

Technical safety of machinery and equipment in the aspect of the activities of the KOMAG Division of Attestation Tests, Certifying Body

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Abstract:

One of the areas of activity of the KOMAG Institute of Mining Technology is related to broadly understood ensuring of technical safety. This activity is carried out by the Division of Attestation Tests, Certifying Body, which by carrying out numerous processes of certification, conformity assessments, issuing opinions and expert opinions, contributes to maintaining and increasing the level of technical safety associated with the use of products, mainly machinery and equipment. This article reviews the activities of the Certifying Body, its competences and authorizations and presents how such activities influence technical safety.

Streszczenie:

Jednym z obszarów działalności Instytutu Techniki Górniczej KOMAG jest działalność związana z szeroko rozumianym zapewnieniem bezpieczeństwa technicznego. Działalność tę w Instytucie realizuje Zakład Badań Atestacyjnych Jednostka Certyfikująca, który prowadząc liczne procesy certyfikacji, oceny zgodności, wydawania opinii i ekspertyz przyczynia się do utrzymania i podnoszenia poziomu bezpieczeństwa technicznego związanego ze stosowaniem wyrobów, głównie maszyn i urządzeń. W niniejszym artykule dokonano przeglądu działalności jednostki certyfikującej, posiadanych kompetencji i uprawnień oraz omówiono w jaki sposób taka działalność kształtuje bezpieczeństwo techniczne.

1. Introduction

The requirement of ensuring technical safety and safe working conditions results directly from the Constitution of the Republic of Poland [1], which contains the following statements:

- everyone has the right to safe and hygienic working conditions (Article 66.1),
- public authorities shall protect consumers, users and tenants from actions which threaten their health, privacy and safety and from unfair market practices (Article 76).

Activities related to ensuring safety are carried out by manufacturers, employers, conformity assessment bodies, market surveillance authorities and other specialised inspection bodies, operating within the framework of the legal acts in force.

The basic actions taken to ensure the technical safety of machinery and equipment are [2]:

- design and manufacture of the machine, taking into account the results of the risk analysis and assessment, so that:
 - all the identified hazards have been eliminated or the risks associated with them have been reduced to an acceptable level,
 - the sources of hazards are monitored in the way enabling to prevent a risk increase by initiating preventive measures,

- use of safe working methods and provision of appropriate means of collective protection and personal protective equipment.

The responsibility for technical safety at the stage of design and manufacture of products, placed on the market, primarily belongs to product manufacturers whereas the responsibility for ensuring safe working conditions belongs to employers (users).

The KOMAG Institute of Mining Technology has in its structure a dedicated organizational unit – the Division of Attestation Tests, Certifying Body, which, due to its authorization for several decades, has been participating in the processes of conformity assessment of products requiring the participation of the so-called "third party". The activity of the Division of Attestation Tests, Certifying Body focuses on the assessment of products at the stage of placing them on the market, hence the article discusses primarily the conformity assessment procedures and other activities of the Body supporting manufacturers in the verification of compliance of products with safety requirements at the design and manufacturing stage (Fig. 1).

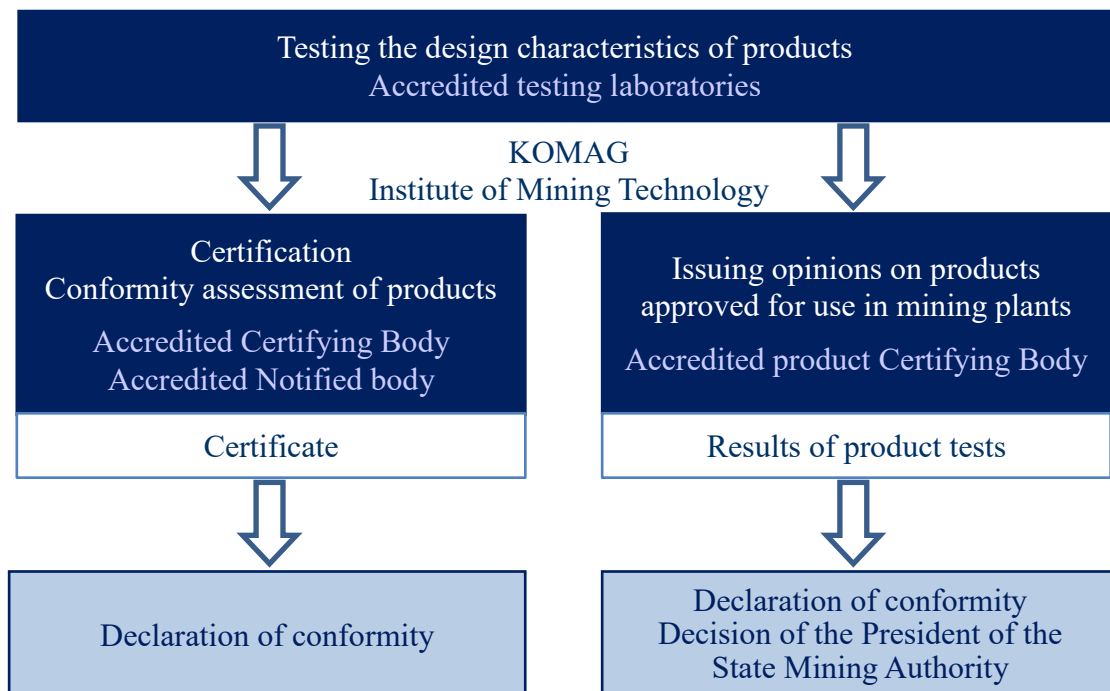


Fig. 1. KOMAG activities in the scope of conformity assessment

With regard to placing products on the market of, understood as making a product available on the market for the first time, the following acts shall apply:

- the Act of 30 August 2002 on the Conformity Assessment System [3] and the Act of 13 April 2016 on Conformity Assessment and Market Surveillance Systems [4], together with the regulations implementing European Union directives issued on its basis, which specify, among others, the essential and additional requirements for products subject to conformity assessment and conformity assessment procedures,
- Law of 12 December 2003 on general product safety [5], which lays down the procedure to be followed concerning products placed on the market where there are no specific other European Union regulations concerning the safety of those products.

The Division of Attestation Tests, Certifying Body carries out assessments of products, mainly machinery and equipment, intended for use in various industries. Products intended for the mining industry, due to specific environmental hazards occurring in mining excavations, are subject to

additional assessment procedures and are required to meet additional safety requirements specified in the regulations issued based on the Act of 9 June 2011 - Geological and Mining Law [6].

2. The competences of the Division of Attestation Tests, Certifying Body

The accreditation guarantees reliable, competent, independent and impartial assessment of products with the requirements of reference documents (standards, normative documents, technical specifications) carried out by a certifying body. The condition for obtaining accreditation is meeting the requirements concerning, among others, the organisational structure, resources (personnel, testing capabilities) and management system contained in the PN-EN ISO/IEC 17065:2013-03 Standard [7] and accreditation requirements of the Polish Centre for Accreditation. The Division of Attestation Tests, Certifying Body fulfils all the accreditation requirements, which is confirmed by the accreditation certificate (Fig. 2).



Fig. 2 Accreditation Certificate for the Division of Attestation Tests, Certifying Body

Characteristics and parameters crucial for the product safety are determined based on a documentation analysis, a verification of calculations, inspections and laboratory test results. It should be emphasized that the KOMAG Institute of Mining Technology has its own accredited laboratories (Table 1), whose testing capabilities ensure the performance of tests under the conformity assessment procedures specified in the above-mentioned directives.

The accreditation granted by the Polish Centre for Accreditation includes:

- certification of conformity of products in accordance with the standards included in the scope of accreditation No. AC 023, carried out based on type 1a, 1b, 3 and 5 certification programmes according to PN-EN ISO/IEC 17067 [8],
- conformity assessment procedures (modules) requiring the involvement of a notified body as defined in Directives 2014/34/EU [9], 2006/42/EC [10], 2009/48/EC [11],
- issuing opinions on products approved for use in mining plants based on art. 113 sec. 3 of the Act - Geological and Mining Law.

Table 1. Accreditation of laboratories and certifying body

	Laboratory of Tests	Laboratory of Applied Tests	Laboratory of Material Engineering and Environment	Division of Attestation Tests, Certifying Body
Management system	PN-EN ISO/IEC 17025:2018-02	PN-EN ISO/IEC 17025:2018-02	PN-EN ISO/IEC 17025:2018-02	PN-EN ISO/IEC 17065:2013-03
Accreditation body	Polish Centre for Accreditation	Polish Centre for Accreditation	Polish Centre for Accreditation	Polish Centre for Accreditation
Accreditation number	AB 039	AB 665	AB 910	AC 023

The competence and practice of the personnel, as well as the infrastructure of the Division of Attestation Tests, Certifying Body allows for additional activities in such areas as a certification of products and quality systems against standards, an assessment of the competence of repair workshops, carrying out technical inspections of products at their work-place, development of technical expert opinions.

3. The activities of the Division of Attestation Tests, Certifying Body

The majority of manufactured products are subject to one or more EU directives containing conditions of placing the products on the market, principles of free trade and a presumption of conformity, conformity assessment procedures, principles of affixing the CE marking, requirements for notified bodies (if such bodies participate in the conformity assessment procedures) and essential safety requirements. Only the products which comply with the essential health and safety requirements, have passed the relevant conformity assessment procedures and are CE-marked may be made available on the EU internal market. In most cases, the conformity assessment procedure(s) is/are carried out by the manufacturer himself. The products which cause the greatest risk are subject to conformity assessment procedures (modules) carried out by the European Commission notified bodies. Such products include the products assessed by the Division of Attestation Tests, Certifying Body, accredited notified body, i.e. equipment and protective systems intended for use in a potentially explosive atmosphere, subject to Directive 2014/34/EU (ATEX), machinery for underground working of the following types: locomotives and brake-vans, hydraulic-powered roof supports, subject to Directive 2006/42/EC (Machinery) and toys, subject to Directive 2009/48/EC (Toys).

The Division of Attestation Tests, Certifying Body, in the framework of its notification, carries out conformity assessment procedures (modules) covering testing and assessment of the product and the quality system applied during its manufacture (Table 2).

Table 2. Conformity assessment procedures carried out by the Division of Attestation Tests, Certifying Body

Directive	Conformity assessment procedure/module	Document containing the results of product assessment	Document containing the results of the quality system assessment
2006/42/EC	EC type-examination (Module B)	EC type-examination certificate	—
2014/34/EU	EU type-examination (Module B)	EU type-examination certificate	—
	Conformity to type based on internal production control plus supervised product testing (Module C1)	Certificate of conformity	—
	Conformity to type based on quality assurance of the production process (Module D)	—	Notification of quality assurance
	Conformity to type based on product quality assurance (Module E)	—	Notification of quality assurance
	Conformity to type based on product verification (Module F)	Certificate of conformity	—
	Conformity based on unit verification (Module G)	Certificate of conformity	—
	Storage of documentation following Article 13.1(b) (ii) of Directive 2014/34/EU - complement to Module A: Internal production control	Statement of storage	—
2009/48/EC	EC type-examination (Module B)	EC type-examination certificate	—

In addition to the conformity assessment procedures listed in Table 2, the Division of Attestation Tests, Certifying Body carries out other tasks aimed at verifying that a properly identified product, product design or manufacturing process are in compliance with the requirements.

These tasks include:

- issuing opinions on products approved for use in mining plants, such as mining components of shaft hoists (hoisting machines, signalling and shaft communication equipment), slow-speed winches, rope wheels and devices used in underground excavations, in particular rope transport equipment, monorail locomotive, underground funicular railway, passenger carriages, special-purpose carriages, electrical machinery and equipment, switching equipment with a voltage of more than 1 kV AC or more than 1.5 kV DC, communication, safety and alarm systems, and integrated control systems for mining and longwall mining complexes based on Article 113 section 3 of the Act of 9 June 2011 - Geological and mining law, according to document DAC-21 [12] issued by the Polish Centre for Accreditation in cooperation with the State Mining Authority,
- a certification of products under certification programmes 1a, 1b, 3 and 5 described in PN-EN ISO/IEC 17067 Standard within the framework of granted accreditation,
- certification of products according to other programmes, including certification for the registered warranty trademark "B",
- certification of quality management systems according to PN-EN ISO 9001:2015-10 [13],
- an assessment of the ability of workshops to provide overhauls of:
 - powered roof supports and their components based on the Regulation of the Minister of Energy of 23 November 2016 on detailed requirements for the management of underground mining plants [14],

- machinery and equipment based on own criteria, the fulfilment of which guarantees the conformity of overhauled products with technical documentation and restoration of their performance,
- explosion-proof equipment based on the criteria specified in the PN-EN 60079-19:2011 Standard [15],
- carrying out technical inspections of the powered roof support sections as part of the assessment of their technical condition after the end of longwall exploitation and before they are built into the next longwall on the basis of the Regulation of the Minister of Energy of 23 November 2016 on detailed requirements for the management of underground mining plants.

4. Conformity assessment in terms of technical safety

The activities of the Division of Attestation Tests, Certifying Body contribute to ensuring technical safety through competent, independent and objective assessment of the conformity of product design with safety requirements at the design and/or manufacturing stage. The assessment, carried out by an independent body, provides objective evidence of conformity of products and processes with the requirements. Certification decisions are made on the basis of tests results from accredited laboratories and inspections as well as audits carried out by competent personnel of the Certifying Body, based on requirements of standards corresponding to the current level of technical knowledge. The assessment of products does not only consist in the verification of constructional characteristics and parameters - the operational manual, given to users together with the product, is also assessed. The content of the operational manual is verified in terms of all the information indispensable for transport, relocation, storage, commissioning, operating, maintenance, decommissioning, disassembly, disposal, as well as emergency procedures, and whether the information clearly identifies the intended use of the product and contains instructions for its correct and safe use; whether it warns of residual risk and hazards associated with prohibited modes of operation. Availability of this information is closely linked to the safe use of products.

5. Summary

For several decades, the KOMAG Institute of Mining Technology has been carrying out activities related to tests and assessments of technical safety of machines and equipment. Current activities of the Certifying Body are carried out on the basis of its own testing facilities, management systems meeting the latest world standards (ISO/IEC series standards) and competent engineering staff. The accreditation of the Polish Centre for Accreditation contributes to the continuous improvement of the product certification programmes and of the management system and it confirms reliability and objectivity of assessment processes. Trust in the activity, carried out by the Certifying Body, is not only a result of the supervision of the national accreditation body but above all, it is a result of technical competence and experience of the staff and ethical principles applied in the Body, confirmed by a strong position of the Certifying Body on the market.

References

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- [4] Act of 13 April 2016 on conformity assessment and market surveillance systems (consolidated text: Journal of Laws of 2019, Item 544).
- [5] Act of 12 December 2003 on general product safety (consolidated text: Journal of Laws of 2016, Item 2047).

- [6] Act of 9 June 2011 - Geological and Mining Law (Journal of Laws of 2019, Item 868, 1214, 1495).
- [7] PN-EN ISO/IEC 17065:2013-03 Conformity assessment. Requirements for bodies certifying products, processes and services.
- [8] PN-EN ISO/IEC 17067:2014-01 Conformity assessment. Fundamentals of product certification and guidelines for product certification schemes.
- [9] Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast), OJ No. L 157, 9 June 2006.
- [10] Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast). OJ L 96, 29.3.2014.
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- [13] PN-EN ISO 9001:2015-10 Quality management systems. Requirements.
- [14] PN-EN 60079-19:2019 Explosive atmospheres. Part 19: Equipment repair, overhaul and reclamation.
- [15] Regulation of the Minister of Energy of 23 November 2016 on detailed requirements for the management of underground mining plants (Journal of Laws of 2017, Item 1118, Journal of Laws of 2019, Item 1880).