

Exemption Request Form

Date of submission: 08/06/2017

1. Name and contact details

1) Name and contact details of applicant:

Company: AMETEK–Advanced
Measurement Technology

Tel.: 865-483-2241

Name: Dan Jones

E-Mail: dan.jones@ametek.com

Function: Quality Assurance Manager

Address: 801 South Illinois Avenue,
Oak Ridge, TN 37830

2) Name and contact details of responsible person for this application (if different from above):

Company: AMETEK–Advanced
Measurement Technology

Tel.: 865-483-2413

Name: Chris Sewell

E-Mail: chris.sewell@ametek.com

Function: Manufacturing Specialist,
Certified IPC Trainer

Address: 801 South Illinois Avenue,
Oak Ridge, TN 37830

2. Reason for application:

Please indicate where relevant:

Request for new exemption in: Amendment to previously New Submission.

Request for amendment of existing exemption in

Request for extension of existing exemption in

Request for deletion of existing exemption in:

Provision of information referring to an existing specific exemption in:

Annex III

Annex IV

No. of exemption in Annex III or IV where applicable: 1

Proposed or existing wording: Lead in solders of alpha spectrometers, pulse-processing electronics, scintillation detectors and spectroscopy systems used in equipment to identify radiation".

Duration where applicable: 7 years – July 23, 2024

Other: Article 5.1 (a) – the total negative environmental, health and consumer safety impacts caused by the substitution are likely to outweigh the total environmental, health and consumer safety benefits thereof.

3. Summary of the exemption request / revocation request

These instruments are designed and used in the nuclear and laboratory environments. The life cycle of these products are considered long term, reaching seven or more years of continuous sustained service and are manufactured under IPC class II electronics assembly standards. Where possible, the electronic components have been replaced with lead-free substitutes. The use of a Tin/Lead solder is required due to the potential effects of tin whisker growth from utilizing a solder mixture of less than 3% Pb. These instruments primarily operate in environments where the risk for Tin whiskers could cause a failure in identifying or classifying radioactive materials which would be more harmful to the environment than allowing these instruments to utilize Tin/Lead solder. Since these instruments are designed for long term use in nuclear environments where replacement is not fiscally reasonable an exception is requested for these product lines.

4. Technical description of the exemption request / revocation request

(A) Description of the concerned application:

1. To which EEE is the exemption request/information relevant? Annex I, Category 11.

Name of applications or products: Alpha Spectrometers, Pulse-Processing Electronics, Scintillation Detectors (NaI) and Spectroscopy Systems. See list at the end of this form for complete Model list by Product Series.

List of relevant categories: (mark more than one where applicable)

- | | |
|----------------------------|--|
| <input type="checkbox"/> 1 | <input type="checkbox"/> 7 |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 8 |
| <input type="checkbox"/> 3 | <input type="checkbox"/> 9 |
| <input type="checkbox"/> 4 | <input type="checkbox"/> 10 |
| <input type="checkbox"/> 5 | <input checked="" type="checkbox"/> 11 |
| <input type="checkbox"/> 6 | |

a. Please specify if application is in use in other categories to which the exemption request does not refer: N/A

b. Please specify for equipment of category 8 and 9: N/A

The requested exemption will be applied in

- monitoring and control instruments in industry
- in-vitro diagnostics
- other medical devices or other monitoring and control instruments than those in industry

2. Which of the six substances is in use in the application/product?

(Indicate more than one where applicable)

- Pb Cd Hg Cr-VI PBB PBDE

3. Function of the substance: Electrical connections where signals are susceptible to interference/shorting when the introduction of tin/lead whiskers are introduced potentially reducing the expected performance and life of the product.

4. Content of substance in homogeneous material (%weight): 37
5. Amount of substance entering the EU market annually through application for which the exemption is requested: 1.928Kg
 170,000 connections @ 1 cubic millimetre per connection
 Lead density = 11342 kilograms per cubic meter @ 20 deg C

W= P x V or Weight = density x volume
 W = 11.342 milligrams/cubic millimetre x 170,000 cubic millimetres
 W = 1,928,140 milligrams
 W = 1,928.14 grams
 W = 1.928 Kilograms
 W = 1.928 * .37 (37 percent lead alloy)
 W = 0.7134 Kilograms

6. Name of material/component: 331 Flux-Cored Lead (Pb) Solder 63Sn/37Pb

7. Environmental Assessment: _____

LCA: Yes
 No

(B) In which material and/or component is the RoHS-regulated substance used, for which you request the exemption or its revocation? What is the function of this material or component?

Solder connection of electronic components of PCBA and electrical wiring.

(C) What are the particular characteristics and functions of the RoHS-regulated substance that require its use in this material or component?

This substance does not have the potential for crystalline whisker growth over long term use.

5. Information on Possible preparation for reuse or recycling of waste from EEE and on provisions for appropriate treatment of waste

1) Please indicate if a closed loop system exist for EEE waste of application exists and provide information of its characteristics (method of collection to ensure closed loop, method of treatment, etc.)

Due to the potential risk of radiation contamination, it is the end user's responsibility for disposal of the equipment.

2) Please indicate where relevant:

- Article is collected and sent without dismantling for recycling
 Article is collected and completely refurbished for reuse
 Article is collected and dismantled:

- The following parts are refurbished for use as spare parts: _____
- The following parts are subsequently recycled: _____
- Article cannot be recycled and is therefore:
- Sent for energy return
 - Landfilled

3) Please provide information concerning the amount (weight) of RoHS substance present in EEE waste accumulates per annum:

- | | |
|---|------------|
| <input type="checkbox"/> In articles which are refurbished | <u>N/A</u> |
| <input type="checkbox"/> In articles which are recycled | <u>N/A</u> |
| <input type="checkbox"/> In articles which are sent for energy return | <u>N/A</u> |
| <input type="checkbox"/> In articles which are landfilled | <u>N/A</u> |

6. Analysis of possible alternative substances

- (A) Please provide information if possible alternative applications or alternatives for use of RoHS substances in application exist. Please elaborate analysis on a life-cycle basis, including where available information about independent research, peer-review studies development activities undertaken**

No alternatives

- (B) Please provide information and data to establish reliability of possible substitutes of application and of RoHS materials in application**

N/A

7. Proposed actions to develop possible substitutes

- (A) Please provide information if actions have been taken to develop further possible alternatives for the application or alternatives for RoHS substances in the application.**

As the life cycle of these products are ending the replacements are being designed to meet the requirements of the RoHS Initiative where design requirements and Customer Approval will allow.

- (B) Please elaborate what stages are necessary for establishment of possible substitute and respective timeframe needed for completion of such stages.**

Currently, there are no substitute available in the market for the existing products.

8. Justification according to Article 5(1)(a):

(A) Links to REACH: (substance + substitute)

1) Do any of the following provisions apply to the application described under (A) and (C)? N/A

- Authorisation
 - SVHC
 - Candidate list
 - Proposal inclusion Annex XIV
 - Annex XIV
- Restriction
 - Annex XVII
 - Registry of intentions
- Registration

2) Provide REACH-relevant information received through the supply chain.

Name of document: _____

(B) Elimination/substitution:

1. Can the substance named under 4.(A)1 be eliminated?

- Yes. Consequences? _____
- No. Justification: Already at the minimum amount of lead/alloy solder that will not impede performance of the product.

2. Can the substance named under 4.(A)1 be substituted?

- Yes.
 - Design changes:
 - Other materials:
 - Other substance:
- No. Justification: Already the minimum amount of lead/alloy solder that will not impede performance of the product.

3. Give details on the reliability of substitutes (technical data + information): N/A

4. Describe environmental assessment of substance from 4.(A)1 and possible substitutes with regard to

- 1) Environmental impacts: N/A
- 2) Health impacts: H302, H312, H332, H351, H360 and H373
- 3) Consumer safety impacts: N/A

⇒ Do impacts of substitution outweigh benefits thereof? N/A

Please provide third-party verified assessment on this:

(C) Availability of substitutes:

- a) Describe supply sources for substitutes: N/A
- b) Have you encountered problems with the availability? Describe: N/A
- c) Do you consider the price of the substitute to be a problem for the availability?
 - Yes
 - No

d) What conditions need to be fulfilled to ensure the availability? N/A

(D) Socio-economic impact of substitution: N/A

⇒ What kind of economic effects do you consider related to substitution?

- Increase in direct production costs
- Increase in fixed costs
- Increase in overhead
- Possible social impacts within the EU
- Possible social impacts external to the EU
- Other: _____

⇒ Provide sufficient evidence (third-party verified) to support your statement: _____

9. Other relevant information

Please provide additional relevant information to further establish the necessity of your request:

10. Information that should be regarded as proprietary

Please state clearly whether any of the above information should be regarded to as proprietary information. If so, please provide verifiable justification:

N/A _____

Models Listed below by Product Series - 112 Models Total

Product Series	Model	Description
Alpha Spectrometers	576-VM	Vacuum Manifold and Control (115/230 V ac)
Alpha Spectrometers	A576	A-PAD Preamplifier, Amplifier, Discriminator with Bias Supply
Pulse-Processing Electronics	113	Scintillation Preamplifier
Pulse-Processing Electronics	296	ScintiPack High-Rate PMT Base with Preamplifier and HV Supply
Pulse-Processing Electronics	426	Linear Gate
Pulse-Processing Electronics	428	Detector Bias Supply
Pulse-Processing Electronics	439	Digital Current Integrator
Pulse-Processing Electronics	449	Log/Lin Ratemeter
Pulse-Processing Electronics	460	Delay Line Amplifier (with standard 1- μ s delay lines)
Pulse-Processing Electronics	462	Time Calibrator
Pulse-Processing Electronics	474	Timing Filter Amplifier
Pulse-Processing Electronics	495	Power Supply (6 V)
Pulse-Processing Electronics	499	Fast/Slow NIM Logic Converter
Pulse-Processing Electronics	533	Dual Sum and Invert Amplifier
Pulse-Processing Electronics	542	Linear Gate and Stretcher
Pulse-Processing Electronics	551	Timing Single-Channel Analyzer
Pulse-Processing Electronics	552	Pulse-Shape Analyzer/Timing SCA
Pulse-Processing Electronics	566	Time-to-Amplitude Converter
Pulse-Processing Electronics	567	Time-to-Amplitude Converter/SCA
Pulse-Processing Electronics	584	Constant-Fraction Discriminator
Pulse-Processing Electronics	661	Ratemeter
Pulse-Processing Electronics	710	Quad 1-kV Bias Supply
Pulse-Processing Electronics	850	Quad Single-Channel Analyzer (requires 6 V)
Pulse-Processing Electronics	863	Quad Timing Filter Amplifier
Pulse-Processing Electronics	871	Timer and Counter (non-printing)
Pulse-Processing Electronics	928	Combination MCB/Quad Counter/Dual Timer.
Pulse-Processing Electronics	935	Quad 200-MHz Constant-Fraction Discriminator (requires 6 V)
Pulse-Processing Electronics	978	Dual Timer
Pulse-Processing Electronics	994	CCNIM Dual Counter and Timer (requires interface option for computer operation)
Pulse-Processing Electronics	995	CCNIM Dual Counter (requires interface option for computer operation)
Pulse-Processing Electronics	996	CCNIM Timer and Counter (requires interface option for computer operation)
Pulse-Processing Electronics	4003	Preamplifier Power Output
Pulse-Processing Electronics	4006	Minibin and Power Supply
Pulse-Processing Electronics	9301	Fast Preamplifier
Pulse-Processing Electronics	9302	Amplifier and Discriminator
Pulse-Processing Electronics	9305	Fast Preamplifier
Pulse-Processing Electronics	9306	1-GHz Preamplifier
Pulse-Processing Electronics	9307	pico-TIMING Discriminator (requires 6 V)
Pulse-Processing Electronics	9326	Fast Preamplifier with 3-m DC power cable
Pulse-Processing Electronics	9327	1-GHz Amplifier and Timing Discriminator
Pulse-Processing Electronics	9349	Log/Lin Ratemeter
Pulse-Processing Electronics	142A	Preamplifier
Pulse-Processing Electronics	142B	Preamplifier
Pulse-Processing Electronics	142C	Preamplifier

Product Series	Model	Description
Pulse-Processing Electronics	276L	Low-Power Photomultiplier Base
Pulse-Processing Electronics	4001A	NIM Bin
Pulse-Processing Electronics	4001A/4002A	NIM Bin and 96-W Power Supply (with ± 12 V, ± 24 V)
Pulse-Processing Electronics	4001A/4002D	NIM Bin and 160-W Power Supply (with ± 6 V, ± 12 V, ± 24 V)
Pulse-Processing Electronics	4001C	NIM Bin (with copper bus bars)
Pulse-Processing Electronics	4001C/4002D	NIM Bin (with copper bus bars) and 160-W Power Supply (with ± 6 V, ± 12 V, ± 24 V)
Pulse-Processing Electronics	4001C/4002E	NIM Bin (with copper bus bars) and BLACK MAX PS (with ± 6 V, ± 12 V, ± 24 V)
Pulse-Processing Electronics	4002A	96-W Power Supply for NIM Bin (with ± 12 V, ± 24 V)
Pulse-Processing Electronics	4002D	160-W Power Supply for NIM Bin (with ± 6 V, ± 12 V, ± 24 V)
Pulse-Processing Electronics	4002E	BLACK MAX Power Supply for NIM Bin (with ± 6 V, ± 12 V, ± 24 V)
Pulse-Processing Electronics	4002P	Portable Power Supply (with ± 12 V, ± 24 V)
Pulse-Processing Electronics	414A	Fast Coincidence
Pulse-Processing Electronics	416A	Gate and Delay Generator
Pulse-Processing Electronics	418A	Universal Coincidence
Pulse-Processing Electronics	425A	Nanosecond Delay
Pulse-Processing Electronics	427A	Delay Amplifier
Pulse-Processing Electronics	449-2	Log/Lin Ratemeter with audible output option
Pulse-Processing Electronics	550A	Single-Channel Analyzer
Pulse-Processing Electronics	572A	Spectroscopy Amplifier
Pulse-Processing Electronics	575A	Spectroscopy Amplifier
Pulse-Processing Electronics	583B	Constant-Fraction Differential Discriminator/SCA (requires 6 V)
Pulse-Processing Electronics	590A	Amplifier and Timing SCA
Pulse-Processing Electronics	920E	EtherNIM 16-Input Multichannel Buffer
Pulse-Processing Electronics	920E-PKG-1	920E with AlphaVision software
Pulse-Processing Electronics	927-PKG-1	ASPEC-927 with MAESTRO and GammaVision Software, and 10-ft. USB interface cable.
Pulse-Processing Electronics	928-COUNT2	Dual Counter/Single Timer module. Includes Front Panel software and USB cable.
Pulse-Processing Electronics	928-COUNT4	Quad Counter/Dual Timer module. Includes Front Panel software and USB cable.
Pulse-Processing Electronics	928-MCB	MCB portion of the 928 only. Includes MAESTRO and USB cable
Pulse-Processing Electronics	9308-UPGRADE-PCI	Upgrade for an existing 9308 to interface to the PCI bus. Includes dual-port memory PCI-bus interface and A69-UX software.
Pulse-Processing Electronics	974A	CCNIM Quad 100-MHz Counter/Timer
Pulse-Processing Electronics	99X-1	994, 995, and 996 Options - RS-232-C Interface Option (requires C-75 Cable)
Pulse-Processing Electronics	99X-4	994 and 995 Options - Internal +6 V Supply Option
Pulse-Processing Electronics	ASPEC-927	Dual 16k Input MCA. Includes MAESTRO Software and 10-ft USB interface cable.
Pulse-Processing Electronics	CF8000	Octal Constant-Fraction Discriminator
Pulse-Processing Electronics	CFD-DELAY-10NS	CF8000 Option - Delay Plug-in
Pulse-Processing Electronics	CFD-DELAY-30NS	CF8000 Option - Delay Plug-in
Pulse-Processing Electronics	CFD-DELAY-50NS	CF8000 Option - Delay Plug-in
Pulse-Processing Electronics	CFD-DELAY-5NS	CF8000 Option - Delay Plug-in
Pulse-Processing Electronics	CO4020	Quad 4-Input Logic Unit (requires 6 V)
Pulse-Processing Electronics	DB463	Delay Box
Pulse-Processing Electronics	DIM-296	296 ScinitPack High-Rate PMT Base for use with DigiDart or DSPEC jr

Product Series	Model	Description
Pulse-Processing Electronics	DPM-M32-USB	DPM-USB with MAESTRO Software
Pulse-Processing Electronics	DPM-UPGRADE-USB	DPM-USB and CONNECTIONS-32 Driver Update to MAESTRO. 5-m cable.
Pulse-Processing Electronics	DPM-USB	Dual Port Memory to USB Converter. 5-m cable.
Pulse-Processing Electronics	EASY-MCA-2K	2k Multichannel Analyzer with MAESTRO Software
Pulse-Processing Electronics	EASY-MCA-8K	8k Multichannel Analyzer with MAESTRO Software
Pulse-Processing Electronics	EASY-MCS	Multichannel Scaler with software
Pulse-Processing Electronics	EASY-PKG-1	EASY-MCA-2K Multichannel Analyzer with MAESTRO software and EASY-MCS Multichannel Scaler with software.
Pulse-Processing Electronics	EASY-PKG-2	EASY-MCA-8K Multichannel Analyzer with MAESTRO software and EASY-MCS Multichannel Scaler with software.
Pulse-Processing Electronics	FTA820A	Octal Fast-Timing Amplifier (200 gain, non-inverting)
Pulse-Processing Electronics	GG8020	Octal Gate and Delay Generator (requires 6 V)
Pulse-Processing Electronics	IT100	Inverting Transformer
Pulse-Processing Electronics	PCBCBL1	PC Interface Pack for MCB. Includes 918A-OPTB PC-Bus Interface and C-DPM-10 10-ft. Dual-Port Memory Cable.
Pulse-Processing Electronics	419	Precision Pulse Generator
Pulse-Processing Electronics	480	Pulser
Pulse-Processing Electronics	VT120A	Fast-Timing Preamplifier (200 gain, non-inverting)
Pulse-Processing Electronics	VT120B	Fast-Timing Preamplifier (200 gain, inverting)
Pulse-Processing Electronics	VT120C	Fast-Timing Preamplifier (20 gain, non-inverting)
Pulse-Processing Electronics	MT050	50-ohm Matched Tee Signal Splitter
Scintillation Detectors (Nal)	2BY2	Rugged Integrated 2 inch by 2 inch Nal detector with HV and Preamplifier.
Scintillation Detectors (Nal)	2BY2-DD	Rugged Integrated 2 inch by 2 inch Nal detector with HV and Preamplifier. For use with DigiDART.
Scintillation Detectors (Nal)	3BY3	Rugged Integrated 3 inch by 3 inch Nal detector with HV and Preamplifier.
Scintillation Detectors (Nal)	3BY3-DD	Rugged Integrated 3 inch by 3 inch Nal detector with HV and Preamplifier. For use with DigiDART.
Spectroscopy Systems	DIGIBASE	14-Pin PMT Base for Scintillation Detectors. Complete with Digital MCA, Preamplifier, High Voltage Supply, and MAESTRO Software. USB Connection.
Spectroscopy Systems	DIGIBASE-CH	14-Pin PMT Base for Scintillation Detectors. Complete with Digital MCA, Preamplifier, High Voltage Supply, and USB Connection. NO Software
Spectroscopy Systems	DIGIBASE-E	High Performance 14-Pin PMT Base for Scintillation Detectors. Complete with Digital MCA, Preamplifier, High Voltage Supply, and MAESTRO Software. PoE Ethernet Connection.
Spectroscopy Systems	DIGIBASE-E-PKG-1	High Performance 14-Pin PMT Base for Scintillation Detectors. Complete with Digital MCA, Preamplifier, High Voltage Supply, MAESTRO and A66SV-BW. PoE Ethernet Connection.
Spectroscopy Systems	DIGIBASE-PKG-1	14-Pin PMT Base for Scintillation Detectors. Complete with Digital MCA, Preamplifier, High Voltage Supply, MAESTRO, and A66SV-BW. USB Connection.

Product Literature for 12 of the 112 Models are attached in a zip file. Models are represented from each of the Product Series requesting Exemption. For a review of the literature for the complete Model list above, go to the Product Index Page on the ORTEC website at:

<http://www.ortec-online.com/products/product-index-by-model>