

May 24, 1972

USARMC  
Materials Branch  
Division of Materials Licensing  
Washington, D.C. 20545

Attention: Mr. Jack M. Bell

Reference: Revision of Gwart Density Gages  
Revision of Specifications of Gages distributed  
to Specific and General Licensees  
Revision of 334-00639-030

Gentlemen:

The Gwart Corporation is introducing a new line of density gages which we expect largely to supplant previous models. However, we wish to maintain the other models on our license 34-00639-030, since we will be shipping the previous models from time to time as the occasion requires. IT IS URGENT THAT WE OBTAIN APPROVAL AS SOON AS POSSIBLE, SO PLEASE GIVE THIS REQUEST HIGH PRIORITY.

Principle changes are in the use of weldments, angle and channel iron, pipe riser clamps and pipe and sheet metal, all readily available materials and adaptable to "in house" fabrication.

The details of the new gages and radiation field stipulations are shown on the attachments.

Please revise our license #34-00639-030, to add the listed models and approve for three (3) year wire test interval.

Very truly yours,

8506220243 850305  
PDR FOIA  
EDMUNDS85-31 PDR

George A. Kelly  
Staff Engineer

Attachments:  
Gage Description  
Reduced and Full Size Drawings

cc: HLC  
RRC

JMK  
GCH

CAK:ish

13

THE OHMART CORPORATION

SERIES ED DENSITY GAGES

Model numbers of the new gages together with source and source holder model numbers, and maximum activity per gage are as follows:

GAGE	CS-137 SOURCE	SOURCE HOLDER	MAX ACTIVITY mCi
ED2	A2102	SR1 or SR2	300
ED3	A2102	SR1 or 2	500
ED4	A2102	SR1 or 2	750
ED5	A2102	SR1 or 2	1000
ED6	A2102	SR1 or 2	1500
ED8	A2102	SR1 or 2	2000
ED10	A2102 or A2104	SR1 or 2	3000
ED12	A2102 or A2104	SR1 or 2	3000
ED14	A2102 or A2104	SR1 or 2	4000
ED16	A2102 or A2104	SR1 or 2	5000
ED18	A2102 or A2104	SR1 or 2	5000
ED20	A2102 or A2104	SR1 or 2	5000

The gages will be used in the usual conditions of density measurement, clamped to pipe. The source holder is sealed against moisture and the detector is designed to operate to 170° ambient temperature in special cases, however, 140° maximum ambient temperature is normal. With Viton gasketing of the source holder housing the gages will operate to 400°F without difficulty (pipe temperature). The sources to be used at present are Ohmart models A2102 and A2104, previously approved for distribution to General Licensees and for 3 year wipe test in source holders.

Drawings C19777, C19836 and C19837 show gage outlines of the model ED8, ED2 and ED20 respectively. The model ED8 is annotated and will be covered in the following explanation. The model SR1 source holder will be used for sources up to 1000 mCi in activity. The model SR2, 1 inch larger in diameter and 2 inches longer, will be used as required in gages up to 1000 mCi and in all gages above 1000 mCi in activity.

AA shown in Dwg. D19788, the source holder housing is constructed of tubing and 1/4" and 7 gage (.1793) steel. The shutter rotor is constructed of tubing, lead and 1/4" plate.

Referring to assembly drawing, D19835, the construction of the source holder may be understood. The source holder is constructed of steel, and lead-filled for shielding. The source tube is constructed similarly to that of the Model HM-8 source holder with the difference that the tube is longer to provide for adjustable collimation. Details of the necessary spacers and bushings are shown on Dwg. B19787. The rotary plate has four (4) positions; ON, OFF, (1) and (2). In the OFF position, a lead shutter is placed over the source tube opening. In the ON position a counterweight is provided to prevent injury due to the torque presented by the weight of the shutter. The counterweight contributes

additional collimation in the ON position. However, collimation is primarily achieved by positioning of the source in the source tube. The (1) and (2) positions are used only in the calibration process. Equivalent absorbers are present in these positions and attenuate the radiation according to the thickness of the absorbers. In these positions, the collimation contributed by the counterweight is not present and radiation surveys are taken with the plate in one of these positions.

Note that whenever the shutter is not in front of the source, the ON tag is visible (uncovered by the bar knob). The bar knob details are shown on Dwg. B19790. Provisions are made for the use of a padlock and/or locking screw to hold the shutter in the OFF position.

The source holder with its cover plate is bolted to a half-bracket constructed of pipe "riser clamps" and angle iron welded together. The assembly bolts are sealed at the factory.

Similar construction is used on the detector half-bracket. The details of the detector housing are shown on Dwg. C19778. This housing is fastened with seal bolts to the detector half-bracket. Note that there is no access to the primary radiation beam and lead shielding is provided.

The dimension changes necessary to the design of the model SR2 source holder are shown on Drawings D19775, D19776, B19780 and B19786.

A radiation profile for prototype model ED8 is included. Other sizes have not been constructed. However, the OHMART CORPORATION stipulates that no gage will be constructed such that the radiation level will exceed 5m/hr at 12" from the gage in the worst condition, i.e., thin pipe, mounting over insulation, etc. The primary radiation beam will be 5" or less in diameter at the center of the detector.

The gage is mounted to the pipe with sealed mounting bolts. When mounted, there is no access to the primary radiation beam. The gage is mounted with the source holder locked in the OFF position. The mounting bolts are sealed with wire and lead seals.

The only prototype tests which have been made and which are most critical to the use of the gage and to radiation safety are those connected with the shutter plate assembly. The shutter was moved sharply from ON to OFF fifty (50) times and each time the radiation measured as detector current. Any change in Geometry of the system would show up as a change in current from the detector due to a change in counterweight position. No change was noted. The shutter rotor plate, with its shaft and handle, was then disassembled and inspected for looseness, weld damage, lead flow and any other change that might affect safety. No change was found.

Quality control - all construction is with the use of suitable jigs and fixtures to assure repeatability. All welds are inspected for quality before painting. Each source shutter assembly is carefully checked for exact alignment and freedom of movement. After complete assembly of each gage, with source installed, a radiation survey is made to assure the level is within the stipulated limits.

Drawing A8422 shows the standard radioactive "caution" label applied to all gages. Drawing A8419 shows the "General License" label installed when the gage is to be distributed to General Licensees. The labels are fastened with stainless steel drive screws. Positioning of the labels is shown on Drawing C19777.

Section 8 of the gage instruction is included. Parts 20 and 30 are part of the instructions for Specific Licensees and a Section 8A is added together with Part 31 for General Licensees. Parts 20, 30 and 31 are left out of this transmittal as superfluous.

The OHMART CORPORATION offers the full range of services to its customers including training classes at the Ohmart or Customer Plant, radiation survey at time of installation, repair, replacement, relocation and any other service the customer may require to enable him to use radiation gages effectively and safely.

Order. Then, after assembly is complete, the standard stainless steel "Caution Radioactive Material" label is stamped with the required information and fastened to the holder with drive pins. No labels are prepared in advance as stock. Each label is stamped for the particular source-holder and source.

Radiation surveys are made for each individual gage as built. As shown on the radiation survey of the ED 8 gage, thirteen measurements on accessible surfaces and thirteen measurements at 12" from the gage are made routinely. These points of measurement are chosen from experience and when highest radiation level may be expected. The gage is scanned also, looking for unacceptable levels. Especially on the surface of the gage, generally, and the source holder in particular, a careful inspection for stray points of unacceptable level, is made.

We do not do "statistical sampling" in inspection and testing. 100% inspection and testing of each gage has always been our practice. This includes, but is not restricted to, proper labelling, source size; shutter operation, presence of lock and proper operation, thorough radiation survey, stability of measurement which verifies geometric stability. These final checks are in addition to those of welds and conformity with design specifications which are carried out as the device is constructed.

The writer is not sure of the full intent of the question regarding the difference between models. The gage may be considered as in three parts, the source holder assembly, the pair of mounting brackets, and the detector assembly. The source holder assemblies SR1 and SR2 and the detector assemblies remain the same for all models. The mounting brackets are the only variable in the physical construction other than those previously described for the source holders (placing of source, etc.). A multitude of pipe size standards exist which make flexibility in the design of the brackets mandatory. Therefore, each different bracket set has different component dimensions but construction will conform to the general conditions shown on the three drawings mentioned.

Additional radiation surveys will be provided as new gages are built. These will be as ordered by customers. As stipulated previously we will use only the SR2 source holder on sources larger than 1000 mCi. Since larger pipe gages and use of large sources such as 5000 mCi constitute a very small percent of our business, some time may elapse before we can supply such surveys. The only survey of an actual gage presently available is the one previously submitted.

With regard to labelling, our labels will be altered to conform to enclosure number 2 with the exception of Item A(4) which from previous agreement, on other general license devices, allows electrical maintenance on the detector after closing the source shutter. Please note that our license 34-00639-03G item 11(4) is worded differently than the suggested standard. This item may be construed as allowing electrical maintenance involving removal of the cap on the detector. Two copies of Dwg. C-20190 are included which show that there is no hazard in servicing the detector with the shutter closed.

Although you will note, from the page from our license, enclosed, there