



United States Testing Company, Inc.

Tulsa Division

1341 NO. 108th EAST AVENUE TULSA, OKLAHOMA 74116
TELEPHONE: AREA CODE 918-437-8333

DX9
VI. 4. 1. 35

REPORT OF TEST

CLIENT: Hilti, Inc.
Technical Marketing Services
Po Box 470400
Tulsa, OK. 74147

NUMBER

EN85-0219.2
12/12/85

Attn: Michael Causey

SUBJECT: Pullover Performance of Hilti Drive Pins.

SCOPE:

Tests to determine the pullover performance of Hilti ENP2-21-L15 and ENP3-21-L15 fastening various thicknesses of steel decking to A-36 steel plate were conducted by Hilti personnel and the procedures and results are documented in Hilti Test Report No. WENT 130-85-E.

PROCEDURE:

The Hilti drive pins were installed in varying thicknesses of A-36 steel plate in accordance with the manufacturer's instructions to secure various thicknesses of steel decking to A-36 steel plate.

SIGNED FOR THE COMPANY

Robert C. Smith
BY Robert C. Smith, M.S., P.
Mgr/Product Certification

Laboratories in: New York • Chicago • Los Angeles • Houston • Tulsa • Memphis • Reading • Richland

THIS REPORT APPLIES ONLY TO THE STANDARDS OR PROCEDURES IDENTIFIED AND TO THE SAMPLE(S) TESTED. THE TEST RESULTS ARE NOT NECESSARILY INDICATIVE OR REPRESENTATIVE OF THE QUALITIES OF THE LOT FROM WHICH THE SAMPLE WAS TAKEN OR OF APPARENTLY IDENTICAL OR SIMILAR PRODUCTS. NOTHING CONTAINED IN THIS REPORT SHALL MEAN THAT UNITED STATES TESTING COMPANY, INC., CONDUCTS ANY QUALITY CONTROL PROGRAM FOR THE CLIENT TO WHOM THIS TEST REPORT IS ISSUED. UNLESS SPECIFICALLY SPECIFIED, OUR REPORTS AND LETTERS ARE FOR THE EXCLUSIVE USE OF THE CLIENT TO WHOM THEY ARE ADDRESSED, AND THEY AND THE NAME OF THE UNITED STATES TESTING COMPANY, INC. OR ITS SEALS OR INSIGNIA, ARE NOT TO BE USED UNDER ANY CIRCUMSTANCES IN ADVERTISING TO THE GENERAL PUBLIC AND MAY NOT BE USED IN ANY OTHER MANNER WITHOUT OUR PRIOR WRITTEN APPROVAL. SAMPLES NOT DESTROYED IN TESTING ARE RETAINED A MAXIMUM OF THIRTY DAYS



Hilti, Inc.
 Technical Marketing Services
 EN85-0219.2
 Rev. 12/20/85
 Page 2

TENSILE
ULTIMATE PULLOVER PERFORMANCE VALUES

<u>Deck Gage Size</u>	<u>ENP2-21-L15</u>			<u>ENP3-21-L15</u>		
	<u>X Ult. lbs.</u>	<u>Sx lbs.</u>	<u>Cv %</u>	<u>X Ult. lbs.</u>	<u>Sx lbs.</u>	<u>Cv %</u>
16	2793	99	3.6	2070	54	2.6
18	2391	122	5.1	1631	89	5.4
20	1984	88	4.4	1478	79	5.4
22	1623	64	3.9	1241	72	5.8
24	1473	115	7.8	1127	108	9.6
26	1075	127	11.8	1016	108	10.7

CERTIFICATION

Hilti Report No. WENT 130-85E is a valid description of the procedures, conditions and results of the tests of Hilti ENP2-21-L15 and ENP3-21-L15 drive pins therein to the best of my knowledge, information and belief of the undersigned who witnessed the tests.

ORIGINAL COPY
DO NOT REMOVE



Hilti Engineering
of North America
12211 E. 51st St.
P.O. Box 45400
Tulsa, Oklahoma 74147

TEST REPORT

Phone (918) 252-6343
Telex 79 6450

Number: WENT 130-85-E

Date: 25 Nov 1985

Ref:

ENP2-21-L15 AND ENP3-21-L15 DECKING PULLOVER TEST

1.0 INTRODUCTION AND PURPOSE

The ENP2-21-L15 and ENP3-21-L15 drive pins are fasteners made specially for attachment of steel decking to structural A-36 steel. (Refer to the Appendix, Photos of Fasteners.)

The purpose of this test was to determine the ultimate tensile pullover holding ability of these fasteners when installed through steel decking sections of various gage thicknesses into A-36 steel.

This test was conducted at the Hilti Technical Center from 10-7-85 through 10-15-85. All testing was witnessed by U.S. Testing Company, Inc.

2.0 SUMMARY OF RESULTS - See Table 1.

<u>TABLE 1. TENSILE</u> <u>ULTIMATE PULLOVER PERFORMANCE VALUES</u>						
DECK GAGE SIZE	ENP2-21-L15			ENP3-21-L15		
	\bar{X} ULT. LBS.	Sx LBS.	Cv %	\bar{X} ULT. LBS.	Sx LBS.	Cv %
16	2793	99	3.6	2070	54	2.6
18	2391	122	5.1	1631	89	5.4
20	1984	88	4.4	1478	79	5.4
22	1623	64	3.9	1241	72	5.8
24	1473	115	7.8	1127	108	9.6
26	1075	127	11.8	1016	108	10.7

3.0 PROCEDURE

A Hilti DX-650 S/N 011688 was used for all fastener installation. The proper drive piston was used for each fastener type:

ENP2-21-L15: Use 65/NP2 Piston
 ENP3-21-L15: Use 65/NP3N Piston

All fastenings were made into 1/2" thick A-36 steel plate (Refer to the Appendix, A-36 1/2" Steel Metallurgical Test Report.)

Decking pullover test specimens in 16, 18, 20, 22, 24, and 26 gauge thicknesses were formed to accomodate the pullover fixture.

All deck material tested conformed to the following ASTM specifications:

16 Ga.: ASTM A611-72 Grade C
 18 Ga.: ASTM A611-72 Grade C
 20 Ga.: ASTM A-366
 22 Ga.: ASTM A446-76 Grade A
 24 Ga.: ASTM A446-76 Grade A
 26 Ga.: ASTM A446-76 Grade D

The Steel Deck Metallurgical Test Reports are given in the Appendix, Pages 8 - 18.

Detailed photos of the pullover test fixture and method are given in the Appendix, Photos of Test Method.

A 20 ton Enerpac ram and hand pump was used for all deck loading.

All loading was measured using a 5K Sensotec load cell with the Daytronics 9020 Mainframe and Hewlett-Packard X-Y plotter.

A sample size of ten was employed for each test condition. (Deck gauge and fastener type).

The ultimate load, fastener standoff, and mode of failure was measured and recorded for each test event.



Richard Neumayer
 Senior Technician

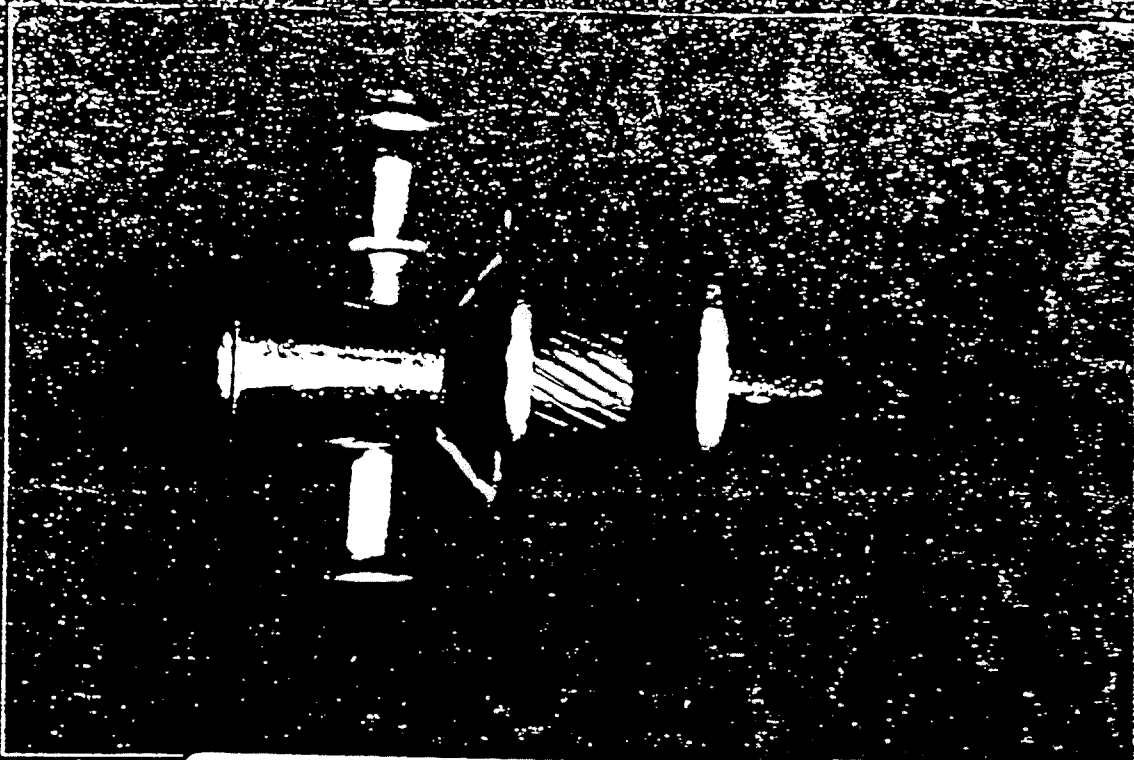


Richard E. Wollmershauser, P.E.
 Manager, Testing Laboratory

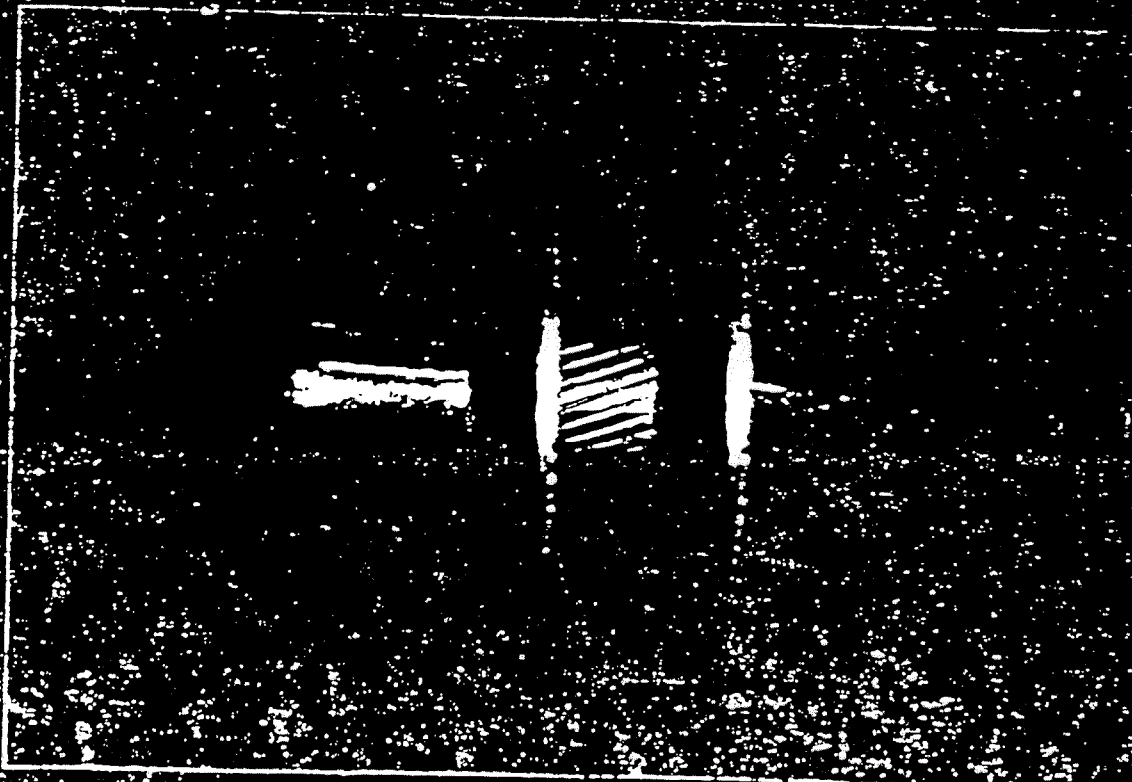
RN/lmp

A P P E N D I X

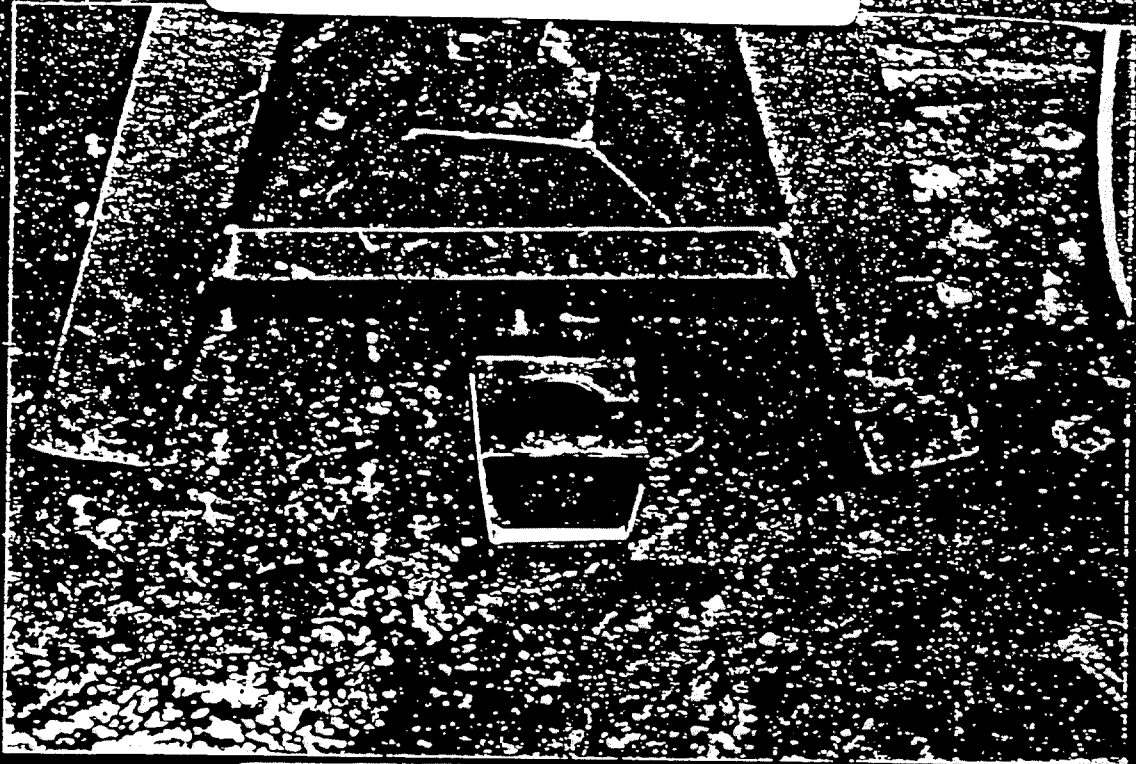
	<u>PAGE NO.</u>
PHOTOS OF FASTENERS	4
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STEEL DECK METALLURGICAL TEST REPORTS	8 - 18
A-36 STEEL METALLURGICAL TEST REPORT	19
RAW DATA	20 - 43
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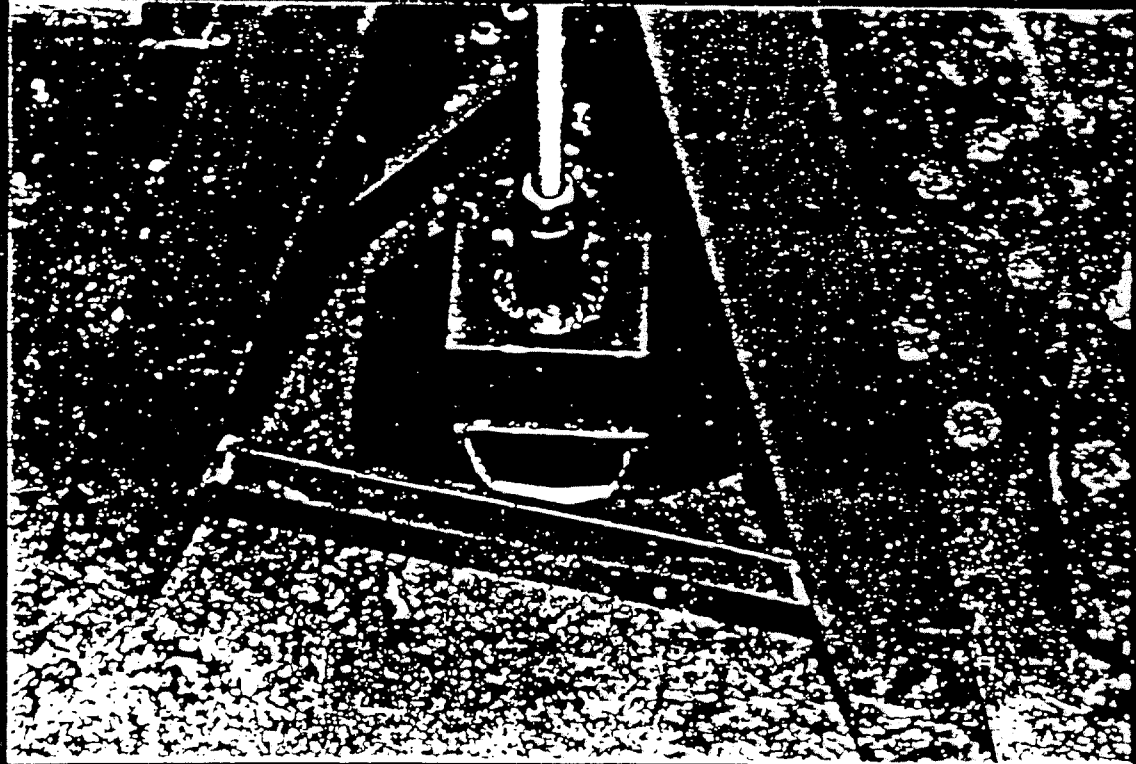
ENP2-21-L15
FASTENER

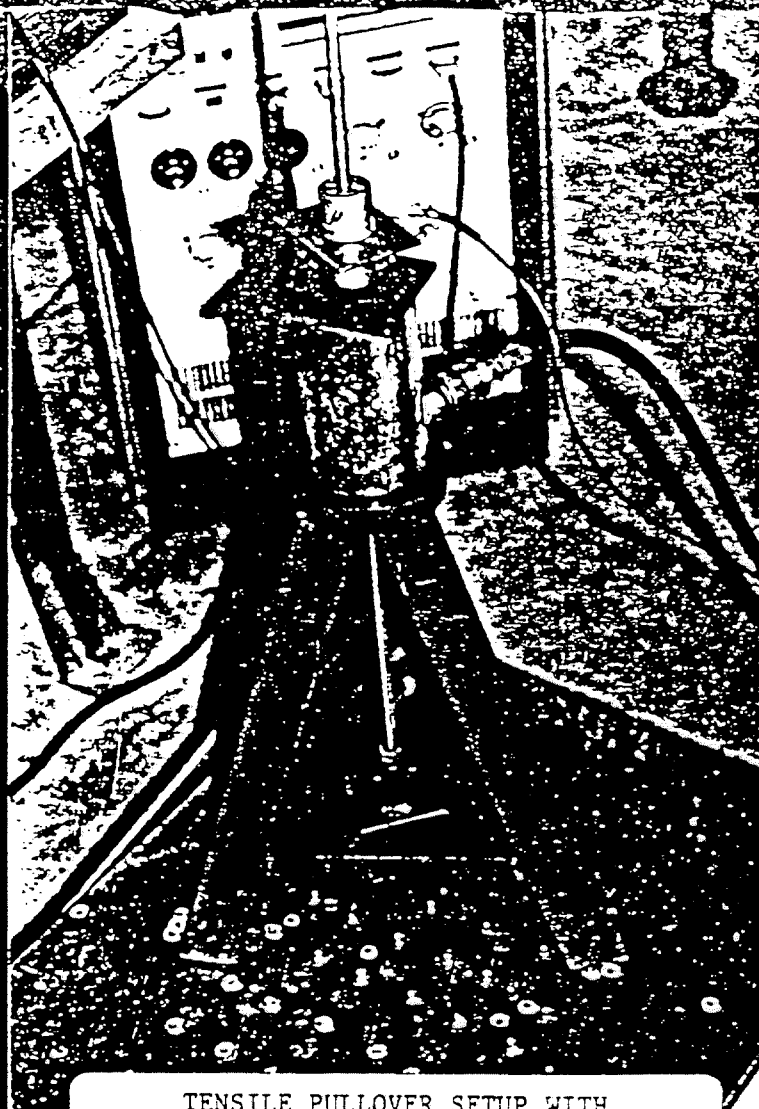


ENP3-21-L15
FASTENER



INSTALLATION OF PULLOVER
FIXTURE AND INITIAL LOADING





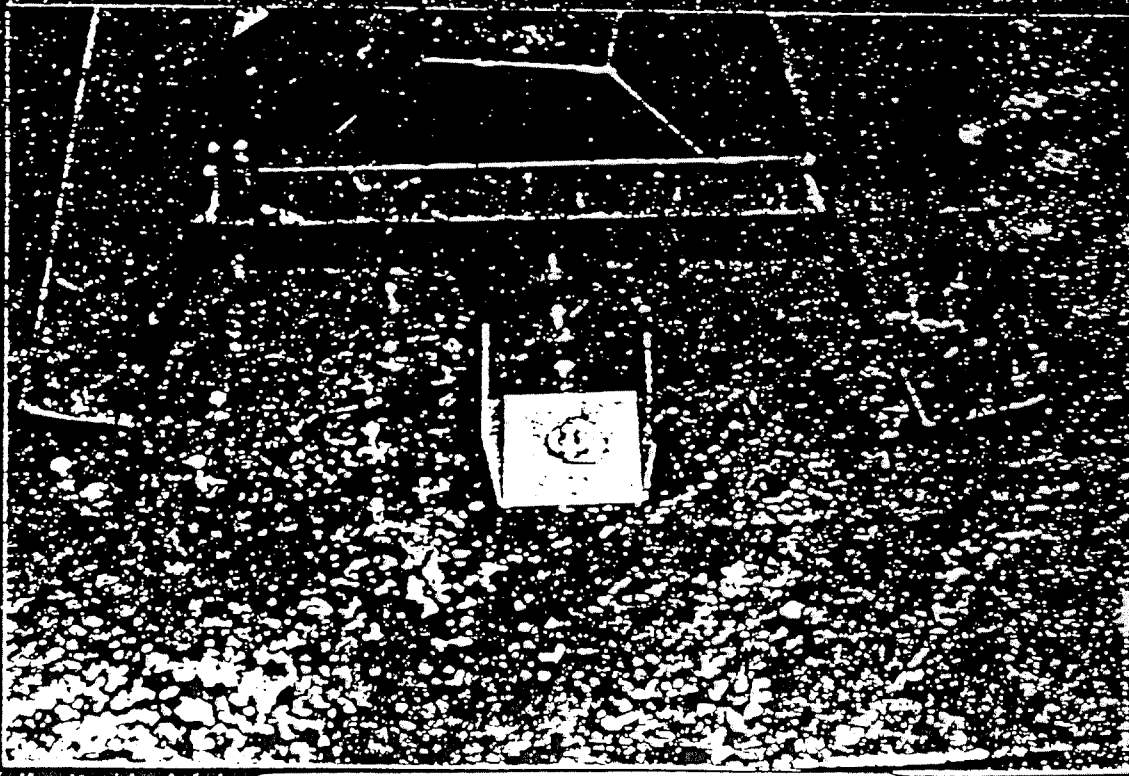
TENSILE PULLOVER SETUP WITH
RAM AND LOAD CELL



FAILED DECK SPECIMENS



PULLOVER JAWS WITH DECK SPECIMEN



INSTALLED FASTENER IN DECK SPECIMEN

ORDER ACKNOWLEDGMENT

04/15/81

04/06/81 02966

EB 09835

1 OF 16

30-3/4-10

NEW YORK REGIONAL SALES
PARK 80 PLAZA WEST-ONE
SADDLE BROOK N J 07662

Handwritten initials: NB, SF

UNITED STEEL DECK INC
P O BOX 662
SUMMIT N J 07901

UNITED STEEL DECK INC
X PRIOR COATED METALS
NEWFORD MILL ROAD
MORRISVILLE PA

JUNE 1981 ENTRY APPROV MKTG
CTR

1 100000 FAIRLESS PA. DEST

BEL

PROD: CR SHEET CARBON CLASS 1
SPEC: ASTM A611-72 GRADE C STRUCTURAL QUALITY MATTE FINISH LIGHTLY OIL
APLN: A FOR PAINTING ROOF DECK
INSP: 01 MILL RA/SN CERTIFIED T/R
MPL: 2P84/2M1/2L36 FLT BED TRK FOR C-HOOK SIDE UNLGD

ITEM	DESCRIPTION	FT LENGTH	IN	PC WGT	DIFF	QUANTITY	ITEM WGT
01	.0570MIN X 31-3/4 COIL			20000/30000			100000

ID 24

INFO PRIOR COATED METALS 2971

VAL107

SHLWY P 5.0 M 5.0

SCHED MO JUL 81

EXP TO SHIP BY 07/11

RECEIVED
U.S. DECK, INC.

KRD-00

T.SR

UNITED STATES STEEL CORPORATION

SHIPPING NOTICE
 TRLS SHEET MET. 000
 32 CC00



0066363011	21	04/06/81	02966
0-0-1	0-1-3	23905	23900-2382-146
		1809235	146-46137

UNITED STEEL DECK INC
 P O BOX 682
 SUMMIT N J 07901

UNITED STEEL DECK INC
 PRIOR COATED METALS
 NEWFORD MILL ROAD
 MORRISVILLE PA

SHIPPER NO. 7941	DATE SHIPPED 08/26/81	FROM FAIRLESS PA.	ROUTE 146	MODE OF SHIPMENT CUSTOMER TRUCK
CTR	0000	DESTINATION	TB95813	

R SHEET CARBON CLASS 1 ASTM A511-72 GRADE C
 TRUCTURAL QUALITY MATTE FINISH LIGHTLY OIL

TEST REPORT FILE NO 328 8-28-81

Heat No.	Piece No.	ANALYSIS						Test Piece Cut From	Yield Point lbs. per sq. in.	Tensile Str. lbs. per sq. in.	Elong. in 2" %
		C	Mn	P	S						
044357		17	48	008	021			0340 MIN.	39.850	58.200	33
								0340 MIN.	38.200	57.300	32
044259		17	49	008	028			0320 MIN	39.850	55.800	31
								0340 MIN	40.650	57.900	35
								0570 MIN	36.750	55.200	34

RECEIVED
 SEP 1 1981
 U.S. STEEL DECK, INC.

[Handwritten signature]

We hereby certify that the above figures are correct as contained in the records of the company

CHIEF METALLURGIST

[Handwritten initials]

ORDER ACKNOWLEDGMENT

06/18/81



United States Steel Corporation

36-5297

06/15/81 03078

NEW YORK REGIONAL SALES
PARK 80 PLAZA WEST-ONE
SADDLE BROOK N J 07662

EB 13785

1 OF

UNITED STEEL DECK INC
P O BOX 662
SUMMIT N J 07901

UNITED STEEL DECK INC
% PRIOR COATED METALS
NEWFORD MILL ROAD
MORRISVILLE PA

30-1-10

AUG 1981

SEE BELOW

1 200000 FAIRLESS PA.

AUG

TRF CTR
PROD: CR SHEET CARBON CLASS 1
SPEC: ASTM A611-72 GRADE C STRUCTURAL QUALITY MATTE FINISH LIGHTLY OIL
~~SPECIAL FLATNESS REQUIREMENT~~
APLN: A FOR PAINTING ROOF DECK
INSP: 01 MILL RA/SN CERTIFIED T/R 3 T/R TO UNITED STEEL DECK INC 14
HARMICH ROAD SOUTH PLAINFIELD NJ 07080
MPL 2P84/2M1/2L86 FLT BED TRK FOR C-HOOK SIDE UNLDG

ITEM	DESCRIPTION	FT LENGTH IN	PC WGT	DIFF	QUANTITY	ITEM WGT
01	.0450MIN X 41-1/2	COIL ID 24 OD 60 MAX	23000 30000 26000# MAX			200000
						SHLWY P 5.0 M 5.0 PROMISE LATER

Handwritten signature

Kenneth P. Dagg, Inside Sales Representative



UNITED STATES STEEL CORPORATION

SHIPPING NOTICE
 FRLS SHEET MET.
 32 CC38 07

0066068011

21

PURCHASE ORDER DATE
 06/15/81

PURCHASE ORDER NO.
 03078

USS ITEM-TRUCK NO.
 24808
 24801-2472-146

USS ORDER NO.
 EB13785

PAGE

T 0-0-1
 S 0-1-3

REVISION TO

Handwritten initials: WAB, JI

INVOICE DATE
 INVOICE NO.
 146-47662
 PLEASE REFER TO THE ABOVE INVOICE NO. IN YOUR ORDER

UNITED STEEL DECK INC
 P O BOX 662
 SUMMIT N J 07901

UNITED STEEL DECK INC
 % PRIOR COATED METALS
 NEWFORD MILL ROAD
 MORRISVILLE PA

UNITED STATES STEEL CORPORATION

SHIPPER NO. 349125	DATE SHIPPED 09/04/81	FROM FAIRLESS PA.	ROUTE/CARRIER 146 CUSTOMER TRUCK
SHIPPER WEIGHT CTR 0000M	FOR MILL	VEHICLE TA 95815	AREAS COLLECT
CR SHEET CARBON CLASS 1 ASTM A611-72 GRADE C STRUCTURAL QUALITY MATTE FINISH LIGHTLY OIL			

TEST REPORT FILE NO 335 9-9-81

Heat No.	Piece No.	ANALYSIS						Test Piece Cut From	Yield Point lbs.per sq.in.	Tensile Str. lbs.per sq.in.	Elong. in 2"
		C	Mn	P	S						
04H507		16	47	009	019			0280 MIN	53.600	66.200	35
								0280 MIN	44.625	54.200	36
06H517		18	45	008	026			0340 MIN	42.850	60.600	32
								0340 MIN	40.950	60.050	34
08H517		16	43	018	030			0340 MIN	41.150	59.100	34
								0340 MIN	40.400	59.500	33
								0450 MIN	36.250	53.800	35
RECEIVED											
SEP 15 1981											
UNITED STATES STEEL CORP.											

We hereby certify that the above figures are correct as contained in the records of the company

CHIEF METALLURGIST
[Signature]

For Account & Risk of Messrs.
KUKJE AMERICA CORP,
 21 E. UNION AVENUE,
 RUTHERFORD, NJ 07073

Notify Party
KUKJE AMERICA CORP,
 21 E. UNION AVENUE,
 E. RUTHERFORD, NEW JERSEY 07073

Remarks:
 * BUYER'S P/O NO. 13489/US DECK.
 * THEORETICAL MINIMUM WEIGHT. 2C

Port of Loading SUSAN KOREA	Final Destination NEWARK, U.S.A.
Carrier SAMICK NORDIC	Sailing on or about SEP. 10, 1984

Marks and Numbers of PKGS	Description of Goods	Quantity	Net-weight	Gross-weight	Measurement
P/O NO. 13489/LOT NO. C SIZE NET WT IN LBS GROSS WT IN LBS NEWARK COIL NO. MADE IN KOREA	COLD ROLLED STEEL SHEET IN COIL ASTM A-366, COMMERCIAL QUALITY, SAE 1017, MILL EDGE, DULL FINISH, VERY LIGHTLY OILED. A SIZE: LOT 1, B SIZE: LOT 2.				

SIZE	T.M.W(M/T) (LBS)	NET-WT(M/T) (LBS)	GROSS-WT(M/T) (LBS)
A-037-A-041 0.029" MIN X 48-3/8" X COIL	50.250 (110,791)	53.350 (117,617)	53.600 (118,167)
B-015-B-019 0.034" MIN X 49-3/8" X COIL	47.456 (104,622)	49.860 (109,923)	50.110 (110,473)
TOTAL 10PKGS	97.706 (215,403)	103.210 (227,540)	103.710 (228,640)

RECEIVED
 OCT 11 1984
 U.S. DECK, INC.

L. ADD. : U.I. I-KA, CHONGRO, CHONGRO-KU,
 SEOUL, KOREA
 P. O. BOX : C. P. O. BOX 747 SEOUL
 CABLE : KUKJECO SEOUL
 TELEX CODE: KUKJECO K27251, K26348, K23702
 TELEPHONE : 771-81, 771-81

Signed by: _____
 S. W. H. J. E.
 SR MANAGING DIRECTOR

U N I O N S T E E L M F G . C O . , L T D .

NO. 5012240666
DATE. 04/09/05
L7C NO. I-15300

HESSRS. NYK AP
APPLIC. COLD ROLLED STEEL COIL
SPEC. ASTM A 366

MILL TEST CERTIFICATE

P K G. NO. (UNSP.NO.)	M F T	G H T	W T	G R S S	S	T	7	F	TENSILE TEST	REND ERIC HARD COAT	SURFACE	CHEMICAL COMPOSIT.
A-037-4-041	53.350	53.600	0.024	HR40-3/8	IC01L	42.6	34.3	GOOD	66.5	0.00	DULL	15 TR 54 12 3
	117.617	118.167										VERY LIGHTLY OILED
M-015-8-014	49.860	50.110	0.034	HR40-3/8	IC01L	44.2	33.3	GOOD	54.2	0.00	DULL	15 I 55 16 3
	109.923	110.473										VERY LIGHTLY OILED
* TOTAL *	103.210	103.710										
	227.540	229.640										

10-27-05

U N I O N S T E E L M F G . C O . , L T D .
MANAGER OF INSPECTION SECTION

RECEIVED
OCT 11 1984
U.S. STEEL, INC.

HIT

22GA

NIPPON STEEL CORPORATION MILL SHEET

Head Office: 6-3, Otemachi 2 - Chome
Chiyoda - Ku, Tokyo 100, Japan
Kimitsu Works: 1, Kimitsu, Kimitsu - City
Chiba - Pref., Japan
Mill Sheet No. 510112 Page: 1

Order No. :
Reference No. : QN150401
Contract No. : 4-965-H7-5-9-1228
Commodity : GALVANIZED STEEL SHEET IN COIL
Specification : ASTM A446-76 GRADE A

Customer : NISSHO-IWAI AMERICAN CORP., NE
Shipper : NEW YORK
Supplier : NISSHO IWAI CORPORATION (J77)

Date of Issue : 1994-09-13
Date of Inspection :

Thickness X Width X Length	Size (mm)	Number of Product	Weight KG	Coil No.	Test Piece No.	Control No.		Tension Test			Endless Value (mm)	Coating Weight	Chemical Composition (%)					Remarks
						Inspection No.	Coil No.	GL	Y.P.	T.S.			EL.	C	Mn	P	S	
		MINNET						LBS/IN ²	%	%	x100	x100	x100	x100	x100			
J.0290*MINX37*XC (COATING G90 OZ/FI2)	3	23403	559371	70633050	1-3	37300	55000	34.2			4.2	2.0	14.1	1.3				
	1	8900	559369	70633020	4	38100	55000	32.2			5.1	1.7	2.5	1.3				
	1	6700	559369	70633020	5	38100	55000	32.2			5.1	1.7	2.5	1.3				
			559371	70633060		38800	55600	33.2			4.2	2.0	14.1	1.3				
	2	17451	559371	70633060	6-7	38800	55600	33.2			4.2	2.0	14.1	1.3				
	2	17702	559370	70633030	8-9	36400	53600	33.2			4.2	1.9	1.3					
	1	8121	559370	70633030	10	36400	53600	33.2			4.2	1.9	1.3					
			559369	70633020		36600	54600	35.2			5.1	1.7	2.5	1.3				
	1	6700	559369	70633020	11	36600	54600	35.2			5.1	1.7	2.5	1.3				
	1	6386	70466	730110483081010	12	35400	52100	36.2			4.2	1.6	0					
TOTAL	12	221095	LVS.															
J.0290*MINX37*XC (COATING G90 OZ/FI2)	3	23707	559369	706280677435030	1-3	39700	57500	33.2			5.1	1.7	2.5	1.3				
	4	3438	559371	706290677433070	4-7	39800	55500	35.2			4.2	2.0	14.1	1.3				
	1	6732	559370	706310677433040	8	40800	55000	35.2			4.2	1.9	1.3					
	1	6732	559370	706310677433040	9	40800	55000	35.2			4.2	1.9	1.3					
			559371	706320677433070		37000	54600	33.2			4.2	2.0	14.1	1.3				
	3	22134	559371	706320677433070	10-12	37000	54600	33.2			4.2	2.0	14.1	1.3				
	2	9175	559369	706260677433010	13-14	33400	56000	34.2			5.1	1.7	2.5	1.3				

RECEIVED

OCT 03 1994

U.S. DECK, INC.

TO BE CONFIRMED

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED
HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE RULES
OF THE ASSOCIATION

KIMITSU WORKS
NIPPON STEEL CORPORATION

F
G
UR
R
F
1



United States Steel Corporation

DATE	09/01/83
------	----------

NJB
②

ROOZINC
NEW YORK REGIONAL SALES
PARK 80 PLAZA WEST-ONE
SADDLE BROOK N J 07662

PURCHASE ORDER DATE	08/30/83	ORDER NO	1305	246
QMS RATING/RECORD		USS ORDER NO.	48625-3	
		TERMS	30-1-10	

UNITED STEEL DECK INC
P O BOX 652
SUMMIT N J 07901

UNITED STEEL DECK INC
% PRIOR COATED METALS
NEWFORD MILL ROAD
MORRISVILLE PA

REQ	SW1030	SCHED	
MOE	CTR		NOV
QTY	1	TOTAL WEIGHT	300000
		PLANT	FAIRLESS, PENNA.
		CONVEYANCE	MILL

PROD: GALV SHEET CARBON
SPEC: ASTM A446-76 GRADE A STRUCTURAL QUALITY SUPPRESSED SPANGLE G90 NO
CHEM TREAT OIL
APLN: B FOR PAINTING ON CONTINUOUS LINE FOR WALL PANELS
INSP: 01 MILL CERTIFIED T/R 3 T/R TO UNITED STEEL DECK INC 14 HARMICH
ROAD SOUTH PLAINFIELD NJ 07080
MPL: MOEF*CTR
PACKPRNT*2PS4
MARKPRNT*2M1*EXC OMIT ALL MARKS ON COIL
LOADPRNT*2L85*FLATBED TRUCK FOR C-HOOK UNLDG

ITEM	DESCRIPTION	FT LENGTH	IN	PC WGT	DIFF	QUANTITY	ITEM WGT
01	.0230MIN X 44-1/2 COIL			MAX 25000			300000
	26 27	ID 20	OR 24				
		OD MAX 60					
						SELWY P 5.0 M 5.0	
						EXP TO SHIP WB 10/30	

RECEIVED
SEP 8 1983
U.S. DECK, INC.

SEP 8 1983
U.S. DECK, INC.

THANK YOU FOR YOUR ORDER •

Mac Legg 9/7/83

McLemmen Legg, Inside Sales Rep

This order for the products specified herein is accepted, subject exclusively to the conditions of this acknowledgment those on the reverse hereof, at our current prices and is being entered in our mill schedules for the months indicated. When these schedules are reached for production, you will be notified should there be any change in the expected time of shipment shown above. Prices are subject without notice and billings will be made at our mill prices plus applicable extras in effect at time of shipment plus actual transportation items priced at destination, less competitive allowance indicated above after the term, "CA."

NOTE: This is an Order Acknowledgment unless identified as "Order Change Accepted," "Shipping Schedule," or "Revised Shipment"



United States Steel Corporation

Metallurgical Test Report



01 000 0772 (REV. 7-78)

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS PREPARED BY THE OFFICE OF: **G.D. LUKES** MANAGER QUALITY ASSURANCE DATE **11/07/83**

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS PREPARED BY THE OFFICE OF: **G.D. LUKES** MANAGER QUALITY ASSURANCE DATE **11/07/83**

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS PREPARED BY THE OFFICE OF: **G.D. LUKES** MANAGER QUALITY ASSURANCE DATE **11/07/83**

P.O. DATE: 08/30/83 PURCHASE ORDER NO. 13084-S

SHIPPERS NO. 44B114 MILL ORDER NO. EB48625 INVOICE NO. 146-55755

VEHICLE IDENTITY TA95815 PA

UNITED STEEL DECK INC
2 PRIOR COATED METALS
NEWFORD HILL ROAD
MORRISVILLE PA

SHIP TO: 91 101 95 96

SHIP FROM: 91 101 95 96

SHIP TO: 91 101 95 96

SHIP FROM: 91 101 95 96

REC. GALV SHEET CARBON
ASTM A446-76 GRADE A STRUCTURAL QUALITY SUPPRESSED SPANGLER G90 NO
CHEM TREAT OIL
01 MILL CERTIFIED T/R 3 T/R TO UNITED STEEL DECK INC 14 HARMICH
ROAD SOUTH PLAINFIELD NJ 07080

ITEM NO.	MATERIAL DESCRIPTION		QUANTITY	WEIGHT	HEAT NO.	TEST OR PIECE IDENTITY	YIELD PT. PST	TENSILE STR.		ELONGATION %		% RED. OF AREA
	THICKNESS OR SECTION	WIDTH, DIA. OR FL. WT.						LENGTH	IN 8"	IN 2"		
1	.0230	44 1/2	2	42200	02T569	0230 min	H3,000	PST	35			
					07T492	0230 min	H1,600	53,000	33			
						0290 min	H2,200	52,000	34			
						0230 min	H1,700	54,500	32			

RECEIVED

NOV 21 1983

U.S. DECK, INC.

HEAT NO.	TYPE	C	AN	P	S	SI	CU	NI	CR	MO	SN	AL	N	V	B	TI	CB	CO
02T569	HEAT 07	0037	0037	008	021													
07T492	HEAT 09	0000	0000	009	020													
* * * * * END OF DATA * * * * *																		

File # 442

United States Steel Corporation

Metallurgical Test Report



01 000 0772 (REV 7-78)

REQ. JOB, CONTRACT NO. 11000

P.O. DATE 08/30/83 PURCHASE ORDER NO. 130B1-S

SHIPPER NO. 445767 MILL ORDER NO. EB48625 INVOICE NO. 146-52811

VEHICLE DESIGNATION TA95B15 PA

FAIRLESS WORKS
FAIRLESS HILLS, PA. 19030

UNITED STEEL DECK INC
P O BOX 652
SUMMIT NJ 07901

UNITED STEEL DECK INC
2 PRIOR COATED METALS
NEWFORD MILL ROAD
MORRISVILLE PA

SHIP TO

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS SAMPLED, TESTED AND INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FILLS REQUIREMENTS IN SUCH RESPECTS.

PREPARED BY THE OFFICE OF: G.D. LUKES MANAGER
QUALITY ASSURANCE
DATE 10/27/83

SPEC: GALV SHEET CARBON
ASTM A446-76 GRADE A STRUCTURAL QUALITY SUPPRESSED SPANGLE G90 NO CHEM TREAT OIL
01 MILL CERTIFIED T/R 3 T/R TO UNITED STEEL DECK INC 14 HARMICH ROAD SOUTH PLAINFIELD NJ 07080

96 107 107 10% 96
91 101 95 9%

107 101 95 9%

ITEM NO.	MATERIAL DESCRIPTION		QUANTITY	WEIGHT	HEAT NO.	TEST OR PIECE IDENTITY	YIELD PT. PST	TENSILE STR. PSI	ELONGATION %		% RED OF AREA					
	THICKNESS OR SECTION	WIDTH, DIA. OR FL. WT.							LENGTH	IN 8"		IN 2"				
1	-0230	44 1/2	4	88500	05T690	0230 min	43,300	53,500	34	34						
		COIL			021569	0230 min	45,300	55,500	35	35						
						0230 min	43,000	53,000	35	35						
						0230 min	41,000	53,000	33	33						
RECEIVED NOV 15 1983																
RECEIVED NOV 14 1983																
U.S. STEEL CORP. RECECK, INC. U.S. DECK, INC.																
HEAT NO.	TYPE	C	MAN	P	S	SI	CU	NI	CR	MO	SN	AI	N	V.	U.S. STEEL CORP.	CO
021569	HEAT 009	0040	009	019												
021569	HEAT 000	0037	000	021												
*** END OF DATA ***																

107 101 95 9%

HULTI

NISSHO # 2770

26 GA.

**NIPPON STEEL CORPORATION
MILL SHEET**

Head office: 63 Oiwakechi 2 Chome
Chiyodaku, Tokyo 100-Japan
Nagoya works: 53 Tokai-machi
Tookataishi Aichi-Pref., Japan

Contract No.: 1-865-H7-5-1-5090

Commodity: GALVANIZED STEEL SHEET IN COIL

Specification: ASTM A446-76 GRADE D 50KSI (MIN)

NISSHO-IMAI JAPAN
ERICA CORP. NEW YORK
2KG-UN096701

Customer: ERICA CORP. NEW YORK
Shipper: NISSHO IMAI CORPORATION

Mill Sheet No.: G8701

Date of Issue: 1981/01/19

Size	Number of Product	Weight C-NET	Charge No.	Control No.		Tension Test GL-2M			Band Test	Erlson Value mm	Chemical Composition				Remarks	
				Cell No.	Inspection No.	Y.P. PSI	T.S. PSI	EL %			C x100	Si x100	Mn x100	P x100		S x100
0.0190INX43-1/8IN IN COIL COATING G60	2	16.684	NZ4247	14247	2	55500	68300	30			16	2	58	17	15	0111
"	2	16.270	"	14248	4	56900	72600	31			"	"	"	"	"	0111
"	2	16.508	"	14249	6	55500	68300	31			"	"	"	"	"	0111
SUB-TOTAL.....	6	49.862	(LBS)	109,927							KG/PIECE (7,1990 - 6,654 25)					
TOTAL.....	6	49.862	(LBS)	109,927												

S. S. Saito
SUPERVISOR
JAPAN INSPECTION CO., LTD.

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE RULES OF THE CONTRACT.

S. F. Dzinnica
MANAGER OF INSPECTION SECTION
NAGOYA WORKS



THIS CERTIFIED TEST REPORT HAS BEEN DELIVERED TO A COMPANY OR INDIVIDUAL PURCHASED FROM ARMCO INC TO AVOID THE POSSIBILITY OF ITS MISUSE OR REDELIVERY OF THIS REPORT TO A THIRD PARTY IT MUST BE RECEIVED BY UNDER THE NAME OF SUCH CONSIGNEE

TEST REPORT # 1698
737-1043-10-7-83

PAGE 1 OF 1

DATE ORDERED 08/09/83
PURCHASE ORDER NO. 7153744
SHIPMENT NO. 157

DATE SHIPPED 10/07/83
TRUCK

CONTRACT NO. C. G. MARTIN
P. O. BOX 9345
TULSA OK 74107

ORDER NUMBER HSB576
VEHICLE IDENTIFICATION NICKELL

CONSIGNEE C. G. MARTIN
P. O. BOX 9345
TULSA OK 74107

TEST REPORTS FROM TRIDENT CO.
OK 71978

INVOICE # OK 74107
CUSTOMER Nulti Ltd.
P.O. # C850709K660

ITEM # 1
DATE 7-30-85
SALES ORDER # D.J.

3520PLATES ASTM A36 * REV-81A

THE CHEMICAL, PHYSICAL OR MECHANICAL TESTS REQUESTED HEREIN ARE CORRECT AS CONTAINED IN THE RECORDS OF THE COMPANY

SIGNED D. D. REED PHYS. MET. ENG.
METALLURGICAL DEPT

ITEM	MATERIAL	DESCRIPTION	QTY.	WEIGHT	HEAT NO.	PIECE NUMBER	YIELD P.S.I.	TENSILE P.S.I.	% ELONG.	% REDUCT BEND	1	2	3	AVG
002	1/2 X 72 X 240		1		800034		37300 37500	65700 63300	30.0-8" 28.0-8"					
003	2-1/4 X 72 X 240		1		58262		46900 41700	70800 73300	31.0-2" 30.0-2"					
004	2-3/4 X 72 X 240		1		80053		37000 39900	71600 72600	31.0-2" 29.0-2"					
005	3 X 72 X 240		1		80079		36800 40800	70600 70800	25.0-2" 29.0-2"					

LAT NUMBER	TYPE	G.S.	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Ti	V	B	Co	Al	N
B0034	LDL		.12	.97	.010	.023	.05										
50262	LDL	9	.14	1.07	.010	.011	.23										
00053	LDL	7	.18	1.01	.010	.017	.20										
B0079	LDL	8	.17	.92	.013	.024	.20										

Test Number 130-85	Type of Test PULLOVER	PIN/STUD TYPE ENPS-1-15	Date 10-15-85	Page # of	P.A.T. TOOL DX 650	SERIAL NO. 011688
Base Material 1/2" STEEL	Casting Date	Check Date	Side Top/Bottom	Embedment	EQUIPMENT	Temperature 70°F
Strength A-36	BOOSTER STRENGTH AND TYPE	FASTENING DIRECTION DOWNWARDS	Test Equipment: 26 GA...			
Other Specifications:						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENT'S	FAILURE MODE	COMMENTS
1		.287	1074			SHEET pullover
2		.310	1168			WASHER pullover
3		.306	830			SHEET pullover
4		.315	1054			WASHER PULLOVER
5		.270	1086			WASHER pullover
6		.299	1180			WASHER pullover
7		.277	984			" "
8		.270	1000			WASHER pullover
9		.286	862			" "
10		.276	982			WASHER pullover
\bar{x}		.292	1016			
Sx			108			
C.V.			10.7%			
Testers Signature/Company:				Witnesses Sign./Company/Date: <i>[Signature]</i> 10/15/85		

10-15-85

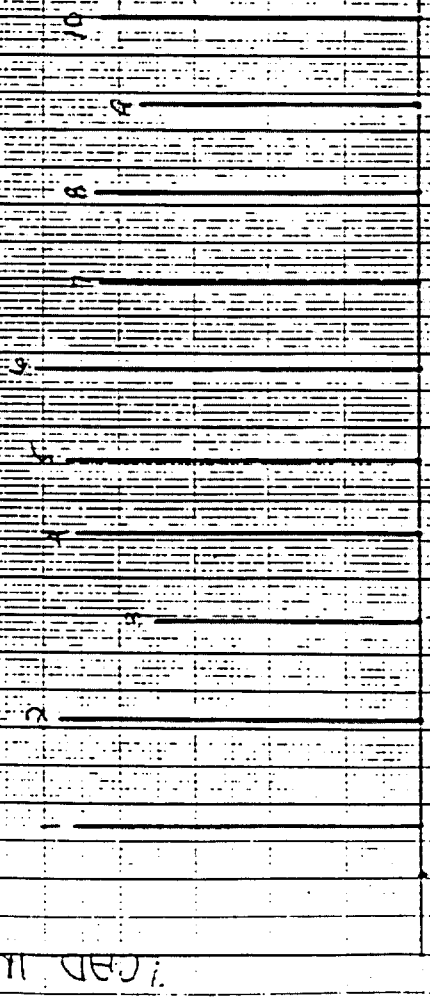
461510

10-2 10 X 10 TO CENTINER IN X 10 CM
REDFIELD & CO. MADE IN U.S.A.

DECKING PULL OVER TEST
ENIPB-31-115 FASTENER
216 GAUGE

SCALE

LOAD 1671.8 330 LBS



LOAD 1671.8 330 LBS

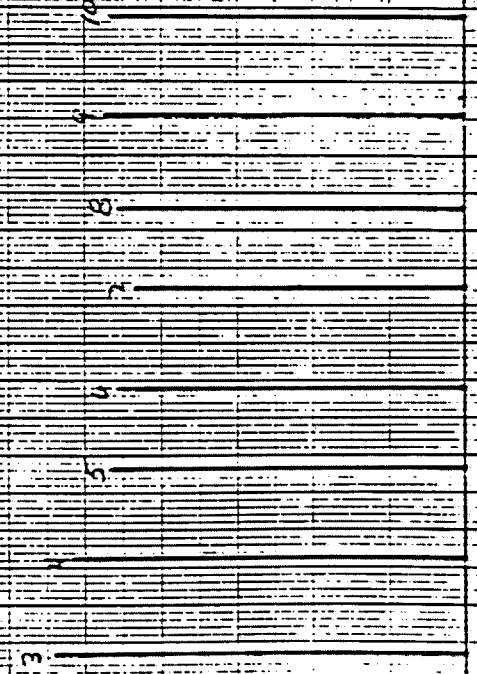
Test Number	Type of Test	PIN/STUD TYPE	Date	Page #	P.A.T. TOOL	SERIAL NO.
130-85	PULLOVER	ENPR-21L15	10-15-85	of	DX 650	011688
Base Material	Casting Date	Check Date	Side	Embedment	EQUIPMENT	Temperature
1/2" STEEL			Top/Bottom			70°F
Strength	BOOSTER STRENGTH AND TYPE	FASTENING DIRECTION				
A-36	Purple	DOWNWARDS				
Other Specifications:						
Test Equipment: 26 GAUGE						

#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.362	780			SHEET PULLOVER
2		.341	1162			"
3		.334	1250			"
4		.336	1188			"
5		.341	1076			"
6		.351	1052			"
7		.349	1004			"
8		.343	1064			"
9		.359	1090			"
10		.365	1088			"
X		.348	1075			"
Sx						
Uv						

Testers Signature/Company:	Witnesses Sign./Company/Date:

Ryd
M-15-85

DECKING PULLOVER TEST
EUPD-21-115 FASTENER
20 GAUGE



LOAD IN LBS

STAGES

LOAD = 1000 ± 30 LBS

Test Number	Type of Test	PIN/STUD TYPE	Date	Page #	P.A.T. TOOL	SERIAL NO.
130-85	PULLOVER	ENP22115	10-8-88	of	DX 650	011688
Base Material	Casting Date	Check Date	Side	Embedment	EQUIPMENT	Temperature
1/2" STEEL			Top/Bottom			70°F
Strength	BOOSTER STRENGTH AND TYPE	FASTENING DIRECTION				
A-36	Purple	DOWNWARDS				
Other Specifications:						
Test Equipment: 24 GA.						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.288	1156			WASHER PULLOVER
2		.283	1012			" "
3		.286	1128			" "
4		.278	1122			" "
5		.286	1068			" "
6		.299	1020			" "
7		.278	1014			" "
8		.316	1182			" "
9		.289	1206			" "
10		.286	1358			" "
\bar{x}		.289	1127			" "
Sx			108			
CV			9.6%			
Testers Signature/Company:				Witnesses Sign./Company/Date:		
				<i>[Signature]</i> 10-8-88		

G

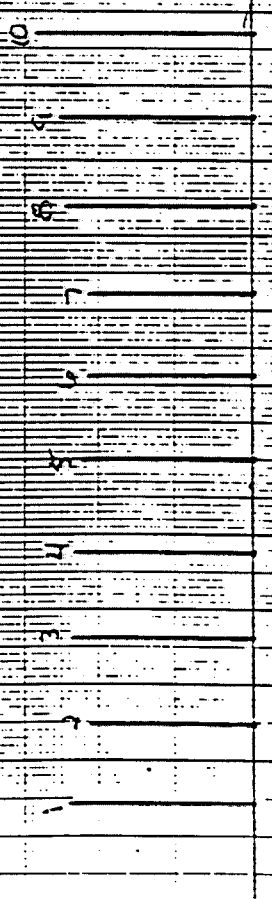
46 1510

Bill
D. W. Co
10-8-85


DECKING PULLOVER TEST
ENP 3-21-115 FASTER
21 GAUGE

SCALE

LOAD = 1 CM = 400 LBS



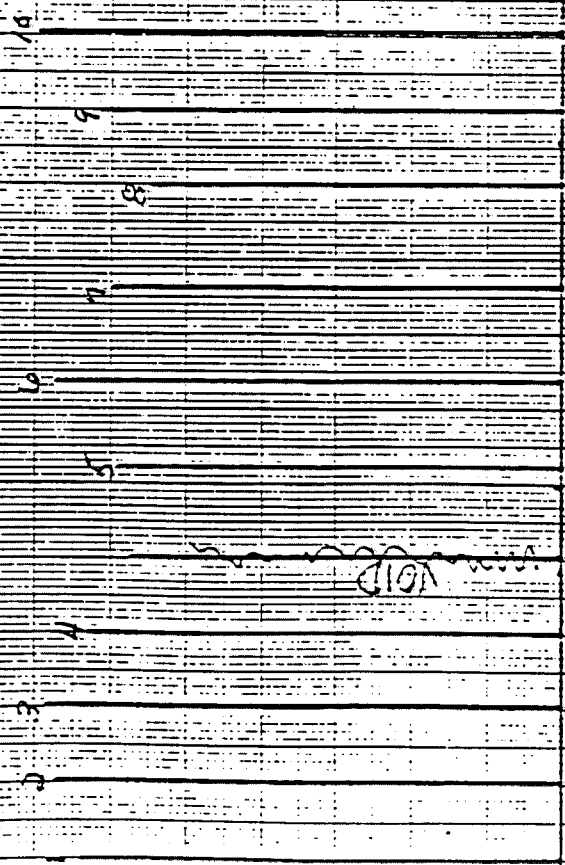
LOAD IN LBS

Test Number	Type of Test	PIN/STUD TYPE	Date	Page #	P.A.T. TOOL	SERIAL NO.
130-85	PULLOVER	ENR-21-L5	10-15-85	of	DX 650	011688
Base Material	Casting Date	Check Date	Side	Embedment	EQUIPMENT	Temperature
1/2" STEEL			Top/Bottom			70°F
Strength	BOOSTER STRENGTH AND TYPE	FASTENING DIRECTION	Test Equipment:			
A-36	Purple	DOWNWARDS	24 GAUGE			
Other Specifications:						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.338	1426			SHEET PULLOVER
2		.315	1570			"
3		.337	1594			"
4		.341	1462			"
5		.334	1362			"
6		.343	1566			"
7		.351	1388			"
8		.365	1266			"
9		.350	1420			"
10		.345	1614			"
X		.342	1475			"
Sx			115			
Cv			7.8%			
Testers Signature/Company:			Witnesses Sign./Company/Date:			
						

R. J. J.
10-15-85

DECKING PULL OVER TEST
EMPD-21-115 FASTENERS
2H GAUGE

LOAD 111 LBS



SCALE

LOAD = 100 = 330 LBS

46 1510

142 10 X 10 TC
NUM. FEL. &
CENTIMETER
IN X 1.00
IN CO. MADE IN U.S.A.

Test Number	Type of Test	PIN/STUD TYPE	Date	Page #	P.A.T. TOOL	SERIAL NO.
130-85	PULLOVER	ENPARALIS	10-15-85	of	DX 650	011688
Base Material	Casting Date	Check Date	Side	Embedment	EQUIPMENT	Temperature
1/2" STEEL			Top/Bottom			70°F
Strength	BOOSTER STRENGTH AND TYPE	FASTENING DIRECTION				
A-36	Purple	DOWNWARDS				
Other Specifications:						
Test Equipment: 22 GAUGE [.0295"]						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.352	1610			SHEET PULLOVER
2		.343	1580			"
3		.346	1618			"
4		.346	1650			"
5		.358	1550			"
6		.352	1692			"
7		.355	1746			"
8		.347	1576			"
9		.362	1660			"
10		.350	1552			"
X		.351	1623			"
Sx			3.64			
Uv			3.96			
Testers Signature/Company:				Witnesses Sign./Company/Date:		
				[Signatures]		

46 1510

1 1/2" 10 X 10 TC ECONOMIZER 10 X 10 (M)
KLUFFEL & ... CO. MADE IN U.S.A.

DECKING PULLOVER TEST
ENPD-21-115 FASTENER
27 GAUGE

11/15/50

LOAD 115 LBS.

SCALE:

LOADS (CM) 23.0 LBS



Test Number	Type of Test	PIN/STUD TYPE	Date	Page #	P.A.T. TOOL	SERIAL NO.
130-85	PULLOVER	ENPS2115	10-2-85	of	DX 650	011688
Base Material	Casting Date	Check Date	Side	Embedment	EQUIPMENT	Temperature
1/2" STEEL			Top/Bottom			70°F
Strength	BOOSTER STRENGTH AND TYPE	FASTENING DIRECTION				
A-36	BLACK	DOWNWARDS				
Other Specifications:						
Test Equipment: 22 GAUGE						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.271	1250			WASHER PULLOVER
2		.291	1248			" "
3		.303	1272			" "
4		.286	1118			" "
5		.304	1288			" "
6		.298	1232			" "
7		.309	1294			" "
8		.285	1136			" "
9		.289	1356			" "
10		.292	1214			" "
X		.293	1241			" "
Sx						
Cv			5.8%			
Testers Signature/Company:				Witnesses Sign./Company/Date:		
				<i>[Signatures]</i> 10-2-85		

46 1510

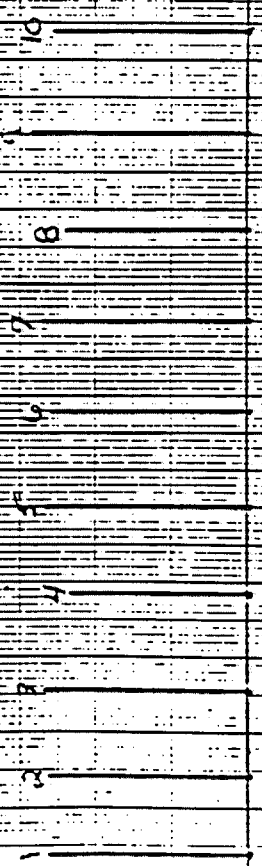
142 10 X 10 10 CEMENTUM IN A 7 CM
NUMBER 81 (100 mm) 833

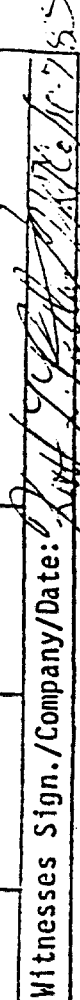
R. G. P.
W. M. Co.
10-8-85

DECKING TRUCKER TEST
ENSP3-21-LIS FASSELER
22 SCALE

SCALE
LOAD = 1CM = 404 LBS

LOAD 10 LBS

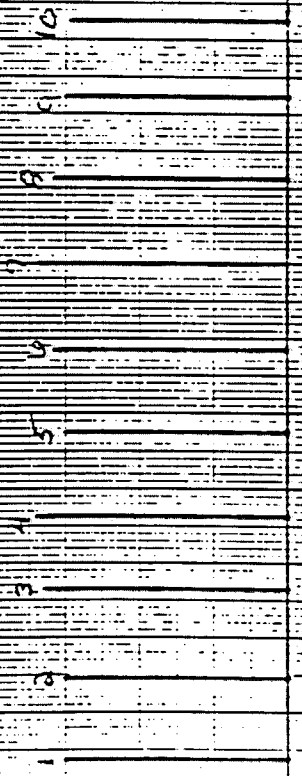


Test Number	Type of Test	PIN/STUD TYPE	Date	Page #	P.A.T. TOOL	SERIAL NO.
130-85	PULLOVER	ENP32-115	10-7-85	of	DX 650	011688
Base Material	Casting Date	Check Date	Side	Embedment	EQUIPMENT	Temperature
1/2" STEEL			Top/Bottom			70°F
Strength	BOOSTER STRENGTH AND TYPE	FASTENING DIRECTION				
A-36	BLACK	DOWNWARDS				
Other Specifications:						
Test Equipment: 20 GAUGE						
(A)						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.285	1418			pullover
2		.280	1416			" "
3		.279	1548			pullover
4		.328	1600			" "
5		.284	1416			" "
6		.296	1490			" "
7		.288	1592			" "
8		.296	1492			" "
9		.278	1418			" "
10		.286	1386			" "
X		250	1478			" "
Sx			79			
Uv			5.47			
Testers Signature/Company:					Witnesses Sign./Company/Date:	
						

DECKING PULLOVER TEST
 ELP 3-21-15 FASTENER
 20 GAUGE

10-7-85

LOAD 11.5 LBS.



SCAVENGE
 LOAD = 10.5 LBS

Test Number 130-85	Type of Test PULLOVER	PIN/STUD TYPE EMP2-21-215	Date 10-8-85	Page # _ of _	P.A.T. TOOL DX 650	SERIAL NO. 011688
Base Material 1/8" STEEL	Casting Date	Check Date	Side Top/Bottom	Embedment	EQUIPMENT	Temperature 70°F
Strength A-36	BOOSTER STRENGTH AND TYPE BLACK	FASTENING DIRECTION DOWNWARDS		Test Equipment: 20 GAUGE SHEET METAL		
Other Specifications:						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.334	2000			SHEET PULLOVER
2		.348	1992			"
3		.341	1972			"
4		.351	1808			"
5		.352	1900			SHEET PULLOVER
6		.336	2112			"
7		.349	2058			"
8		.350	1928			"
9		.358	2038			"
10		.341	2036			"
X		.346	1984			"
Sx			.88			
Uv			4.47			
Testers Signature/Company:				Witnesses Sign./Company/Date:		

[Handwritten signatures and dates]

J

[Handwritten signature]
10-8-85

46 1510

INSTRUMENT NUMBER 46 1510

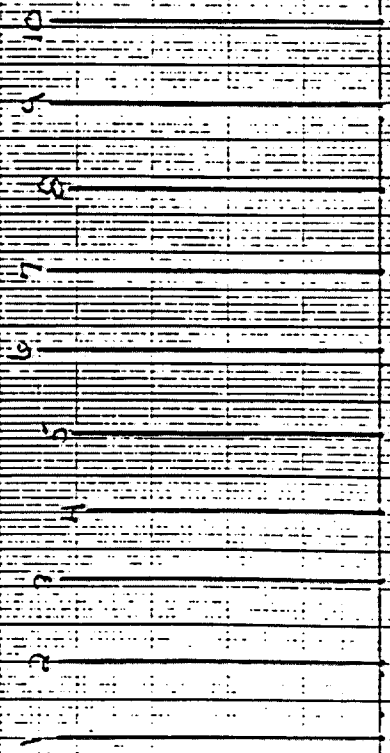
DECKING PULL OVER TEST

EUPD-21-113 FASTENER

20 GAUGE

SCALE:

LOAD = 1000 LBS



LOAD IN LBS

Test Number 130-85	Type of Test PULLOVER	PIN/STUD TYPE ENPSA-LIS	Date 10-7-85	Page # __ of __	P.A.T. TOOL DX 650	SERIAL NO. 011688
Base Material 1/2" STEEL	Casting Date	Check Date	Side Top/Bottom	Embedment	EQUIPMENT	Temperature 70°F
Strength A-36	BOOSTER STRENGTH AND TYPE BLACK	FASTENING DIRECTION DOWNWARDS	Test Equipment: 18 GAUGE			
Other Specifications: (B)						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.290	1646			WASHER PULLOVER
2		.303	1566			WASHER PULLOVER
3		.286	1586			" "
4		.288	1468			WASHER PULLOVER
5		.279	1632			" "
6		.291	1596			" "
7		.286	1976			" "
8		.305	1718			WASHER PULLOVER
9		.289	1610			" "
10		.286	1716			" "
X		.250	1631			" "
Sx			89			
UV			5.4%			
Testers Signature/Company:				Witnesses Sign./Company/Date:		

[Handwritten signatures and dates]

12-7-85

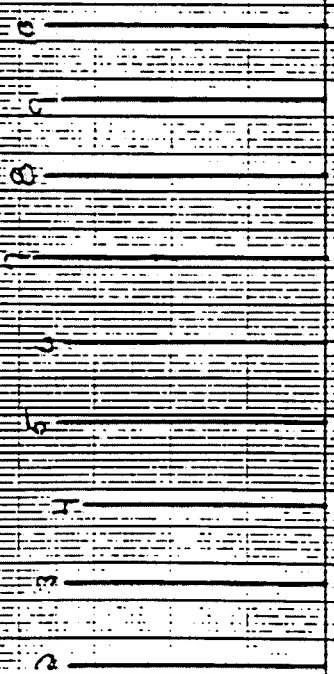
DECKING PULL OVER TEST

ENR3-D-415 FASTENER

1/8 GAUGE

SCALE

LOAD = 1000 LBS



LOAD 10 LBS

461510

1 1/2" 10 X 10 T.C. CALIBRATOR INCHES
KLEINFELDER & CO. MADE IN U.S.A.

Test Number	Type of Test	PIN/STUD TYPE	Date	Page #	P.A.T. TOOL	SERIAL NO.
130-85	PULLOVER	ENP-21-115	10/7/85	__ of __	DX 650	011688
Base Material	Casting Date	Check Date	Side	Embedment	EQUIPMENT	Temperature
1/2" STEEL			Top/Bottom			70°F
Strength	BOOSTER STRENGTH AND TYPE	FASTENING DIRECTION				
A-36	BLACK	DOWNWARDS				
Other Specifications:						
Test Equipment: 18 GAUGE						
(C)						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.358	2192			SHEET PULLOVER
2		.365	2328			"
3		.364	2378			SHEET PULLOVER
4		.343	2330			WASHER PULLOVER
5		.345	2324			WASHER PULLOVER
6		.367	2598			WASHER PULLOVER
7		.381	2384			"
8		.354	2562			WASHER PULLOVER
9		.362	2342			WASHER PULLOVER
10		.348	2474			WASHER PULLOVER
\bar{x}		.359	2391			
Sx		.122				
U.V		5.1%				
Testers Signature/Company:				Witnesses Sign./Company/Date:		
				<i>Accepted</i> <i>10-7-85</i>		

46 1510

ENGINEER IN A TEST
CO. MATERIALS

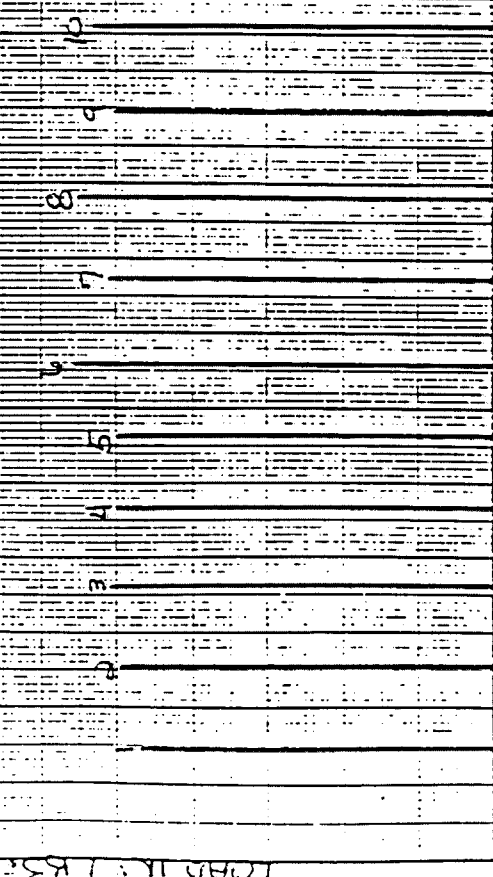
DECKING PULLNER TEST

EWP-21-115 FASHELER

18 GAUGE

SUBMIT

LOAD = 1000 LBS.



LOAD IN LBS.

10-7-85

Test Number	Type of Test	PIN/STUD TYPE	Date	Page #	P.A.T. TOOL	SERIAL NO.
130-85	PULLOVER	ENPSALIS	10-8-85	__ of __	DX 650	011688
Base Material	Casting Date	Check Date	Side	Embedment	EQUIPMENT	Temperature
1/2" STEEL			Top/Bottom			70°F
Strength	BOOSTER STRENGTH AND TYPE	FASTENING DIRECTION	Test Equipment:			
A-36		DOWNWARDS	16 GAUGE SHT. METAL			
Other Specifications:						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.292	2058			WASHER PULLOVER
2		.291	2078			" "
3		.293	2046			" "
4		.290	2122			" "
5		.293	1992			" "
6		.296	2048			" "
7		.295	2026			WASHER PULLOVER
8		.298	2084			" "
9		.289	2188			" "
10		.297	2062			" "
\bar{x}		.293	2070			
Sx			54			
Cv			2.6%			
Testers Signature/Company:				Witnesses Sign./Company/Date:		
				<i>Jay... ..</i> 10-8-85		

46 1510

INCH TO CENTIMETER RULER

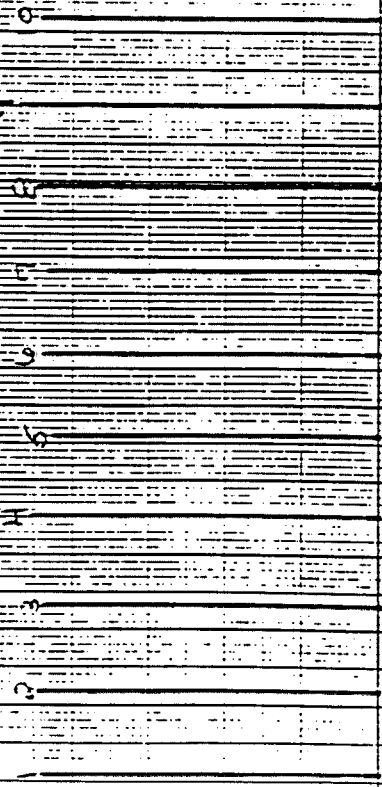
MADE IN U.S.A.

Handwritten: 10-8-85

Decking Pullover Test
ENR 3 - 21-11.5 FASTER
10 GAUGE

SCALE

LOAD = 161 LBS.



LOAD IN LBS.

Test Number	Type of Test	PIN/STUD TYPE	Date	Page #	P.A.T. TOOL	SERIAL NO.
130-85	PULLOVER	INPA-21-L15	10-8-85	of	DX 650	011688
Base Material	Casting Date	Check Date	Side	Embedment	EQUIPMENT	Temperature
1/2" STEEL			Top/Bottom			70°F
Strength	BOOSTER STRENGTH AND TYPE	FASTENING DIRECTION				
A-36	BACK	DOWNWARDS				
Other Specifications:						
Test Equipment: 16 GAUGE SHT. METAL						
#	PIN TYPE	STANDOFF (IN.)	ULT. LOAD (LBS.)	GRAPH INCREMENTS	FAILURE MODE	COMMENTS
1		.378	2668			WASHER PULLOVER
2		.369	2718			" "
3		.348	2980			" "
4		.364	2746			" "
5		.358	2942			WASHER PULLOVER
6		.363	2672			" "
7		.360	2744			" "
8		.358	2838			" "
9		.355	2864			" "
10		.352	2812			" "
X		.361	2793			" "
Sx			299			
Lv			3.67			
Testers Signature/Company:				Witnesses Sign./Company/Date		
				James H. Thompson / Welding 12/8/85		

461510

1 1/2" X 10" PHOTO CHROMOMETER IN A. S. I. M.
K&E NUFFEL & LUGER CO. MADE IN U.S.A.

John U.S. Testing
10-8-85

DECKING PULLOVER TEST
ENP2-21-LIS FASTENER
1/6 GAUGE

SCALE:

2 3 4 5 6 7 8 9 10

LOAD = 1 CM = 464 LBS.

LOAD IN LBS.

10-15-85

2 P.A.
10-15-85

LEAD

16 CM = 7428 lbs. (2.2)

1 CM = 464 (2.2)

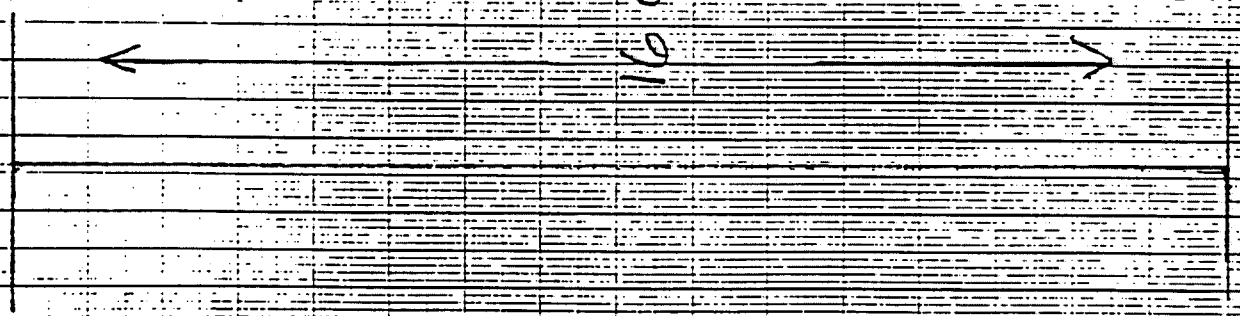
1 CM = 232 lbs. (1.1)

CALIBRATION LOG

26 BS

K&S 10 X 10 TC CENTIMETER 10 X 10 CM
ALUFEL A. INC. CO. MADE IN U.S.A.

461510



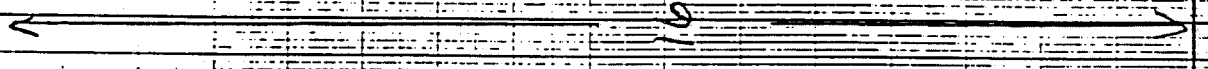
115
11/10/85
11-11-85

46 1510

10 X 10 TO CENTIMETER 10 X 5 CM
K&S NEUFEL & CO. MADE IN U.S.A.

CALIBRATION LOG

16 CM = 7428 LBS.



46 1510

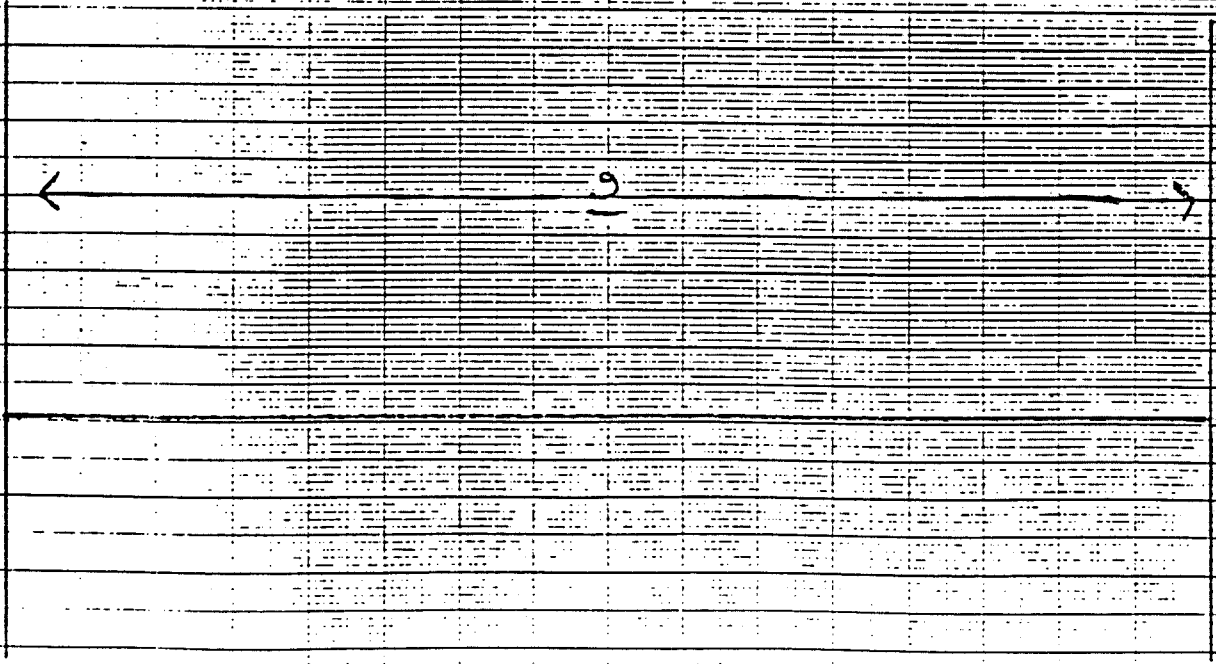
14 1/2" 10 X 10 TO CENTIMETER
K&S NEUMER & SONS CO. NEW YORK

Q. 14

10-8-85

CALIBRATION LOG

16 CM = 7428 LBS





United States Testing Company, Inc.

DX 10

Tulsa Division

1341 NO. 108th EAST AVENUE TULSA, OKLAHOMA 74116
TELEPHONE: AREA CODE 918-437-8333

REPORT OF TEST

NUMBER

CLIENT: Hilti, Inc.
Technical Marketing Services
Po Box 470400
Tulsa, OK. 74147

EN85-0219.1
12/12/85
Rev. 5/6/86

Attn: Michael Causey

SUBJECT: Tensile Strength of Hilti Drive Pins in Steel Plate.

SCOPE:

Tests to determine the tensile strength of Hilti ENP2-21-L15 and ENP3-21-L15 drive pins installed in A-36 steel plate of various thicknesses were conducted by Hilti personnel and the procedures and results are documented in Hilti Test Report No. WENT 131-85.

PROCEDURE:

The Hilti drive pins were installed in varying thicknesses of A-36 steel plate in accordance with the manufacturer's instructions. The fasteners were loaded in tension while the loads and deflections were recorded.

SIGNED FOR THE COMPANY

Robert C. Smith
BY Robert C. Smith, M.S., P
Mgr/Product Certificati

Page 1 of 2

Laboratories in: New York • Chicago • Los Angeles • Houston • Tulsa • Memphis • Reading • Richland

THIS REPORT APPLIES ONLY TO THE STANDARDS OR PROCEDURES IDENTIFIED AND TO THE SAMPLE(S) TESTED. THE TEST RESULTS ARE NOT NECESSARILY INDICATIVE OR REPRESENTATIVE OF THE QUALITIES OF THE LOT FROM WHICH THE SAMPLE WAS TAKEN OR OF APPARENTLY IDENTICAL OR SIMILAR PRODUCTS. NOTHING CONTAINED IN THIS REPORT SHALL MEAN THAT UNITED STATES TESTING COMPANY, INC., CONDUCTS ANY QUALITY CONTROL PROGRAM FOR THE CLIENT TO WHOM THIS TEST REPORT IS ISSUED UNLESS SPECIFICALLY SPECIFIED. OUR REPORTS AND LETTERS ARE FOR THE EXCLUSIVE USE OF THE CLIENT TO WHOM THEY ARE ADDRESSED, AND THEY AND THE NAME OF THE UNITED STATES TESTING COMPANY, INC. OR ITS SEALS OR INSIGNIA, ARE NOT TO BE USED UNDER ANY CIRCUMSTANCES IN ADVERTISING TO THE GENERAL PUBLIC AND MAY NOT BE USED IN ANY OTHER MANNER WITHOUT OUR PRIOR WRITTEN APPROVAL. SAMPLES NOT DESTROYED IN TESTING ARE RETAINED A MAXIMUM OF THIRTY DAYS



Hilti, Inc.
Technical Marketing Services
EN85-0219.1
5/6/86
Page 2

ENP2-21-L15 & ENP 3-21-L15

ULTIMATE TENSILE PERFORMANCE IN A-36 STEEL

<u>MAT'L THICKNESS</u>	<u>1/4"</u>	<u>3/8"</u>	<u>1/2"</u>	<u>5/8"</u>
X Ult. Load (Lbs.)	2820	3375	3308	2968
Sx (Lbs.)	350	608	539	552
Cv (%)	12.4	18.0	16.3	18.6

All fastener ultimate pullout failure modes were found to be fastener pullout from the A-36 Steel.

CERTIFICATION

Hilti Report No. WENT-131-85 is a valid description of the procedures, conditions and results of the tests of Hilti ENP2-21-L15 and ENP3-21-L15 drive pins therein to the best of my knowledge, information and belief of the undersigned who witnessed the tests.