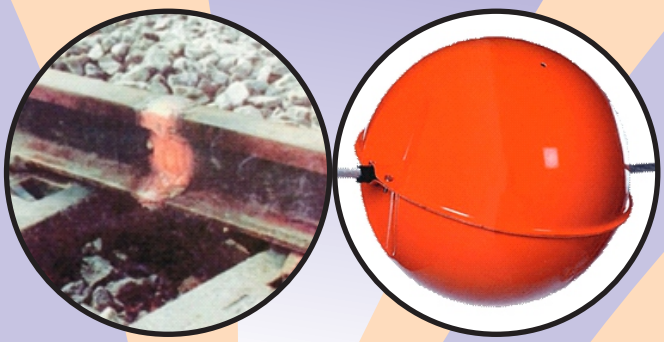
THERMITE WELDING

NEW

GENERATION WELDING





Manufacturer

Thermite Weld (Pakistan) EST.

Office: Room No. 1, 3rd Floor Raja Chamber,
35-Queens Road, Lahore.

Factory: Shadiwal, Moterway, Thokar Niaz Baig,
Lahore

0322-4101587,

wncsaeed_5@hotmail.com,
thermiteweld@gmail.com

www.thermiteweld.com

thermiteweld

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EXECOTHERMICWELD

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thermiteweld

INTRODUCTION

The thermite welding system is a miracle of chemistry an easy simple to use in field process for welding copper to copper, copper to steel, without the use of external source. Thermite connections utilize the high temperature reaction of powdered copper oxide and aluminum, which when ignited, produced aluminum oxide (in the form of slag) and super-heated copper.
The reaction takes place oxide with molten metal aluminum in various welding applications. The reaction takes place in a graphite crucible. The pieces to be welded are introduced prior to the reaction. After the powder is ignited, molten metal from the aluminothermic reaction flows around the pieces, causing them to melt and fuse into a solid homogeneous piece.

When the total mass of powder becomes supper heated molten copper, it flows through the mould into the conductor to be joined by melting a thin steel disc which previously has stopped the powder from dropping through the mould.



THE THERMITE WELD PROCESS

THERMITEWELD/EXOTHERMIC WELD

THERMITEWELD is similar to **CADWELD** for use in making Electrical Connections and Rail Welding Joints. All connections in the earthing system shall be made by the thermite welding / Cad Weld standards: -

BS 6651(1992) STATES:
Exothermic welded joints will ultimately join the cable with a connector or material that has about the same fusing temperature, so the entire connections can be viewed and rated as being an integral part of one homogeneous conductor.



IEEE-837-2002
Direction And Methods For Qualifying Permanent Connections Used For Substation Grounding As Provided In This Standard. This Standard Particularly Address The Connection Used Within The Grid System.
Recommended By IEEE Power



WAPDA SPECIFICATION P-114:82

This Specification prepared by the Design Department, WAPDA/NTDC, Pakistan. Thermite Joints For Substation Earthing. Connection suitable for copper conductors and copper clad steel rod.



STANDARDS/SPECIFICATIONS

THERMITE WELD

A thermite connection becomes an integral part of the conductors. The thermite connection is a fusion or molecular weld of virtually pure copper. The finished connection in the majority of cases sectional a read of the conductors being welded and therefore:

1. Connection conductivity is at least equal or greater than conductors welded. There is no possibility of corrosion at the point of weld, since conductors become an integral part of the connection.
2. Connections are not affected by high current surges. Tests have shown that the electrical conductor will melt before the thermite connection when subjected to short circuit current.
3. Is time saving on job side. Requires no special skills. Can be checked for quality by visual inspiration. Requires no external power or heat. Maintenance saving as the welds are unaffected by oxidation and fault currents.
4. There are no contact surfaces or mechanical pressures involved.
5. Has low labour costs.
6. Will withstand repeated faults.
7. Will not deteriorate with passage of time.

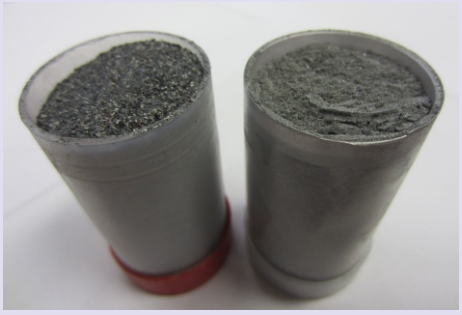




EFFICIENCY

WELDING FLUX

Product: Exothermic Welding Powder



SAFETY DATA SHEET

Ingredients / Identity Information

COMPONENTS	CAS #	EXPOSURE LIMITS (mg/m^3)		PERCENTAGE %
		OSHA PEL	ACGIH TLV	
Copper Oxide	1317-39-1	Dust 1.0 Fume 0.1	Dust 1.0 Fume 0.2	Not > 80%
Aluminium	7429-90-5	Total Dust 15.0 Respirable Fraction 15.0	Dust 10.0 Fume 0.2	Not > 20%
Copper		Dust 1.0 Fume 0.1	Dust 1.0 Fume 0.2	Not > 10%

Physical / Chemical Characteristics

Solubility in water	:	Insoluble
Specific Gravity (H2O=1)	:	5
Melting Point	:	2000F
Evaporation Rate (Butyl Acetate = 1)	:	N/A
Appearance and odor	:	Gray-Black, Gramular Particles,

THERMITE WELDING FLUX

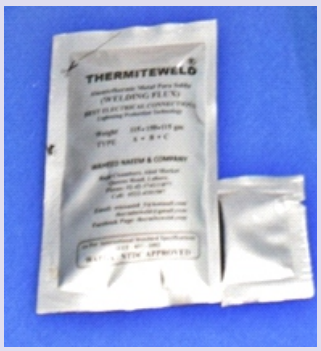
CARTRIDGES

Each aluminum packet holds the aluminothermic powder range 100 gms to 250 gms according to requirement. Operating Instructions are written on back side of each packet.

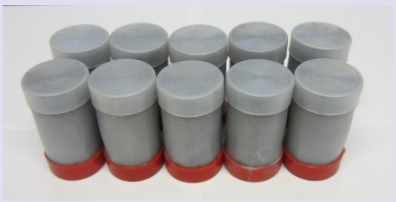


STARTER POWDER

Each small aluminum Sasha holds starter powder range 2-3 grams according to requirement.



Packed in aluminum foil paper



STEEL DISC

Steel disc are used as timer to hold the welding flux in the mold and prevent it from falling down. Size and thickness of the disc must be match with the mold in order to weld conductors.

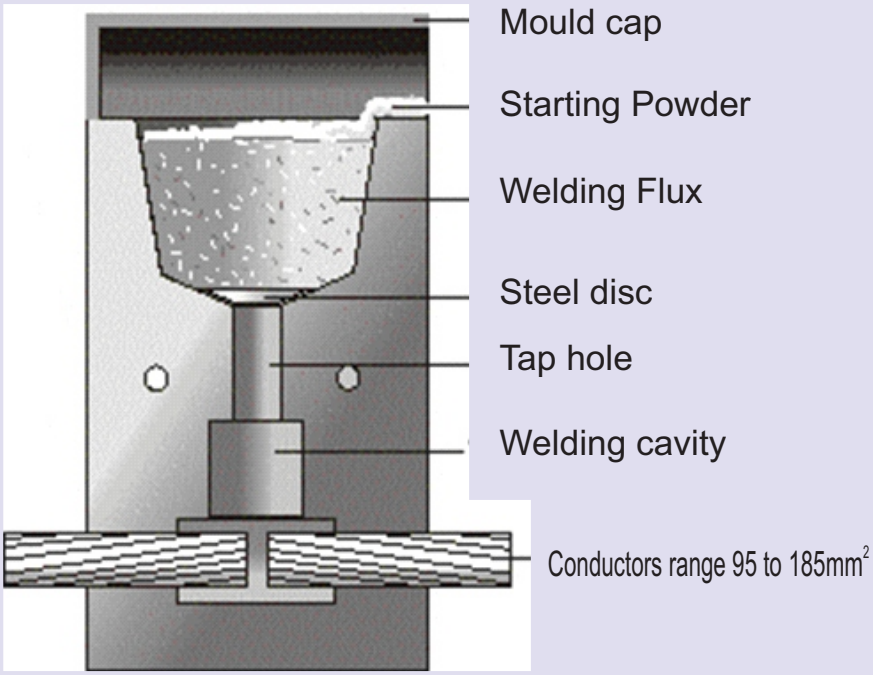


Packed in bottles with starter

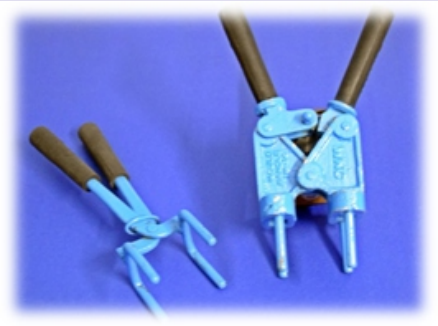
THERMITE WELDING (Graphite Mould):



Moulds are manufactured from a heat-resistant material (graphite) that leasts for an average of 60-100 connections under normal conditions of use. The metallic cover protects from the reaction projections.



OPTIONAL ACCESSORIES



MOULD HANDLE CLAMP:

They are designed to handle the moulds. The type of clump depends on the mould size and shape.



FLINT IGNITER :

It is used for easy fusion of starting powder. Standard new flints can be used as replacement



SCRAPER:

It is used to remove the slag from the mould after each joint and increase life of the mould.



CLEANING BRUSH:

It is used to clean the inner side of mould after each joint hence increase the life of mould.



CONDUCTOR CLEANING BRUSH:

It is used to clean the conductors before making the perfect joints.



THERMO IGNITER:

New technoloy of fusing thermite welding flux by using thermo igniter 5000 shots/charges

THERMO IGNITER TM-13 Optional Accessoreis

This Modern System-The new Technology of using Thermite Welding Flux by using Thermo Ignition adopted in American, Europe and Japan instead of using old traditional match, chil sparker, mg. Ribbon and flint gun etc. It is friendly environmental equipment as it can remove the danger brought by the relief combustible gas to the environment. It helps in instant ignition of material in just blink of eye and totally harmless. This system is better, economical and durable than any other system.

POWER SOURCE

12 Volt
Rechargeable
Battery
High Voltage for
Instant Current
Deep Cycle
AGM (Sealed
Lead Acid)
Dual Stage
charger with
controller.



BATTER LIFE

5000 Shots /
Charges
Battery Life
5000-6000
Shots
40 Shots /
150 Charges
= 6000 Shots

WELD IGNITION TIME

Just push the button & start fusing
Longer sparking until fusion
No question of delay
No wastage of time.

IGNITION LEAD

Removable lead
Easily interchangeable lead
Light in weight/Easily movable

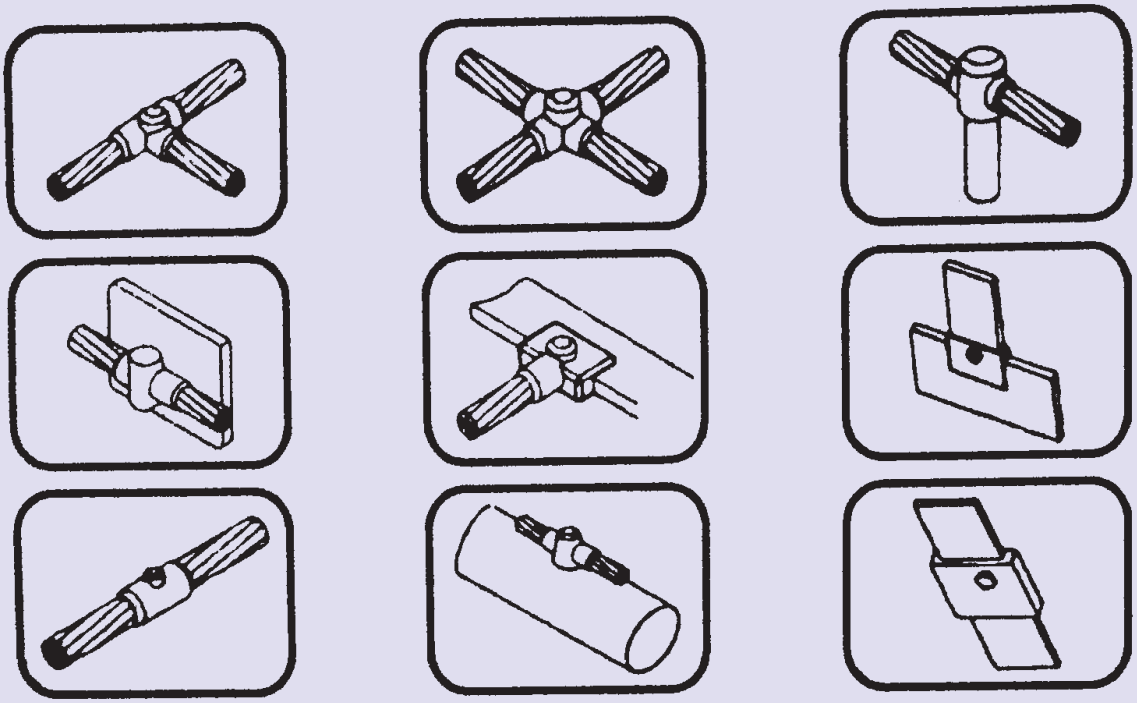


HOW TO OPERATE

- On the switch - Red Light indicates
- Put the Earth Wire into Mould Earthing Point
- Press the Start Button
- Hold the Control Wire & Just touch the starting powder
- Ignition is made instantly.
- For battery charging insert the battery charger
- Pin into charging point indicating green light

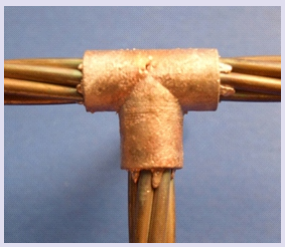
STANDARD THERMITE CONNECTIONS

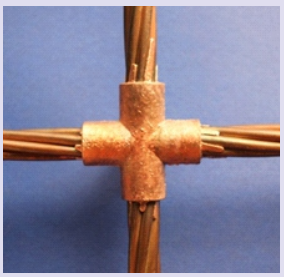
Cu Condcutor / Earth Rod / Bus Bar
Steel Re-bars / Pipes / Rail Etc



Weight Range : 100GM TO 250 GM
TYPE : A/B/C/D/E/F/G/H/I

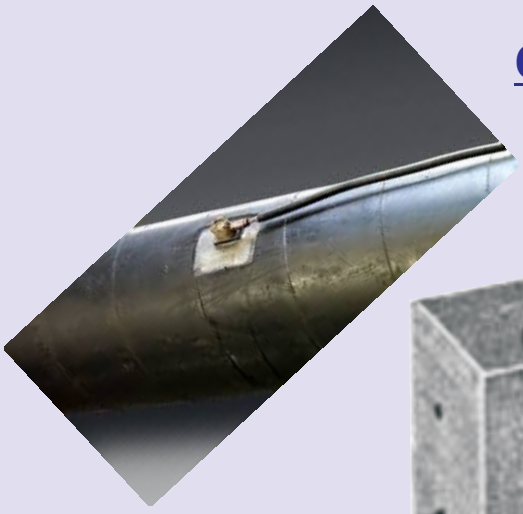
THERMITE FLUX CAN BE USED LESS OR MORE ACCORDING TO REQUIREMENT OF THE CONNECTION

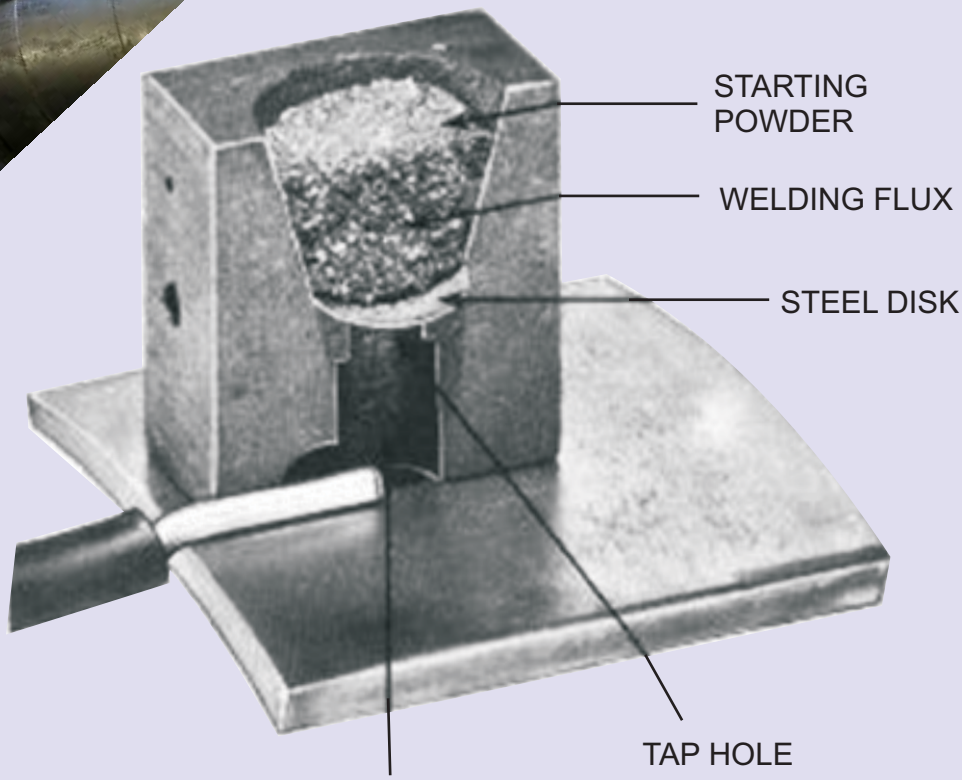




CONNECTIONS

CATHODIC CONNECTIONS





Connections are made with a semi-permanent graphite mold, which holds the conductors to be welded. Weld metal (a mixture of copper oxide and aluminum) is dumped into the top of the mold. The mold is covered and the weld metal ignited.

Connections are the accepted method of attaching cathodic protection leads to pipes (Steel or cast iron), tanks and structures.

Connections for cathodic protection use a special alloy to provide minimum heat effect on the steel, especially important on thin wall, high stress pipes.

COPPER CONDUCTORS RANGE 35MM^2 TO 300MM^2
STEEL PIPE LARGE RANGE 4" TO 20"

IEEE Power Engineering Society U.S.A.

The Institute of Electrical Electronics Engineers, Inc. 3 Park Avenue, New York, NY 1016-5997, USA.

Standard for Permanent Connections Used in Substation Grounding Standard for Direction and methods for qualifying permanent connections used for substation grounding area provided in this standard. This standard particularly addresses the connection used within the grid system, the connection used to join ground leads to the grid system, and the connection used to join the ground leads to equipment and structures.

The purpose of this standard is to give assurance to the user that a connection meeting the requirements of this standard will perform in a satisfactory manner over the lifetime of the installation, provided that the proper connection is selected for the application and that the connection is installed correctly. Grounding connections that meet the test criteria stated in this standard for a particular conductor size range and material should satisfy all of the criteria for connections.

There are various type of electrical test such as:

1. **Electromagnetic Force Test.**
2. **Current Temperature Cycling Test.**
3. **Freeze Thaw Test.**
4. **Fault Current Test.**

Specimen Test Report Carri ed out High Voltage Testing Laboratory University of Engineering and Technology, Lahore in the presence of representatives of Chief Engineer (Design) NTDC' Wapda, Lahore, Pakistan Certified reports attached.

IEEE CURRENT TEMPERATURE CYCLING TEST

HIGH VOLTAGE ENGINEERING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. Univ./EED/2013/747
Dated 23.09.2013.

M/s. Waheed Naeem & Company,
7-S, Raja Chamber,
35-Queen Road,
Lahore.

Sub:-**CURRENT TEMPERATURE CYCLE TEST STANDARD IEEE 837 – 2002.**

Ref. Letter NO WNC/FESCO/DESIGN/TYPE TEST **28.06.2013**

Sample Detail: Sample of conductor 9.5mm² 7 Stand AWG 3.0 Copper Wire **Tee Joint.**

TEST RESULT

Resistance of Tee Joint before Test at @33°C 0.29 m ohm. After Test 0.34 m ohm
Duration of Current Cycle : 60 Minutes Minimum temperature Required 350°C
Date of Commencement of Test: 30.07.2013 Date of Completion of Test: 20.09.2013
Ambient Conditions 30°C – 40°C

Cycle Number	Current Applied – Amp	Conductor Temperature	Connection Temperature	Result
1	870	480	466	OK
2	870	480	425	OK
3	870	445	417	OK
4	868	375	410	OK
5	865	216	396	OK
6	868	582	390	OK
7	870	577	382	OK
8	870	567	408	OK
9	860	562	394	OK
10	863	552	356	OK
11	885	555	399	OK
12	875	560	395	OK
13	870	656	390	OK
14	875	560	395	OK
15	865	545	380	OK
16	860	525	370	OK
17	875	563	390	OK
18	870	570	428	OK
19	876	560	410	OK
20	870	531	403	OK
21	875	547	431	OK
22	865	540	425	OK
23	875	545	430	OK
24	868	556	405	OK
25	870	546	409	OK

Remarks: The Tee-Joint was found OK after complete testing no cracks, fusion or deformation was observed. The resistance of the joint was within limits.

Test Witnessed & Advised by:

Engr. Nasir Osaman, Manager (S&R) Design NTDC.
Engr. Muhammad Nadeem, assistant Manager (Design) NTDC.
Engr. Maqsood, Deputy Manager, (Design) NTDC.
Mian Muhammad Saeed (Manufacturer representative)
Syed Abdul Rehman Kashif, UET, Lahore.

Dr. Muhammad Asghar Saqib
Director,
High Voltage Engineering Laboratory.

Dept. Univ. of Engg. & Tech., Lahore ★ Elect. Engg. Director High Voltage Lab.

HIGH VOLTAGE ENGINEERING LABORATORY
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Sub:-**CURRENT TEMPERATURE CYCLE TEST STANDARD IEEE 837 – 2002.**

Ref. Letter NO WNC/FESCO/DESIGN/TYPE TEST **28.06.2013**

Sample Detail: Sample of conductor 9.5mm² 7 Stand AWG 3.0 Copper Wire **Cross Joint.**

TEST RESULT

Resistance of Tee Joint before Test at @33°C 0.29 m ohm. After Test 0.34 m ohm
Duration of Current Cycle : 60 Minutes Minimum temperature Required 350°C
Date of Commencement of Test: 30.07.2013 Date of Completion of Test: 20.09.2013
Ambient Conditions 30°C – 40°C

Cycle Number	Current Applied – Amp	Conductor Temperature	Connection Temperature	Result
1	870	556	390	OK
2	875	610	520	OK
3	865	625	510	OK
4	860	632	490	OK
5	880	620	480	OK
6	875	610	460	OK
7	865	600	450	OK
8	860	595	430	OK
9	875	395	395	OK
10	855	400	400	OK
11	860	410	410	OK
12	865	440	440	OK
13	860	390	390	OK
14	870	395	395	OK
15	875	390	390	OK
16	880	500	500	OK
17	885	520	520	OK
18	860	510	510	OK
19	855	400	400	OK
20	865	410	410	OK
21	870	430	430	OK
22	870	440	440	OK
23	875	450	450	OK
24	865	440	440	OK
25	860	430	430	OK

Remarks: The Cross-Joint was found OK after complete testing no cracks, fusion or deformation was observed. The resistance of the joint was within limits.

Test Witnessed & Advised by:

Engr. Nasir Osaman, Manager (S&R) Design NTDC.
Engr. Muhammad Nadeem, assistant Manager (Design) NTDC.
Engr. Maqsood, Deputy Manager, (Design) NTDC.
Mian Muhammad Saeed (Manufacturer representative)
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Ref. Letter NO WNC/FESCO/DESIGN/TYPE TEST **28.06.2013**

Sample Detail: Sample of conductor 9.5mm² 7 Stand AWG 3.0 Copper Wire **Cross Joint.**

TEST RESULT

Resistance of Tee Joint before Test at @33°C 0.21 m ohm. After Test 0.26 m ohm
Duration of Current Cycle : 60 Minutes Minimum temperature Required 350°C
Date of Commencement of Test: 30.07.2013 Date of Completion of Test: 20.09.2013
Ambient Conditions 30°C – 40°C

Cycle Number	Current Applied – Amp	Conductor Temperature	Connection Temperature	Result
1	875	661	472	OK
2	880	657	476	OK
3	870	647	457	OK
4	865	640	455	OK
5	860	645	450	OK
6	870	640	460	OK
7	875	630	455	OK
8	880	637	440	OK
9	865	650	445	OK
10	855	655	470	OK
11	860	620	430	OK
12	865	615	435	OK
13	870	660	430	OK
14	875	630	435	OK
15	880	625	450	OK
16	865	615	440	OK
17	870	600	430	OK
18	870	595	410	OK
19	875	600	400	OK
20	860	595	390	OK
21	860	590	390	OK
22	875	590	400	OK
23	880	600	410	OK
24	870	595	440	OK
25	865	590	410	OK

Remarks: The Cross-Joint was found OK after complete testing no cracks, fusion or deformation was observed. The resistance of the joint was within limits.

Test Witnessed & Advised by:

Engr. Nasir Osaman, Manager (S&R) Design NTDC.
Engr. Muhammad Nadeem, assistant Manager (Design) NTDC.
Engr. Maqsood, Deputy Manager, (Design) NTDC.
Mian Muhammad Saeed (Manufacturer representative)
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35-Queen Road,
Lahore.

Sub:-**CURRENT TEMPERATURE CYCLE TEST STANDARD IEEE 837 – 2002.**

Ref. Letter NO WNC/FESCO/DESIGN/TYPE TEST **28.06.2013**

Sample Detail: Sample of conductor 9.5mm² 7 Stand AWG 3.0 Copper Wire **Rod Joint.**

TEST RESULT

Resistance of Tee Joint before Test at @33°C 0.29 m ohm. After Test 0.34 m ohm
Duration of Current Cycle : 60 Minutes Minimum temperature Required 350°C
Date of Commencement of Test: 30.07.2013 Date of Completion of Test: 20.09.2013
Ambient Conditions 30°C – 40°C

Cycle Number	Current Applied – Amp	Conductor Temperature	Connection Temperature	Result
1	875	630	480	OK
2	870	660	475	OK
3	860	550	470	OK
4	855	620	430	OK
5	855	610	410	OK
6	865	600	430	OK
7	870	595	425	OK
8	875	590	440	OK
9	860	640	450	OK
10	870	630	395	OK
11	875	635	390	OK
12	880	650	400	OK
13	870	625	410	OK
14	865	595	430	OK
15	860	590	420	OK
16	855	620	475	OK
17	870	630	480	OK
18	875	595	465	OK
19	865	590	450	OK
20	860	605	455	OK
21	875	610	410	OK
22	870	625	415	OK
23	860	620	420	OK
24	865	595	400	OK
25	870	590	395	OK

Remarks: The Rod-Joint was found OK after complete testing no cracks, fusion or deformation was observed. The resistance of the joint was within limits.

Test Witnessed & Advised by:

Engr. Nasir Osaman, Manager (S&R) Design NTDC.
Engr. Muhammad Nadeem, assistant Manager (Design) NTDC.
Engr. Maqsood, Deputy Manager, (Design) NTDC.
Mian Muhammad Saeed (Manufacturer representative)
Syed Abdul Rehman Kashif, UET, Lahore.

Dr. Muhammad Asghar Saqib
Director,
High Voltage Engineering Laboratory.

Dept. Univ. of Engg. & Tech., Lahore ★ Elect. Engg. Director High Voltage Lab.

PROPERTY OF WEC PAKISTAN

HIGH VOLTAGE ENGINEERING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. Univ./EED/2013/
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Lahore.

Sub:-**CURRENT TEMPERATURE CYCLE TEST STANDARD IEEE 837 – 2002.**

Ref. Letter NO WNC/FESCO/DESIGN/TYPE TEST **28.06.2013**

Sample Detail: Sample of conductor 9.5mm^2 7 Stand AWG 3.0 Copper Wire **Tee Joint.**

TEST RESULT

Resistance of Tee Joint before Test at @33°C 0.29 m ohm. After Test 0.34 m ohm
Duration of Current Cycle : 60 Minutes Minimum temperature Required 350°C
Date of Commencement of Test: 30.07.2013 Date of Completion of Test: 20.09.2013
Ambient Conditions 30°C – 40°C

Cycle Number	Current Applied – Amp	Conductor Temperature	Connection Temperature	Result
1	870	480	466	OK
2	870	480	425	OK
3	870	445	417	OK
4	868	375	410	OK
5	865	216	396	OK
6	868	582	390	OK
7	870	577	382	OK
8	870	567	408	OK
9	860	562	394	OK
10	863	552	356	OK
11	885	555	399	OK
12	875	560	395	OK
13	870	656	390	OK
14	875	560	395	OK
15	865	545	380	OK
16	860	525	370	OK
17	875	563	390	OK
18	870	570	428	OK
19	876	560	410	OK
20	870	531	403	OK
21	875	547	431	OK
22	865	540	425	OK
23	875	545	430	OK
24	868	556	405	OK
25	870	546	409	OK

Remarks: The Tee-Joint was found OK after complete testing no cracks, fusion or deformation was observed. The resistance of the joint was within limits.

Test Witnessed & Advised by:

Engr. Nasir Osaman, Manager (S&R) Design NTDC.
Engr. Muhammad Nadeem, assistant Manager (Design) NTDC.
Engr. Maqsood, Deputy Manager, (Design) NTDC.
Mian Muhammad Saeed (Manufacturer representative)
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Sub:-**CURRENT TEMPERATURE CYCLE TEST STANDARD IEEE 837 – 2002.**

Ref. Letter NO WNC/FESCO/DESIGN/TYPE TEST **28.06.2013**

Sample Detail: Sample of conductor 9.5mm^2 7 Stand AWG 3.0 Copper Wire **Cross Joint.**

TEST RESULT

Resistance of Tee Joint before Test at @33°C 0.29 m ohm. After Test 0.34 m ohm
Duration of Current Cycle : 60 Minutes Minimum temperature Required 350°C
Date of Commencement of Test: 30.07.2013 Date of Completion of Test: 20.09.2013
Ambient Conditions 30°C – 40°C

Cycle Number	Current Applied – Amp	Conductor Temperature	Connection Temperature	Result
1	870	556	390	OK
2	875	610	520	OK
3	865	625	510	OK
4	860	632	490	OK
5	880	620	480	OK
6	875	610	460	OK
7	865	600	450	OK
8	860	595	430	OK
9	875	395	395	OK
10	855	400	400	OK
11	860	410	410	OK
12	865	440	440	OK
13	860	390	390	OK
14	870	395	395	OK
15	875	390	390	OK
16	880	500	500	OK
17	885	520	520	OK
18	860	510	510	OK
19	855	400	400	OK
20	865	410	410	OK
21	870	430	430	OK
22	870	440	440	OK
23	875	450	450	OK
24	865	440	440	OK
25	860	430	430	OK

Remarks: The Cross-Joint was found OK after complete testing no cracks, fusion or deformation was observed. The resistance of the joint was within limits.

Test Witnessed & Advised by:

Engr. Nasir Osaman, Manager (S&R) Design NTDC.
Engr. Muhammad Nadeem, assistant Manager (Design) NTDC.
Engr. Maqsood, Deputy Manager, (Design) NTDC.
Mian Muhammad Saeed (Manufacturer representative)
Syed Abdul Rehman Kashif, UET, Lahore.

Dr. Muhammad Asghar Saqib
Director,
High Voltage Engineering Laboratory.

Dept. Univ. of Engg. & Tech. Lahore ★ Elect. Engg. Director High Voltage Lab.

HIGH VOLTAGE ENGINEERING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. Univ./EED/2013/
Dated 23.09.2013.

M/s. Waheed Naeem & Company,
7-S, Raja Chamber,
35-Queen Road,
Lahore.

Sub:-**CURRENT TEMPERATURE CYCLE TEST STANDARD IEEE 837 – 2002.**

Ref. Letter NO WNC/FESCO/DESIGN/TYPE TEST **28.06.2013**

Sample Detail: Sample of conductor 9.5mm^2 7 Stand AWG 3.0 Copper Wire **Cross Joint.**

TEST RESULT

Resistance of Tee Joint before Test at @33°C 0.21 m ohm. After Test 0.26 m ohm
Duration of Current Cycle : 60 Minutes Minimum temperature Required 350°C
Date of Commencement of Test: 30.07.2013 Date of Completion of Test: 20.09.2013
Ambient Conditions 30°C – 40°C

Cycle Number	Current Applied – Amp	Conductor Temperature	Connection Temperature	Result
1	875	661	472	OK
2	880	657	476	OK
3	870	647	457	OK
4	865	640	455	OK
5	860	645	450	OK
6	870	640	460	OK
7	875	630	455	OK
8	880	637	440	OK
9	865	650	445	OK
10	855	655	470	OK
11	860	620	430	OK
12	865	615	435	OK
13	870	660	430	OK
14	875	630	435	OK
15	880	625	450	OK
16	865	615	440	OK
17	870	600	430	OK
18	870	595	410	OK
19	875	600	400	OK
20	860	595	390	OK
21	860	590	390	OK
22	875	590	400	OK
23	880	600	410	OK
24	870	595	440	OK
25	865	590	410	OK

Remarks: The Cross-Joint was found OK after complete testing no cracks, fusion or deformation was observed. The resistance of the joint was within limits.

Test Witnessed & Advised by:

Engr. Nasir Osaman, Manager (S&R) Design NTDC.
Engr. Muhammad Nadeem, assistant Manager (Design) NTDC.
Engr. Maqsood, Deputy Manager, (Design) NTDC.
Mian Muhammad Saeed (Manufacturer representative)
Syed Abdul Rehman Kashif, UET, Lahore.

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HIGH VOLTAGE ENGINEERING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. Univ./EED/2013/
Dated 23.09.2013.

M/s. Waheed Naeem & Company,
7-S, Raja Chamber,
35-Queen Road,
Lahore.

Sub:-**CURRENT TEMPERATURE CYCLE TEST STANDARD IEEE 837 – 2002.**

Ref. Letter NO WNC/FESCO/DESIGN/TYPE TEST **28.06.2013**

Sample Detail: Sample of conductor 9.5mm^2 7 Stand AWG 3.0 Copper Wire **Rod Joint.**

TEST RESULT

Resistance of Tee Joint before Test at @33°C 0.29 m ohm. After Test 0.34 m ohm
Duration of Current Cycle : 60 Minutes Minimum temperature Required 350°C
Date of Commencement of Test: 30.07.2013 Date of Completion of Test: 20.09.2013
Ambient Conditions 30°C – 40°C

Cycle Number	Current Applied – Amp	Conductor Temperature	Connection Temperature	Result
1	875	630	480	OK
2	870	660	475	OK
3	860	550	470	OK
4	855	620	430	OK
5	855	610	410	OK
6	865	600	430	OK
7	870	595	425	OK
8	875	590	440	OK
9	860	640	450	OK
10	870	630	395	OK
11	875	635	390	OK
12	880	650	400	OK
13	870	625	410	OK
14	865	595	430	OK
15	860	590	420	OK
16	855	620	475	OK
17	870	630	480	OK
18	875	595	465	OK
19	865	590	450	OK
20	860	605	455	OK
21	875	610	410	OK
22	870	625	415	OK
23	860	620	420	OK
24	865	595	400	OK
25	870	590	395	OK

Remarks: The Rod-Joint was found OK after complete testing no cracks, fusion or deformation was observed. The resistance of the joint was within limits.

Test Witnessed & Advised by:

Engr. Nasir Osaman, Manager (S&R) Design NTDC.
Engr. Muhammad Nadeem, assistant Manager (Design) NTDC.
Engr. Maqsood, Deputy Manager, (Design) NTDC.
Mian Muhammad Saeed (Manufacturer representative)
Syed Abdul Rehman Kashif, UET, Lahore.

Dr. Muhammad Asghar Saqib
Director,
High Voltage Engineering Laboratory.

Dept. Univ. of Engg. & Tech. Lahore ★ Elect. Engg. Director High Voltage Lab.

FREE SOFTWARE

HIGH VOLTAGE TESTING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. EE/671/2013,
Dated 13.02.2013.

M/s. Waheed Naeem & Company,
19-F, Raja Chambers, 35-Queens Road,
Lahore.

Sub:- Fault Current Testing of Conductor Combination Joint according to IEEE STANDARD 837-2002 specifications..

Reference your letter No. WNC/UET/NTDC/FESCO/12, dated 20.01.2013.

Following samples were tested in the High Voltage Engineering Laboratory on 11.02.2013 and results are reproduced below:-

Sample Detail:

Six samples of conductor combination joint 95mm^2, 7 strands, AWG 3.0 copper wire & copper coated earth rod 14.3mm.

Test Procedure:

The terminal of combination joint was connected with current transformer and current was supplied. The result is as under:

Test results:

1- Sample A (TEE JOINT)

No. of surges	Applied current	Time duration	Remarks
1.	7800 Ampere	10 seconds	OK
2.	7900 Ampere	10 seconds	OK
3.	8100 Ampere	10 seconds	OK

2- Sample B (CROSS JOINT)

No. of surges	Applied current	Time duration	Remarks
1.	8400 Ampere	10 seconds	OK
2.	8800 Ampere	10 seconds	OK
3.	8000 Ampere	10 seconds	OK

3- Sample B (CROSS JOINT)

No. of surges	Applied current	Time duration	Remarks
1.	8800 Ampere	10 seconds	OK
2.	9000 Ampere	10 seconds	OK
3.	8600 Ampere	10 seconds	OK

Contd… P/2….

HIGH VOLTAGE TESTING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

4- Sample C (EARTH ROD)

No. of surges	Applied current	Time duration	Remarks
1.	7500 Ampere	10 seconds	OK
2.	7800 Ampere	10 seconds	OK
3.	7600 Ampere	10 seconds	OK

5- Sample C (EARTH ROD)

No. of surges	Applied current	Time duration	Remarks
1.	8000 Ampere	10 seconds	OK
2.	7600 Ampere	10 seconds	OK
3.	7800 Ampere	10 seconds	OK

6- Sample C (EARTH ROD)

No. of surges	Applied current	Time duration	Remarks
1.	8400 Ampere	10 seconds	OK
2.	8100 Ampere	10 seconds	OK
3.	7700 Ampere	10 seconds	OK

Remarks: All the samples mentioned above were found OK after complete examination and no cracks fusion or deformation was observed.

Test(S) witnessed by:

1. Muhammad Nadeem, Assistant Manager (Design), NTDC, WAPDA House, Lahore.
2. Syed Abdul Rehman Kashsif, Assistant Professor, Electrical Engineering Department, UET, Lahore.
3. Mian Muhammad Saeed, (Manufacturer representative)

Dr. Muhammad Asghar Saqib,
Director,
High Voltage Engineering Laboratory.

HIGH VOLTAGE TESTING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. EE/671/2013,
Dated 13.02.2013.

M/s. Waheed Naeem & Company,
19-F, Raja Chambers, 35-Queens Road,
Lahore.

Sub:- Fault Current Testing of Conductor Combination Joint according to IEEE STANDARD 837-2002 specifications..

Reference your letter No. WNC/UET/NTDC/FESCO/12, dated 20.01.2013.

Following samples were tested in the High Voltage Engineering Laboratory on 11.02.2013 and results are reproduced below:-

Sample Detail:

Six samples of conductor combination joint 95mm^2, 7 strands, AWG 3.0 copper wire & copper coated earth rod 14.3mm.

Test Procedure:

The terminal of combination joint was connected with current transformer and current was supplied. The result is as under:

Test results:

1- Sample A (TEE JOINT)

No. of surges	Applied current	Time duration	Remarks
1.	7800 Ampere	10 seconds	OK
2.	7900 Ampere	10 seconds	OK
3.	8100 Ampere	10 seconds	OK

2- Sample B (CROSS JOINT)

No. of surges	Applied current	Time duration	Remarks
1.	8400 Ampere	10 seconds	OK
2.	8800 Ampere	10 seconds	OK
3.	8000 Ampere	10 seconds	OK

3- Sample B (CROSS JOINT)

No. of surges	Applied current	Time duration	Remarks
1.	8800 Ampere	10 seconds	OK
2.	9000 Ampere	10 seconds	OK
3.	8600 Ampere	10 seconds	OK

Contd… P/2….

HIGH VOLTAGE TESTING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

Page 2/2

4- Sample C (EARTH ROD)

No. of surges	Applied current	Time duration	Remarks
1.	7500 Ampere	10 seconds	OK
2.	7800 Ampere	10 seconds	OK
3.	7600 Ampere	10 seconds	OK

5- Sample C (EARTH ROD)

No. of surges	Applied current	Time duration	Remarks
1.	8000 Ampere	10 seconds	OK
2.	7600 Ampere	10 seconds	OK
3.	7800 Ampere	10 seconds	OK

6- Sample C (EARTH ROD)

No. of surges	Applied current	Time duration	Remarks
1.	8400 Ampere	10 seconds	OK
2.	8100 Ampere	10 seconds	OK
3.	7700 Ampere	10 seconds	OK

Remarks: All the samples mentioned above were found OK after complete examination and no cracks fusion or deformation was observed.

Test(S) witnessed by:

1. Muhammad Nadeem, Assistant Manager (Design), NTDC, WAPDA House, Lahore.
2. Syed Abdul Rehman Kashsif, Assistant Professor, Electrical Engineering Department, UET, Lahore.
3. Mian Muhammad Saeed, (Manufacturer representative)

Dr. Muhammad Asghar Saqib,
Director,
High Voltage Engineering Laboratory.

TIEMME WELD PAKISTAN

IEEE CURRENT TEMPERATURE CYCLING TEST

HIGH VOLTAGE TESTING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. EE/672/2013,
Dated 13.02.2013.

M/s. Waheed Naeem & Company,
19-F, Raja Chambers, 35-Queens Road,
Lahore.

Sub:- RESISTANCE TEST ON CONDUCTOR COMBINATION JOINT ACCORDING TO IEEE STANDARD 837-2002 SPECIFICATIONS.

Reference your letter No. WNC/UET/NTDC/FESCO/12, dated 20.01.2013.

Following samples were tested in the High Voltage Engineering Laboratory on 11.02.2013 and results are reproduced below:-

Sample Detail:

Six samples of conductor combination joint 95mm^2, 7 strands, AWG 3.0 copper wire & copper coated earth rod 14.3mm.

Test Procedure:

The terminal of combination joint was connected with current transformer and current was supplied. The result is as under:

Test results:

RESISTANCE TEST

	Resistance before test	Resistance after test
1- Sample A (TEE JOINT)	0.34 m ohm	0.32 m ohm
2- Sample B (CROSS JOINT)	0.25 m ohm	0.25 m ohm
3- Sample B (CROSS JOINT)	0.23 m ohm	0.22 m ohm
4- Sample C (EARTH ROD)	0.50 m ohm	0.50 m ohm
5- Sample C (EARTH ROD)	0.50 m ohm	0.51 m ohm
6- Sample C (EARTH ROD)	0.21 m ohm	0.20 m ohm

Test(S) witnessed by:
1. Muhammad Nadeem, Assistant Manager (Design), NTDC, WAPDA House, Lahore.
2. Syed Abdul Rehman Kashsif, Assistant Professor, Electrical Engineering Department, UET, Lahore.
3. Mian Muhammad Saeed, (Manufacturer representative)

Dr. Muhammad Asghar Saqib,
Director,
High Voltage Engineering Laboratory.

HIGH VOLTAGE TESTING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. EE/672/2013,
Dated 13.02.2013.

M/s. Waheed Naeem & Company,
19-F, Raja Chambers, 35-Queens Road,
Lahore.

Sub:- RESISTANCE TEST ON CONDUCTOR COMBINATION JOINT ACCORDING TO IEEE STANDARD 837-2002 SPECIFICATIONS.

Reference your letter No. WNC/UET/NTDC/FESCO/12, dated 20.01.2013.

Following samples were tested in the High Voltage Engineering Laboratory on 11.02.2013 and results are reproduced below:-

Sample Detail:

Six samples of conductor combination joint 95mm^2, 7 strands, AWG 3.0 copper wire & copper coated earth rod 14.3mm.

Test Procedure:

The terminal of combination joint was connected with current transformer and current was supplied. The result is as under:

Test results:

RESISTANCE TEST

	Resistance before test	Resistance after test
1- Sample A (TEE JOINT)	0.34 m ohm	0.32 m ohm
2- Sample B (CROSS JOINT)	0.25 m ohm	0.25 m ohm
3- Sample B (CROSS JOINT)	0.23 m ohm	0.22 m ohm
4- Sample C (EARTH ROD)	0.50 m ohm	0.50 m ohm
5- Sample C (EARTH ROD)	0.50 m ohm	0.51 m ohm
6- Sample C (EARTH ROD)	0.21 m ohm	0.20 m ohm

Test(S) witnessed by:
1. Muhammad Nadeem, Assistant Manager (Design), NTDC, WAPDA House, Lahore.
2. Syed Abdul Rehman Kashsif, Assistant Professor, Electrical Engineering Department, UET, Lahore.
3. Mian Muhammad Saeed, (Manufacturer representative)

Dr. Muhammad Asghar Saqib,
Director,
High Voltage Engineering Laboratory.

HIGH VOLTAGE TESTING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. Univ./EE/712/2013,
Dated 27.06.2013.

M/s. Waheed Naeem & Company,
19-F, Raja Chambers, 35-Queens Road,
Lahore.

Sub:- TESTING OF CROUNDING CONNECTION (EARTHING ROD).

Reference your letter No. WNC/FESCO/DESIGN/PT/23, dated 18.05.2013.

Following samples were tested in the High Voltage Engineering Laboratory on 19.06.2013 and results are reproduced below:-

Sample Detail:

Five samples of conductor combination joint 95mm^2, 7 strands, AWG 3.0 copper wire & copper coated earth rod 14.3mm.

Test Procedure:

The terminal of combination joint was connected with current transformer and current was supplied. The result is as under:

TEST RESULTS:

		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Resistance of sample before test @ 33 °C		**0.34 m Ω**	**0.24 m Ω**	**0.20 m Ω**	**0.50 m Ω**	**0.42 m Ω**
Resistance of sample after test @ 33 °C		**0.34 m Ω**	**0.24 m Ω**	**0.23 m Ω**	**0.54 m Ω**	**0.45 m Ω**
Test 1	**Peak**	**85 kA**	**94 kA**	**96 kA**	**105 kA**	**105 kA**
	RMS	**34 kA**	**26.7 kA**	**24 kA**	**30.05 kA**	**30.34 kA**
	Peak/RMS	**2.5**	**3.52**	**4**	**3.49**	**3.46**
Test 2	**Peak**	**104 kA**	**95 kA**	**104 kA**	**104 kA**	**105 kA**
	RMS	**29 kA**	**27 kA**	**30.05 kA**	**30.34 kA**	**30.35 kA**
	Peak/RMS	**3.586**	**3.518**	**3.461**	**3.427**	**3.459**
Test 3	**Peak**	**93 kA**	**104 kA**	**104 kA**	**104 kA**	**100 kA**
	RMS	**26 kA**	**29.62 kA**	**30.05 kA**	**30.05 kA**	**28.9 kA**
	Peak/RMS	**3.576**	**3.511**	**3.461**	**3.461**	**3.460**
Time duration for all the tests is one second						

Remarks: All the samples mentioned above were found OK after complete examination and no cracks fusion or deformation was observed.

Test(S) witnessed by:

1. Muhammad Nadeem, Assistant Manager (Design), NTDC, WAPDA House, Lahore.
2. Syed Abdul Rehman Kashsif, Assistant Professor, Electrical Engineering Department, UET, Lahore.
3. Mian Muhammad Saeed, (Manufacturer representative)

Dr. Muhammad Asghar Saqib,
Director,
High Voltage Engineering Laboratory.

HIGH VOLTAGE TESTING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. Univ./EE/712/2013,
Dated 27.06.2013.

M/s. Waheed Naeem & Company,
19-F, Raja Chambers, 35-Queens Road,
Lahore.

Sub:- TESTING OF GROUNDING CONNECTION (EARTHING JOINT A,B,C).

Reference your letter No. WNC/FESCO/DESIGN/PT/23, dated 18.05.2013.

Following samples were tested in the High Voltage Engineering Laboratory on 19.06.2013 and results are reproduced below:-

Sample Detail:

Five samples of conductor combination joint 95mm^2, 7 strands, AWG 3.0 copper wire & copper coated earth rod 14.3mm.

Test Procedure:

The terminal of combination joint was connected with current transformer and current was supplied. The result is as under:

TEST RESULTS:

		Sample 1 A (T. Joint)	Sample 2 B (Cross Joint)	Sample 3 B (Cross Joint)	Sample 4 C (T. Earth Rod)	Sample 5 C (T. Earth Rod)
Resistance of sample before test @ 33 °C		**0.34 m Ω**	**0.24 m Ω**	**0.20 m Ω**	**0.50 m Ω**	**0.42 m Ω**
Resistance of sample after test @ 33 °C		**0.34 m Ω**	**0.24 m Ω**	**0.23 m Ω**	**0.54 m Ω**	**0.45 m Ω**
Test 1	**Peak**	**85 kA**	**94 kA**	**96 kA**	**105 kA**	**105 kA**
	RMS	**34 kA**	**26.7 kA**	**24 kA**	**30.05 kA**	**30.34 kA**
	Peak/RMS	**2.5**	**3.52**	**4**	**3.49**	**3.46**
Test 2	**Peak**	**104 kA**	**95 kA**	**104 kA**	**104 kA**	**105 kA**
	RMS	**29 kA**	**27 kA**	**30.05 kA**	**30.34 kA**	**30.35 kA**
	Peak/RMS	**3.586**	**3.518**	**3.461**	**3.427**	**3.459**
Test 3	**Peak**	**93 kA**	**104 kA**	**104 kA**	**104 kA**	**100 kA**
	RMS	**26 kA**	**29.62 kA**	**30.05 kA**	**30.05 kA**	**28.9 kA**
	Peak/RMS	**3.576**	**3.511**	**3.461**	**3.461**	**3.460**
Time duration for all the tests is one second						

Remarks: All the samples mentioned above were found OK after complete examination and no cracks fusion or deformation was observed.

Test(S) witnessed by:

1. Muhammad Nadeem, Assistant Manager (Design), NTDC, WAPDA House, Lahore.
2. Syed Abdul Rehman Kashsif, Assistant Professor, Electrical Engineering Department, UET, Lahore.
3. Mian Muhammad Saeed, (Manufacturer representative)

Dr. Muhammad Asghar Saqib,
Director,
High Voltage Engineering Laboratory.

IEEE RESISTENCE TEST

WELCOME TO PAKISTAN

HIGH VOLTAGE ENGINEERING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. Univ./EED/2013/752
Dated 04.11.2013.

M/s. Waheed Naeem & Company,
7-S, Raja Chamber,
35-Queen Road,
Lahore.

Sub:- **FINAL MEASUREMENT OF RESISTANT: STANDARD IEEE-837- 2002.**

Ref. Letter NO WNC/FESCO/DESIGN/TYPE TEST **28.06.2013.**

Following sample of conductor combination joint 95 mm^2, 7-Strand, AWG 3.0 Copper Wire Tee Joint, Cross Joint and Rod Joint were tested in the High Voltage Engineering Laboratory on 29 October, 2013.

TEST RESULTS

The results of the relevant samples are as under:

Test \ Sample Type	Tee Joint	Cross Joint	Earth Rod Joint
Sample Resistance before the corrosion test @ 32^0C	0.01 mΩ	0.01 mΩ	*0.05 mΩ
Sample Resistance after the corrosion test @ 28^0C	0.01 mΩ	0.01 mΩ	0.04 mΩ

Remarks: 1. *The resistance of the Earth Rod Joint as reported in our early letter No. Univ./EED/2013/752 dated 27.09.2013 was wrongly measured between wire to wire ends rather than between wire and the solid rod ends (which was desired). Thus previous value 0.01 must be treated as 0.05 mΩ.

2. The resistance of all the samples – Tee Joint, Cross Joint and Earth Rod Joint – is within limits.

The test was witnessed & advised by:

1. Engr. Nasir Osaman, Manager (S&R) Design, NTDC.
2. Mian Muhammad Saeed (Manufacturer Representative)

Dr. Muhammad Asghar Saqib,
Director,
High Voltage Engineering Laboratory.

HIGH VOLTAGE ENGINEERING LABORATORY
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE (☎99029423)

No. Univ./EED/2013/752
Dated 27.09.2013.

M/s. Waheed Naeem & Company,
7-S, Raja Chamber,
35-Queen Road,
Lahore.

Sub:-**FREEZ AND THAW TEST STANDARD IEEE-837 - 2002.**

Ref. Letter NO WNC/FESCO/DESIGN/TYPE TEST **28.06.2013**

Following sample of conductor combination joint 95 mm^2, 7-Strand, AWG 3.0 Copper Wire Tee Joint, Cross Joint and Rod Joint were tested in the High Voltage Engineering Laboratory on 24^{th} to 27^{th} September, 2013.

TEST PROCEDURE

The relevant samples were kept in highcool incubator and their results are as under:

No. of Cycle 10 each sample	Tee Joint	Cross Joint	Cross Joint	Earth Rod Joint
Sample Resistance before test @ 32^0C	0.01 mΩ	0.01 mΩ	0.01 mΩ	0.01 mΩ
Low Temperature Duration 2 hours	-11C	-11C	-11C	-11C
High Temperature Duration 2 Hours	33C	35C	34C	33C
Sample Resistance after test @ 31^0C	0.01 mΩ	0.01 mΩ	0.01mΩ	0.01 mΩ

Remarks: Joints found OK after complete examination and no cracks fusion or deformation was observed. Resistance of the Joints was within limits.

The test was witnessed & advised by:

1. Engr. Nasir Osaman, Manager (S&R) Design, NTDC.
2. Mian Muhammad Saeed (Manufacturer Representative)
3. Mr. Muhammad Bilal, Lecturer UET, Lahore.

Dr. Muhammad Asghar Saqib,
Director,
High Voltage Engineering Laboratory.

THERMITE WELD PAKISTAN

IEEE FINAL RESISTANT/FREEZ & THAW TEST

IEEE SALT SPRAY TEST

HERMETIC WELD PAKISTAN

Pakistan Council of Scientific & Industrial Research
LABORATORIES COMPLEX, FEROZEPUR ROAD, LAHORE – 54600

PNAC LAB 041 17025

REF. NO. EMTL/1653/-

DATE: 10 October 2013

Mian Muhammad Saeed,
Director,
Waheed Naeem & Company,
19-F, Raja Chambers, 35-Queen's Road,
Lahore.
Tel. #: 042-37569081

Subject: **TESTING OF TEE JOINT, CROSS JOINT AND ROD JOINT OF COPPER CONDUCTOR**

Reference your letter WNC/PCSIR/NTDC/FESCO/39 dated 02-10-2013, Please find enclosed herewith the test report for the Tee Joint, Cross Joint and Rod Joint of copper conductor provided by you for testing purpose.

Kindly acknowledge the documents.

Rabbani 10.10.13

(IRFAN AHMAD RABBANI)
Chief Engineer / Head
Electrical Measurement & Test Lab.
Tel. #: 042-99231699
Email: emtlpcsir@gmail.com

CC
Chief Engineer (Design) NTDC,
622- WAPDA House, Lahore

Tel: ++92 42 99230697 PABX No. ++92 42 99230689–95 Fax: ++92 42 99230705
E-mail: pcsir@brain.net.pk Web Site: http://www.brain.net.pk/~pcsir/lhr.htm

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Pakistan Council of Scientific & Industrial Research
LABORATORIES COMPLEX, FEROZEPUR ROAD, LAHORE – 54600

Report No. EMTL/1653 Date: 10th October, 2013

TEST REPORT

Testing Laboratory		
Name:	Electrical Measurement & Test Laboratory	
Address:	PCSIR Laboratories Complex, Ferozepur Road, Lahore – 54600, Pakistan	
Testing Location:	Same as above	
Job Code #	1653	
ILO Log # & Date:	110 / 07-10-2013	
Customer		
Name:	Waheed Naeem & Company,	
Address:	19-F, Raja Chambers, 35-Queen's Road, Lahore	
Request Ref. & Date:	WNC/PCSIR/NTDC/FESCO/39	Dated: 02-10-2013
Test Specification		
Standard:	ISO 9227 : 2006 Neutral Salt Spray Test (NSS)	
Test Procedure:	N.A.	
Procedure Deviation:	N.A.	
Non-standard Test Method:	N.A.	
Test Item Description	Product:	- Tee Joint of copper conductor - Cross Joint of copper conductor - Rod Joint of copper conductor
Copy of Marking Plate / Label	Nil	

Test Witnessed & Advised by:

Engr. Nasir Osaman Manager (S&R) Design NTDC.
Engr. Muhammad Nadeem assistant Manager (Design) NTDC.
Engr. Maqsood, Deputy Manager, (Design) NTDC.
Mian Muhammad Saeed (Manufacturer Representative)
Syed Abdul Rehman Kashif, UET, Lahore.

Tel: ++92 42 99231699 PABX No. ++92 42 99230689–95 Fax: ++92 42 99230705
E-mail: emtlpcsir@gmail.com Web Site: http://www.pcsir-lhr.gov.pk

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Pakistan Council of Scientific & Industrial Research
LABORATORIES COMPLEX, FEROZEPUR ROAD, LAHORE – 54600

Report No. EMTL/1653 Date: 10th October, 2013

Test Case Verdicts (if applicable)	
Test case does not apply to the test object:	N(.A.)
Test item does meet the requirement:	P(ass)
Test item does not meet the requirement:	F(ail)
Testing	
Date of Receipt of Test Item:	07-10-2013
Date (s) of Performance of Test:	08-10-2013 to 09-10-2013
General Remarks	
Neutral Salt Spray (NSS) Test was carried out for 24 hours on the supplied samples of Tee Joint, Cross Joint and Rod Joint of copper conductor in accordance with ISO 9227: 2006. No corrosion was observed and the supplied samples conform the standard requirements.	

Report:

Prepared by: Muhammad Azhar, Sr. Scientific Officer — (Signature) 10/10/13

Reviewed by: Irfan Ahmad Rabbani, Head, Electrical Measurement & Test Laboratory — (Signature) 10.10.13

Approved by: Dr. Shahzad Alam, Director General — (Signature) 10/10/13

Note: The Test Results and the Terms & Conditions Governing Testing and Calibration Services provided by PCSIR Laboratories Complex, Lahore – Pakistan are attached herewith.

Tel: ++92 42 99231699 PABX No. ++92 42 99230689–95 Fax: ++92 42 99230705
E-mail: emtlpcsir@gmail.com Web Site: http://www.pcsir-lhr.gov.pk

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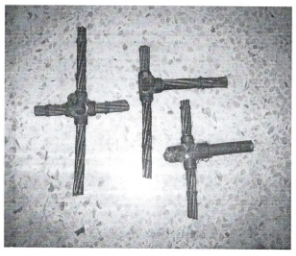
Pakistan Council of Scientific & Industrial Research
LABORATORIES COMPLEX, FEROZEPUR ROAD, LAHORE – 54600

Report No. EMTL/1653 Date: 10th October, 2013

TEST DATA / INFORMATION

Product:	Tee Joint, Cross Joint and Rod Joint of copper conductor
Manufacturer:	Waheed Naeem & Company, 19-F, Raja Chambers, 35-Queen's Road, Lahore
Test Description:	Neutral Salt Spray (NSS) Test
Test Standard:	ISO 9227 : 2006
Time Duration:	24 Hours

Photograph of the Tested Sample of Tee Joint, Cross Joint and Rod Joint



Tel: ++92 42 99231699 PABX No. ++92 42 99230689–95 Fax: ++92 42 99230705

MECHANICAL & CHEMICAL TESTS :

There are various type of test such as

1. Pullout Test
2. Chemical Test
3. Corrosion Test – Salt Spray

Tests are Carried out at Pakistan Council of Scientific & Industrial Research (PCSIR) Laboratories Complex Lahore, in the presence of representatives of Chief Engineer (Design) NTDC' Wapda, Lahore

GOVERNMENT OF PAKISTAN
MINISTRY OF SCIENCE & TECHNOLOGY

PSQCA

PAKISTAN STANDARDS AND QUALITY CONTROL AUTHORITY
TECHNICAL SERVICES CENTRE
(FORMER MIRDC)

Certificate of Acceptance

Job No. 18116 **Dated: 28.08.2002**

Product: **Railroad Thermit welding ®**

Manufacturer: **THERMIT WELD (PAKISTAN) ESTD.**
19-F, RAJA CHAMBERS, 35-QUEEN'S ROAD, LAHORE, PAKISTAN

Scope of Acceptance:

The product identified above is suitable for use on Railtrack infrastructure. After applying on the Rail Track the properties achieved are found in accordance to the specifications of French and German manufactures.

Product: Railtech Alumino-Thermic Welding — Elektro-Thermit Welding.

Manufacturers: 1. Railtech International, France. — 2. Elektro Thermit GmbH & Co. Germany.

General Condition:

The product is suitable for welding of rail steel grades 90/100/120 lbs. Or S 49, UIC 54 UIC 60. Petrol/Oxygen-propane preheating.

Note: This certificate is based on the results of metallographic studies and hardness testing carried out at TSC(PSQCA) Lahore.

HEAD OF NDE
METALLURGICAL ENGG. DIV.

MANAGING DIRECTOR
MUNIR AHMAD
Managing Director
Technical Services Centre (PSQCA)
Government Of Pakistan
Ministry of Science & Technology
125-A Industrial Area, Kot Lakhpat, Lahore

125-A, Industrial Area, Kot Lakhpat, Lahore, Pakistan
Tel: 5118022, 5150739, 5111804 Fax: 92-(042) 5122829





THERMIT WELD PAKISTAN

GOVERNMENT OF PAKISTAN
Ministry of Science & Technology
Pakistan Council of Scientific & Industrial Research
Laboratories Complex, Lahore
Ferozepur Road, Lahore 54600 - Pakistan

Sr. No. PCSIR - LLC- 0175

Doc#LLC/QMR/FF/030 | Issue Date: Nov 1st 2006 | Issue # 01 | Rev # 01

TEST REPORT

Report No: PITMAEM/SA/11152-12/12 Dated: 21-12-2012

Name & Address of Customer:	M/s Waheed Naeem & Company, 19-F, Raja Chambers, 35-Queen's Road, Lahore.		
Request Ref. # & Date:	WNC/PCSIR/NTDC/FESCO/12	***Sheet No:***	1/1
Description of Sample:	Pull our load tests of provided Tee joint, Cross joint & Rod joint samples, Breaking force (T joint) sample	**No. of Sample(s):**	Six (06)
ILO Log # and Date:	294 Dated: 19-12-2012	**Ref/Code #:**	MECH # 2492
Method used /Specs:	IEEE-Std-837	***Temp. & Humidity:***	-
Statement of Non-compliance:	Nil	**Testing Date:**	18-12-2012

RESULTS

Sample ID	Pull Out Load (KN)	Remarks
T Joint-1	2.225	OK
Cross Joint-1	2.225	OK
Cross Joint-2	2.225	OK
Rod Joint-1	2.225	OK
Rod Joint-2	2.225	OK
	Breaking Force (KN)	
T Joint-2	13.72	

Remarks: The tensile test was witnessed by Mr. Muhammad Nadeem, Assistant Manager (Design) NTDC and Junaid Dilawar, Additional Manager (S&R) NTDC.

♦.....♦ End ♦.....♦

- This test/calibration certificate is based solely on the particular sample (s) supplied by the client and should not be reported in part.
- Sampling has not been performed by the PCSIR Labs. And PCSIR does not accept the responsibility that the item(s) supplied is/are truly representative item(s) of any batch or stock or entire production.
- While the PCSIR agrees to take every reasonable precaution to ensure validity of its test results, it assumes no liability thereof beyond the amount of the fee charged for the analysis/test.
- The party shall assume full responsibility for the ethical use of the results in the test/calibration certificates and the laboratory shall be held free from any and all claims, which may result from the use of such data by the client or others.
- After completion of the test/calibration the sample if required will be retained for one month until negotiated otherwise.
- The contents of this certificate cannot be, in any manner, used for the publicity of the product or any advertisement.

Prepared by: Section Incharge 21/12/12

Head of the Centre 21/12/2012

Counter signature: Director General 21/12/12

Page 1 of 1

Computer Generated

Tel: +92 42 9231798 PABX No. +92 42 99230688 - 95 Fax: +92 42 99230705
Email: ilo@pcsir-lhr.gov.pk website:www.pcsir-lhr.gov.pk

Pakistan Council of Scientific & Industrial Research
PAKISTAN INSTITUTE OF TECHNOLOGY FOR MINERALS AND ADVANCED ENGINEERING MATERIALS
FEROZEPUR ROAD, LAHORE-54600 – PAKISTAN
Doc. # LLC/QMR/FF/030 Issue # 01 Rev. # 01 Issue Date: Nov. 01, 2006 Page 1 of 1

TEST REPORT

Report No: PITMAEM/SA/11373-02/13 Dated: 18-02-2013

Name & Address of Customer:	M/s Waheed Naeem & Company, 19-F, Raja Chambers, 35 Queens Road, Lahore.		
Request Ref. # & Date:	WNC/NTDC/FESCO/13 Dated: 12-02-2013	***Sheet No:***	1/1
Description of Sample:	Chemical Composition of provided metal sample	**No. of Sample(s):**	One (01)
ILO Log # and Date:	223 Dated: 14-02-2013	**Ref/Code #:**	JHM # 1580
Method used /Specs:	ASTM E 1476-04	***Temp. & Humidity:***	
Statement of Non-compliance:	Nil	**Testing Date:**	15-02-2013

RESULTS

Elements	Percentage
Antimony (Sb)	0.038
Tungsten (W)	0.105
Niobium (Nb)	0.125
Iron (Fe)	2.599
Copper (Cu)	97.090

Remarks: The Chemical Analysis was witnessed by Mr. Muhammad Nadeem, Assistant Manager Design (NTDC).

♦ END ♦

- This test report is based solely on the particular sample(s) supplied by the client and should not be reproduced in part.
- Sampling has not been performed by the PCSIR Labs and the PCSIR does not accept the responsibility that the sample(s) supplied is/are truly representative sample(s) of any batch or stock or entire production.
- While the PCSIR agrees to take every reasonable precaution to ensure validity of its test results, it assumes no liability thereof beyond the amount of the fee charged for the analysis/test.
- The party shall assume full responsibility for the ethical use of the results in the test reports and the laboratory shall be held free from any and all claims, which may result from the use of such data by the client or others.
- This test report shall not be reproduced wholly or in parts unless negotiated.
- After completion of the report the sample will be preserved for one month until negotiated otherwise.
- The contents of this report cannot be, in any manner, used for the publicity of the product or any advertisement.

Report prepared by: Countersignature

Engr. Badaruddin Soomro
Section Incharge 18/2

Engr. Muhammad Irfan
Head, PITMAEM 18-02-2013

Director General 18-2-13

Tel: +92 42 99231798 PABX No. +92 42 99230688~95 Fax: +92 42 99231795
E-mail: pitmaem.lhr@gmail.com, pitmaem@pcsir-lhr.gov.pk **Website:** http://www.pcsir-lhr.gov.pk



IEEE MECHANICAL & CHEMICAL TEST

PREPARATION OF JOINT TO BE WELD:

1. Remove the insolation of the conductor on a length of 15 cm when using insulated cable. Using the card cloth-brush clean the cable , dust and oxides.



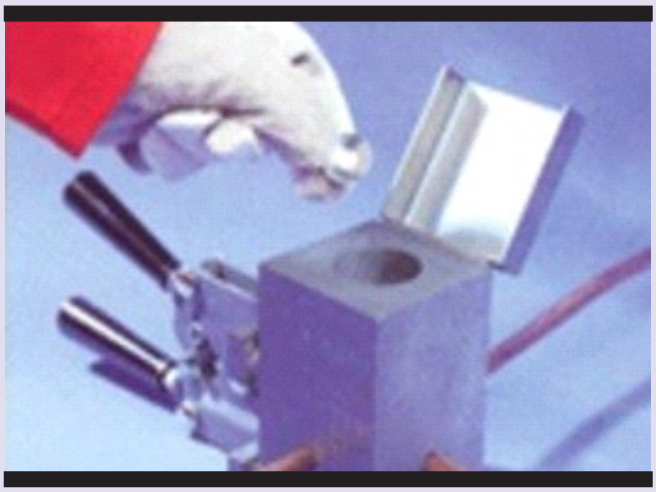
2. Before starting the first weld pre-heat the graphite mould with a welding torch during at least 5 minutes having temperature 100°C. This operation is very important to prevent from porous weld.



3. Open the mould by separating the two arms of the handle clamp. Cable must sit on top of rod. Support mould to keep it from sliding down the rod when welding. Use lock pliers or clamp on rod below mould.

4. Close the mould with the handle clamp to avoid molten metal losses. Place the metallic disc, conical side to bottom, on tap hole.

5. Open packed thermite weld packet and pour the thermite weld powder into the crucible.



6. Open started powder sasha and spread all the top bottom of the mould also starting powder on the top edge of the mould, under open cover, for easy ignition.

7. Close the mould cover and placing the flint ignitor from aside ignite the starting powder. It is advisable, once the ignition takes place, to pull away the flint igniter quickly to avoid its damage.

8. Wait one minute and open completely the mould handle clamp to remove the welded connection. During this operation take care of your graphite mould.

9. Remove slag from the crucible and tap hole with the mould scraper. Remove dust from the weld cavity, tap hole, crucible with mould brush. If the mould is still warm, you can go on the welding process without preheating it again.







SAFETY FIRST

Use Gloves, Safety Glasses, Safety Boots, Handle, Mouth cover Before Starting Work

APPLICATION:

The Thermiteweld exothermic welding system is used for in making Electrical connections of copper to copper, copper to steel or copper to cast iron for the grounding and cathodic application.

Thermiteweld connections shall be suitable for exposure to the elements of direct burial in earth or concrete without degradation over the lifetime of the grounding system.

OPERATING INSTRUCTING:

1. Surfaces of conductor / copper rod must be dry and free of rust or grease.
2. Before start welding, the mould has to be dried by pre-heating it up to 120-130degress with a blow lamp or through burning a powder cartridge.
3. Place into mould materials to be welded, then close the mould properly to prevent molten metal leakage.
4. close tap hole at the crucible with provided metal disc and then fill it with the powder from the compartment sealed with the colored cap (Be sure that proper powder size is used according to the mould size.
5. Spread starting powder on welding flux, and lay a trail of it on mould edge.
6. Close mould cover and ignite with flint gun from a side (never attempt from the front).
7. Open mould after metal solidifies and carefully take out the welding. Before making the next welding, remove slag from crucible and tap hole with proper mould scraper and brush.
8. As molten metal Sparks, slag and hot work surface are produced during Welding reaction, take precautionary measures to avoid burns. Do not use water or oil.



EARTHING CONNECTORS

These mechanical grounding connectors are designed for use with cable to bar in grounding and bonding systems and to connect the grounding electrode conductor to the ground rod.

They are made up of copper and brass material, used for 132KVA, 220KVA and 500 KVA Grid station.

There are many types of grounding connector such as

- Type I, II, III Raiser Connector
- Lugs Thimbles CU Connector
- Single groove Brass Connector
- Double groove CU Connector



Used in Fesco



Connectors LUGS Thimble



Used in MEPCO Grids GSC-33 Project





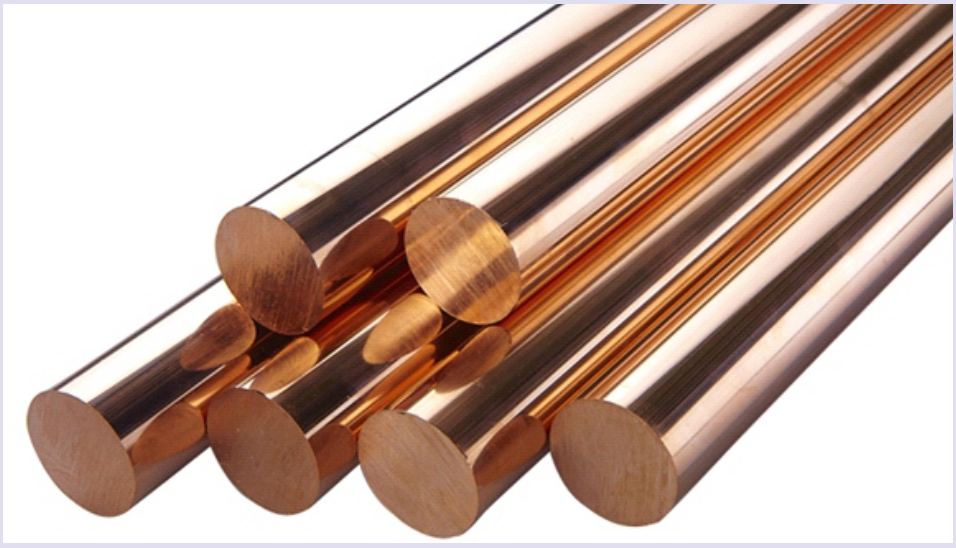
MEPCO 132 KVA Grid Connectors LUGS Thimble

COPPER COATED EARTH ROD

Earth rod used for substation grounding having following dimensions

- Length 3mt without threading
- Diameter of 14mm, 16mm,18mm
- Copper coated thickness range 250-350 micron



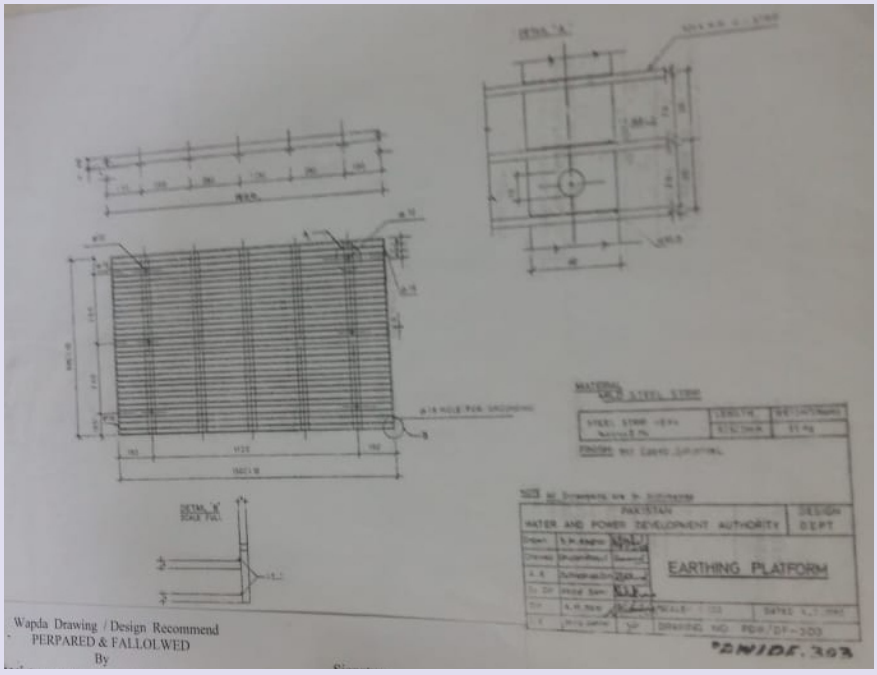


EARTHING PLATFORM

Earthing platform used for grounding of grid stations. Specialized structures are made of mild steel with hot dip galvanized zinc coating that prevents structure from corrosion. Dimensions of earthing platform are as under,

- Micron Range 136-142
- Material Mild steel Flat (MS flat)
- Length 15mm
- Breath 900mm
- Thickness 4mm
- Weight 69 kg (approx.)

Above mention dimensions are according to NTDC/WAPDA, Pakistan as per drawing no. PWD/DF-303 and Standard Specifications.



GOVERNMENT OF PAKISTAN
MINISTRY OF SCIENCE & TECHNOLOGY
PAKISTAN STANDARDS & QUALITY CONTROL AUTHORITY
QUALITY CONTROL CENTRE
PITAC Compound Ferozepur Road, Lahore-54600
PSQCA

TEST REPORT

Your Ref No. WNC/NTDC/DESIGN/08 Dated :- 01-07-2008
Our Ref No QCC/4(348)/08-09 (625) Dated :- 5/7/08

Sample received from: The Director, Waheed Naeem & Co, LAHORE
Report issue to
No. of sample One (1)
Specification against which tested. As per test request

Subject :- Testing of sample stated to be Hot Dip Galvanized Strip Size 40x4mmx12"

The sample as received has been tested with the following results :-

S.No	Description of tests.	Test Results Corresponding to Lab.Reg.No. CH/001
1.	Galvanized test (grams/m²)	785

End of Test Report.

SECTION INCHARGE

DEPUTY DIRECTOR INCHARGE
QUALITY CONTROL CENTRE
LAHORE. (178)

Waheed Naeem & Co.
Director

LIST OF CLIENTS



Lahore Electric Supply Company



Gujranawala Electric Power Company



Tribel Electric Supply Company



Islamabad Electric Supply Company



Faisalabad Electric Supply Company



Hyderabad Electric Supply Company



Multan Electric Power Company



Quetta Electric Supply Company



Pak Elektron Limited



Sui Northern Gas Company



Sui Southern Gas Company



Shaheen Traders



LIST OF CLIENTS

LIST OF CLIENTS

Pakistan Railway

National Transmission & Despatch Company (NTDC)

Peshawar Electric Supply Company

Sukkur Electric Power Company

Siddique Sons Engineering (PVT.) LTD.

MK Engineering

Potential Engineers



Orange Metro Train Project

Oil & Gas Development Company Ltd.

WARNING SPHERE MARKER BALL

Aircraft warning spheres are also called as marker balls or aerial warning spheres are used as a visual marking of overhead power lines to make power lines visible to aircraft and helicopters.

The warning spheres are attached to the shield wires or to phase conductors, always to the wire or conductor having the highest point.

Aircraft warning sphere is designed to provide daytime visual warning or night time visual warning with reflective tape, for electricity transmission line and overhead wire for aircraft pilots.

Aerial Warning Spheres marker ball according to international standard specifications: diameter range 25-65 inches









END USER PERFORMANCE CERTIFICATE

PESHAWAR ELECTRIC SUPPLY COMPANY

OFFICE OF PROJECT Director (GSC)
PESCO PESHAWAR.
Fax No. # 091-2248900

No.CE(Dev)/GC 318 / Dated 29 /01/2018

END USER CERTIFICATE

It is certified that M/s Waheed Naeem & Company have supplied the Grid Station Materials (Cartridges and Moulds) under different purchase orders.

This office has not received any complaints regarding the quality/quantity /performance of the materials.

Executive Engineer (G.C)
PESCO, Peshawar

Copy to:-

➢ *MFILE.*

NATIONAL TRANSMISSION AND DISPATCH COMPANY LIMITED

OFFICE OF THE
EXECUTIVE ENGINEER
EHV Const: Division NTDC
171-B Johar Town Lahore.

XEN EHV Const LHR No. 1996 Dated 07 DEC 2011

TO WHOME IT MAY CONCERN

Subject;- **PERFORMANCE REPORT OF CADWELD/THERMITEWELD.**

Thermoweld cartridges Type G,H and I manufactured by M/S Waheed Naeem Co, Lahore checked and utilized at 220 kv Grid Station Jaranwala Road Faisalabad on experimental basis. The performance of thermitedweld cartridges found satisfactory and according to Wapda Specification P-114.

This certificate has been issued on the specified request of the party vide his letter No.WNC/CE/TSC/11/ dated 24-11-2011.

EXECUTIVE ENGINEER
EHV CONST: DIVISION NTDC
LAHORE

GUJRANWALA ELECTRIC POWER CO. LTD.GUJRANWALA

Office of the
Manager (Material Management)
565/A Model Town G.T.Road,
Gujranwala
Ph: No.055-9200527
PBX-055-9200519-26 Ext.217
Fax No.055-9200528

Memo No. 11219 /DD(T&G) Dated: 19 /03/2012

TO WHOM IT MAY CONCERN

Sub:- ***PERFORMANCE OF CARTRIDGES & MOULDS***

The Performance of Cartridges & Moulds supplied by M/s. Waheed Naeem & Co., Lahore remained satisfactory uptill now.

Dy: Manager PP (T&G) 19/3/2012
GEPCO LTD. GUJRANWALA

MEPCO

MULTAN ELECTRIC POWER COMPANY (MEPCO)
OFFICE OF THE CHIEF ENGINEER (DEVELOPMENT) PMU MEPCO

No. 7572 / Proc/ Dated: 14 APR 2017

TO WHOM IT MAY CONCERN

Subject: **PERFORMANCE OF CARTRIDGES & MOULDS**

The Performance of Cartridges & Moulds supplied by M/s Waheed Naeem & Co., Lahore remained satisfactory because no complaint has been received from field formation up-till now.

Manager (Procurement) PMU
MEPCO Ltd: Multan

HESCO HYDERABAD ELECTRIC SUPPLY COMPANY
PHONE & FAX No.022-9250146

OFFICE OF THE
EXECUTIVE ENGINEER
G.C DIVISION GSC HESCO
N.T.P.S COLONY, T.M.KHAN
ROAD HYDERABAD

No. XEN/GCD/GSC/HESCO/HYD/3563 Dated: 01/2/18.

TO WHOM IT MAY CONCERN

ENDUSER / PERFORMANCE CERTIFICATE.

Certified that the Cartridge and Moulds supplied by M/s Waheed Naeem & company Lhaore has been consumed in the field and found satiosfactory accord ing to NTDC specification P-114 amended to dated 1982.

EXECUTIVE ENGINEER
G.C DIVISION GSC HESCO
N.T.P.S COLONY, T.M.KHA
ROAD HYDERABAD
Executive Engineer
GC-Division GSC
HESCO HYDERABAD

SUKKUR ELECTRIC POWER COMPANY
OFFICE OF THE DEPUTY MANAGER WAREHOUSE SEPCO

No. 845 /DM/SEPCO/WH-SUK/ Dated: 23.01.2018

The Manager (Procurement),
PMU, SEPCO Sukkur.

Subject: SATISFACTORY CERTIFICATE OF MOULDS TYPE A, B & C AGAINST SEPCO PURCHASE ORDER NCB-S-06/2016

Reference: Our Telephonic Discussion dated 18.01.2018.

This has reference to our telephonic discussion in this regard it is to inform that the performance of Moulds Type A, B & C of M/s Waheed Naeem & Company Lahore against SEPCO Purchase order No. NCB-S-06/2016 is satisfactory.

No Complain has been received from Field Formations till to date.

DEPUTY MANAGER WAREHOUSE
SEPCO SUKKUR

SUPPLY RECORD

List of Purchased order Completed 2006-2019

PURCHASER/ AUTHORITY NAME	PURCHASE ORDER N0. & DATED	QUANTITY		INSPECTION AUTYORITY	INSPECTION CERTIFICATE N0 & DATE	GOODS RECEIPT NOTE NO. AND DATE/ Delivery
		Cartridges A,B,C	Molds A,B,C			
MEPCO	01/MMM 22-11-05	1980	36	Chief Engineer Material inspection	8329 18-10-06	014234-33-32 21-10-06
HESCO	002/CE/MMM 17-01-06	2520	138	Chief Engineer Material inspection	7964 08-09-06	041435,36,37 20-09-06
FESCO	1245/CE/MMM 22-04-06	1140	27	Chief Engineer Material inspection	7102 10-06-06	045595 15-06-06
FESCO	1300/CE/MMM 20-05-06	2980	69	Chief Engineer Material inspection	7304 29-06-06	044597 30-06-06
IESCO	1year(6th STG) 26-05-06	1640	40	Chief Engineer Material inspection	2379-84 24-02-07	072164,65 12-03-07
IESCO	1 year(6th STG)24 07-08-06	740	0	Chief Engineer Material inspection	2390-94 24-02-7	072160,61,62 12-03-07
IESCO	1 year(6th STG)25 07-08-06	0	31	Chief Engineer Material inspection	2385-89 24-02-07	072160,6 1,62 12-03-07
MEPCO	061081/MMM 16-12-06	476	0	Chief Engineer Material inspection	9182 09-01-07	071007 18-01-07
PESCO	7965-68 03-05-07	570	17	Chief Engineer Material inspection	10881-85 30-05-07	022705,06 13.06.07
QESCO	STG-35/35817-	2037	23	Chief Engineer Material inspection	521 30-08-07	070132 04-09-07
QESCO	STG-29/3621 18-07-07	385	06	Chief Engineer Material inspection	522 30-08-07	070133 04-09-07
GEPCO	STG-34 21-07-07	2470	100	Chief Engineer Material inspection	15474-80 27-10-07	046059 02-11-07
GEPCO	STG-2/11/0708/ 7051 13-12-07	1627	34	Chief Engineer Material inspection	2397-2402 20-02-08	077851,52 22-02-08
PESCO	8582 -85 19.12.07	5405	73	Chief Engineer Material inspection	3299 06-03- 08	026320,21,22 15.03.08
MEPCO	061098/MMM 04-02-08	2400	96	Chief Engineer Material inspection	9890-93 17-06-08	018485,87, 25-06-08
IESCO	1612 22-02-08	806	63	Chief Engineer Material inspection	1888 15-03-08	069363,64,65 25-03-08
QESCO	CEO/MMM/ KF-448-21 10-04-08	1260	18	Chief Engineer Material inspection	2511 04-06-08	019054 17-06-08
FESCO	262/CE/MMM 28-04-08	1500	0	Chief Engineer Material inspection	12185-88 26-07-08	012003 28-07-08
HESCO	02-0004 28-11-08	1974	46	Chief Engineer Material inspection	3039-43 23-02-09	014366,67 25-02-09
FESCO	445/CE/MMM 24-02-09	200	40	Chief Engineer (DESIGN) NTDC	5723-27 10-04-09	099574 13-04-09
GEPCO	STG-8-10/0809 19-03-09	1579	58	Chief Engineer (DESIGN) NTDC	6740-44 28-04-09	013459,58 30-04-09
MEPCO	061129/MMM 06-04-10	987	0	Asstt. Manager (T&G) Mepco	3103-06 19-04-10	023160,59 27-04-10
FESCO	480/CE/MMM 26-06-09	0	30	Chief Engineer (DESIGN) NTDC	5378-81 08-04-10	005864,63 21-04-10
HESCO	01-0117/CE 16-07-09	1900	55	Chief Engineer (DESIGN) NTDC	165337-42 03-10-09	008770,69,68 06-10-09
GEPCO	STG-9-8/0910 19-04-09	700	30	AE (T) Gepco	981-86 03- 07- 10	013495,94,96 03-08-10
MEPCO	NCB_03/WB/PMU 29-09-10	2715	75	A. M. Procurement Mepco	1307-11 14-02-11	022060,59,58 22-02-11
FESCO	125/MMM/GSC	505	0	NTDC. DESIGN & XEN.SS&	30.07.11	Within DELIVERY TIME
IESCO	4639 21.06.11	500	280	XEN.SS& T IESCO	073810-11 29.10 .11	Within DELIVERY TIME
Pakistan Railway	15/0020/00-/1-2013 08/05/ 13	3500	800	XEN TRACK, PR. HQ.LAHORE	17.07.13	Within DELIVERY TIME
LESCO	72 05.04.13	4050	300	ADL.MANAGER& A.M.	05.11.2013	Within DELIVERY TIME
SEPCO	**S-032 28.08.13**	2273	173	DESIGN & USER	15191-95 31.10.13	Within DELIVERY TIME

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SUPPLY RECORD

HESCO CE(PMU)	ICB-4-V 16.03.13	4800	195	Pakistan Engineer Ing Services Ltd	1355 -64 15.06.13
FESCO	151 22.07.13	1097	15	DESIGN NTDC	15106-10 29.10 .13
MEPCO	3146 30.09.13	410	55	Purchaser Team	5777-82 05.12.13
FESCO	179 22.01.14	2300	49	DESIGN & USER	22.02.14
FESCO	189 26.02.14	3626	0	Fesco Insp. Team	910886,7 05.05.2014
NTDC- NOR-31	NOR-31 12.08.14	7000	150	CE (design) ntdc	15.05.15
IESCO	NCB-03 410 23-03-14	4530	201 Earth Rod: 305 Nos	AET(Jhelum) SDO (GC) Iesco	8605-9/AET/TM 25-05-14
I.Z.Multi Engineers	OTO/14 29.11.2014	Bus Bars Connections &Moulds		Sites Under Completions	Within DELIVERY TIME
TESCO Peshawar	10672 -75 17-10-2014	3305	111	Dy. Manager FATA Cont. Division - TESCO	7075 -80 02.12.2014
MEPCO	P.O.-4849 23.03.15	6500	262	MEPCO TEAM	19.06.15
LESCO	P.O.151 08.02.16	9000	0	LESCO Committee	338 09.03.2016
FESCO	40/PMU 25.07.16	2305	94	FESCO Committee	30.07.2016
FESCO	41/PMU 25.07.16	1378	52	FESCO Committee	30.07.2016
MK Engineering for IESCO	IESCO NCB-04 LOT (IV) Date: 12.01.2017	Earth Rods ,cartridges & Mold		IESCO Inspectors	Within DELIVERY TIME
Saddique Sons Ltd, Lahore for (QESCO)	ADB/QESCO Tranches 03	Cartridges, Molds, Holding Clamps Earth Rods		IESCO Inspectors	Within DELIVERY TIME
PESCO	3129 -39	Cartridges, Molds, Holding Clamps Earth Rods		PESCO Inspector	Within DELIVERY TIME
HESCO	3435 -40	Cartridges, Molds, Holding Clamps		HESCO Inspector	15-08-17	Within DELIVERY TIME
SEPCO	4311 - 17	Cartridges, Molds, Holding Clamps		LESCO Inspector	21 -08 -17	Within DELIVERY TIME
LESCO	201	Cartridges, Molds, Holding Clamps		LESCO Inspector	16-03- 17	Within DELIVERY TIME
MEPCO	061323	Cartridges, Molds, Holding Clamps		MEPCO Inspector	14-04-17	Within DELIVERY TIME
IESCO	NCB -19	Cartridges, Molds, Holding Clamps Earth Rods		IESCO Inspector	10-11-17	Within DELIVERY TIME
QESCO	305/STG- 585	Marker Ball		QESCO inspector	11-05-18	Within 20 days
HESCO	01-339 18.2.19	Cartridges, Molds, Holding Clamps		HESCO & NTDC Instpectors		Under Inspection
GEPCO	STG-18-8-513-18 19.02.2019	Cartridges, Molds, Holding Clamps		GEPCO Inspector		Under Inspection
PEL	Mepco -033 GSC	Cartridges, Molds,Rod Connectors, Holding Clamps		MEPCO Inspector		Under Delivery
MEPCO	061429 22-11-18	Cartridges, Molds, Holding Clamps		MEPCO Inspector		Under Delivery

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SUPPLY RECORD