

**NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN MINE
SAFETY AND PROTECTION TO EXPLOSION - INSEMEX PETROȘANI**

Trade Registry No. J20/1504/1992, VAT number: RO 2664676, Petroșani, G-ral Vasile Milea Street,
no.32-34, Hunedoara county
Postal Code 332047, Phone: 0254 / 541.621 / 541.622, FAX 0254 / 546.277, IBAN code RO 28 RNCB
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INCD INSEMEX - PRESENTATION

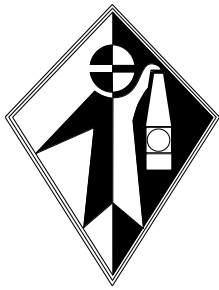
Short History

The institute was founded in 1949 in order to carry out research on the safety to explosion for the mining industry, later on for the oil and gas extractive industry and for the petrochemical industry, and since 2006, INSEMEX has been re-organized as National Institute for Research and Development in Mine Safety and Protection to Explosion – INSEMEX Petrosani,.

All through the 64 years of existence, INSEMEX has seen a continuous development from the point of view of the research domains, of its infrastructure, of the quality level and of the human resource

Mission of INCD INSEMEX Petrosani

Through its mission, INSEMEX performs fundamental and applied research, technological development and technical solutions for the regulated fields, of national public interest, regarding the assessment and prevention of risks which may occur during operations performed in industries with explosive and toxic atmospheres hazard or in operations which involve the use of explosives/pyrotechnic articles, solutions for closure and greening of areas affected by mining or related activities, scientific and technological services for testing and conformity assessment of equipment and installations, preparation and organization of rescue activities for underground mining and for surface industries with explosive/toxic atmospheres, ventilation systems evaluation, training and certification of staff directly involved in avoiding explosions risks, all the above mentioned being carried out in order to achieve a contemporary goal: benefits in terms of safety for humans – industry – environment.



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Main research areas

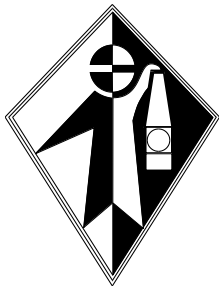
According to national RDI strategy and integration in Europe, the strategic guidelines for increasing the capacity, competitiveness and quality of RDI activities, namely increasing the impact in sustainable economic and social development, the institute performs basic, applied, technological development and technological transfer research for the following directions:

- safety of mineral resources;
- protection to explosion;
- safety of equipment and installations;
- explosive and toxic environments;
- environmental protection;
- explosion-risk industries;
- explosives and blasting techniques;
- mining rescue in toxic/explosive environments;
- human resources;
- mining and industrial ventilation;
- classification of underground works in terms of emanations.

In addition, one of the activities carried out by the institute, of great importance for the Romanian society, is the elucidation of causes which led to the occurrence of explosion type events, resulting in human and/or material losses, events generated by solid, gaseous or liquid flammable substances.

In order to respond efficiently to this type of requests, INSEMEX develops technical-scientific works, based on laboratory researches, modelling, simulations, complex laboratory tests and physico-chemical analyses, the institute disposing of a proper material base and of high qualified personnel. The staff of the institute performs its activity within four research departments:

- Department for Safety of Mineral Resources;
- Department for Industrial Safety;
- Department for the Safety of Installations and Explosion-Proof Equipment;
- Department for Safety of Explosives and Pyrotechnic Articles.



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Relevant research projects

The European project entitled ***Advanced Tools for Ventilation and Methane Emissions Control - AVENTO*** (Project No. RFCR-CT-2012-00004, funded through the Research Fund for Coal and Steel of the European Commission) is carried out by a consortium of 8 partners representing the industry, research units and universities from 5 different countries: Spain, United Kingdom, Germany, Poland and Romania.

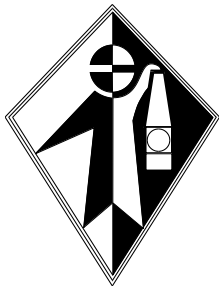
Providing proper ventilation is the primary protection in respect of underground operations, primarily aimed at providing the oxygen content at the values prescribed by the regulations in force and to diminish the value of gas concentration to avoid the occurrence of explosive atmospheres.

Within this project, INSEMEX has to main tasks:

- i) creating and testing a fast sealing system for mine workings that are affected by the occurrence of events in firedamp mines in order to restore the critical ventilation paths;
- ii) developing a DSS (Decision Support System) for post-incident management.

Other relevant research projects carried out by INCD INSEMEX Petrosani:

- ***Diminishing the explosion hazard in Jiu Valley hard coal mines through computerised management of ventilation networks***
- ***Research on the dynamics of migration through the soil of natural gas released from faulty distribution pipes, depending on the soil structure and on the nature of the buried infrastructure elements***
- ***Research regarding the development and implementation of an expert system designed for the crisis situations management applicable for the accidents clearance commands in case of events occurrence in the mining industry***
- ***Computerised simulation of air-flammable gas mixture explosions occurred in sealed spaces***



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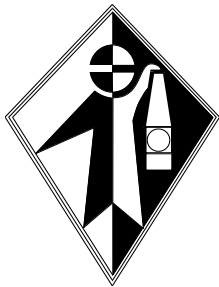
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International recognition

At international level, INSEMEX is a member in several specialized organizations in the field: International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres (IECEX), International Mines Rescue Body (IMRB), European State Mining Authorities and European Federation of Explosives Engineers (EFEE).

INSEMEX, through the Product Conformity Assessment Body, Brussels Notified Body NB 1809, for six European Directives

- Technical equipment used in in areas with explosion hazard according to the requirements of Directive 94/9/EC on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX)
- Explosives for civil use and means of initiating them in accordance with the requirements of Directive 93/15/EEC Explosives for civil uses;
- Pyrotechnic articles intended for entertainment: Fireworks of categories 1, 2, 3 or 4; Theatrical pyrotechnics of categories T1, T2 and Other pyrotechnic articles of categories P1 and P2, in accordance with the requirements of Directive 2007/23/EC on the placing on the market of pyrotechnic articles
- Equipment intended to be used outdoors regarding the limitation of noise emissions: compressors, concrete-breakers, lawn trimmers, scarifiers, motor hoes, welding and power generators, in compliance with the regulations of Directive 2000/14/EC Noise emission in the environment by equipment for use outdoors;
- Equipment used underground: locomotives, brake-vans, hydraulic-powered roof supports and protective devices designed to detect the presence of persons, compliance with the regulations of Directive 2006/42/EC;
- Personal protective equipment for: head, hands, feet, respiratory protection and high visibility clothing, in accordance with the requirements of Directive 89/686/EEC on Personal protective equipment



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Also, INSEMEX has been assigned as testing laboratory, recognized at European level, for the determination of the detonability of chemical fertilizers based on ammonium nitrate of high nitrogen content, according to the requirements comprised in Regulation (EC) No. 2003/2003 relating to fertilizers