WELCOME

KRINNER QUALITY

versus

CHINESE “QUALITY”

Marcel Quadvlieg – Advice, Sales & Marketing
Krinner Nederland by Pijnenburg Import BV

KRINNER
Het schroeffundament

CURRENT SITUATION HOLLAND

- Competition Chinese suppliers
  - small range - very low price setting
- Our strategy: convincing customers about KRINNER Quality and Total Concept
- How?
- By testing KRINNER versus Chinese quality through an independent, accredited laboratory

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RAAD VOOR ACCREDITATIE

Dutch Accreditation Council RvA
PO Box 2768 NL-3500 GT Utrecht

The Dutch Accreditation Council RvA, by law appointed as
the national accreditation body for The Netherlands,
hereby declares that accreditation has been granted to:

Element Materials Technology Amsterdam B.V.
Laboratorium
Amsterdam en Hengelo

The organisation has demonstrated to be able to generate technical valid results in a competent way and work according to a management system.

This accreditation is based on an assessment against the requirements as laid down in ISO/IEC 17025:2005.

The accreditation covers the activities as specified in the authorized annex bearing the registration number.

The accreditation is valid provided that the organisation continues to meet the requirements.

The accreditation with registration number:

L 048

is granted on 29 November 2012

This declaration is valid until
1 December 2016

The accreditation has been granted for the first time on
27 March 1992

The Chief Executive

Ir. J.C. van der Poel

Locations of micro structure and zinclayer thickness

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Comparison of groundscrews

KSF M76x1600-M16 versus **Chinese "copy"**

- Steel quality
- Inspection of welds (helix / flange)
- Inspection zinc layer thickness

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Comparison Steel Quality

- KRINNER: according to S235

- China product: ??
  The laboratory could not determine the exact steel quality. They found out that a mixture of several kinds of steel must have been used.
  No link tensile strengths - yield values.

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Comparison Welds

- KRINNER: groundscrew showed acceptable welds acc. to EN-ISO 5817:2007 class C of the shaft/flange and the shaft/helix connections.

- China product: the weldquality was not acceptable, showed many weld defects and the surfaces were irregular.

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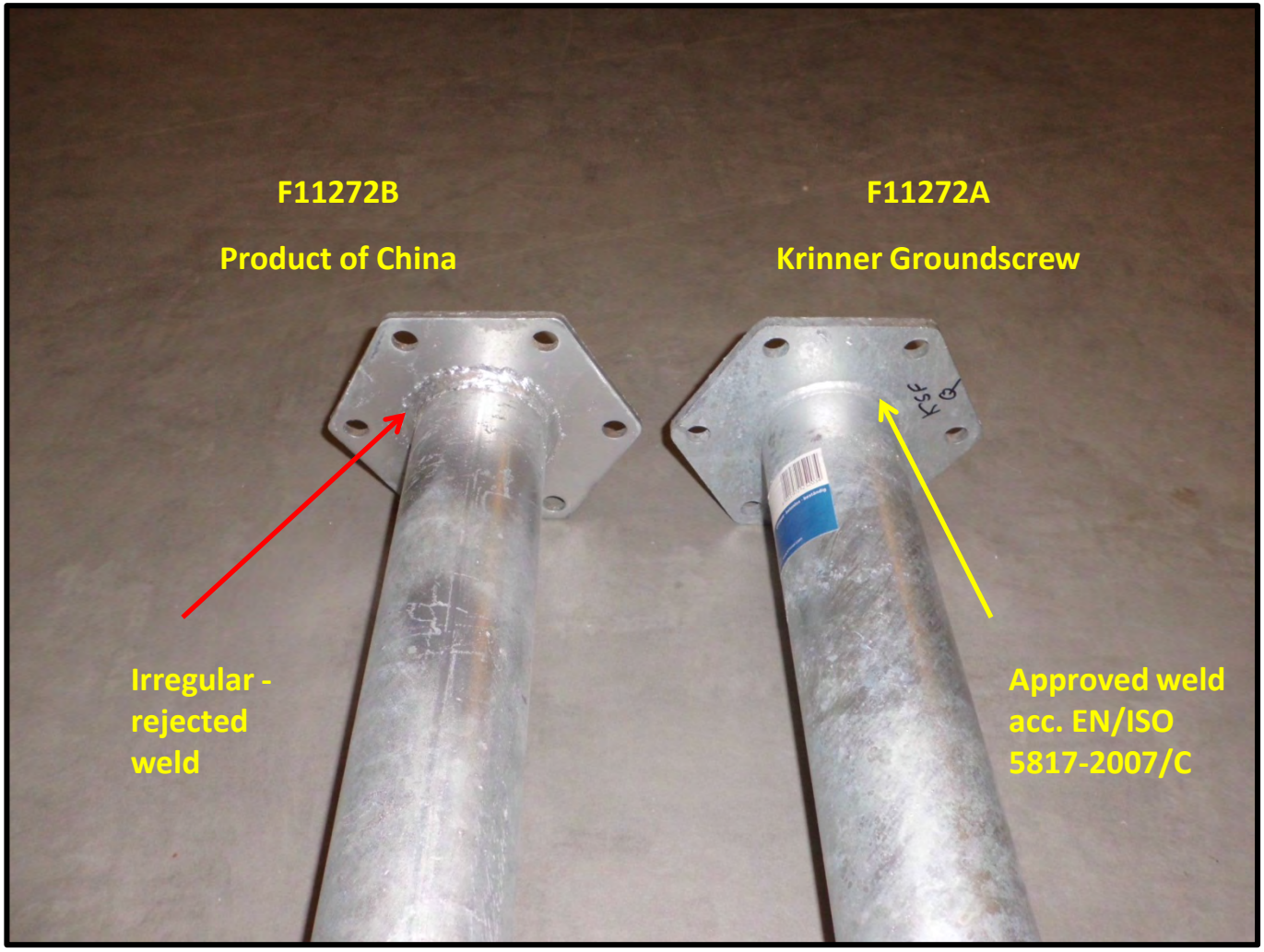
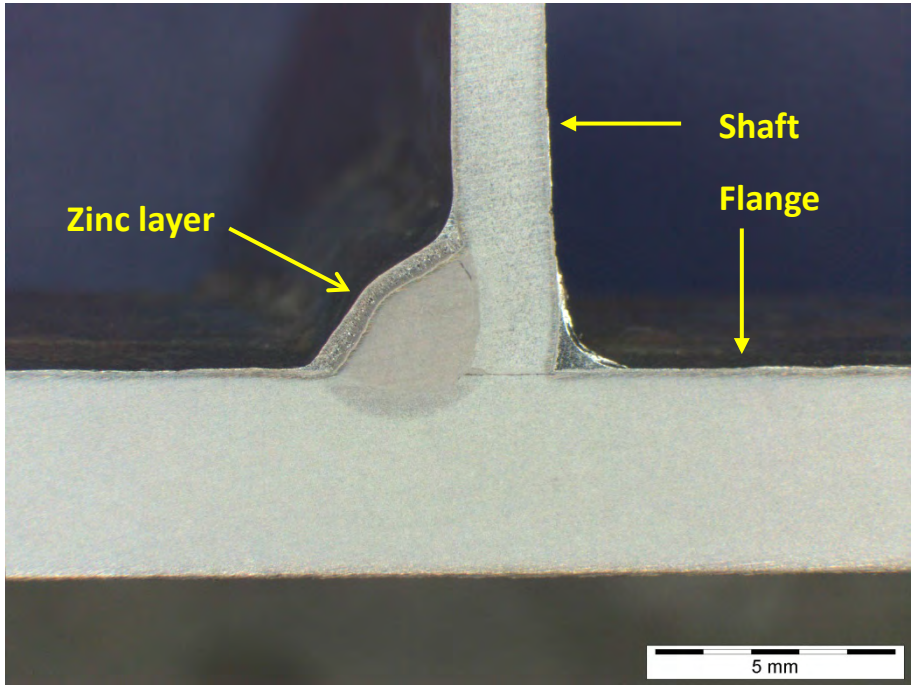


Specimen no.:
F11272

Detail of the flange / shaft

MACROPHOTOS

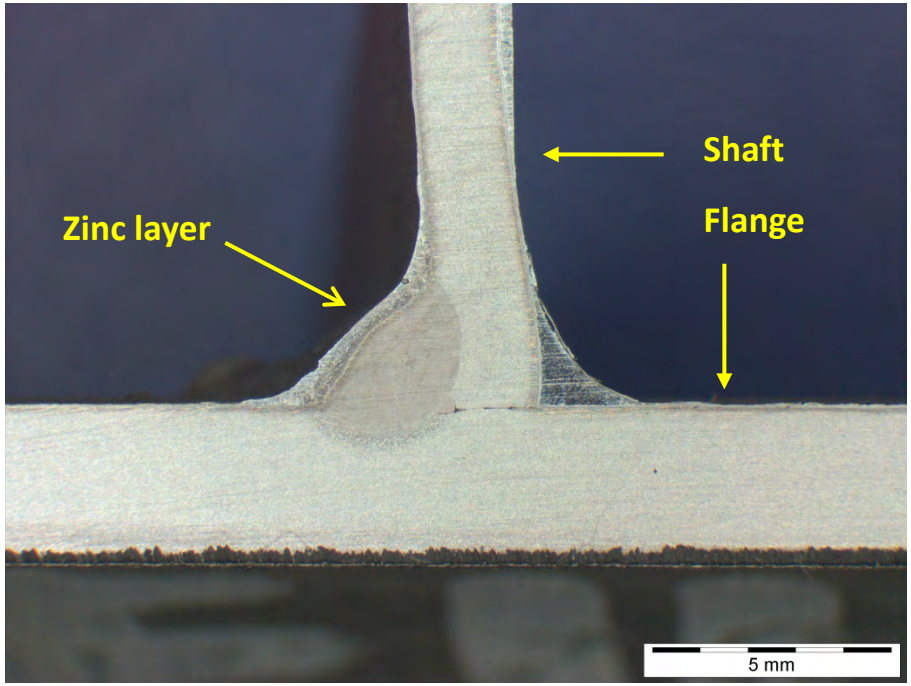
WELDS KRINNER GROUNDSCREW



Specimen no.:
F11272A

Etchant:
Nital

Photographed
with M ≈ 3.6 x



Specimen no.:
F11272A

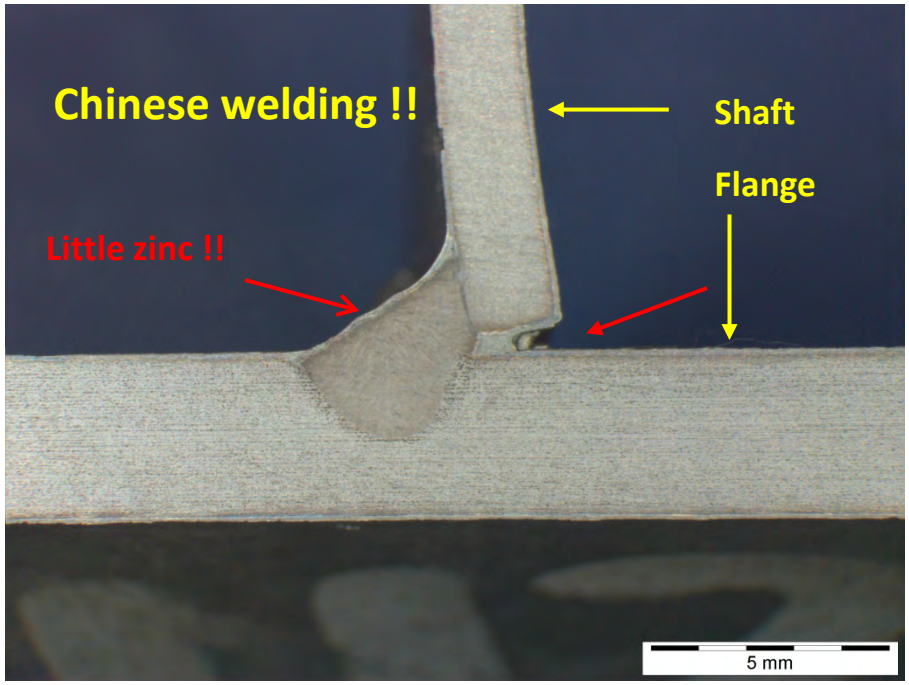
Etchant:
Nital

Photographed
with M ≈ 3.6 x

element

MACROPHOTOS

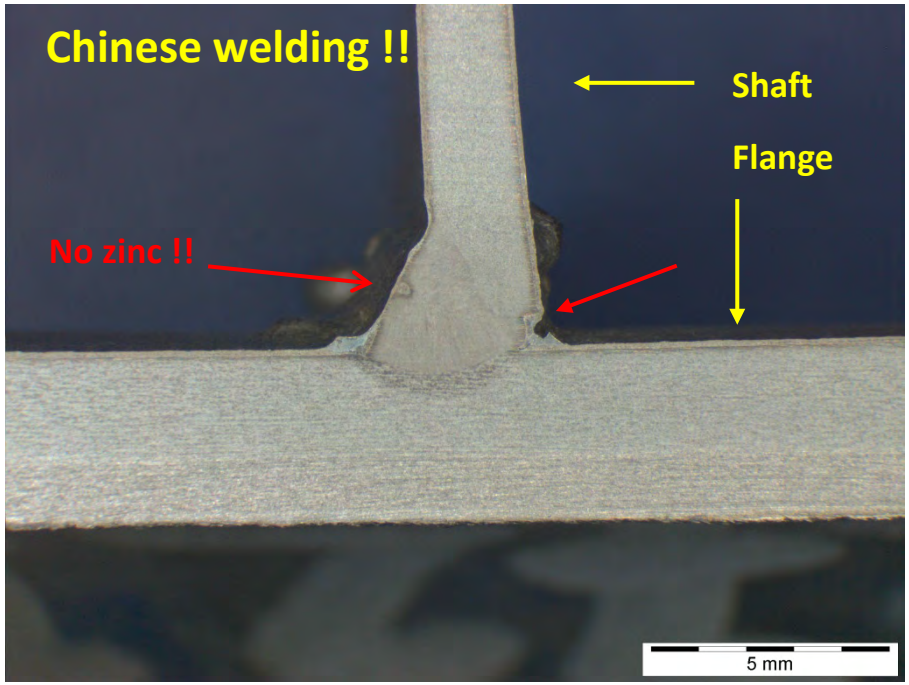
WELDS CHINESE GROUNDSCREW



Specimen no.:
F11272B

Etchant:
Nital

Photographed
with M ≈ 3.6 x



Specimen no.:
F11272B

Cross-section
microstructure
inside shaft

Etchant:
Nital

Photographed
with M ≈ 3.6 x

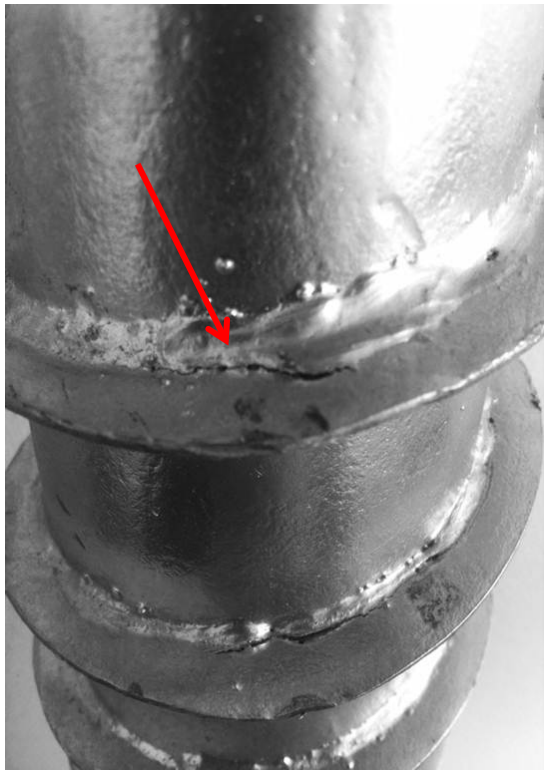
element

Bad welds. See visual examination results

element

Helix China Product

Deviations Chinese “copy”



KRINNER
Het schroeffundament

VISUAL INSPECTION TABLE

Groundscrew F 11272A (product of Krinner Schraubfundamente GmbH)

Inspection location:	Element Amsterdam	*Welding position:*	-
Inspection percentage :	100%	*Produced by:*	-
Inspection criteria :	EN 970:1998	*Date of welding:*	-
Investigation acc.:	EN-ISO 5817	*Inspection perc.:*	100%
Inspection temp.:	+ 21°C	*Procedure:*	ISO 6520-1:2007
Type of material shaft:	C-Steel	*Inspection criteria:*	EN 970:1998
Type of material helix:	C-Steel	*Illumination:*	>350 Lux
Material dim. shaft:	Ø 76x3 mm		
Material dim. helix:	t = 2 mm		
Material dim. flange:	t = 8 mm		
Surface condition:	Zinclayer		
Weld preparation:	-		
Welding process:	MAG	*Other equipment:*	-

Details:

A visual inspection on the surface is carried out on:
Fillet welds
See for the details the inspection scope on the next page

Results:

Acceptable to specification: EN-ISO 5817:2007 class C

Visual Welding Inspector VT-w-2: W.H. Mooij (Cert-104601-2011-ISO5817-ROT-RvA) **Signature:** Element Amsterdam WM	**Customer:** M. Quadvlieg Krinner Schroeffunderingsproducten Nederland **Date:**

element

Comparison of groundscrews

The latest welding development of Krinner meets the highest welding qualification acc. to EN-ISO 5817:2007 **class B** !

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VISUAL INSPECTION TABLE

Groundscrew F 11272B (product of China-FPH)

Inspection location:	Element Amsterdam	*Welding position:*	-
Inspection percentage :	100%	*Produced by:*	-
Inspection criteria :	EN 970:1998	*Date of welding:*	-
Investgation acc.:	EN-ISO 5817	*Inspection perc.:*	100%
Inspection temp.:	+ 21°C	*Procedure:*	ISO 6520-1:2007
Type of material shaft:	C-Steel	*Inspection criteria:*	EN 970:1998
Type of material helix:	C-Steel	*Illumination:*	>350 Lux
Material dim. shaft:	Ø 76x3 mm		
Material dim. helix:	t = 2 mm		
Material dim. flange:	t = 8 mm		
Surface condition:	Zinclayer		
Weld preparation:	-		
Welding process:	MAG	*Other equipment:*	-

Details:

A visual inspection on the surface is carried out on:
Fillet welds
See for the details the inspection scope on the next page

Results:

Not acceptable to specification: EN-ISO 5817:2007 class C nor D

Visual Welding Inspector VT-w-2: W.H. Mooij (Cert-104601-2011-ISO5817-ROT-RvA) **Signature:** Element Amsterdam WM	**Customer:** M. Quadvlieg Krinner Schroeffunderingsproducten Nederland **Date:**

element

Comparison Zinc Layer

- KRINNER: zinc layer thickness from shaft, flange and helix is inside & outside equal and showed no significant defects.

- China product: zinc layer thickness from shaft, flange and helix is inside & outside irregular and showed defects. Also rust was observed on the zinc layer.

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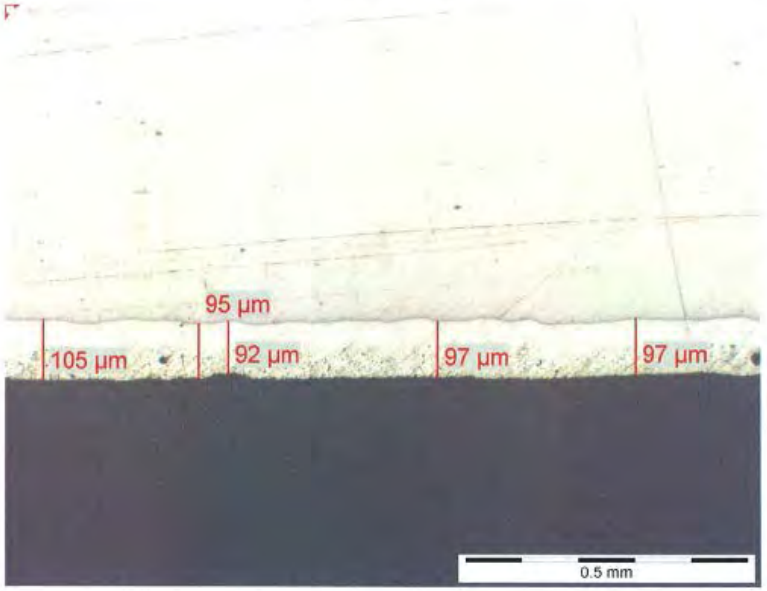
Comparison Zinc Layer

- KRINNER:

  - inside shaft – 73 to 105 microns/89
  - outside shaft – 76 to 176 microns/104
  - helix upper side – 76 to 165 microns/107
  - helix weldside – 74 to 100 microns/87

KRINNER
Het schroeffundament

PHOTO'S ZINCLAYERS

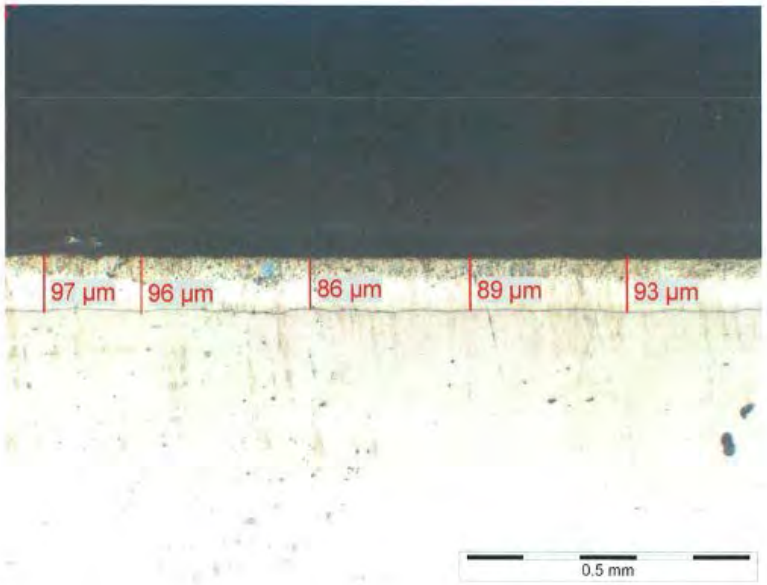


Specimen no.:
F11272A1

Zinclayer thickness
inside shaft

Etchant:
Nital

Photographed
with M ≈ 100 x



Specimen no.:
F11272A1

Zinclayer thickness
outside shaft

Etchant:
Nital

Photographed
with M ≈ 100 x

element

Comparison Zinc Layer

- Chinese product:

  - inside shaft – 78 to 132 microns/107
  - outside shaft – 67 to 135 microns/107
  - helix upper side – 91 to 130 microns/95
  - helix weldside – **10 to 157 microns/107**

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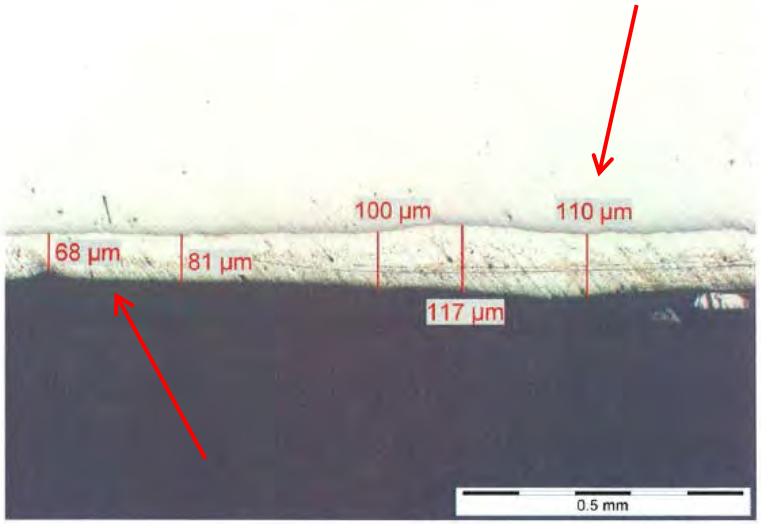
PHOTO'S ZINCLAYERS

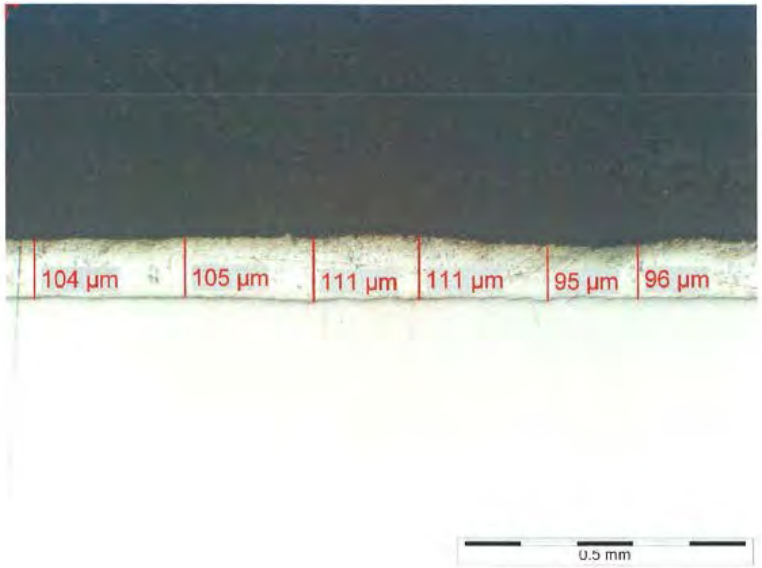


Specimen no.:
F11272B1

Zinclayer thickness
inside shaft

Etchant:
Nital

Photographed
with M ≈ 100 x



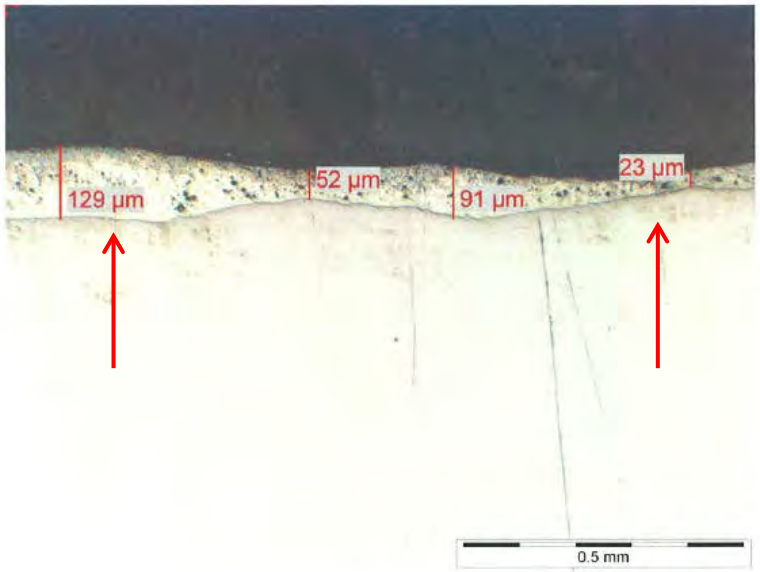
Specimen no.:
F11272B1

Zinclayer thickness
outside shaft

Etchant:
Nital

Photographed
with M ≈ 100 x

element



Specimen no.:
F11272B3

Zinclayer thickness
Helix weld area
upside

Etchant:
Nital

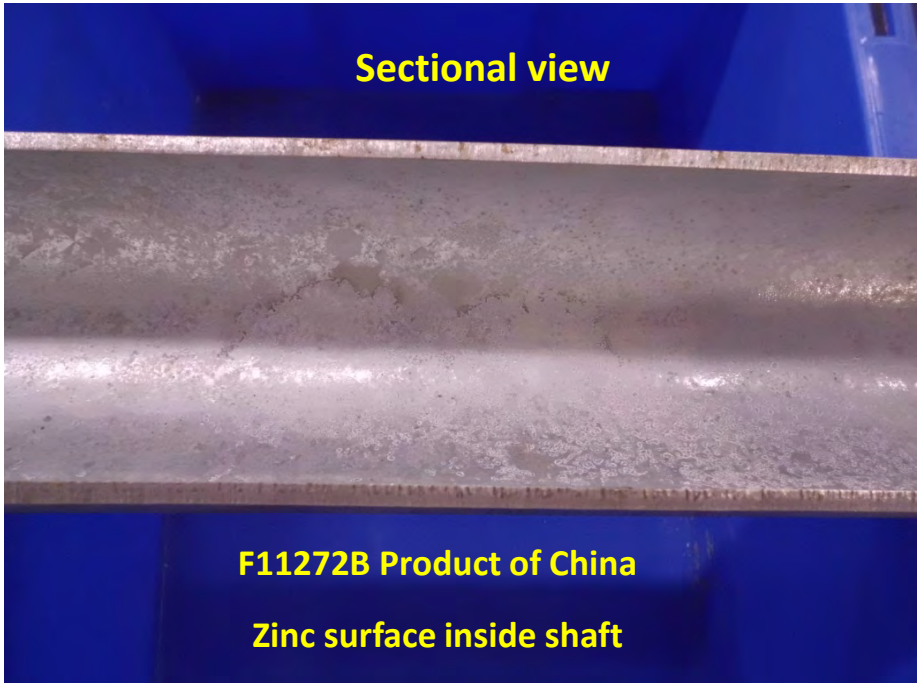
Photographed
with M ≈ 100 x

Specimen no.:
F11272B3

Zinclayer thickness
Helix weld area
weldside

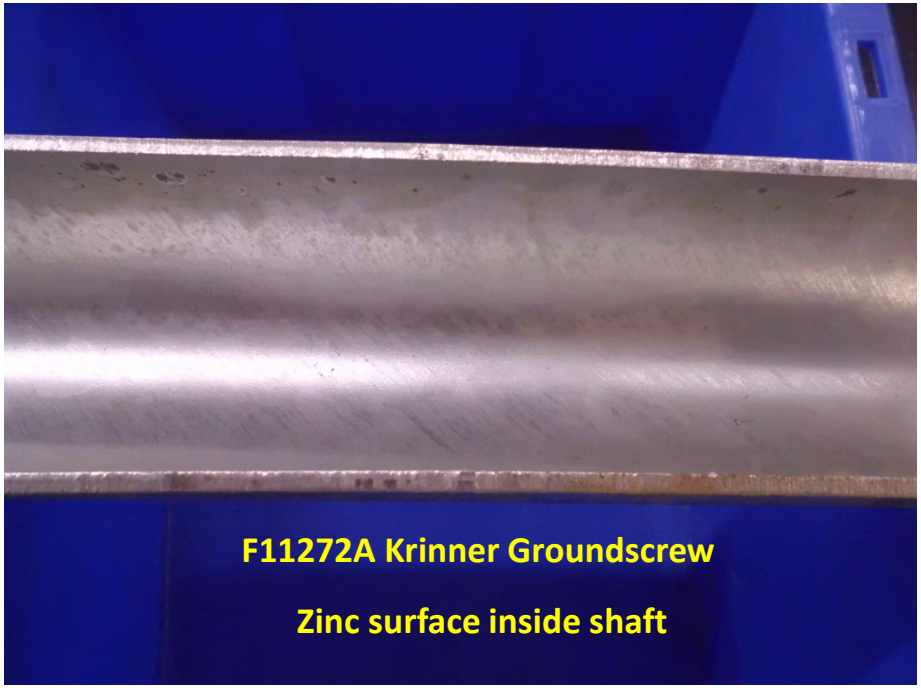
Etchant:
Nital

Photographed
with M ≈ 100 x



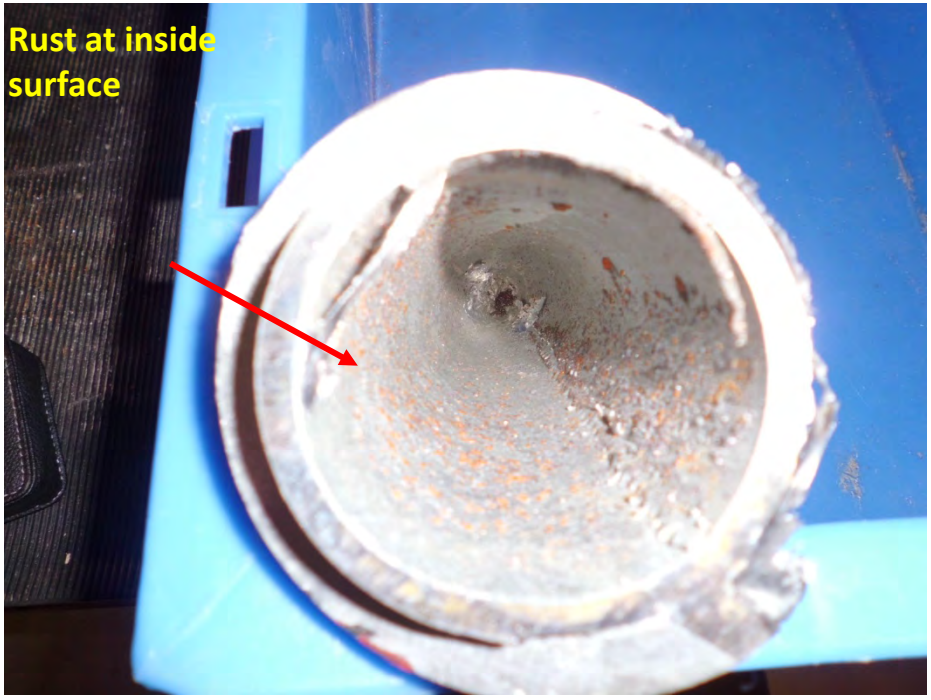
The surface of the Chinese product shows stains which indicate an irregular layer thickness!

Reasons: insufficient or no cleaning before galvanising, usage of polluted zinc → negative effects on the surface bonding !



Krinner product has been cleaned/pickled before galvanising → the surface = equal and shows no stains compared to the Chinese product → regular zinc layer /perfect bonding !

element



F11272B
Product of China

F11272A
Krinner Groundscrew

element

VISUAL EXAMINATION OF THE ZINCLAYER

Specimen no.

F11272A	F11272A The groundscrew (product of Krinner Schraubfundamente GmbH) The zinclayer thickness from shaft, flange and helix is inside and outside equal, and shown no significant defects.
F11272B	The zinclayer thickness from shaft, flange and helix is inside and outside irregular and shown defects. On different places inside the shaft oxides on the surface of the zinclayer were observed.

VISUAL EXAMINATION OF WELDS

Specimen no.

F11272A	The groundscrew F11272A (product of Krinner Schraubfundamente GmbH) shown acceptable welds according EN-ISO 5817: 2007 class C of the shaft/flange and the shaft/helix connections. (see also the visual inspection results in the table on page 3)
F11272B	The groundscrew F11272B (product of China-FPH) shown bad weld quality. The weldsurface are irregular and welddefects are vissible

CONCLUSIONS

The weld quality of groundscrew F11272A (product of Krinner Schraubfundamente GmbH) is acceptable according EN-ISO 5817 class C.
The weldquality of groundscrew F11272B ((product of China-FPH) is not acceptable according EN-ISO 5817 class C nor D. These groundscrew shown many weld defects. Also rust on the zinclayer observed.
The elongation of F11272B shaft is lower than specified.

Element Materials Technology Amsterdam

Verified: W.H. Mooij

element
Materials Technology

Authorised: G.R. Barents

element

Comparison of groundscrews

Final conclusion:

Sales argument Chinese “quality”: low pricing

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SALES ARGUMENTS KRINNER

TOTAL CONCEPT

- German know-how – innovative (Nova 2013)
- Complete standard program
- Consistent – registered - quality
- Short delivery time also regarding SMU products

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SALES ARGUMENTS KRINNER

- (Geo)Technical support – static information
- Professional Sales Support – skilled staff, website and brochures
- Various and reliable assembling equipment “made in Germany”

KRINNER offers added value !

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So why KRINNER ?
Because it's all about quality and people !




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The complete test results are available at the KRINNER export department !

Marcel Quadvlieg – Advice, Sales & Marketing
Krinner Nederland by Pijnenburg Import BV

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THANK YOU
FOR YOUR ATTENTION!

Marcel Quadvlieg – Advice, Sales & Marketing
Krinner Nederland by Pijnenburg Import BV