

附錄(四)

Tested object:	Wire Bz 10 mm ² 7x7x0,51 (Wire Cu-Li H LEONI Histral 10 mm ² 7x7x0,51)
Drawing no:	8WL7060-2
Production lot no:	
Manufacturer:	LEONI Draht GmbH, 93444 Bad Kötzing, Germany
Materials:	LEONI histral® (Bz)
Testing laboratory:	No laboratory, ccheck performed instorage area of Frapack GmbH Nürnberg
Test specification:	DIN 43138:1980-09, DIN 48203-2:1984-03, Data sheet Cu-Li H Histral 10 7x7x0,51 - No. 113877D, Material specification for "LEONI histral"
performed tests:	following DIN 43138, clause 2, 3, 4, DIN 48203-2, clause 2, 3, 4
Samples:	DIN 48203-2, clause 4, ... % of production lot (... of ... drum(s))

a) Material Composition :

Test arrangement : See standards: Material specification for "LEONI histral"/C18080 (ASTM B 936), Mechanical/electrical properties of starting material (single wires) as specified: R_m: 650-750 N/mm², ε: < 3%, κ: 64 – 74%

Test result : The material certificate 3.1 dated xx-xx-xx is available and conforms to standard.

passed	
yes	no
✓	

b) Surface Check of Rope / Single Wire:

Test arrangement : Visual check acc. to DIN 48203-2, clause 2.3

Test result : All checks conform to the standard.

passed	
yes	no
✓	

c) Dimension, Weight and Marking of Rope. Dimension of Single Wires:

Test arrangement : Measurements acc. to standards: Data sheet Cu-Li H Histral 10 7x7x0,51 - No. 113877D, DIN 43138, clause 3

Test result : All measurements conform to the standards. yes no

Test Dimension Rope	specimen / drum number								passed	
	1	2	3	4	5	6	7	8	yes	no
Diameter 4,65 mm ± 0,15 mm (4,50 mm – 4,80 mm)	Ok									
Weight 90,3 kg/km ± 8 % (83,4 kg/km – 97,5 kg/km)	Not checked									
Marking: Manufacturer's identification thread	Ok									
Single Wire										
Diameter 0,51 mm ± 0,01 mm (0,50 mm – 0,52 mm)	Ok									

Specimen / drum number 1=xxx, 2=xxx

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d) Tensile Strength of Rope or Single Wires:
Test arrangement : Measurement acc. to standards: Data sheet Cu-Li H Histral 10 7x7x0,51 - No. 113877D, DIN 43138, clause 3, DIN 48203-2, clause 2.5; not checked due to missing equipment in the storage area
Test result : All measurements conform to the standards. yes no

Rope
 breaking load 5,6 kN
 min. 95 %
 Acc. to DIN 43138, the single wires after stranding have to be tensile tested. At least 10% of the wires have to be tested. The tested wires have to be taken of different strands.
 1 wire of each strand (7 strands per rope) has been tensile tested:

Test Dimension	specimen / drum number							passed	
	1		2		3		yes	no	
	Load N	Rm**	Load N	Rm**	Load N	Rm**			
Single Wires tensile strength 589 N/mm ² - 730 N/mm ² * center wire of center strand ** d = 0,51 mm s. c	Strand1*								
	Strand2								
	Strand3								
	Strand4								
	Strand5								
	Strand6								
	Strand7								

e) Conductivity and Resistivity of Rope:
Test arrangement : Measurements acc. to standards: Data sheet Cu-Li H Histral 10 7x7x0,51 - No. 113877D, DIN 43138, clause 4, DIN 48203, clause 2.6; not checked due to missing equipment in the storage area
Test result : All measurements conform to the standards. yes no

Test Dimension	specimen / drum number								passed	
	1	2	3	4	5	6	7	8	yes	no
Wire Resistivity, 20° C in Ω*mm ² /m 0,0246 - 0,0278										
Conductivity in m/Ω*mm ² 36,0 - 40,6 (62% IACS - 70% IACS)										

f) Direction of Lay and Lay Ratio of Rope:
Test arrangement : Check acc. to standards: Data sheet Cu-Li H Histral 10 7x7x0,51 - No. 113877D, DIN 43138, clause 2, DIN 48203, clause 3; not checked due to missing equipment in the storage area
Test result : All checks conform to the standards. yes no

Test Dimension	specimen / drum number									passed	
	1	2	3	4	5	6	7	8		yes	no
Number of wires 49(7x7)											
	length of lay	length of lay	length of lay	length of lay	length of lay	length of lay	length of lay	length of lay	direction of lay		
Outer layer 38,0 mm - 46,0 mm									Z		
Single strands 12,0 mm - 16,0 mm									S		

present during testing: Customer: 李徐華頰 Siemens AG: [Signature] Manufacturer:

Test passed: yes no

SIEMENS TS EL Railway Electrification	Date and place: 09-08-2018 Ludwigshafen, Germany
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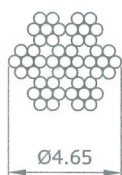
Part 2

Order no.	8WL7056-0
Designation	Wire 150
Material	Cu-ETP
Weight	1.34 kg/m
Nominal cross-section	150 mm ²
Number of wires	37
Calculated breaking load	58.98 kN
Perm. permanent current	510 A
d	15.8 mm

Further wire cross-sections on request.

Wire 10, flexible made of Bronze

for droppers



Order no.	8WL7060-2
Designation	Wire 10x49
Material	Bronze
Weight	0.09 kg/m
Nominal cross-section	10 mm ²
Number of wires	49
Min. tensile strength	589 N/mm ²
Perm. permanent current	75 A
Electric conductivity	36 Sm/mm ²

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91052 Erlangen

FAT PLAN

Date: 09.08.2018

Report no:

Project no: C5987

FAT/Sample Test

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Tested object: 8WL4620-0T, Dropper clip

Material No.: A2V00002684453

Drawing No.: A6Z00041771084, Version.-

Samples: ...specimen

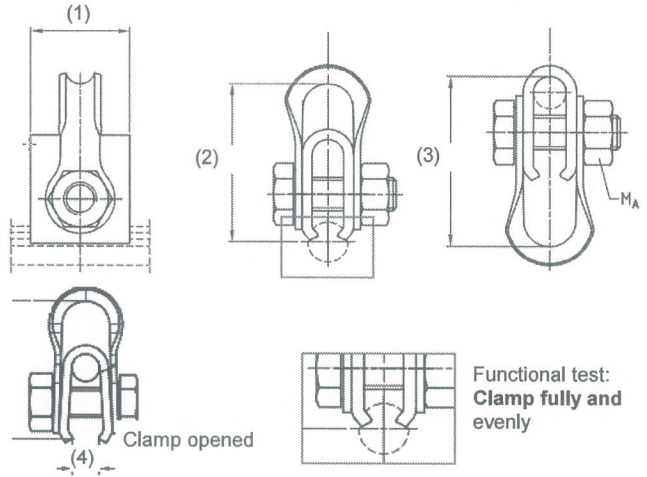
Manufacturer:

Materials:
Clamp hoop, CuNi2Si
Dropper strap:
Bolt M10, Nut stlSt.

Testing laboratory:

Test specification: EN 50119/ EN ISO 6506-1

Performed tests:
a) Verification of dimensions relevant for function according drawing:
b) Functional test:
c) Tightening torque test:
d) Tensile test:
e) Hardness test: optional



Functional test:
Clamp fully and evenly

a) Verification of dimensions relevant for function according drawing:

Test arrangement: All dimensions relevant for function were measured

test dimension acc. to drawing [mm]	measured dimension												passed		
	specimen no.												yes	no	
	1	2	3	4	5	6	7	8	9	10	11	12			
(1) 30 _{-0,5/+0,3}															
(2) 47 ±0,5															
(3) 49 ±0,5															
(4) 9 _{0/+1}															

Test result: test passed: yes no

Comments: *not tested*

b) Functional test:

Test arrangement:
1) Assemble with AC-80 to AC-150 and dissemble – Clamp fully and evenly, contact line removable
2) 8WL7034-0 (Wire 50mm2) and 8WL4622-0 (Clip M4) – clamp fully

passed	functional test												yes	no	
	specimen no.														
	1	2	3	4	5	6	7	8	9	10	11	12			
yes	✓														
no															

Test result: test passed: yes no

Comments:

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c) Tightening torque test:

Test arrangement: required: 28 Nm (25 Nm x Factor 1.1) without any damages after loosen the screw connection

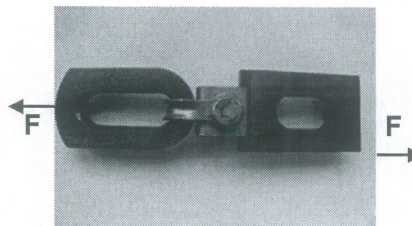
M / passed	tightening torque													
	specimen no.													
	1	2	3	4	5	6	7	8	9	10	11	12		
M [Nm]														
yes														
no														

Test result: test passed: yes no

Comments: *not tested*

d) Tensile test:

Test arrangement:



specimen	performed test	tensile load	load achieved	Load required					Notes:	
				Test load F_{test}^* [kN]	perm. operating load $F_{perm. operating}$ [kN]	Safety factor	Load required $F_{req.}$ [kN]	passed		
								yes		no
1	EN 50119	$F_{perm. operating}$		2	1,33	2,66				
1	EN 50119	$F_{min. failing}$		2	3	6				
2	EN 50119	$F_{perm. operating}$		2	1,33	2,66				
2	EN 50119	$F_{min. failing}$		2	3	6				
3	EN 50119	$F_{perm. operating}$		2	1,33	2,66				
3	EN 50119	$F_{min. failing}$		2	3	6				

*For $F_{min. failing}$ $F_{test} = F_{max}$ according to EN 50119

Test result: test passed: yes no

Comments: *not tested*

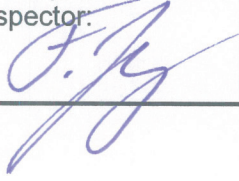

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e) Hardness test: optional

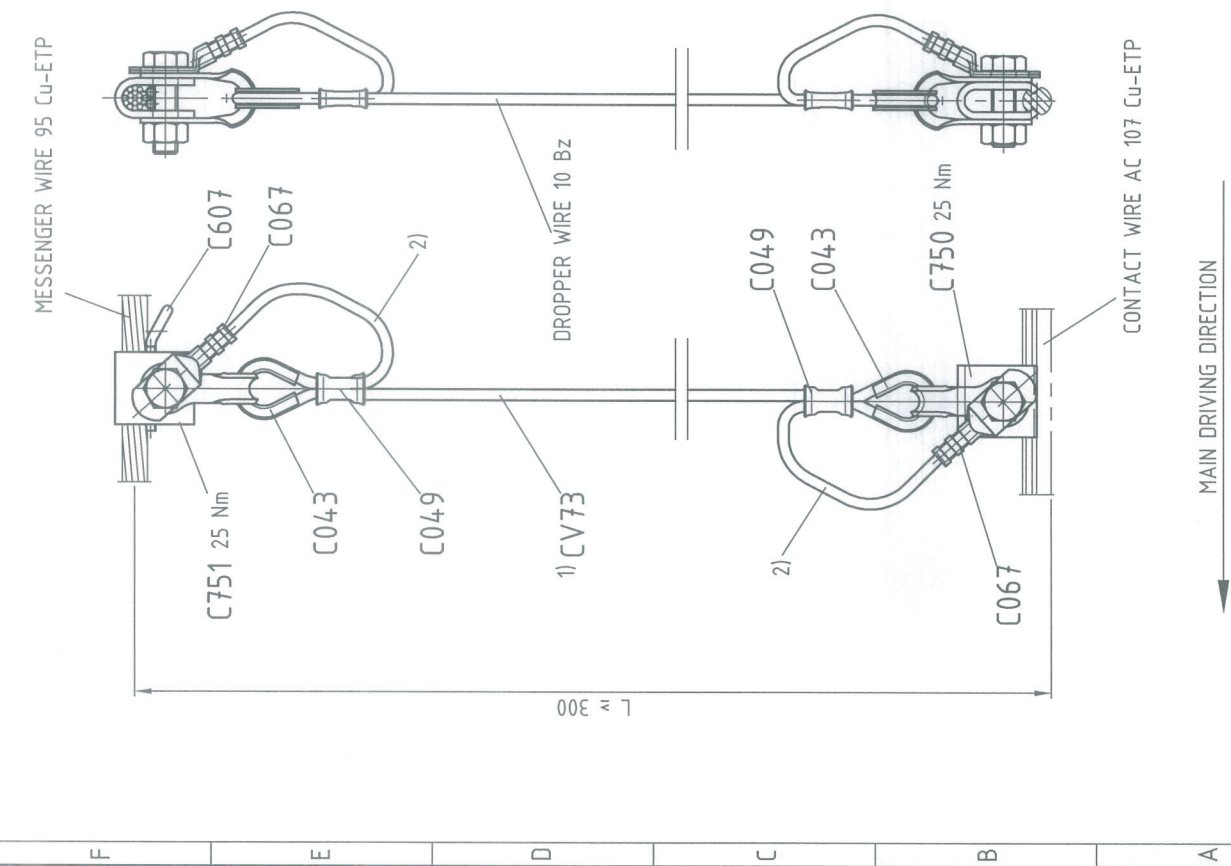
Test arrangement: 8WL4621-0 (Clamp strap): DIN EN 1652- CuNi2Si – R490 min.140-max. 190HV
 8WL4621-2 (Dropper strap): DIN EN 1652- CuNi2Si – R490 min.140-max. 190HV

passed	functional test													
	specimen no.													
	1	2	3	4	5	6	7	8	9	10	11	12		
yes														
no														

Test result: test passed: yes no
Comments: *not tested*

SIEMENS MO TPE Rail Electrification	Date and place: <i>Ludwigshafen</i> <i>09.08.2018</i>	Factory-Authorized Inspector: 	Customer: 
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1) EXACT LENGTH ACCORDING TO COMPUTER AIDED CALCULATION
 2) LENGTH OF LOOP ~ 200 mm
 FOR THE MOUNTING OF BOLTED CONNECTIONS USE LUBRICANT WITH A WATER BASE.
 (FOR EXAMPLE: OKS 1710)

Qty Unit	Description Application	Product No. SAP-Material No.	Equipm.-Ident.
2.00 PC	Thimble DIN43154-16, E-Cu	8WL1500-0	C043
2.00 PC	Crimped/compression connector 10T-20 Cu-ETP	8WL1520-0	C049
2.00 PC	Cable lug DIN46235-10-16-E-Cu	8WL1575-0	C067
1.00 PC	Clip M4.5 for wire 95mm ² Bronze grade II	8WL4622-1	C607
1.00 PC	Dropper clip 50 CuNiSi	8WL4620-0T	C750
1.00 PC	Dropper clip 95 CuNiSi	8WL4624-0T	C751
1.40 M	Wire 10x49, Bronze	8WL7060-2	CV73

FOR INSTALLATION USE THE CURRENT SIEMENS ASSEMBLY INSTRUCTIONS.
 THIS DRAWING IS A COMPUTER PRODUCT, THEREFORE NO SIGNATURE IS REQUIRED.
 NO MANUAL MODIFICATIONS PERMITTED.

Taiwan Southlink		Scale: 1:2	Weight:	Size: A3
Drawn	01.02.18	Parts list: C.5987-03-D14-10-C001		
Checked	01.02.18	CURRENT RESISTIVE DROPPER		
Appr.	02.02.18	1x CW AND 1x MW		
SIEMENS		C.5987-03-D14-10-C001		
Rev.	00	Sh.No	2	
Remarks	02.02.18	Srs	2	
Date	02.02.18	Origin	2	
Name	File No. C.5987-03-D14-10-C001-00-2.dwg			

SIEMENS MO TPE RE EN&OP COL Rail Electrification P.O.Box 3240 91050 Erlangen	TEST PROCEDURE/ TEST REPORT	Date: 09.08.2018
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Tested object: Material No.: Drawing No.:	8WL7090-1C, Steel wire 26 mm ² d= 7.0 mm A2V00001713891 N.A.	
Manufacturer: Materials:	Stranded wires: Steel, galvanised, coated w. bitumen Thimbles: htgSt Compression clamps: Al	
Testing laboratory:		
Test specification:	EN 12385-1, -4	
Performed tests:	a) Material certificate: b) <u>Visual test:</u> c) Mechanical test:	

a) Material certificate:

Required material: Material certificate 3.1

Test result: Material Certificate: yes no
 Material Certificate No.: _____ Date: _____

Summary:	Results from the Certificate	passed	
	8x19S-PWRC-2160	Yes	no
	Rope Diameter: 7.0 mm + 6% (7.42 mm)	✓	
	Weight: 0.230 kg/m		
	Tensile strength 2160 N/mm ²		
	Surface finish Galvanised and coated with bitumen		

Comments: *others not tested*

b) Visual test:

Test arrangement: Visual inspection acc. to EN12385-1, chapter 6.2.3

Test result: test passed: yes no

Comments: the compression clamps are with manufacturer's logos and date

c) Mechanical test:

Test arrangement: Tensile strength acc. to EN12385-1, chapter 6.4

Test result: test passed: yes no

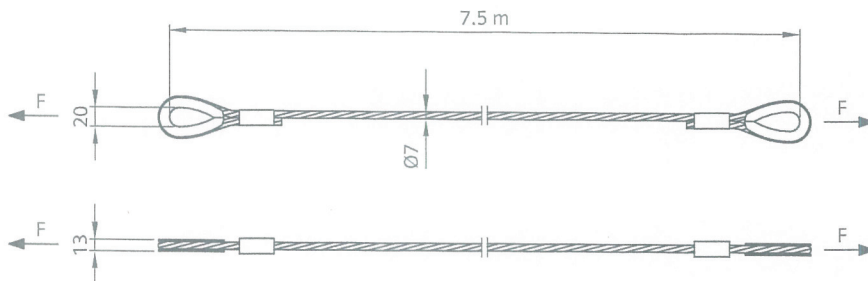
Comments: Tensile strength 2160 N/mm², arithmetical tensile strength 55.6 kN, minimum breaking force 46.7 kN, length ready-made rope 7.5 m, thickness of thimbles 13.0 mm, through boring of thimbles 20.0 mm

not tested

SIEMENS MO TPE RE EN&OP COL Rail Electrification	Date and place:	
	09.08.2018, Ludwigshafen	

Steel wire 26 with connecting fittings

for connection of tension wheel assemblies up to 24 kN 8WL5078- to the catenary system



Order no.	8WL7090-1C
Designation	Steel wire 26 for tension wheel assemblies 8WL5078- (1:3)
Material	
Steel wire 26 mm ²	Stranded wires hot-dip galvanized, wires without twist, torsion-free, each strand coated with bitumen, without fibre core
Thimbles	htgSt
Compression clamps	Al
Weight	2.1 kg
Perm. operating load	2x12 kN
Min. failing load	2x36 kN

Connection strap 8WL1018-0 must be ordered separately, see page 74.