STRATEGIC BUSINESS PLAN

ISO/TC 174

Jewellery and precious metals

EXECUTIVE SUMMARY

The scope of this technical committee covers jewellery (including definition, specification, fineness and analysis), diamonds & gemstones (as well as related products; including definition, specification and analysis), and precious metals (including definition, specification, sampling and analysis). Other industries such as watch-making industry or precious metal refiners are covered by the scope of this technical committee for using precious metals, diamonds, gemstones or any related products.

ISO/TC 174 maintain specific standards for jewellery. This includes the fineness of alloys linked with hallmarking, which is internationally recognized in many countries, the color of alloys, as well as definition and grading of diamonds, gemstones and related products. These standards help trade between parties and protect the customers.

Diamonds and gemstones are defined as natural inorganic or organic materials/substances which have been formed completely by nature without human interference during their formation. Gemstones are usually used in jewellery or objets d'art due to a combination of properties that provide them with beauty, rarity and relative durability. Products related to gemstones encompass pearls, cultured pearls, coral, and other materials/substances of organic origin. Other related products may encompass all artificial products present in the jewellery trade. Proper nomenclature and quality control for diamonds, gemstones and related products are essential to maintain consumer confidence in the jewellery industry.

ISO/TC 174 also maintain standards for precious metals, which are defined as gold, silver, platinum, palladium, iridium, rhodium, and ruthenium. There are multiple analytical standards, as due to the high value of finished and semi-finished articles made with precious metals, the uncertainty associated with precious metal analysis is typically much lower than in any other field. Those analytical standards developed by ISO/TC 174 are hence used by many industries and services, including mines, collectors, refiners, jewellery manufacturers, customs and assay offices, to assess the fineness of raw materials and semi-finished or finished goods.

In addition, the standards on test methods are used for quality management purposes as well as to achieve ISO 17025 accreditation – an accreditation mandatory in several countries for laboratories working with precious metals.

ISO/TC 174 adjusts its work programme to meet the needs of marketplaces, regulations and changing technologies.

1. INTRODUCTION

1.1 ISO technical committees and business planning

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for projects throughout their development.

1.2 International standardization and the role of ISO

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: ISO (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of IEC (International Electrotechnical Committee), and most of the Telecommunications Technologies, which are largely the responsibility of ITU (International Telecommunication Union).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 164 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the International Standard.

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its Technical Committees are also able to offer the ISO Technical Specification (ISO/TS), the ISO Public Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an International Standard.

ISO offers also the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.

2. BUSINESS ENVIRONMENT OF THE ISO/TC

2.1 Description of the Business Environment

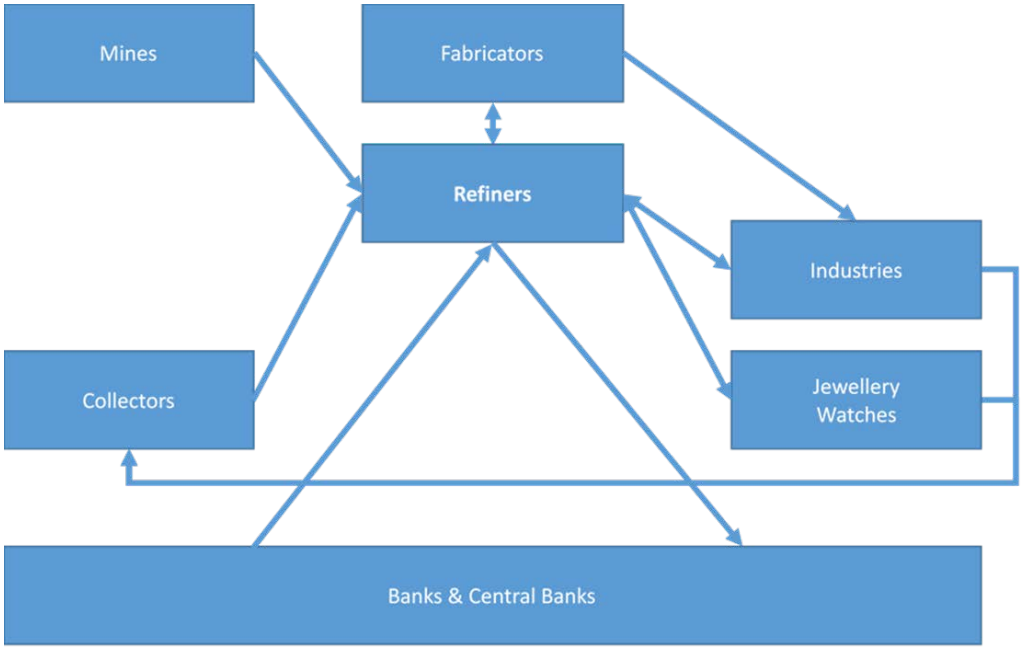
The following political, economic, technical, regulatory, legal and social dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this ISO/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards.

2.1.1 Precious Metals

Precious Metals are defined as Gold (Au), Silver (Ag), Platinum (Pt), Palladium (Pd), Iridium (Ir), Rhodium (Rh), Ruthenium (Ru) and Osmium (Os). Those are rare chemical elements, found naturally in metallic shape on Earth. They are used as investment tools, for jewellery and for industrial applications.

Precious metal flows

Mines are sourcing the metal from soil and, after pre-refining processes performed at the mines or in their vicinity, send the concentrated material to refiners. Refiners are purifying the concentrates received to produce fine (pure) metals, which are transformed by refiners themselves or fabricators to added-value materials (investment products, alloys, semi-finished goods, chemicals, powders, salts…). All those products are delivered to banks, industries and jewellery manufacturers. After usage, precious metal containing materials are returned to refiners, directly or through collectors, for recovery of the metals (recycling).



Precious metal analysis

Because of the high value of finished and semifinished articles made with precious metals, the uncertainty associated with precious metal analysis is typically much lower than in any other field. Laboratories are expected to provide precise results with minimum uncertainty. Many laboratories working with precious metals are ISO 17025 accredited – it is mandatory in several countries – and have based their analytical procedures on standards developed and validated by ISO/TC 174.

ISO/TC 174 is hence responsible for maintaining and developing test methods (sampling, analysis of fineness) for precious metals. Those methods have to be adapted as technological improvements are being made: historically, fineness was determined by direct measurements (cupellation, gravimetry), but spectroscopic methods are widespread nowadays.

Historically applied for jewellery alloys, those analytical and nomenclature standards became universal and are used today by many industries and services, including mines, collectors, refiners, jewellery manufacturers, customs, assay offices and end-consumers. Hence, in 2017, the scope of the ISO/TC 174 was extended to cover all standardization in the field of precious metals – rather than only for jewellery applications.

Today, those standards are also recognized by multiple trade associations in the world.

Jewellery alloys

Jewellery and jewellery alloys are finished or semifinished articles, which are made from Gold, Silver, Platinum and Palladium at specific concentrations (finenesses). Many countries are following international and national regulations on hallmarking, which are typically enforced by national customs and assay offices. Such marks have international recognition in other countries as offering effective quality guarantees. The role of ISO/TC 174 is to contribute to standard rules and procedures in the determination of precious metal contents of those articles, to help the trade between parties in a market characterized by a large number of competitors (multinational corporations, large, mid-size and small manufacturers). There are different regulatory measures within the market, usually based on national concepts of consumer protection. Apart the analysis of fineness, this includes the determination of impurities, the color of alloys and diamonds.

Precious metal compliance

With the sourcing of precious metals all around the world, including in many developing countries where environmental, safety and societal standards are not always a priority, many private initiatives have been put in place to regulate the extraction and recycling of precious metals. Industries and jewellery makers are strongly advocating for a more regulated market.

The OECD Due Diligence Guidance provides detailed recommendations to help companies respect human rights and avoid contributing to conflict through their mineral purchasing decisions and practices. This Guidance is for use by any company potentially sourcing minerals or metals from conflict-affected and high-risk areas. The OECD Guidance is global in scope, and applies to all mineral supply chains.

The Responsible Jewellery Council (RJC) Code of Practices is a standard that defines responsible ethical, human rights, social, and environmental practices for businesses in the precious metal jewellery supply chain.

Other key stakeholders in the compliance processes are the regulators, the professional associations (including LBMA & LPPM) as well as, of course, the consumers.

2.1.2 Diamonds

Diamonds are specifically defined by the international standard ISO 18323 (Consumer Confidence in the Diamond Industry). Gemstones are defined as natural inorganic or organic materials/substances which have been formed completely by nature without human interference during their formation. Gemstones are usually used in jewellery or objets d'art due to a combination of properties that provide them with beauty, rarity and relative durability. Products related to gemstones encompass pearls, cultured pearls, coral, and other materials/substances of organic origin. Other related products may encompass all artificial products present in the jewellery trade.

Originally, standards developed by ISO/TC 174 were focusing on the analysis of precious metals for jewellery applications. In 2015, in order to maintain Consumer Confidence in the Diamond Industry, the ISO/TC 174 launched the International Standard ISO 18323 to set forth the proper nomenclature that the jewellery shall use for marketing diamonds and synthetic diamonds.

Diamond flows

Depending of qualities, unpolished also named rough diamonds may mainly enter into two separate trades: industrial diamond trade for low quality and jewellery trade for higher quality. The jewellery industry with very rare exceptions uses only polished diamonds as ornamentation or added-value.

Diamond analysis

At the level of mining operations, diamonds are extracted through various industrial processes. After cutting and polishing most valuable diamonds are authenticated and graded for their quality based on the 4C's quality criteria (Carat weight, Colour, Clarity & Cut) by gemmological institutions or laboratories. A diamond grading standardization will enable the harmonization of reports emitted by various institutions/laboratories, and this is already worked upon at the TC 174. A standard for the quality control of small diamond batches will enable a fair competition on the melee-size diamond

market. It will also permit manufacturer using large quantities of small diamonds to optimize the quality control of their final products.

Diamond compliance

With the sourcing of diamonds all around the world, including in many developing countries where environmental, safety and societal standards are not always a priority, many private initiatives have been put in place to regulate the extraction and trade of rough diamonds. Industries and jewellery makers are strongly advocating for a more regulated market for both rough and polished diamonds.

The Kimberley Process is an international certification scheme that regulates trade in rough diamonds. It aims to prevent the flow of conflict diamonds, while helping to protect legitimate trade in rough diamonds. The Kimberley Process Certification Scheme (KPCS) outlines the rules that govern the trade in rough diamonds.

The World Diamond Council (WDC) system of warranties offers sellers the option to attach a guarantee to the invoice, which shows that the goods meet KP standards. This mechanism can also be used when selling polished diamonds. A jewelry manufacturer can use the guarantee to demonstrate that the purchased diamond was not involved in the financing of conflict, and is in accordance with the resolutions of the United Nations.

Similarly to precious metals, OECD Due Diligence Guidance is for use by any company potentially sourcing diamonds and gemstones from conflict-affected and high-risk areas. CIBJO's responsible sourcing book provides a framework and guidance for due diligence related to the responsible sourcing of diamonds and gemstones in the jewellery sector. The Responsible Jewellery Council (RJC) Code of Practices are also used for responsible ethical, human rights, social, and environmental practices in the diamond sourcing.

2.2 Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the ISO/TC.

Precious metals are sourced either from mines (primary market) or are recycled (secondary market). The gold mining market is truly a global one. In 2016, over 3’200 tons of gold were extracted from earth; the 6 largest gold producing countries (representing 37% of the worldwide production) are each based on a different continent! The gold recycling market represents also a significant source of metal, with almost 1’300 tons of gold recycled in 2016.

A large part of the gold processed annually is used for jewellery. The jewellery market consumed 2 040 tons of gold in 2016. Other usages are for electronics (256 tons), decorative (50 tons) and dental (18 tons) fabrication. Gold is obviously also a very important investment tool. Every day, 600 tons of gold are exchanged (electronically or physically) on the London Bullion Market.

Silver represents the largest volume of precious metals, with 27’550 tons of silver mined and 4’350 more recycled from scraps in 2016, out of which more than 50% were used for industrial applications – only 20% of the silver being used for jewellery.

For platinum and palladium, the main source of metal comes from mining with 188 ton of platinum and 204 tons of palladium extracted in 2016. Jewellery demand is lower than autocatalyst demand for both metals (67 vs 103 tons for platinum, 9 vs 229 tons for palladium).

Rough worldwide diamond production in 2017 was 151 million carats with a total value of 14,125 billion US$ (source: KPCS). This covers both rough diamonds used later in jewellery and rough

diamonds of industrial quality. Rough diamonds destined for jewellery are later processed into polished diamonds, adding further value.

In 2014, the global output of polished diamonds smaller than 2.60 mm was 6.4 billion US$ while that of diamonds over 1ct (6.6 mm) was only 6.1 billion US$ (source: Tacy Ltd.) The comparison of these two figures highlightes the importance of the melee-size diamonds market specifically traded in large batches, sometimes over 10'000 units per batch.

3. BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC

ISO/TC 174 expects to satisfy the following needs:

- Facilitate global market access and trade for precious metals, diamonds, gemstones and related products, as well as goods containing any of those products. Increase confidence of the customer in those products: the price of many finished articles is often directly related to the content of precious metal, as well as the content and quality of diamonds, gemstones and related products. Clear analytical standards and nomenclature definitions serve as preferred basis of agreements and contracts to properly characterize finished and semi-finished articles when legal and contractual requirements have to be met.
- Define fineness of jewellery and jewellery alloys to be used by fabricators and assay offices for the marking of these articles.
- Define nomenclature and standard for the grading of diamonds, or the quality control of small diamonds batches to be used by diamond grading laboratories, the diamond trade downstream to the end-consumer.
- Develop and maintain analytical standards to be used by mines, collectors, refiners, watch and jewellery manufacturers, customs, independent laboratories and assay offices.
- Develop quality and compliance standards to be used by specific industries in the precious metal, diamonds and gemstones supply chains.
- Develop standards for responsible sourcing of precious metals, to ensure that OECD Due Diligence Guidance recommendations are followed, and define nomenclature associated with different sources of precious metals.
- Propose clear analytical standards to be use in quality management systems (including ISO 9001) and for obtaining a laboratory ISO 17025 accreditation, and to serve as preferred basis of agreements and contracts to proper characterization of finished and semi-finished articles, prevent dispute of the trade and preserve end-consumer confidence.

4. REPRESENTATION AND PARTICIPATION IN THE ISO/TC

4.1 Membership

Current membership can be found here:

http://www.iso.org/committee/53874.html?view=participation

4.2 Analysis of the participation

As of June 2023, ISO/TC 174 has 19 P-members and 23 O-members. Active participants in ISO/TC 174 include precious metals refiners, watch and jewellery makers, assay offices, service

laboratories, government and regulatory staff, diamond and precious stones suppliers, grading laboratories...

Geographically, the representation is quite diversified, although Peru and Tanzania are the only active P-members from the Americas and Africa, respectively.

Major precious metals mining countries are represented among the participating members (China, Russia, Peru), as well as precious metals refining countries (Switzerland, Russia, Germany) and jewellery making countries (China, India, Italy, France). Key players in the diamond and gemstones industry are also represented (Belgium, India, Israel, Russia, Japan, Germany, Switzerland).

Several African and Eastern European countries are O-members. For some of those countries, it is supposed that lack of ressources leads to a lesser active role in ISO/TC 174, even though their importance as raw material or jewellery producers generates a strong interest in the work of this committee.

ISO/TC 174 has also liaisons with CIBJO (The World Jewellery Confederation), LBMA (London Bullion Market Association), IPA (The International Platinum Association), PMC (Convention on the Control and Marking of Articles from Precious Metals) and the WCO (World Customs organization).

5. OBJECTIVES OF THE ISO/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

5.1 Defined objectives of the ISO/TC

Elaboration of standards within the scope of the committee, adjusting the work programme as needed to meet the needs of the marketplace and changing technology. If no new work is proposed after the completion of the current programme the committee will merely monitor its existing standards and undertake any amendments which may prove necessary.

5.2 Identified strategies to achieve the ISO/TC's defined objectives

ISO/TC 174 consists of the main technical body as well as several working groups. The strategies adopted to reach the above objectives include the following:

- Maintain and improve the existing technical analytical standards;
- Draft new technical analytical standards to consider the development of new techniques and business usages – for example XRF and SPARK-OES analyses;
- For both existing and new standards, validate them when possible with round robin testings and potentially publish a corresponding Technical Report;
- Collaborate with the CEN/TC 410, whose scope was extended in 2023 to cover Jewellery and Precious Metals, following the disbandment of CEN/TC 283 in December 2011;
- Develop sampling standards;
- Develop standards on investment products;
- Support implementation of best practice guidance on jewellery marking, like The Hallmarking Convention rulings (in context of trade and consumers);
- Develop standards useful for the mining industry to increase the customer's confidence in mined precious metals and diamonds;
- Develop standards for the gemstone industry;
- Develop standards for the gemstones and its related products industry;

- Develop standards for pearl and cultured pearl industries;
- Develop standards for the definition, the nomenclature and the quality control of artificial products present in the jewellery trade;
- Develop standard for vocabulary used in jewellery and precious metals
- Develop standards for responsible sourcing;
- Ensure that new work item proposals are properly justified in terms of market need, and support the agreed ISO/TC 174 objectives;
- Hold plenary meetings when needed and justified (with an expected bi-annual frequency), convince as many participating countries to join both ISO/TC 174 plenary and workgroup meetings.

6. FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC WORK PROGRAMME

Factors that could place constraints on the completion of the proposed work programme are the following:

- European countries are representing the essential active participation; it is important to ensure that all members have access to the meetings (main technical body and workgroups);
- Due to financial reason, it is often challenging for experts to attend international meetings, which is against the needed internationalization of the ISO/TC 174;
- Round robin participation for standard validation is extremely time consuming; experts are not only expected to dedicate their time to join meetings, but also to perform multiple analyses in their laboratories;
- The usage of several new analytical technics has risen in the last decade, leading to multiple fields where standardization is needed;
- Compliance has become crucial for companies dealing with precious metals, but edition of standards in that field involve multiple stakeholders and is very complex.

7. STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC

Information on ISO online

The link below is to the TC's page on ISO's website:

http://www.iso.org/committee/53874.html

Click on the tabs and links on this page to find the following information:

- About (Secretariat, Secretary, Chair, Date of creation, Scope, etc.)
- Contact details
- Structure (Subcommittees and working groups)
- Liaisons
- Meetings
- Tools
- Work programme (published standards and standards under development)

Reference information

Glossary of terms and abbreviations used in ISO/TC Business Plans

General information on the principles of ISO's technical work