



CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1211841 (LR 113642-1)

Master Contract: 184585

Project: 1879829

Date Issued: 2007/06/07

Issued to: **CMP Products**
Glasshouse St.
St. Peters
Newcastle Upon Tyne, NE6 1BE
United Kingdom
Attention: Dr. Geof Mood

The products listed below are eligible to bear the CSA Mark shown



Issued by: Jay McVeigh

Authorized by: Patricia Pasemko, Operations
Manager

PRODUCTS

CLASS 4418 05 - CABLE - Hardware - For Hazardous Locations

Class I, Groups B, C & D

Ex d IIC, CSA Enclosure type 4x

PROTEX 2000 Cable Gland

Class II, Div. 2, Groups E, F & G

Poseidon 2000 (P2K) Cable Gland



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Ex d IIC & Ex e II, CSA Enclosure Type 4x

A2F, Cable Gland and Poseidon 2000 (P2K) Cable Gland

NON - Hazardous Locations, CSA Enclosure Type 4x

A2 Industrial Cable Gland

Note: Trade Sizes M16-M90 (M16 to M130 for A2, A2F only) and equivalent NPT thread Sizes to 4 inch.

Note:

1. Additional marking denoting trade size, and manufacturer information will be included.
2. The P2K and A2F cable glands are designed for appropriate Steel Tape Armour (STA), Steel Wire Armour (SWA), and appropriate braided cable. These cables must be with extruded sealing (solid polymeric) completely surrounding the 'core' (insulation and conductor), allowing for no holes or ventilation through the inner jacket or along the cores.

The Protex 2000 cable gland is designed for appropriate Steel Tape Armour (STA), Steel Wire Armour (SWA), and appropriate braided cable. These cables may or may not have extruded sealing (solid polymeric) completely surrounding the 'core' (insulation and conductor).

3. According to CEC C22.1-98, Section 18-106 Part 3, Tapered Threads shall have 5 fully engaged threads, and where non-tapered threads are used in Groups IIC there must be 8 fully engaged threads.
4. IEC Canadian Standards may have either tapered or non-tapered threads which comply to ISO Standards.
5. These cable glands are designed for appropriate cable, and installed to the manufacturers instructions, to maintain integrity of the installation.

APPLICABLE REQUIREMENTS

CSA Standard C22.2 No 0. M1991 - General Requirements - Canadian Electrical Code Part II.

CSA Standard C22.2 No. 0.4-04 - Bonding of electrical equipment

CSA Standard C22.2 No. 174-M1984 - Cables and Cable Glands for Use in Hazardous Locations.



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CAN/CSA-E60079-0:02 - Electrical apparatus for explosive gas atmospheres. PART 0: General requirements.

CAN/CSA-E60079-1:02 - Electrical apparatus for explosive gas atmospheres. PART 1: Flameproof enclosures "d".

MARKINGS



CSA INTERNATIONAL

Supplement to Certificate of Compliance

Certificate: 1211841

Master Contract: 184585

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
1879829	2007/06/07	Update to Report 1211841 to include minor product revisions.

History

LR 113642-1 Sept. 24, 1998 Original Certification of the Poseidon 2000, A2, A2F, and PROTEX 2000 Cable Glands.

LR 113642-2 April 21, 1999 Update to -1 report to include Clarifications of gland restrictions.

LR 113642-3 May 11, 1999 Update to the -1 report to expand the use of the PROTEX 2000 gland.

LR 113642-4 June 18, 1999 Update to the -1 report to include testing and removal of 2L and 20 L Enclosure size restrictions.

1211841 August 7, 2001 Supersedes LR 113642-1 report to include Division Systems to selected models.

1433881 June 27, 2003 Update to 1211841 to cover alternate construction of A2F, A2F/U, A2FRC, A2FCC and A2 Series glands.

Supplement Notes

MASTER CONTRACT: 184585

REPORT: 1211841 (LR 113642-1)

PROJECT: 1879829

- Edition 1:** September 24, 1998; Application No LR 113642-1 - Western Region
Issued by; Scott Friel, EIT; Reviewed by David Adams, P.Eng
- Edition 2:** April 21, 1999; Application No LR 113642-2 - Western Region
Issued by; Scott Friel, P. Eng.; Reviewed by David Adams, P.Eng
- Edition 3:** May 11, 1999; Application No LR 113642-3 - Western Region
Issued by; Scott Friel, P. Eng.; Reviewed by David Adams, P.Eng
- Edition 4:** June 18, 1999; Application No LR 113642-4 - Western Region
Issued by; Scott Friel, P. Eng.; Reviewed by David Adams, P.Eng
- Edition 5:** August 7, 2001; Project: 1211841; Edmonton
Issued by: Tho Nguyen, C.E.T.; Reviewed by David Adams, P.Eng
- Edition 6:** June 27, 2003; Project: 1433881; Edmonton
Issued by: Rick Parlby, R.E.T.; Reviewed by David Adams, P.Eng
Figure Added: Figure 4
- Edition 7:** May 25, 2007; Project: 1879829; Edmonton
Issued by: Jay R McVeigh.; Reviewed by Andrew Redeker, C.E.T.

Contents: Certificate of Compliance: Pages 1 to 3
Supplement to Certificate of Compliance: Page 1
Descriptive and Test Report: Pages 1 to 10
Figures added: Figure 5 (1 page)
Figures: 1 to 5

CLASS

4418 05 - CABLE - Hardware For Hazardous Locations

PRODUCTS

Class I, Groups B, C & D

Ex d IIC, CSA Enclosure type 4x

PROTEX 2000 Cable Gland

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Class II, Div. 2, Groups E, F & G

Poseidon 2000 (P2K) Cable Gland

Ex d IIC & Ex e II, CSA Enclosure Type 4x

A2F, Cable Gland and Poseidon 2000 (P2K) Cable Gland

NON - Hazardous Locations, CSA Enclosure Type 4x

A2 Industrial Cable Gland

Note: Trade Sizes M16-M90 (M16 to M130 for A2, A2F only) and equivalent NPT thread Sizes to 4 inch.

Notes:

1. Additional marking denoting trade size, and manufacturer information will be included.
2. The P2K and A2F cable glands are designed for appropriate Steel Tape Armour (STA), Steel Wire Armour (SWA), and appropriate braided cable. These cables must be with extruded sealing (solid polymeric) completely surrounding the 'core' (insulation and conductor), allowing for no holes or ventilation through the inner jacket or along the cores.
The Protex 2000 cable gland is designed for appropriate Steel Tape Armour (STA), Steel Wire Armour (SWA), and appropriate braided cable. These cables may or may not have extruded sealing (solid polymeric) completely surrounding the 'core' (insulation and conductor).
3. According to CEC C22.1-98, Section 18-106 Part 3, Tapered Threads shall have 5 fully engaged threads, and where non-tapered threads are used in Groups IIC there must be 8 fully engaged threads.
4. IEC Canadian Standards may have either tapered or non-tapered threads which comply to ISO Standards.
5. These cable glands are designed for appropriate cable, and installed to the manufacturers instructions, to maintain integrity of the installation.

APPLICABLE REQUIREMENTS

The following standards were used as a guide in the evaluation of the products covered by this report.

- CSA Standard C22.2 No 0-M1991 - General Requirements - Canadian Electrical Code Part II.
- CSA Standard C22.2 No. 0.4-04 - Bonding of electrical equipment
 - 174-M1984 - Cables and Cable Glands for Use in Hazardous Locations.
- CAN/CSA-E60079-0:02 - Electrical apparatus for explosive gas atmospheres. PART 0: General requirements.
- CAN/CSA-E60079-1:02 - Electrical apparatus for explosive gas atmospheres. PART 1: Flameproof enclosures "d".

MARKINGS

- (1) Submitter's name, trademark, or the CSA file or certificate number (adjacent the CSA Mark).
- (2) Catalogue / Model designation including trade size.
- (3) Hazardous Location designations; The letters SL if the cable gland has an integral seal along with the class and group; cable glands without integral seal shall be marked with the class, the group may be omitted.
- (4) The CSA Mark.

ALTERATIONS

- 1) Marking as noted above.
- 2) NPT thread-forms for mating with or mounting to the Explosion-Proof enclosure are required in the Division Systems (e.g. Class I, Groups B, C & D for PROTEX 2000 (PX2K) Cable Gland and Class II, Div. 2, Groups E, F & G for Poseidon 2000 (P2K) Cable Gland; Encl. Type 4X).

REQUIRED METHOD OF MARKING:

The marking shall be permanent such as cast, etched, engraved or CSA Accepted self adhesive nameplate material.

FACTORY TESTS

None required.

DESCRIPTION

List Of Figures:

<u>Number</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
*MP 1303	01	18.12.96	General Arrangement, Protex 2000 Cable Glands
*MP 1308	01	22.10.96	Skid Washer
*MP 1309	01	6.1.97	Sleeve Retaining Component with Integral Earth Lug
*MP 1310	01	6.1.97	Sleeve Retaining Component
*MP 1325	01	21.10.96	Entry Component
*MP 1326	01	6.1.96	Barrier Sleeve
*MP 1327	01	23.10.96	Barrier Compounds
*MP 1282	01	18.12.96	General Arrangement, Poseidon 2000 Cable Glands
*MP 1312	01	22.10.96	Entry Component, Item 1
**MP 1313	01	22.10.96	Entry Component, Item 1 for Long seal
**MP 1314	01	21.10.96	Inner Seal
**MP 1315	01	21.10.96	Inner seal, 20mm Long
**MP 1316	01	23.10.96	Metallic Continuity Diaphragm
**MP 1317	01	22.10.96	Skid Washer
**MP 1331	01	22.10.96	Skid Washer
**MP 1286	01	22.10.96	Locking ring
**MP 1284	01	19.12.96	Compression Component, Item 1
**MP 1288	01	19.12.96	Compression component, Item 1 with Earth Lug

<u>Number</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
***MP 1307	01	22.10.96	'O' Ring
***MP 1285	01	22.10.96	Reversible Cone
***MP 1306	01	22.10.96	Cone ring
***MP 1287	01	22.10.96	Clamping Component, Main item
***MP 1318	01	21.10.96	Seal Nut
***MP 1319	01	22.10.96	Seal Nut, Alternative
***MP 1311	01	22.10.96	Seal Nut, short
***MP 1320	01	21.10.96	Ferrule
***MP 1321	01	21.10.96	Outer seal
***MP 1322	01	21.10.96	Outer Seal, Thick, small Bore
***MP 1323	01	22.10.96	Outer Seal, thick, large O/D
***MP 1324	01	22.10.96	Standard Tolerances
***MP 1330	01	21.10.96	Materials List
#MP 1331	01	23.10.96	Poseidon/Protex Drawing Cross Reference Chart
SCH0242	08	07.03.2007	ATEX outer seal arrangement, alternate construction

* Drawings for the PROTEX 2000 CABLE GLAND

** Drawings for the POSEIDON 2000 CABLE GLAND

*** Drawings that are common for both the PROTEX 2000 and the POSEIDON 2000 CABLE GLAND

Drawings provided for Reference Only.

Description:

Ex d IIC, CSA Enclosure type 4x, Model PROTEX 2000 Cable Glands

The Protex 2000 Cable Glands are barrier type glands comprising a threaded entry component, a compound filled barrier sleeve with a metallic or nylon skid washer, a sleeve retaining component, a reversible armour/braid clamping cone and clamping ring, a threaded armour/braid clamping component, an elastomeric outer seal with a metallic or nylon ferrule, and an outer seal nut. All the above components, unless otherwise specified, may be manufactured in brass, aluminium, mild steel or stainless steel as detailed on drawing MP 1330. The outer seals may be manufactured in neoprene, silicone rubber, or thermoplastic elastomer grade TS2312. The entry component is available in a range of sizes from M20s to M75 and may be supplied with equivalent thread forms within this size range. The reversible armour clamping cone and ring assembly is designed to retain steel wire armour on the plain face and braid or steel tape armour on the grooved face, when reversed. This gland may also be used with unarmoured cables passing through the above clamping assembly. A range of outer seal and nut configurations are available to suit the outside diameter of the cable. A range of outer seal and nut configurations are available to suit the outside diameter of the cable. The sleeve retaining component may be supplied with an integral earth lug, in this form the suffix/CIEL is included in the designation, ie PROTEX 2000/CIEL. The Protex 2000 range of cable glands are further described by the drawings listed above. Each and every gland shall be marked as detailed on the general arrangement drawing.

For **Class I, Groups B, C & D** NPT thread-forms for mating with or mounting to the Explosion-Proof enclosure shall be provided.

Ex d IIC & Ex e II, CSA Enclosure Type 4x, Model Poseidon 2000 Cable Gland

The Poseidon 2000 Cable Glands are compression type glands comprising a threaded entry component, an elastomeric inner seal with a metallic or nylon skid washer and an optional metallic continuity washer, a compression component with an optional locking ring, a reversible armour/braid clamping cone and clamping ring, a threaded armour braid clamping component, an elastomeric outer seal with a metallic or nylon ferrule, and an outer seal nut. All the above components, unless otherwise specified, may be manufactured in brass, aluminium, mild steel or stainless steels detailed on drawing MP1330. The inner and outer seals may be manufactured in neoprene, silicone rubber, or thermoplastic elastomer grade TS2312. The entry component is available in a range of sizes from M16 to M90 and may be supplied with equivalent thread forms within this size range. In addition an alternative entry component and inner seal arrangement is available to form a long seal option. The reversible armour clamping cone and ring assembly is designed to retain steel wire armour on one of the faces and braid or steel tape armour when reversed. This gland may also be used with unarmoured cables passing through the above clamping assembly. A range of outer seal and nut configurations are available to suit the outside diameter of the cable. For identification the designation of the main variants are marked with a suffix as follows:

- POSEIDON 2000/U- 20mm long inner seal
- POSEIDON 2000/LN- Compression component with long external thread.
- POSEIDON 2000/CIEL- Compression component with integral earth lug.

The Poseidon 2000 range of cable glands are further described by the drawings listed above. Each and every gland shall be marked as detailed on the general arrangement drawing.

For **Class II, Div. 2, Groups E, F & G** NPT thread-forms for mating with or mounting to the Explosion-Proof enclosure shall be provided.

<u>Number</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
MP1109	01	26.5.94	General arrangement A2F (See also MP1141/B)
MP1126	01	29.10.93	Fixing component Item 1
MP1141	01	22.1.94	Neoprene seal (See also MP1141/B)
MP1141/B	02	14.4.03	Neoprene seal (ATEX)
MP1131	01	22.1.94	Stepped skid washer
MP1130	01	22.1.94	Flat skid washer
MP1135	01	29.1.94	Compression nut
MP1169	01	23.1.94	Tolerances
MP1170	01	21.1.94	Alternative materials
MP1110	01	26.5.94	General arrangement A3F
MP1140	01	22.1.94	Continuity diaphragm
MP1147	01	29.1.94	Alternative skid washer
MP1111	01	26.5.94	General arrangement 2A2f

<u>Number</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
MP1144	01	23.1.94	Screwed bush RH
MP1125	01	29.1.94	Second fixing component Item 1
MP1129	01	22.1.94	Skid washer
MP1112	01	26.5.49	General arrangement 2A3F
MP1127	01	20.10.93	Fixing component Item 1
MP1145	01	26.5.94	Screwed bush RH
MP1137	01	22.10.93	Outer neoprene seal
MP1124	01	20.10.93	Third fixing component Item 1
MP1113	01	26.5.94	General arrangement 2A4F
MP1143	01	26.1.94	Lead seal
MP1114	01	26.5.94	General arrangement D1FW
MP1146	01	28.10.93	Screwed bush
MP1128	01	5.2.94	Armour clamp without external earth
MP1142	01	29.1.94	Armour nut
MP1154	01	29.1.94	Armour clamp with integral earth
MP1115	01	26.5.94	General arrangement
MP1116	01	26.5.94	General arrangement E1FW, E1FW Poseidon
MP1138	01	22.1.94	Neoprene seal outer
MP1139	01	29.1.94	Ferrule
MP1136	01	29.1.94	Captive nut
MP1132	01	28.10.93	Main item
MP1164	01	29.1.94	Poseidon Item 1 without integral earth
MP1173	01	29.1.94	Poseidon Item 1 with integral earth
MP1165	01	29.1.94	Main item Poseidon
MP1163	01	23.1.94	'O' ring Poseidon
MP1155	01	23.1.94	Thick neoprene seal
MP1117	01	26.5.94	General arrangement E2FW and E2FW Poseidon
MP1118	01	26.5.94	General arrangement E1FX
MP1134	01	29.1.94	Solid sleeve
MP1149	01	29.1.94	Split sleeve
MP1133	01	20.10.93	CX main item clamping nut

<u>Number</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
MP1178	01	29.1.94	4 part cone
MP1175	01	29.1.94	4 part clamp with integral earth
MP1174	01	29.1.94	4 part clamp without integral earth
MP1166	01	29.1.94	CX main item clamping nut Poseidon
MP1176	01	29.1.94	4 part clamp with integral earth Poseidon
MP1177	01	29.1.94	4 part clamp without integral earth Poseidon
MP1220	01	29.1.94	4 part ferrule
MP1119	01	24.5.94	General arrangement E2FX
MP1120	01	26.5.94	General arrangement
MP1121	01	26.5.94	A2F/SR general arrangement
MP1168	01	19.1.94	A2F/SR compression nut
MP 1122	01	26.5.94	General assembly M25 E1FW/2FC
MP1150	01	29.1.94	Threaded fixing component
MP1151	01	29. 1.94	Inner neoprene seal
MP1152	01	29. 1.94	Body
MP1153	01	29. 1.94	Skid washer
MP1156	01	29. 1.94	Main item CW
MP1158	01	29. 1.94	Captive nut
MP1160	01	23. 1.94	Outer neoprene seal standard
MP1162	01	23. 1.94	Outer neoprene seal thick
MP1159	01	29. 1.94	Ferrule
MP1123	01	26.5.94	Gland for wire braided cable M25 E1FX/2
MP1157	01	29.1.94	Main item CX
MP1161	01	20.10.93	Tapered sleeve
MP1217	01	29.1.94	Item 1 black arrow gland
MP1218	01	29.1.94	M25 Item 1 E1FX/2 and E1FW/2

<u>Number</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
MP1223	01	21.2.94	Item 1 20 mm long seal
MP1224	01	1.2.94	Item 1 20 mm long seal black arrows
MP1226	01	10.3.94	20mm long seal
MP1227	01	9.3.94	Compression nut 20 mm long seal
MP1252			Item 1 20 mm long seal E1FX/2, E1FW/2
MP1253	01	25.5.94	Item 1 black arrow E1FX/2, E1FW/2
MP1254	01	24.5.94	Body 20mm long seal E1FX/2, E1FW/2
MP1255	01	24.5.94	20mm long E1FX/2, E1FW/2 seal
MP1246	01	24.5.94	Captive nut alternative seal
MP1247	01	24.5.94	CW main item alternative seal
MP1248	01	24.5.94	CX main item alternative seal
MP1249	01	24.5.94	CW Poseidon main item alternative seal
MP1250	01	24.5.94	CX Poseidon main item alternative seal
MP1251	01	24.5.94	Alternative outer seal

Ex d IIC & Ex e II, CSA Enclosure Type 4x - A2F, Cable Gland

The A2F range of glands comprises a series of hexagonal and circular components which when assembled provide various means of clamping cables to prevent movement, additionally a compression ring sealing arrangement is fitted which provides facilities for sealing on the inner sheath diameter of armoured or unarmoured cables. See above drawings.

NOTE: Seals dimensions indicated in Figure 3 (1 of 10) and Figure 3 (5 of 10) may be increased in length as indicated in Figure 4.

TESTS

The Testing for Ingress protection was completed by ERA Technology Limited. The testing was for hose down, submersion and continuous submersion. Testing from IEC 529 was considered adequate for CSA Enclosure Type 4x.

The P2K-Poseidon 2000 Cable Gland is suitable for IP 66, 67, 68.

The PX2K Protex Poseidon 2000 is suitable for IP 66, 67, 68.

The A2/A2F Cable Gland is suitable for IP 66, 67, 68.

A Salt fog test was applied to the Poseidon Model Series, 35 C, 55 NaCl Concentration, Salt pH 6.98, for a duration of 500 Hours. The Brass Electroless Nickel, Aluminum, and Brass Electro Nickel each took more than 200 hours to reach 5% oxidation. The Brass Zinc Chromate pass also maintained resistance to the salt fog.

EN 50 014; Aging Test for material used for Elastomeric Sealing Rings for Cable Entries of Flameproof enclosures, Clause 14.3, Sealing Clause 14.3, Mechanical Strength Clause 14.4.1.

Cable and Conduit entry requirements of EN 50 014 15. Impact tests to EN 50 014 Clause 22.4.3.2, Tests of Clamping for armoured cables in cable entries En 50 014 Clause 22.4.10. Tests for ingress protection covered in EN 50 014 Clause 22.4.4.

For Tensile strength, Each Size gland was fitted with a sample of cable having the smallest section/diameter armour allowable. One end was tightened to full proof torque, the other end tightened to half proof torque. A force in newtons to 80 times the value in millimeters of the diameter of the cable sample was applied over the armour. Each gland tightened to 100% full torque after tensile test was complete. All components were examined after the test. All of the assemblies withstood the armour clamping test with zero slippage for 2 minutes when a constant tensile force was maintained.

Each Ex d gland has an integral seal, the Ex e does not. This meets the requirements of C22.1 and C22.2 No 174.

The cable glands were designed appropriate to IEC 79-0 and IEC 79-1. No further testing was deemed necessary.

Application LR 113642-2

Update to -1 report to include clarifications of gland restrictions.

Application LR 113642-3

The PROTEX 2000 gland was reviewed, and it was found that the gland underwent 28% Hydrogen Flame Propagation tests 5 times, and 7.5% acetylene 5 times in a 20 Litre enclosure. This test is considered equivalent to increase the suitability of the gland for increased volume. The restrictions on the cable still apply. A 450 PSI hydrostatic was also completed on the gland without failure. No further testing was deemed necessary.

Application LR 113642-4

The Protex 2000 and Posiedon Glands were tested in a 28 L enclosure according to C22.2 Nos 174, for flame propagation. The hydrostatic test of 400 PSI without leakage was acceptable as representative for CSA Hydrostatic 500 PSI allowing leakage. The restrictions were lifted from the glands. The sizes tested were M20, M40, M75 and M90. The M90 was added to the report. No further testing was deemed necessary.

Project 1211841

This project covers the evaluation of **Class I, Groups B, C & D** for PROTEX 2000 (PX2K) Cable Gland and **Class II, Div. 2, Groups E, F & G** for Poseidon 2000 (P2K) Cable Gland. These cable glands shall be of the NPT thread-form for mating or mounting to the explosion-proof enclosure. Due to previously evaluated to C22.2 No. 174 -M M1984 - Cables and Cable Glands for Use in Hazardous Locations, no further testing was deemed necessary.

Project 1433881

Due to the nature of the changes, no testing was considered necessary.

Project 1879829

No tests deemed necessary due to minor changes with the seal being wider and has an external groove to encourage it to deform at that position (and hence form a seal easier). The ferrule now has a flat face against the seal and acts more like a skid washer.

