

**Harvard Bioscience, Inc.****Conflict Minerals Report****For The Year Ended December 31, 2016**

This report for the year ended December 31, 2016 is presented to comply with Rule 13p-1 under the Securities Exchange Act of 1934, as amended (the “Rule”). The Rule was adopted by the Securities and Exchange Commission (“SEC”) to implement reporting and disclosure requirements related to conflict minerals as directed by the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (the “Dodd-Frank Act”). The Rule imposes certain reporting obligations on SEC registrants whose manufactured products contain conflict minerals which are necessary to the functionality or production of their products. Conflict Minerals are defined as cassiterite, columbite-tantalite, gold, wolframite, and their derivatives, which are limited to tin, tantalum, tungsten, and gold (“Conflict Minerals”) for the purposes of this report. These requirements apply to registrants whatever the geographic origin of the conflict minerals and whether or not they fund armed conflict.

As described in this report, Harvard Bioscience, Inc., a Delaware corporation (herein referred to as “Harvard Bioscience” the “Company,” “we,” “us,” or “our”) has reason to believe that some of the Conflict Minerals present in its supply chain may have originated in the Covered Countries. For purposes of this report, Covered Countries refers to the Democratic Republic of the Congo (the “DRC”) and adjoining countries, defined as any country that shares an internationally recognized border with the Democratic Republic of the Congo. We are unable with absolute assurance to determine the origin of the Conflict Minerals in our products and therefore cannot exclude the possibility that some may have originated in the Covered Countries.

**1. Company Overview**

This report has been prepared by management of Harvard Bioscience. The information includes the activities of all majority-owned subsidiaries.

Harvard Bioscience is a global developer, manufacturer and marketer of a broad range of scientific instruments, systems and lab consumables used to advance life science for basic research, drug discovery, clinical and environmental testing. Our products are sold to thousands of researchers in over 100 countries through our global sales organization, websites, catalogs, and through distributors including Thermo Fisher Scientific Inc., VWR, and other specialized distributors. We have sales and manufacturing operations in the United States, the United Kingdom, Germany, Sweden, Spain, France, Canada, and China.

***Conflict Minerals Policy***

We adopted a conflict minerals policy in 2013 which is publicly available at <http://investor.harvardbioscience.com/corporate-governance.cfm>.

**2. Product Description**

Our product range is organized into three product families: Cell and Animal Physiology, Lab Products and Services, and Molecular Separation and Analysis. We primarily sell these products under brand names that include Harvard Apparatus, Denville, Biochrom, Warner Instruments, BTX, KD Scientific, Hugo Sachs Elektronik, Panlab, Coulbourn Instruments, Multi Channel Systems, Triangle Biosystems, HEKA Instruments, and CMA Microdialysis. Our products consist of instruments, consumables, and systems made up of several individual products. We manufacture our products at our locations in the United States, Germany, Sweden and Spain. Our broad and complex product range may contain conflict minerals within the following components:

- Tantalum, used in capacitors,
- Tin, used in soldered components,
- Tungsten, used in coatings, alloys, heating elements and electrodes,
- Gold, used in circuit boards, electrodes and electronic components.

**3. Description of Reasonable Country of Origin Inquiry, or RCOI**

We began our RCOI by completing a supplier list extraction from our Vendor List. This list was then filtered to remove:

- Service Providers/Suppliers

- Indirect Materials Suppliers
  - Inactive Suppliers (minimum 1 year since last purchase)
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This ensures that all suppliers surveyed provided items to Harvard Bioscience that were used in final products in the year 2016. Once the filtering was completed, we populated the list with contact information and this list was then provided to Assent Compliance (“Assent”), our third party service provider, for upload to their Assent Compliance Manager SaaS system (“ACM”). It was deemed appropriate to not further filter this list based on the necessity of the presence of Conflict Minerals in the products as we could not definitively determine the presence or absence of Conflict Minerals in all parts supplied. The survey employed the CFSTI’s Conflict Minerals Reporting Template (the “CMRT”), version 4.10 or higher, originally developed by the Electronic Industry Citizenship Coalition® and The Global e-Sustainability Initiative. The CMRT allows for further scoping as they ask suppliers whether any of the Conflict Minerals are intentionally added and if they are necessary to the functionality or production of their products. Assent conducted additional analysis of the supply chain and such analysis combined with supplier feedback, allowed Assent and Harvard Bioscience to remove additional suppliers from scope of the conflict minerals regulation. The factors considered in Assent’s secondary analysis and the information provided that removed these suppliers from scope included:

- The product they supply is packaging. (Labels do not count as packaging)
- Parts that do not end up in the final product. (This includes equipment used to make the product but is not a part of the actual product itself (i.e. Industrial equipment, computers etc..))
- Test Labs (i.e. Providers that test the resistance or durability of a product)
- Service Providers (i.e. any supplier that provides a service but not an actual physical part).
- Any supplier who has not supplied anything to Harvard Bioscience, Inc., in the last 2 years.

Assent then conducted the supplier survey portion of the RCOI.

During the supplier survey, suppliers were contacted via the ACM, a SaaS platform that enables its users to complete and track supplier communications as well as allow suppliers to upload completed CMRTs directly to the platform for assessment and management.

Non-responsive suppliers were contacted a minimum of three times by ACM and then were also managed by the Assent Compliance team in one on one communications. This includes two to three direct follow ups from that team.

Assent’s communications with suppliers included training and education on the completion of the CMRT to alleviate any remaining confusion with suppliers. All of these communications were monitored and tracked in Assent's system for future reporting and transparency.

The program continues to include automated data validation on all submitted CMRTs. The goal of data validation is to increase the accuracy of submissions and identify any contradictory answers in the CMRT. All submitted forms are accepted and classified as valid or invalid so that data is still retained. Suppliers are contacted in regards to invalid forms and are encouraged to resubmit a valid form.

#### **4. Due Diligence Process**

##### ***4.1 Design of Due Diligence***

Our due diligence measures have been designed to conform, in all material respects, with the framework in The Organisation for Economic Co-operation and Development (“OECD”) Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (the “OECD Guidance”) and the related Supplements for Conflict Minerals.

##### ***4.2 Management Systems***

###### **Internal Team**

Harvard Bioscience has established a management system for conflict minerals. Our management system includes a committee selected by the Chief Financial Officer of the Company as well as executive-level representatives and a team of subject matter experts from relevant functions such as:

- Quality
- Purchasing
- Finance
- Engineering

The team of subject matter experts is responsible for implementing our conflict minerals compliance strategy. Senior management is briefed about the results of our due diligence efforts on a regular basis.

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## Control systems

As we do not typically have a direct relationship with Conflict Minerals smelters and refiners, we are engaged and actively cooperate with other major manufacturers in our sector and other sectors. Controls include, but are not limited to, the use of the CMRT as the data collection format for our suppliers, our Code of Business Conduct and Ethics which outlines certain expected behaviors for all Harvard Bioscience employees. In addition, we rely on our direct suppliers to provide information on the origin of the Conflict Minerals contained in components and materials supplied to us – including sources of Conflict Minerals that are supplied to them from lower tier suppliers.

## Supplier Engagement

With respect to the OECD requirement to strengthen engagement with suppliers, we have, through Assent, provided education on the Conflict Minerals regulation as well as the expectations of the law and for a continued business relationship. This year, we put a stronger emphasis on supplier education and training. To accomplish this, we utilized Assent's learning management system, Assent University, and provided all in-scope suppliers access to their Conflict Minerals training course. This training is tracked and evaluated based on completion. All suppliers are encouraged to complete all modules within this course.

## Grievance Mechanism

Various communication channels exist to serve as grievance mechanisms for early-warning risk awareness. We have multiple longstanding grievance mechanisms whereby employees (internal) and suppliers (external) can report violations of our policies. This includes, but is not limited to our whistleblower hotline that is part of our Code of Business Conduct and Ethics policy located on our website at <http://investor.harvardbioscience.com/corporate-governance.cfm>.

## Maintain Records

Our existing policy related to relevant documentation of our conflict mineral compliance process requires that documentation will be retained for a period of at least five years.

### *4.3 Identify and assess risk in the supply chain*

Because of the complexity of our products, and the depth, breadth, and constant evolution of our supply chain, it is difficult to identify actors upstream from our direct suppliers. Risks are identified automatically in ACM based on criteria established for supplier responses in the Conflict Policy document and Management System.

Invalid responses are dealt with directly by Assent Compliance staff who contact the supplier, encourage the submission of a valid CMRT, gather pertinent data and perform an assessment of the supplier's Conflict Minerals status.

All of the information and findings from this process are stored in a database that can be audited by internal or external parties.

Certain of the responses to the surveys included the names of facilities listed by the suppliers as smelters or refiners. We compared, via Assent, each facility listed in the responses to the lists of smelters and refiners maintained by the CFSI to verify the existence of the facility and to determine whether the facility has met the requirements of the CFSI's Conflict Free Smelter Protocol (CFSP) and is considered Compliant to that protocol.

Each facility that meets the CFSI definition of a smelter or refiner of a 3TG mineral is assigned a risk of high, medium or low based on 3 scoring criteria:

1. Geographic proximity to the DRC and covered countries;
2. Conflict-Free Smelter Program (CFSP) audit status;
3. Known or plausible evidence of unethical or conflict sourcing.

Based on this criteria, certain facilities have been identified as being of highest concern to the supply chain. When these facilities were reported on a CMRT by one of the suppliers surveyed, risk mitigation activities were initiated. Through Assent, submissions that include any of the above facilities immediately produce a receipt instructing the supplier to take their own risk mitigation actions, including submission of a product specific CMRT to better identify the connection to products that they supply to Harvard Bioscience, and escalating up to removal of these high risk smelters from their supply chain.

As per the OECD Due Diligence Guidance, risk mitigation will depend on the supplier's specific context. Suppliers are given clear

performance objectives within reasonable timeframes with the ultimate goal of progressive elimination of these risks from the supply chain.

In addition, suppliers are guided to the Assent University learning platform to engage in educational materials on mitigating the risk of smelters or refiners on the supply chain.

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If any smelter or refiner is not recognized by the CFSI, Assent conducts outreach and research to gain more information about whether they are a smelter or a refiner, sourcing practices, location, and country of origin. Additionally, if any smelter is not certified conflict-free, Assent conducts outreach providing education on the Conflict-Free Smelter Program and encouraging them to join this program.

Additionally, suppliers are evaluated on program strength (further assisting in identifying risk in the supply chain). Many companies continue to be in the middle of the process and still have “unknown” as some of the answers. It has been decided that penalizing or failing them for working through the process is likely not the best approach for the initial years of compliance, it does not meet the goals or spirit of the Rule, however evaluating and tracking the strength of the program does meet the OECD Due Diligence Guidelines and can assist in making key risk mitigation decisions as the program progresses. The criteria used to evaluate the strength of the program are:

- A. Do you have a policy in place that includes DRC conflict-free sourcing?
- E. Have you implemented due diligence measures for conflict-free sourcing?
- H. Do you verify due diligence information received from your suppliers?
- I. Does your verification process include corrective action management?

When suppliers meet or exceed those criteria (“Yes” to at least A,E,H,I) , they are deemed to have a strong program. When suppliers do not meet those criteria, they are deemed to have a weak program.

We believe that the inquiries and investigations described above represent a reasonable effort to determine the mines or locations of origin of the Conflict Minerals in our Covered Products, including (1) seeking information about Conflict Minerals smelters and refiners in our supply chain through requesting that our suppliers complete the CMRT, (2) verifying those smelters and refiners with the expanding CFSI lists, (3) conducting the due diligence review, and (4) obtaining additional documentation and verification, as applicable.

#### ***4.4 Design and Implement a Strategy to Respond to Risks***

In response to this risk assessment, Harvard Bioscience has an approved risk management plan, through which the conflict minerals program is implemented, managed and monitored.

As part of our risk management plan, to ensure suppliers understand our expectations we have provided both video, recorded training and documented instructions through Assent. As the program progresses, contacts via email and phone by Harvard Bioscience procurement team members will be completed as an escalation to ensure the importance of a response via CMRTs to Assent and the required cooperation for compliance to the Conflict Minerals rules will be emphasized.

As described in our conflict minerals policy, we engage any of our suppliers whom we have reason to believe are supplying us with Conflict Minerals from sources that may support conflict in the Covered Countries to establish an alternative source of Conflict Minerals that does not support such conflict, as provided in the OECD guidance. We have found no instances where it was necessary to terminate a contract or find a replacement supplier.

#### ***4.5 Carry out Independent Third Party Audit of Supply Chain Due Diligence at Identified Points in the Supply Chain***

We do not typically have a direct relationship with smelters and refiners and therefore do not perform or direct audits of these entities. However, we will rely on publicly available third party assurances and certifications, for example, through the CFSI's Conflict-Free Smelter Program.

#### ***4.6 Report annually on supply chain due diligence***

We report annually on our supply chain due diligence by filing a Form SD and a Conflict Minerals Report with the SEC. Our Form SD and Conflict Minerals Report can be found on the Corporate Governance page of our website:  
<http://investor.harvardbioscience.com/corporate-governance.cfm>.

### **5. Due Diligence Results**

#### **Survey Responses**

We are actively surveying our supplier chain. We review the responses against criteria developed to determine whether further engagement with our suppliers is required. These criteria included untimely or incomplete responses as well as inconsistencies within the data reported in the template. We, through the assistance of Assent, have worked with these suppliers to provide revised responses.

**Smelters or Refiners**

The information that we received from a majority of our Applicable Suppliers was at their company-wide level. Thus, the smelters or refiners identified by our Applicable Suppliers contained in the tables below may contain smelters or refiners that processed conflict minerals that our Applicable Suppliers supplied to their other customers, but not to us. As a result, we are unable to conclusively determine whether the smelters or refiners included in the tables below were used to process the conflict minerals necessary to the functionality or production of our products during 2016. Because of this uncertainty, we are also unable to conclusively determine whether each of the countries of origin listed above were the country of origin of conflict minerals in our products during 2016, and therefore also unable to conclusively determine the source and chain of custody of those conflict minerals. In addition, the information that we receive from our Applicable Suppliers may yield inaccurate or incomplete information because they may not have received accurate and complete conflict minerals information from all of the suppliers in their own supply chain. As we are not a member of the CFSI, we also do not have access to audit reports or detailed findings of the third-party audits conducted as part of the CFSI Conflict-Free Smelter Program or the LBMA Responsible Gold Programme and, as a result, are not responsible for the quality of these audits or the audit findings.

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Our third-party service provider compared the facilities listed in the responses in the CMRT to the list of smelters maintained by the Conflict-Free Sourcing Initiative (“CFSI”), and confirmed that the name was listed by CFSI as a legitimate smelter. As of May 1, 2017, we have validated in this manner that 317 smelters or refiners provided in our supplier CMRTs are included on these lists. The facilities determined to be legitimate smelters or refiners based on this comparison to the CFSI-maintained list have also been compared to the CFSI’s Conflict Free Smelter Protocol (CFSP) list. Based on this comparison, we are aware of 246 compliant smelters or refiners, 13 smelters or refiners that have begun the process to be validated as Conflict-Free, they are deemed as active in the Conflict Free Smelter Program but have not yet been validated as Conflict-Free and 58 smelters or refiners that are not enrolled in the process to become compliant to the CFSP. Confirmed smelter or refiner sourcing is not generally available through public information sources related to the smelter or refiner however Attachment A does include an aggregate country list of known smelter or refiner sourcing countries. Despite the additional smelter information obtained from these suppliers, in most cases information has been provided on a company or division level, rather than on a component level. Therefore, we cannot yet ascertain whether the smelters identified by our suppliers are related to any parts or components actually provided to us by the suppliers. Attachment A lists the smelters and refiners that the suppliers we surveyed reported as being in their supply chains. We have not included in Attachment A any smelters or refiners that we have not been able to validate. Attachment A also includes the facility location and whether a smelter or refiner is Conflict-Free.

### **Efforts to determine mine or location of origin**

As noted above, the current efforts focus on gathering smelter information via the CMRT reporting template and, as the program progresses, requiring full completion of all necessary smelter identification information which will enable the validation and disclosure of the smelters as well as the tracing of the Conflict Minerals to their location of origin. Seeking information about Conflict Minerals smelters and refiners in our supply chain represents the most reasonable effort we can make to determine the mines or locations of origin of the Conflict Minerals in our supply chain.

### **6. Steps to improve future due diligence and to mitigate risk**

We intend to take the following steps to improve the due diligence conducted to further mitigate any risk that the necessary Conflict Minerals in our products could benefit armed groups in the DRC or adjoining countries:

- Include a conflict minerals flow-down clause in new or renewed supplier contracts.
- Engage with suppliers and direct them to training resources to attempt to increase the response rate and improve the content of the supplier survey responses.
- Suppliers will also be requested to inform Harvard Bioscience of the correlation between these smelters and the products and parts they supply to Harvard Bioscience
- Engage any of our suppliers found to be supplying us with Conflict Minerals from sources that support conflict in the DRC or any adjoining country to establish an alternative source of Conflict Minerals that does not support such conflict.

### ATTACHMENT A

<b>Metal</b>	<b>Standard Smelter Name</b>	<b>Smelter Facility Location</b>	<b>CFSI Audit Status</b>
Gold	Abington Reldan Metals, LLC	UNITED STATES	Active
Gold	Advanced Chemical Company	UNITED STATES	Compliant
Gold	Aida Chemical Industries Co., Ltd.	JAPAN	Compliant
Gold	Al Etihad Gold Refinery DMCC	UNITED ARAB EMIRATES	Compliant
Gold	Allgemeine Gold-und Silberscheideanstalt A.G.	GERMANY	Compliant
Gold	Almalyk Mining and Metallurgical Complex (AMMC)	UZBEKISTAN	Compliant
Gold	AngloGold Ashanti Córrego do Sítio Mineração	BRAZIL	Compliant
Gold	Argor-Heraeus S.A.	SWITZERLAND	Compliant
Gold	Asahi Pretec Corp.	JAPAN	Compliant
Gold	Asahi Refining Canada Ltd.	CANADA	Compliant
Gold	Asahi Refining USA Inc.	UNITED STATES	Compliant

Gold	Asaka Riken Co., Ltd.	JAPAN	Compliant
Gold	Atasay Kuyumculuk Sanayi Ve Ticaret A.S.	TURKEY	Not Enrolled
Gold	AU Traders and Refiners	SOUTH AFRICA	Compliant
Gold	AURA-II	UNITED STATES	Not Enrolled
Gold	Aurubis AG	GERMANY	Compliant
Gold	Bangalore Refinery	INDIA	Active
Gold	Bangko Sentral ng Pilipinas (Central Bank of the Philippines)	PHILIPPINES	Compliant
Gold	Boliden AB	SWEDEN	Compliant
Gold	C. Hafner GmbH + Co. KG	GERMANY	Compliant
Gold	Caridad	MEXICO	Not Enrolled
Gold	CCR Refinery - Glencore Canada Corporation	CANADA	Compliant
Gold	Cendres + Métaux S.A.	SWITZERLAND	Active
Gold	Chimet S.p.A.	ITALY	Compliant
Gold	Chugai Mining	JAPAN	Not Enrolled
Gold	Daejin Indus Co., Ltd.	KOREA, REPUBLIC OF	Compliant
Gold	Daye Non-Ferrous Metals Mining Ltd.	CHINA	Not Enrolled
Gold	Degussa Sonne / Mond Goldhandel GmbH	GERMANY	Not Enrolled
Gold	DODUCO GmbH	GERMANY	Compliant
Gold	Dowa	JAPAN	Compliant
Gold	DSC (Do Sung Corporation)	KOREA, REPUBLIC OF	Compliant
Gold	Eco-System Recycling Co., Ltd.	JAPAN	Compliant
Gold	Elemental Refining, LLC	UNITED STATES	Compliant
Gold	Emirates Gold DMCC	UNITED ARAB EMIRATES	Compliant
Gold	Fidelity Printers and Refiners Ltd.	ZIMBABWE	Not Enrolled
Gold	Gansu Seemine Material Hi-Tech Co., Ltd.	CHINA	Not Enrolled
Gold	Geib Refining Corporation	UNITED STATES	Active
Gold	Great Wall Precious Metals Co., Ltd. of CBPM	CHINA	Not Enrolled
Gold	Guangdong Jinding Gold Limited	CHINA	Not Enrolled
Gold	Gujarat Gold Centre	INDIA	Not Enrolled
Gold	Guoda Safina High-Tech Environmental Refinery Co., Ltd.	CHINA	Not Enrolled
Gold	Hangzhou Fuchunjiang Smelting Co., Ltd.	CHINA	Not Enrolled
Gold	Heimerle + Meule GmbH	GERMANY	Compliant
Gold	Heraeus Ltd. Hong Kong	CHINA	Compliant
Gold	Heraeus Precious Metals GmbH & Co. KG	GERMANY	Compliant
Gold	Hunan Chenzhou Mining Co., Ltd.	CHINA	Not Enrolled
Gold	Hwasung CJ Co., Ltd.	KOREA, REPUBLIC OF	Not Enrolled
Gold	Inner Mongolia Qiankun Gold and Silver Refinery Share Co., Ltd.	CHINA	Compliant
Gold	Ishifuku Metal Industry Co., Ltd.	JAPAN	Compliant
Gold	Istanbul Gold Refinery	TURKEY	Compliant
Gold	Japan Mint	JAPAN	Compliant
Gold	Jiangxi Copper Co., Ltd.	CHINA	Compliant

Gold	JSC Ekaterinburg Non-Ferrous Metal Processing Plant	RUSSIAN FEDERATION	Compliant
Gold	JSC Uralelectromed	RUSSIAN FEDERATION	Compliant
Gold	JX Nippon Mining & Metals Co., Ltd.	JAPAN	Compliant
Gold	Kaloti Precious Metals	UNITED ARAB EMIRATES	Not Enrolled
Gold	Kazakhmys Smelting LLC	KAZAKHSTAN	Not Enrolled
Gold	Kazzinc	KAZAKHSTAN	Compliant
Gold	Kennecott Utah Copper LLC	UNITED STATES	Compliant
Gold	KGHM Polska Miedź Spółka Akcyjna	POLAND	Active
Gold	Kojima Chemicals Co., Ltd.	JAPAN	Compliant
Gold	Korea Zinc Co., Ltd.	KOREA, REPUBLIC OF	Compliant
Gold	Kyrgyzaltyn JSC	KYRGYZSTAN	Compliant
Gold	L'azurde Company For Jewelry	SAUDI ARABIA	Not Enrolled
Gold	Lingbao Gold Co., Ltd.	CHINA	Not Enrolled
Gold	Lingbao Jinyuan Tonghui Refinery Co., Ltd.	CHINA	Not Enrolled
Gold	L'Orfebre S.A.	ANDORRA	Not Enrolled
Gold	LS-NIKKO Copper Inc.	KOREA, REPUBLIC OF	Compliant
Gold	Luoyang Zijin Yinhui Gold Refinery Co., Ltd.	CHINA	Not Enrolled
Gold	Materion	UNITED STATES	Compliant
Gold	Matsuda Sangyo Co., Ltd.	JAPAN	Compliant
Gold	Metalor Technologies (Hong Kong) Ltd.	CHINA	Compliant
Gold	Metalor Technologies (Singapore) Pte., Ltd.	SINGAPORE	Compliant
Gold	Metalor Technologies (Suzhou) Ltd.	CHINA	Compliant
Gold	Metalor Technologies S.A.	SWITZERLAND	Compliant
Gold	Metalor USA Refining Corporation	UNITED STATES	Compliant
Gold	Metalúrgica Met-Mex Peñoles S.A. De C.V.	MEXICO	Compliant
Gold	Mitsubishi Materials Corporation	JAPAN	Compliant
Gold	Mitsui Mining and Smelting Co., Ltd.	JAPAN	Compliant
Gold	MMTC-PAMP India Pvt., Ltd.	INDIA	Compliant
Gold	Modeltech Sdn Bhd	MALAYSIA	Not Enrolled
Gold	Morris and Watson	NEW ZEALAND	Not Enrolled
Gold	Morris and Watson Gold Coast	AUSTRALIA	Not Enrolled
Gold	Moscow Special Alloys Processing Plant	RUSSIAN FEDERATION	Compliant
Gold	Nadir Metal Rafineri San. Ve Tic. A.Ş.	TURKEY	Compliant
Gold	Navoi Mining and Metallurgical Combinat	UZBEKISTAN	Active
Gold	Nihon Material Co., Ltd.	JAPAN	Compliant
Gold	Ögussa Österreichische Gold- und Silber-Scheideanstalt GmbH	AUSTRIA	Compliant
Gold	Ohura Precious Metal Industry Co., Ltd.	JAPAN	Compliant
Gold	OJSC "The Gulidov Krasnoyarsk Non-Ferrous Metals Plant" (OJSC Krastsvetmet)	RUSSIAN FEDERATION	Compliant
Gold	OJSC Novosibirsk Refinery	RUSSIAN FEDERATION	Compliant
Gold	PAMP S.A.	SWITZERLAND	Compliant

Gold	Pease & Curren	UNITED STATES	Not Enrolled
Gold	Penglai Penggang Gold Industry Co., Ltd.	CHINA	Not Enrolled
Gold	Prioksky Plant of Non-Ferrous Metals	RUSSIAN FEDERATION	Compliant
Gold	PT Aneka Tambang (Persero) Tbk	INDONESIA	Compliant
Gold	PX Précinox S.A.	SWITZERLAND	Compliant
Gold	Rand Refinery (Pty) Ltd.	SOUTH AFRICA	Compliant
Gold	Remondis Argentia B.V.	NETHERLANDS	Not Enrolled
Gold	Republic Metals Corporation	UNITED STATES	Compliant
Gold	Royal Canadian Mint	CANADA	Compliant
Gold	SAAMP	FRANCE	Not Enrolled
Gold	Sabin Metal Corp.	UNITED STATES	Not Enrolled
Gold	SAFINA A.S.	CZECH REPUBLIC	Not Enrolled
Gold	Sai Refinery	INDIA	Not Enrolled
Gold	Samduck Precious Metals	KOREA, REPUBLIC OF	Compliant
Gold	SAMWON Metals Corp.	KOREA, REPUBLIC OF	Not Enrolled
Gold	SAXONIA Edelmetalle GmbH	GERMANY	Compliant
Gold	Schone Edelmetaal B.V.	NETHERLANDS	Compliant
Gold	SEMPSA Joyeria Plateria S.A.	SPAIN	Compliant
Gold	Shandong Tiancheng Biological Gold Industrial Co., Ltd.	CHINA	Not Enrolled
Gold	Shandong Zhaojin Gold & Silver Refinery Co., Ltd.	CHINA	Compliant
Gold	Sichuan Tianze Precious Metals Co., Ltd.	CHINA	Compliant
Gold	Singway Technology Co., Ltd.	TAIWAN	Compliant
Gold	So Accurate Group, Inc.	UNITED STATES	Not Enrolled
Gold	SOE Shyolkovsky Factory of Secondary Precious Metals	RUSSIAN FEDERATION	Compliant
Gold	Solar Applied Materials Technology Corp.	TAIWAN	Compliant
Gold	Sudan Gold Refinery	SUDAN	Not Enrolled
Gold	Sumitomo Metal Mining Co., Ltd.	JAPAN	Compliant
Gold	SungEel HiTech	KOREA, REPUBLIC OF	Active
Gold	T.C.A S.p.A	ITALY	Compliant
Gold	Tanaka Kikinzoku Kogyo K.K.	JAPAN	Compliant
Gold	The Refinery of Shandong Gold Mining Co., Ltd.	CHINA	Compliant
Gold	Tokuriki Honten Co., Ltd.	JAPAN	Compliant
Gold	Tongling Nonferrous Metals Group Co., Ltd.	CHINA	Not Enrolled
Gold	Tony Goetz NV	BELGIUM	Active
Gold	TOO Tau-Ken-Altyn	KAZAKHSTAN	Not Enrolled
Gold	Torecom	KOREA, REPUBLIC OF	Compliant
Gold	Umicore Brasil Ltda.	BRAZIL	Compliant
Gold	Umicore Precious Metals Thailand	THAILAND	Compliant
Gold	Umicore S.A. Business Unit Precious Metals Refining	BELGIUM	Compliant
Gold	United Precious Metal Refining, Inc.	UNITED STATES	Compliant

Gold	Universal Precious Metals Refining Zambia	ZAMBIA	Not Enrolled
Gold	Valcambi S.A.	SWITZERLAND	Compliant
Gold	Western Australian Mint trading as The Perth Mint	AUSTRALIA	Compliant
Gold	WIELAND Edelmetalle GmbH	GERMANY	Compliant
Gold	Yamamoto Precious Metal Co., Ltd.	JAPAN	Compliant
Gold	Yokohama Metal Co., Ltd.	JAPAN	Compliant
Gold	Yunnan Copper Industry Co., Ltd.	CHINA	Not Enrolled
Gold	Zhongyuan Gold Smelter of Zhongjin Gold Corporation	CHINA	Compliant
Gold	Zijin Mining Group Co., Ltd. Gold Refinery	CHINA	Compliant
Tantalum	Changsha South Tantalum Niobium Co., Ltd.	CHINA	Compliant
Tantalum	Conghua Tantalum and Niobium Smeltry	CHINA	Compliant
Tantalum	D Block Metals, LLC	UNITED STATES	Compliant
Tantalum	Duoluoshan	CHINA	Compliant
Tantalum	Exotech Inc.	UNITED STATES	Compliant
Tantalum	F&X Electro-Materials Ltd.	CHINA	Compliant
Tantalum	FIR Metals & Resource Ltd.	CHINA	Compliant
Tantalum	Global Advanced Metals Aizu	JAPAN	Compliant
Tantalum	Global Advanced Metals Boyertown	UNITED STATES	Compliant
Tantalum	Guangdong Zhiyuan New Material Co., Ltd.	CHINA	Compliant
Tantalum	H.C. Starck Co., Ltd.	THAILAND	Compliant
Tantalum	H.C. Starck GmbH Goslar	GERMANY	Compliant
Tantalum	H.C. Starck GmbH Laufenburg	GERMANY	Not Enrolled
Tantalum	H.C. Starck Hermsdorf GmbH	GERMANY	Compliant
Tantalum	H.C. Starck Inc.	UNITED STATES	Compliant
Tantalum	H.C. Starck Ltd.	JAPAN	Compliant
Tantalum	H.C. Starck Smelting GmbH & Co. KG	GERMANY	Compliant
Tantalum	Hengyang King Xing Lifeng New Materials Co., Ltd.	CHINA	Compliant
Tantalum	Hi-Temp Specialty Metals, Inc.	UNITED STATES	Compliant
Tantalum	Jiangxi Dinghai Tantalum & Niobium Co., Ltd.	CHINA	Compliant
Tantalum	Jiangxi Tuohong New Raw Material	CHINA	Compliant
Tantalum	JiuJiang JinXin Nonferrous Metals Co., Ltd.	CHINA	Compliant
Tantalum	Jiujiang Tanbre Co., Ltd.	CHINA	Compliant
Tantalum	Jiujiang Zhongao Tantalum & Niobium Co., Ltd.	CHINA	Compliant
Tantalum	KEMET Blue Metals	MEXICO	Compliant

Tantalum	KEMET Blue Powder	UNITED STATES	Compliant
Tantalum	King-Tan Tantalum Industry Ltd.	CHINA	Compliant
Tantalum	LSM Brasil S.A.	BRAZIL	Compliant
Tantalum	Metallurgical Products India Pvt., Ltd.	INDIA	Compliant
Tantalum	Mineração Taboca S.A.	BRAZIL	Compliant
Tantalum	Mitsui Mining & Smelting	JAPAN	Compliant
Tantalum	Molycorp Silmet A.S.	ESTONIA	Compliant
Tantalum	Ningxia Orient Tantalum Industry Co., Ltd.	CHINA	Compliant
Tantalum	Plansee SE Liezen	AUSTRIA	Not Enrolled
Tantalum	Plansee SE Reutte	AUSTRIA	Compliant
Tantalum	Power Resources Ltd.	MACEDONIA	Compliant
Tantalum	QuantumClean	UNITED STATES	Compliant
Tantalum	Resind Indústria e Comércio Ltda.	BRAZIL	Compliant
Tantalum	RFH Tantalum Smeltry Co., Ltd.	CHINA	Compliant
Tantalum	Solikamsk Magnesium Works OAO	RUSSIAN FEDERATION	Compliant
Tantalum	Taki Chemicals	JAPAN	Compliant
Tantalum	Telex Metals	UNITED STATES	Compliant
Tantalum	Tranzact, Inc.	UNITED STATES	Compliant
Tantalum	Ulba Metallurgical Plant JSC	KAZAKHSTAN	Compliant
Tantalum	XinXing HaoRong Electronic Material Co., Ltd.	CHINA	Compliant
Tantalum	Yichun Jin Yang Rare Metal Co., Ltd.	CHINA	Compliant
Tantalum	Zhuzhou Cemented Carbide Group Co., Ltd.	CHINA	Compliant
Tin	Alpha	UNITED STATES	Compliant
Tin	An Thai Minerals Co., Ltd.	VIET NAM	Not Enrolled
Tin	An Vinh Joint Stock Mineral Processing Company	VIET NAM	Not Enrolled
Tin	Chenzhou Yunxiang Mining and Metallurgy Co., Ltd.	CHINA	Compliant
Tin	China Tin Group Co., Ltd.	CHINA	Compliant
Tin	CNMC (Guangxi) PGMA Co., Ltd.	CHINA	Not Enrolled
Tin	Cooperativa Metalurgica de Rondônia Ltda.	BRAZIL	Compliant
Tin	CV Ayi Jaya	INDONESIA	Compliant
Tin	CV Dua Sekawan	INDONESIA	Compliant
Tin	CV Gita Pesona	INDONESIA	Compliant
Tin	CV Serumpun Sebalai	INDONESIA	Compliant
Tin	CV Tiga Sekawan	INDONESIA	Compliant

Tin	CV United Smelting	INDONESIA	Compliant
Tin	CV Venus Inti Perkasa	INDONESIA	Compliant
Tin	Dowa	JAPAN	Compliant
Tin	Electro-Mechanical Facility of the Cao Bang Minerals & Metallurgy Joint Stock Company	VIET NAM	Active
Tin	Elmet S.L.U.	SPAIN	Compliant
Tin	EM Vinto	BOLIVIA	Compliant
Tin	Estanho de Rondônia S.A.	BRAZIL	Not Enrolled
Tin	Fenix Metals	POLAND	Compliant
Tin	Gejiu Fengming Metallurgy Chemical Plant	CHINA	Compliant
Tin	Gejiu Jinye Mineral Company	CHINA	Compliant
Tin	Gejiu Kai Meng Industry and Trade LLC	CHINA	Active
Tin	Gejiu Non-Ferrous Metal Processing Co., Ltd.	CHINA	Compliant
Tin	Gejiu Yunxin Nonferrous Electrolysis Co., Ltd.	CHINA	Active
Tin	Gejiu Zili Mining And Metallurgy Co., Ltd.	CHINA	Not Enrolled
Tin	Guanyang Guida Nonferrous Metal Smelting Plant	CHINA	Compliant
Tin	HuiChang Hill Tin Industry Co., Ltd.	CHINA	Compliant
Tin	Huichang Jinshunda Tin Co., Ltd.	CHINA	Not Enrolled
Tin	Jiangxi Ketai Advanced Material Co., Ltd.	CHINA	Compliant
Tin	Magnu's Minerai's Metais e Ligas Ltda.	BRAZIL	Compliant
Tin	Malaysia Smelting Corporation (MSC)	MALAYSIA	Compliant
Tin	Melt Metais e Ligas S.A.	BRAZIL	Compliant
Tin	Metallic Resources, Inc.	UNITED STATES	Compliant
Tin	Metallo-Chimique N.V.	BELGIUM	Compliant
Tin	Mineração Taboca S.A.	BRAZIL	Compliant
Tin	Minsur	PERU	Compliant
Tin	Mitsubishi Materials Corporation	JAPAN	Compliant
Tin	Modeltech Sdn Bhd	MALAYSIA	Not Enrolled
Tin	Nankang Nanshan Tin Manufactory Co., Ltd.	CHINA	Active
Tin	Nghe Tinh Non-Ferrous Metals Joint Stock Company	VIET NAM	Not Enrolled
Tin	O.M. Manufacturing (Thailand) Co., Ltd.	THAILAND	Compliant
Tin	O.M. Manufacturing Philippines, Inc.	PHILIPPINES	Compliant
Tin	Operaciones Metalurgical S.A.	BOLIVIA	Compliant
Tin	Phoenix Metal Ltd.	RWANDA	Not Enrolled
Tin	PT Aries Kencana Sejahtera	INDONESIA	Compliant
Tin	PT Artha Cipta Langgeng	INDONESIA	Compliant
Tin	PT ATD Makmur Mandiri Jaya	INDONESIA	Compliant
Tin	PT Babel Inti Perkasa	INDONESIA	Compliant
Tin	PT Bangka Prima Tin	INDONESIA	Compliant
Tin	PT Bangka Tin Industry	INDONESIA	Compliant
Tin	PT Belitung Industri Sejahtera	INDONESIA	Compliant

Tin	PT Bukit Timah	INDONESIA	Compliant
Tin	PT Cipta Persada Mulia	INDONESIA	Compliant
Tin	PT DS Jaya Abadi	INDONESIA	Compliant
Tin	PT Eunindo Usaha Mandiri	INDONESIA	Compliant
Tin	PT Inti Stania Prima	INDONESIA	Compliant
Tin	PT Justindo	INDONESIA	Not Enrolled
Tin	PT Karimun Mining	INDONESIA	Compliant
Tin	PT Kijang Jaya Mandiri	INDONESIA	Compliant
Tin	PT Lautan Harmonis Sejahtera	INDONESIA	Compliant
Tin	PT Mitra Stania Prima	INDONESIA	Compliant
Tin	PT O.M. Indonesia	INDONESIA	Compliant
Tin	PT Panca Mega Persada	INDONESIA	Compliant
Tin	PT Prima Timah Utama	INDONESIA	Compliant
Tin	PT Refined Bangka Tin	INDONESIA	Compliant
Tin	PT Sariwiguna Binasentosa	INDONESIA	Compliant
Tin	PT Stanindo Inti Perkasa	INDONESIA	Compliant
Tin	PT Sukses Inti Makmur	INDONESIA	Compliant
Tin	PT Sumber Jaya Indah	INDONESIA	Compliant
Tin	PT Timah (Persero) Tbk Kundur	INDONESIA	Compliant
Tin	PT Timah (Persero) Tbk Mentok	INDONESIA	Compliant
Tin	PT Tinindo Inter Nusa	INDONESIA	Compliant
Tin	PT Tommy Utama	INDONESIA	Compliant
Tin	PT Wahana Perkit Jaya	INDONESIA	Compliant
Tin	Resind Indústria e Comércio Ltda.	BRAZIL	Compliant
Tin	Rui Da Hung	TAIWAN	Compliant
Tin	Soft Metais Ltda.	BRAZIL	Compliant
Tin	Thaisarco	THAILAND	Compliant
Tin	Tuyen Quang Non-Ferrous Metals Joint Stock Company	VIET NAM	Not Enrolled
Tin	VQB Mineral and Trading Group JSC	VIET NAM	Compliant
Tin	White Solder Metalurgia e Mineração Ltda.	BRAZIL	Compliant
Tin	Yunnan Chengfeng Non-ferrous Metals Co., Ltd.	CHINA	Active
Tin	Yunnan Tin Company Limited	CHINA	Compliant
Tungsten	A.L.M.T. TUNGSTEN Corp.	JAPAN	Compliant
Tungsten	ACL Metais Eireli	BRAZIL	Not Enrolled
Tungsten	Asia Tungsten Products Vietnam Ltd.	VIET NAM	Compliant
Tungsten	Chenzhou Diamond Tungsten Products Co., Ltd.	CHINA	Compliant
Tungsten	Chongyi Zhangyuan Tungsten Co., Ltd.	CHINA	Compliant
Tungsten	Dayu Weiliang Tungsten Co., Ltd.	CHINA	Not Enrolled
Tungsten	Fujian Jinxin Tungsten Co., Ltd.	CHINA	Compliant



Tungsten	Ganzhou Huaxing Tungsten Products Co., Ltd.	CHINA	Compliant
Tungsten	Ganzhou Jiangwu Ferrotungsten Co., Ltd.	CHINA	Compliant
Tungsten	Ganzhou Seadragon W & Mo Co., Ltd.	CHINA	Compliant
Tungsten	Ganzhou Yatai Tungsten Co., Ltd.	CHINA	Not Enrolled
Tungsten	Global Tungsten & Powders Corp.	UNITED STATES	Compliant
Tungsten	Guangdong Xianglu Tungsten Co., Ltd.	CHINA	Compliant
Tungsten	H.C. Starck GmbH	GERMANY	Compliant
Tungsten	H.C. Starck Smelting GmbH & Co.KG	GERMANY	Compliant
Tungsten	Hunan Chenzhou Mining Co., Ltd.	CHINA	Compliant
Tungsten	Hunan Chuangda Vanadium Tungsten Co., Ltd. Wuji	CHINA	Compliant
Tungsten	Hunan Chunchang Nonferrous Metals Co., Ltd.	CHINA	Compliant
Tungsten	Hydrometallurg, JSC	RUSSIAN FEDERATION	Compliant
Tungsten	Japan New Metals Co., Ltd.	JAPAN	Compliant
Tungsten	Jiangwu H.C. Starck Tungsten Products Co., Ltd.	CHINA	Compliant
Tungsten	Jiangxi Dayu Longxintai Tungsten Co., Ltd.	CHINA	Not Enrolled
Tungsten	Jiangxi Gan Bei Tungsten Co., Ltd.	CHINA	Compliant
Tungsten	Jiangxi Minmetals Gao'an Non-ferrous Metals Co., Ltd.	CHINA	Not Enrolled
Tungsten	Jiangxi Tonggu Non-ferrous Metallurgical & Chemical Co., Ltd.	CHINA	Compliant
Tungsten	Jiangxi Xinsheng Tungsten Industry Co., Ltd.	CHINA	Compliant
Tungsten	Jiangxi Xiushui Xianggan Nonferrous Metals Co., Ltd.	CHINA	Compliant
Tungsten	Jiangxi Yaosheng Tungsten Co., Ltd.	CHINA	Compliant
Tungsten	Kennametal Fallon	UNITED STATES	Compliant
Tungsten	Kennametal Huntsville	UNITED STATES	Compliant
Tungsten	Malipo Haiyu Tungsten Co., Ltd.	CHINA	Compliant
Tungsten	Moliren Ltd	RUSSIAN FEDERATION	Compliant
Tungsten	Niagara Refining LLC	UNITED STATES	Compliant
Tungsten	Nui Phao H.C. Starck Tungsten Chemicals Manufacturing LLC	VIET NAM	Compliant
Tungsten	Philippine Chuangxin Industrial Co., Inc.	PHILIPPINES	Compliant
Tungsten	South-East Nonferrous Metal Company Limited of Hengyang City	CHINA	Compliant
Tungsten	Tejing (Vietnam) Tungsten Co., Ltd.	VIET NAM	Compliant
Tungsten	Unecha Refractory metals plant	RUSSIAN FEDERATION	Compliant

Tungsten	Vietnam Youngsun Tungsten Industry Co., Ltd.	VIET NAM	Compliant
Tungsten	Wolfram Bergbau und Hütten AG	AUSTRIA	Compliant
Tungsten	Woltech Korea Co., Ltd.	KOREA, REPUBLIC OF	Compliant
Tungsten	Xiamen Tungsten (H.C.) Co., Ltd.	CHINA	Compliant
Tungsten	Xiamen Tungsten Co., Ltd.	CHINA	Compliant
Tungsten	Xinfeng Huarui Tungsten & Molybdenum New Material Co., Ltd.	CHINA	Compliant
Tungsten	Xinhai Rendan Shaoguan Tungsten Co., Ltd.	CHINA	Compliant

**Country of Origin List:**

This list below sets out possible countries of origin of 3TGs used in the manufacture of products containing conflict minerals that are necessary to the functionality or production of our products. The list is based on publicly available information, our reasonable country of origin investigation, and other due diligence. For the reasons described in the Report, however, these possible countries of origin cannot necessarily be linked to our products.

Argentina, Australia, Austria, Belgium, Bolivia, Brazil, Cambodia, Canada, Chile, China, Columbia, Cote D'Ivoire, Czech Republic, Djibouti, Ecuador, Egypt, Estonia, Ethiopia, France, Germany, Guyana, Hungary, India, Indonesia, Ireland, Israel, Japan, Kazakhstan, Laos, Luxembourg, Madagascar, Malaysia, Mongolia, Myanmar, Namibia, Netherlands, Nigeria, Peru, Portugal, Russia, Sierra Leone, Singapore, Slovakia, South Korea, Spain, Suriname, Switzerland, Taiwan, Thailand, United Kingdom, United States, Vietnam, Zimbabwe, Kenya, Mozambique, South Africa, Democratic Republic of the Congo, Angola, Burundi, Central African Republic, Republic of Congo, Rwanda, South Sudan, Tanzania, Uganda, and Zambia.