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**CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY  
(Former Mines Branch)**

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EXAMINATION AND TEST OF A TELEVISION CAMERA ENCLOSURE FOR USE IN CLASS I,  
GROUP D, HAZARDOUS LOCATIONS FOR INSPECTRONIC LTD.

J.A. BOSSERT

CANADIAN EXPLOSIVE ATMOSPHERES LABORATORY

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EXAMINATION AND TEST OF A TELEVISION CAMERA  
ENCLOSURE FOR USE IN CLASS I, GROUP D  
HAZARDOUS LOCATIONS FOR INSPECTRONIC LTD.

by

J. A. Bossert

PURPOSE

The Inspectronic Limited company requested that we examine and test a television camera enclosure to see if it meets the requirements of CSA Standard C22.2, No. 30 "Enclosures for Use in Class I Hazardous Locations." This enclosure is intended for use with a closed circuit television system to inspect sewers which may contain explosive mixtures of methane and air or vapour/air mixtures of common industrial solvents (e.g. kerosene, gasoline, etc.). In order to use the television camera in this application, the company felt that it was necessary to have the approval of the "Quebec Board of Examiners of Electricians". The "Board of Examiners" have indicated that they would accept a report from our Laboratory, that the enclosure had been examined and tested for Class I, Group D Hazardous Locations, as evidence that it was safe for use in sewers.

METHOD

The sample enclosure was examined to determine whether it met the physical requirements of the above CSA Standard. A brief description of the pertinent construction details is as follows:

- (a) Body: Consists of a stainless steel tube 3 in O.D. by  $21\frac{1}{2}$  in. long having a wall thickness of  $\frac{1}{8}$  in. The body is machined and threaded at each end to accommodate the end cap (b) and lens and lens holding ring (c).
- (b) End Cap: Stainless steel, approx.  $\frac{3}{8}$  in. thick, machined to fit a rabbet joint machined in one end of the body (a) and secured in place with a threaded ring engaging 3 full threads with the threaded section inside the end of the body. The total path of the radial joint is  $\frac{5}{16}$  in. (excluding the "O" ring groove) and the maximum clearance is 0.005 in. The second radial path between the ring and the end cap is  $\frac{7}{64}$  in. and

has a joint of 3 full threads in parallel (see Fig. 1)

- (c) Lens: Plexiglass,  $3/8$  in thick (sample tested was  $1/4$  in. thick but the submitter indicated that the final version would be  $3/8$  in) machined to fit against a shoulder forming a rabbet joint with the body having a total length of  $5/8$  in and a maximum clearance of 0.005 in. The lens is secured in the body by a threaded ring which engages 3 full threads with the threaded section inside the end of the body (see Fig. 1)
- (d) Supply Connection: The sample was provided with a plug for supply connections which was not considered suitable for use in hazardous locations. However, the submitter indicated that he would install either a plug approved for hazardous locations or would provide a suitable length of extra hard usage flexible cord sealed in a neoprene bushing in place of the plug. This would give the cord a sealed length of about  $15/16$  in.

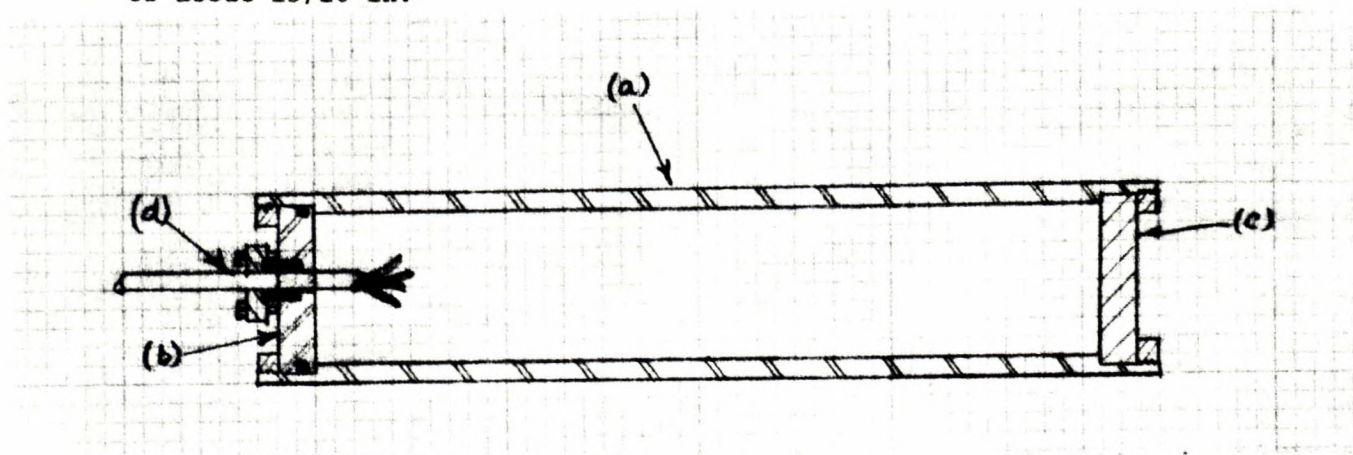


Figure 1: - Assembly drawing of television camera enclosure

Tests: Explosion tests in Pentane/Air mixtures and a hydrostatic test were conducted on the sample provided. The results are shown on Test Sheet No. 1

#### OBSERVATIONS

The sample appeared to meet the physical requirements of the applicable CSA standard except for the supply connection and successfully withstood the explosion and hydrostatic tests conducted in our Laboratory.

CANADA  
DEPARTMENT OF ENERGY MINES AND RESOURCES  
MINES BRANCH

Canadian Explosive Atmospheres Laboratory

File No. 252-2-I5-1

Job No.

Investigation No.

Date Aug 1/75

Your File No.

78,120

TEST SHEET NO. 1

Operator S. Ferguson

D.E. Jones

Recorded by H. Slaney

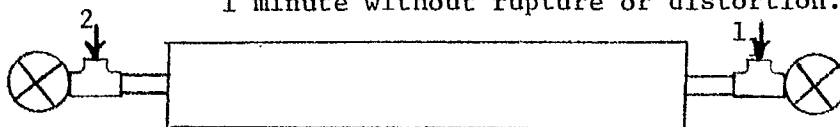
Checked by J.A. Bossert

Witnesses Present M. Guibord

Explosion tests, using Pentane of a Television Camera submitted by Inspectronic Ltd.

Test No.	Mixture Percentage		Ignition Point in Enclosure	Explosion Outside Enclosure	Visible Flames Light Or Sparks	Pressure Point	Pressure Measured	Notes
	Inside Enclosure	Outside Enclosure						
1	3.0	2.2	1	NO	NO	2	62	-
2	3.0	2.2	1	NO	NO	2	60	-
3	3.0	2.2	1	NO	NO	2	65	-
4	3.0	2.2	1	NO	NO	2	61	-
5	3.0	2.2	1	NO	NO	2	63	-
6	3.0	2.2	1	NO	NO	2	62	-
7	3.0	2.2	1	NO	NO	2	63	-
8	3.0	2.2	1	NO	NO	2	62	-
9	3.0	2.2	1	NO	NO	2	61	-
10	3.0	2.2	1	NO	NO	2	61	-

Remarks: Hydrostatic test - a pressure of  $1.5 \times 65 = 97.5$  psi was held for 1 minute without rupture or distortion.



Explosion Test Arrangement