


LABORATORY REPORT

FIGURE 3

Showing the microstructure through the EHSP plate sample with the visible dispersion of fine, longitudinally oriented white carbides.

(Microscope Magnification x1000, Full Scale 10 microns)



検査証明書 INSPECTION CERTIFICATE

本社 東京事務所：〒100 東京都千代田区丸の内1丁目1番2号
Head Office: 1-1-2, MARUNOUCHI, CHIYODA-KU, TOKYO 100 JAPAN

買主
Purchaser
東京製鉄株式会社
Tokyo Steel Works Co., Ltd.
購買者
Purchaser's Order No. D703-01P

注文書
Ordering Co.
注文者
Marubeni Corporation
注文書番号
Reference No. B647 -C0589301

品名
Commodity
HOT ROLLED STEEL PLATE
規格
Specification NK-EH-SP

NKK 日本製鉄株式会社
NKK CORPORATION

証明書番号
Certificate No. ASHEX-8261

日付
Date 1997-02-06

工. 番号
Construction No.

契約番号
Contract No. A0XR487

品名 Item	数量 Quantity	質量 Mass (CAL)	化学成分 Chemical Composition (%)	引張試験 Tensile Test	検査結果 Inspection Results
24844 SL77101 24844 SL77102 24844 SL77103	1 1 1	2826 2826 2826	C: 0.16, Mn: 0.037, P: 0.006, S: 0.0019, Cr: 0.023	Y.P.: 394, T.S.: 486, EL: 23.5, 延伸率: 23.5%	CAVEY 486
TOTAL					
VISUAL & DIMENSIONS 1 GOOD					

(注) 1. 検査結果の記載は検査の結果に合格していることを表明いたします。
(Notes) 1. Inspection results are indicated as satisfactory.
2. 検査結果の記載は検査の結果に合格していることを表明いたします。
(Notes) 2. Inspection results are indicated as satisfactory.

検査位置
Inspection Position
T: 頂上, F: 77%, Flange 1: 10x10mm 2: 7.5x10mm 3: 2/2x10mm 4: 5x10mm
B: 底面 Bottom W: 2x7, web 5.1/3x10mm 6: 2.5x10mm 7: Thickness 10mm
検査方向
Inspection Direction
L: 縦 Longitudinal
C: 横 Transverse
Z: 厚 Through-thickness

試験方法
Test Method
U: 引張 Tensile
V: 圧縮 Compression
W: 引張-圧縮 Tensile-Compression
X: 引張-圧縮-引張 Tensile-Compression-Tensile
Y: 引張-圧縮-引張-圧縮 Tensile-Compression-Tensile-Compression
Z: 引張-圧縮-引張-圧縮-引張 Tensile-Compression-Tensile-Compression-Tensile

試験機
Test Machine
A: 200mm (寸) D: 50mm (寸)
E: 50mm (寸) H: 8 (寸)
J: 2 (寸) K: 50 (寸)
M: 5.65 (寸) P: 5.65 (寸)
R: 40 (寸) S: 80mm (寸)
U: 100mm (寸) Y: 2 (寸)

試験機
Test Machine
A: 200mm (寸) D: 50mm (寸)
E: 50mm (寸) H: 8 (寸)
J: 2 (寸) K: 50 (寸)
M: 5.65 (寸) P: 5.65 (寸)
R: 40 (寸) S: 80mm (寸)
U: 100mm (寸) Y: 2 (寸)

上記商品は検査の結果に合格していることを表明いたします。
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN TESTED AND INSPECTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE ABOVE SPECIFICATION.

東京製鉄所 品質保証室
Manager of Quality Assurance Sec.
KEIHIH WORKS

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検査結果
Inspection Results
S726X
検査結果
Inspection Results
S726X

Note: JFE is the merged identity of NKK and Kawasaki Steel. EHSP was manufactured under the NKK name at the time of this report.



Total Steel

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