

March 2, 2017

U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards
Division of Material Safety, State, Tribal, and Rulemaking Programs
Materials Safety Licensing Branch
Mail Stop: T8E18
Attn: Tomas Herrera
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852-2738

Re: Request for Additional Information
Docket No. 030-36971
License No. 09-23920-01E

Dear Mr. Struckmeyer

The following is a response to your request for additional information. Each response is enumerated per your questions.

A. Information required for review of Sealed Source and Device amendment application.

1. Model NM1092C is the proper and complete designation for the model timepiece.
2. Model NM1092C will have a maximum activity of 102.3 mCi (3.79 GBq).
3. See Attachment "A". The location will be on the lower face of the timepiece.

B. Information required for review of exempt-distribution license amendment application

1. Attachment "B" is a cross section of the timepiece. The crystal is constructed of sapphire glass. The sapphire glass is permanently sealed to the bevel encasing the GTLSs. The only accessible part of the timepiece is through the underside which will allow access to the mechanical movements of the timepiece. Access to the underside requires specialized tools and is not a function of normal operation or use of the timepiece.
2. The useful life of the GTLS is approximately one half-life of H-3 (approximately 12.3 years). At this time, the H-3 still interacts with the phosphor contained in the borosilicate glass tube but with less intensity. However, the mechanical portion of the timepiece still functions without regard to the H-3 concentration and are not discarded.
3. Pursuant to 10 CFR 32.23, the standard required by the NRC is the likeliness of external radiation dose from normal use and disposal. There is no likelihood of all GTLS tubes simultaneously rupturing. No GTLS leakage has been reported from a timepiece. The dose estimates were used based on an unlikely scenario that one GTLS would leak as a result of manufacturing. The likelihood of all the GTLS tubes simultaneously becoming damaged is an impossibility and falls outside the requirements of 10 CFR 32.

For all GTLS tubes to simultaneously rupture would require a destruction of the timepiece crystal. The timepiece crystals are sapphire. Sapphires (also known as Corundum) have a hardness of 9 on the Mohs scale. Sapphires are mechanically second only to a diamond which has the maximum hardness of 10 on the Mohs scale. Sapphire glass is one of the hardest and most scratch resistant materials available. The high modulus of elasticity and high tensile strength make it extremely wear, abrasion and impact resistant.

Sapphire glass is thermally very stable. It does not lose any of its mechanical and optical qualities from temperatures ranging from cryogenic to over 2000C. There is no surface damage and devitrification due to extreme thermal cycling. Sapphire glass is more resistant to corrosive chemicals than most standard hard materials available.

Even in the event all GTLS tubes becoming damaged, the H-3 would still be sealed between the sapphire crystal and hardened steel which has a hardness of 7-8 on the Mohs scale.

Sincerely



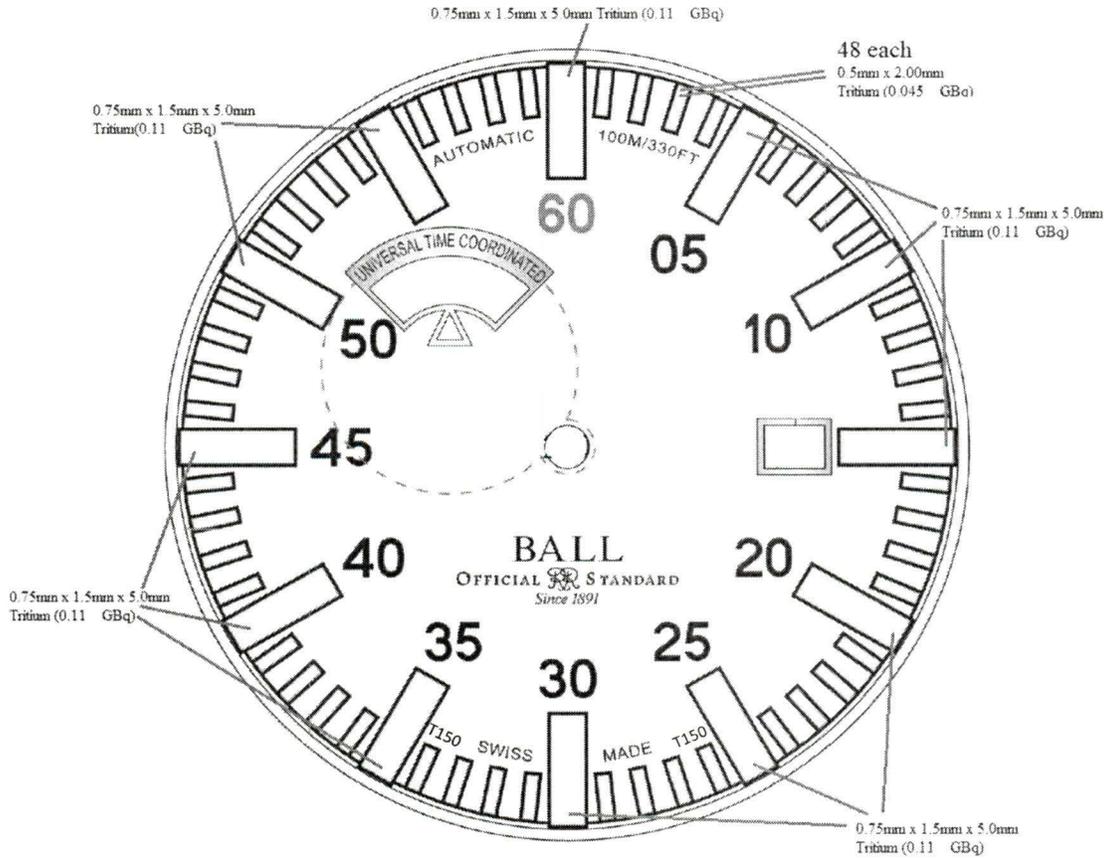
Jeffrey Hess
Hess Fine Art

NM1092C

Dial

48 each 0.5mm x 2.00mm (0.045 GBq) total = 2.16 GBq Dial 1-12h
 11 each 0.75mm x 1.5mm x 5.0mm (0.11 GBq) total = 1.21 GBq Dial 1-11h
 1 each 0.75mm x 1.5mm x 5.0mm (0.11 GBq) total = 0.11 GBq Dial 12h

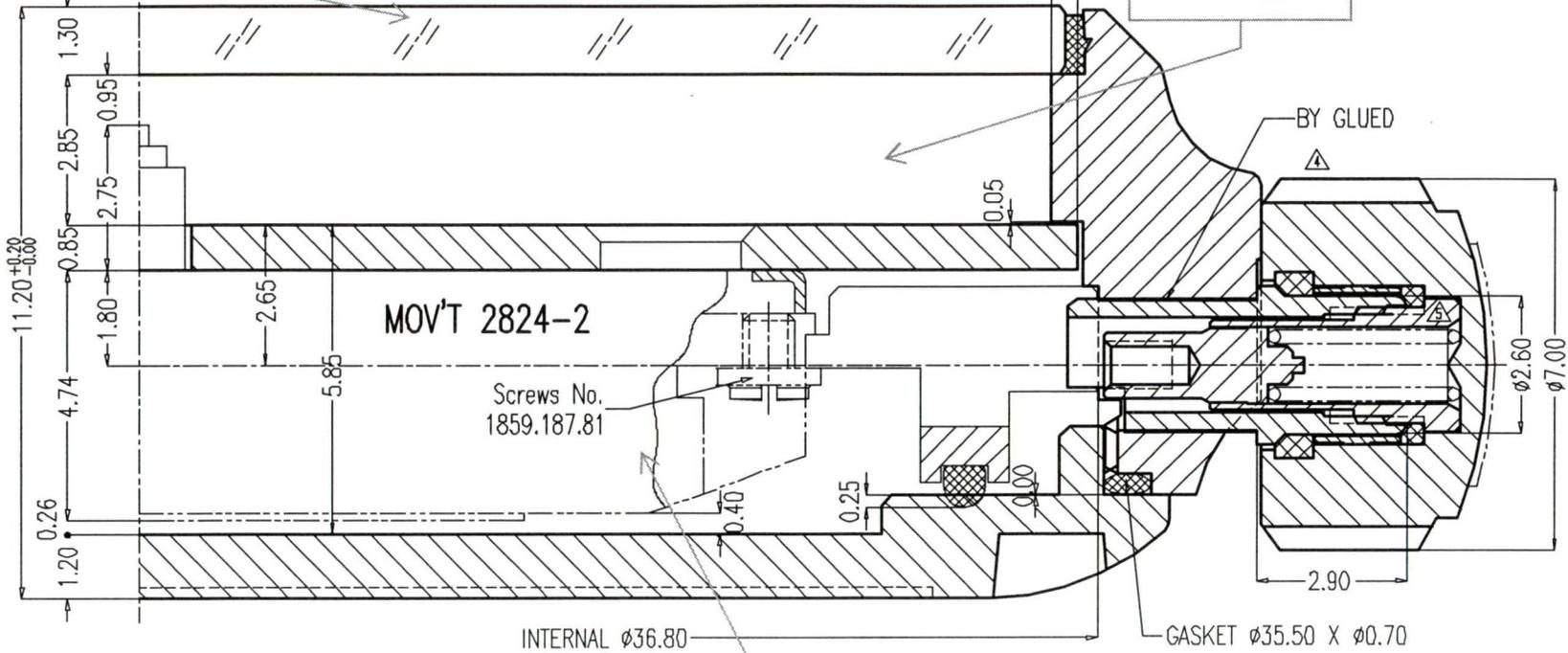
1 each 0.65mm x 4.10mm (0.134 GBq) total = 0.134 GBq Hour hand
 1 each 0.50mm x 6.50mm (0.137 GBq) total = 0.137 GBq Minute hand
 1 each 0.50mm x 1.64mm (0.035 GBq) total = 0.035 GBq Second hand



Sapphire Glass

DIAL $\phi 36.00$
 OPENING $\phi 35.00$

Sealed location
 of GTLS



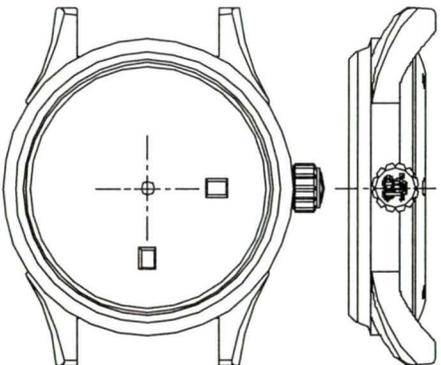
MOV'T 2824-2

Screws No.
 1859.187.81

INTERNAL $\phi 36.80$

GASKET $\phi 35.50 \times \phi 0.70$
 (SCALE 8 : 1)

Mechanical Movements



△	2009-04-11
△	2008-10-27
△	2008-07-23
△	2008-06-27
△	2008-04-29
△	2008-04-28
△	2007-06-01
△	2007-05-21
△	2007-05-08

LF LUEN FUNG WATCH CASE FACTORY LIMITED

CUSTOMER: BALL	MODEL: 3775GS-C	DRAWER: Deng
YOUR MODEL: NM1092C		DATE: 2007-03-31
MOVEMENT: 2824-2	A T M: 10	13 PAGES
		CHECKER: