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APPROVAL REPORT

APPROVAL EXAMINATION OF VARIOUS NEWSON-GALE CENELECTREX METALLIC STATIC GROUNDING AND BONDING CLAMPS PER FM APPROVALS DRAFT STANDARD 6085

Prepared for:

**Newson-Gale Ltd.
Unit 6 Churchill Park
Colwick
Nottingham, England
NG4 2HF**

Project ID: 3026387

Class: 6085

Date of Approval:

Authorized by:

July 7, 2006
G. Smith

George A. Smith, Director, Assistant V.P.

FM Approvals
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Norwood, MA 02062

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from

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I INTRODUCTION

- 1.1 Newson-Gale requested Approval of their Cenelectrex VESX 90 Stainless Steel Heavy Duty and Cenelectrex VESX 02 Stainless Steel Medium Duty Grounding Clamps. These assemblies are used to provide electrical conductivity between a flammable liquid container and ground to dissipate static electricity which may be generated in the transfer of the flammable liquid. The clamps were supplied with a ¼ in. (6 mm) by 246 in. (6.3 m) plastic covered grounding cable, one end of the cable was connected to the clamp and the opposite end had a crimped eye connector.
- 1.2 The static grounding clamps described within this report are manufactured at Newson-Gale, Ltd., Nottingham, England.
- 1.3 Testing was conducted at FM Approvals test facilities located in Norwood, MA and West Gloucester, RI.
- 1.4 This Report may be reproduced only in its entirety and without modification.
- 1.5 **Standard:**

Title	Class Number	Date
Draft Standard - "Bonding and Grounding Clamps"	6085	March 1991

- 1.6 Examination included Electrical Resistance, Vibration, Mechanical Strength and Clamping Force testing.
- 1.7 Tests show that Newson-Gale Cenelectrex VESX 90 Stainless Steel Heavy Duty and Cenelectrex VESX 02 Stainless Steel Medium Duty Grounding Clamp assemblies meet the Approval requirements of the **Standard** listed above for Bonding and Grounding Clamp assemblies.
- 1.8 **Listings:** The tested Cenelectrex VESX 90 Stainless Steel Heavy Duty and Cenelectrex VESX 02 Stainless Steel Medium Duty Grounding Clamp assemblies will be listed in the Approval Guide CD when Approval is effective.

II DESCRIPTION

- 2.1 The Newson-Gale Cenelectrex VESX 90 Stainless Steel Heavy Duty grounding clamp is a self-closing, plier type clamp constructed from stamped stainless steel with a compression spring. Each handle is approximately 9-1/4 in. (235 mm) long with a 1-1/2 in. (38 mm) handle spread. The handles are held together with a stainless steel pin and screw arrangement. The jaws are provided with sharpened, replaceable stainless steel points. One handle has a clamp screw arrangement for securing a Hytrel coated grounding cable.
- 2.2 The Newson-Gale Cenelectrex VESX 02 Stainless Steel Medium Duty grounding clamp is a self-closing, plier type clamp constructed from stamped stainless steel with a torsion spring. Each handle is approximately 5-1/2 in. (140 mm) long with a 3/4 in. (19 mm) handle spread. The handles are held together with a stainless steel rivets. The jaws are provided with replaceable stainless steel jaws. One handle has a clamp screw arrangement for securing a Hytrel coated grounding cable.

III MARKINGS

- 3.1 The manufacturer shall mark each clamp assembly with the manufacturer's name and product trade name. In addition, the clamp assembly must be marked with the Approval Mark of FM Approvals.
- 3.2 Markings denoting Approval by FM Approvals shall be applied by the manufacturer only within and on the premises of manufacturing locations that are under the FM Approvals Facilities and Procedures Audit program.
- 3.3 The manufacturer agrees that use of the FM Approvals name or Approval Mark is subject to the conditions and limitations of the Approval by FM Approvals. Such conditions and limitations must be included in all references to Approval by FM Approvals.

IV EXAMINATION AND TESTS

- 4.1 Newson-Gale, Ltd submitted product samples of their model Cenelectrex VESX 90 Stainless Steel Heavy Duty and Cenelectrex VESX 02 Stainless Steel Medium Duty Grounding clamp assemblies for examination and testing.
- 4.2 The samples were examined for conformance to the manufacturer's published information and drawings with respect to materials, dimensions, components, markings and workmanship. These examinations indicated the samples were in conformance with the manufacturer's statement and comply with FM Approvals requirements.

4.3 Electrical Resistance Test:

A test circuit was used to determine the electrical resistance of a clamp assembly in actual use. An ohmmeter was connected to bare metal and to ground. The circuit was completed by the clamp assembly which connected the bare metal to ground. Each of the grounding clamp assemblies tested showed less than 1 ohm resistance in the circuit. Contact was positive with no extra manipulating of the clamps necessary to complete the circuit.

- 4.3.1 These tests met our minimum requirements.

4.4 Vibration Test:

Both the Cenelectrex VESX 90 and Cenelectrex VESX 02 grounding clamps were subjected to 4-hour vibration test of 0.2 in. (0.5mm) displacement with a varying frequency from 10 to 30 cycles per second while attached to a piece of ¼ in. (6 mm) steel plate.

4.4.1 Both clamps remained in place, this test is satisfactory.

4.5 Mechanical Strength:

Mechanical strength tests were performed using the Tinius-Olsen tensile testing machine using a pull rate of 0.3 in (7.6 mm) per minute on various combinations shown below.

<u>Clamp Number</u>	<u>Sample Thickness</u>	<u>Max. Force</u>	<u>Average Force</u>
VESX 90	¼ in. (6 mm) Steel	36.4 lb (16.5 kg) 38.7 lb (17.6 kg) 31.5 lb (14.3 kg)	35.6 lb (16.1 kg)
VESX 90	0.030 (0.7 mm) Steel	14.8 lb (6.7 kg) 22.6 lb (10.2 kg) 10.5 lb (4.7 kg)	16 lb (7.2 kg)
VESX 02	¼ in. (6 mm) Steel	19.9 lb (9.0 kg) 29.2 lb (13.6 kg) 11.9 lb (5.4 kg)	20.12 lb (9.15 kg)
VESX 02	0.030 (0.7 mm) Steel	9.88 lb (4.5 kg) 10.77 lb (4.89 kg) 11.82 lb (5.37 kg)	10.82 lb (4.9 kg)

4.5.1 These tests met our minimum requirements.

4.6 Clamping Force Tests:

The start-to-open force to actuate the hand clamp is as follows:

<u>Clamp Number</u>	<u>Opening Force</u>
VESX 90	34 lb (15.4 kg)
VESX 02	12.4 lb (5.6 kg)

4.6.1 These tests met our minimum requirements.

V REMARKS

The grounding clamps shall be used only in accordance with the manufacturer's instructions.

VI FACILITIES AND PROCEDURES AUDIT

The Newson-Gale Ltd. production facility is located in Nottingham, England is currently included in FM Approval's Facilities and Procedures Audit program. The addition of the Approved product to this manufacturer's currently Approved line represents no change to the manufacturing or quality control procedures that would require a special audit.

VII MANUFACTURER'S RESPONSIBILITIES

- 7.1 As part of the listing requirements, FM Approvals requires assurance that subsequent units produced will present the same quality and reliability as the specific unit examined. The manufacturer shall maintain a Quality Assurance Program which includes as a minimum: incoming inspection and testing, in-process inspection and testing, final inspection and testing, equipment calibration, and drawing change control. The specific procedures used to control quality are best determined by the manufacturer.
- 7.2 The manufacturer shall notify FM Approvals of any planned change in the Approved products, prior to general sale or distribution, using Form 797, Approved Product Revision Report

VIII DOCUMENTATION

The following drawings describe the subject grounding clamps and are filed under Project ID 3026387.

<u>Drawing No.</u>	<u>Issued</u>	<u>Description</u>
W-A4-4548	June 2006	Cenelectrex VESX90 Heavy Duty Clamp
AC-006	June 2006	Cenelectrex VESX02 Medium Duty Clamp

IX CONCLUSION

- 9.1 The grounding clamps, as described in Section II, herein, meet draft Standard 6085 Approval requirements.
- 9.2 Since a duly signed Master Agreement is on file for this customer, Approval is effective as of the date of this report.
- 9.3 Continued Approval will depend upon satisfactory field experience and periodic Facilities and Procedures Audits.

EXAMINATION AND TESTING BY:

J. A. Nunes
FM Approvals Test Center Personnel

PROJECT DATA RECORD:

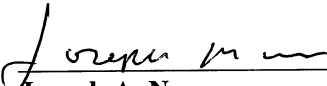
3026387

ATTACHMENTS:

Drawing # AC-006, Cenelectrex VESX02 Medium Duty
Clamp
Drawing # W-A4-4548, Cenelectrex VESX90 Heavy Duty
Clamp

REPORT BY:

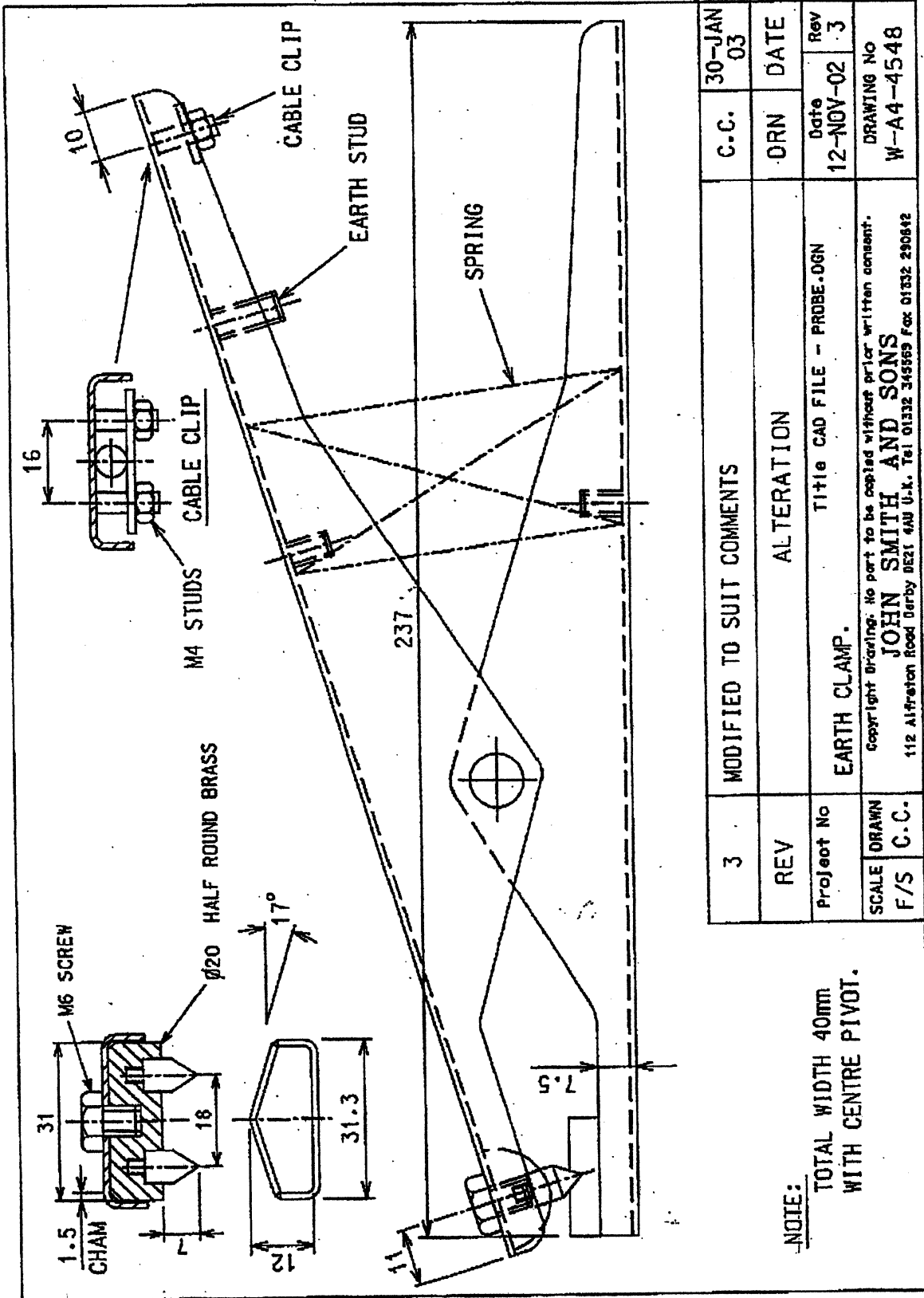
REPORT REVIEWED BY:



Joseph A. Nunes
Engineer
Materials Group



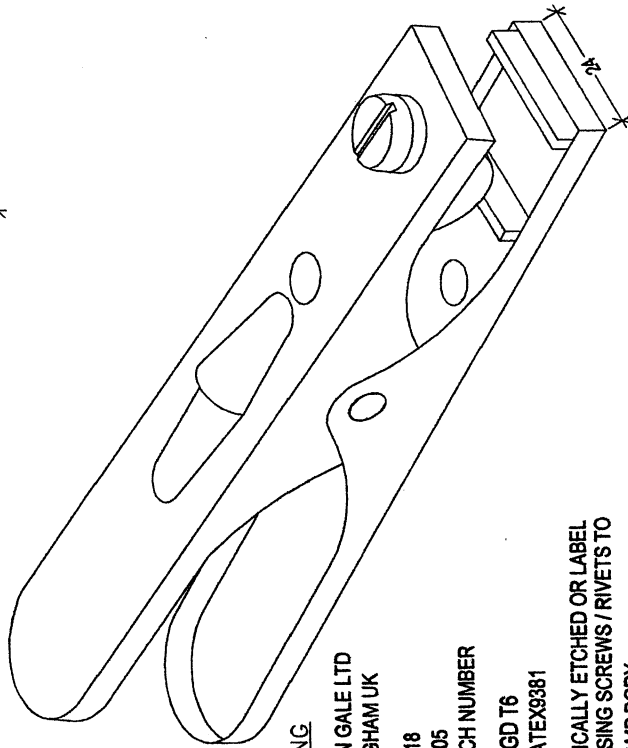
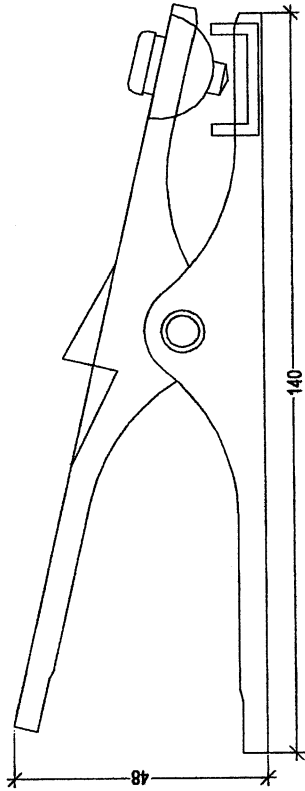
Phillip J. Smith, P.E.
Technical Team Manager
Materials Group



3	MODIFIED TO SUIT COMMENTS	C.C.	30-JAN 03
REV	ALTERATION	DRN	DATE
Project No	EARTH CLAMP.	Date	Rev
SCALE	Title CAD FILE - PROBE.DGN	12-NOV-02	3
F/S	Copyright Drawing. No part to be copied without prior written consent. JOHN SMITH AND SONS 112 Alfreton Road Derby DE21 4AU U.K. Tel 01332 345559 Fax 01332 290642	DRAWING No	W-A4-4548

MATERIALS:-

CLAMP : Mild Steel c/w Brass Contact Holder
SPRING : Zinc Plated Steel or Stainless Steel
CONTACTS : Stainless Steel c/w Brass 'U' Section



MARKING

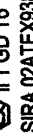
NEWSON GALE LTD
NOTTINGHAM UK



0518

VESX02/05

02 / BATCH NUMBER



II 1 GD T6

SIRA 02ATEX9381

ELECTRICALLY ETCHED OR LABEL
FIXED USING SCREWS / RIVETS TO
THE CLAMP BODY

DISTRIBUTION:	PRODUCTION <input type="checkbox"/>	SUB-CONTRACTOR <input type="checkbox"/>	DATE: 29-8-02	EARTHLING CLAMP
CLAMP	CUSTOMER <input type="checkbox"/>	OTHER:	DATE:	
NEWSON GALE LTD - CENELECTREX			SCALE: N.T.S	Drg No. AC-006
				REV 3