

Annual report 2013

Basic data on company

Trade name:	SVÚOM Ltd.
Registered office:	U Měšťanského pivovaru 934/4 170 00 Praha 7
Company registration number/Tax identification number:	25794787/CZ25794787
Data of foundation:	1999
Legal form:	limited liability company

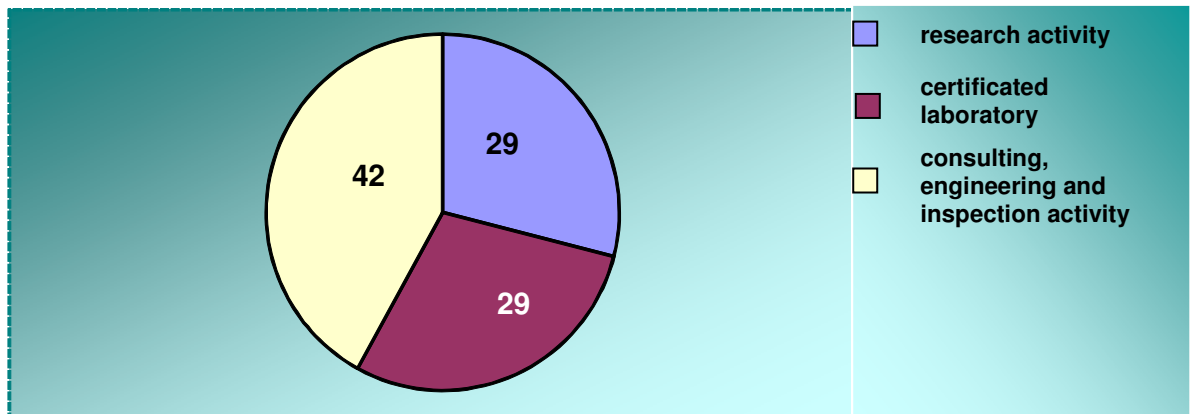
Company profile

SVUOM Ltd., a private company pursues research, development, consulting, testing, expert accounts, inclusive environmental ones, and other activities according to the demands of its clients. SVUOM Ltd. was founded in 1999 and it continues in research, testing, consulting and inspection activities of State Research Institute of Protection of Materials (1952 -1994).

The SVUOM Ltd. creates and implements research results within the fields of materials, process, products and production technologies from point of view of degradation, corrosion and corrosion protection. The international collaboration takes place with other institutes, universities, academia or companies where the EU programmes dominate. Company's activities are focused on the customer's needs and requirements too.

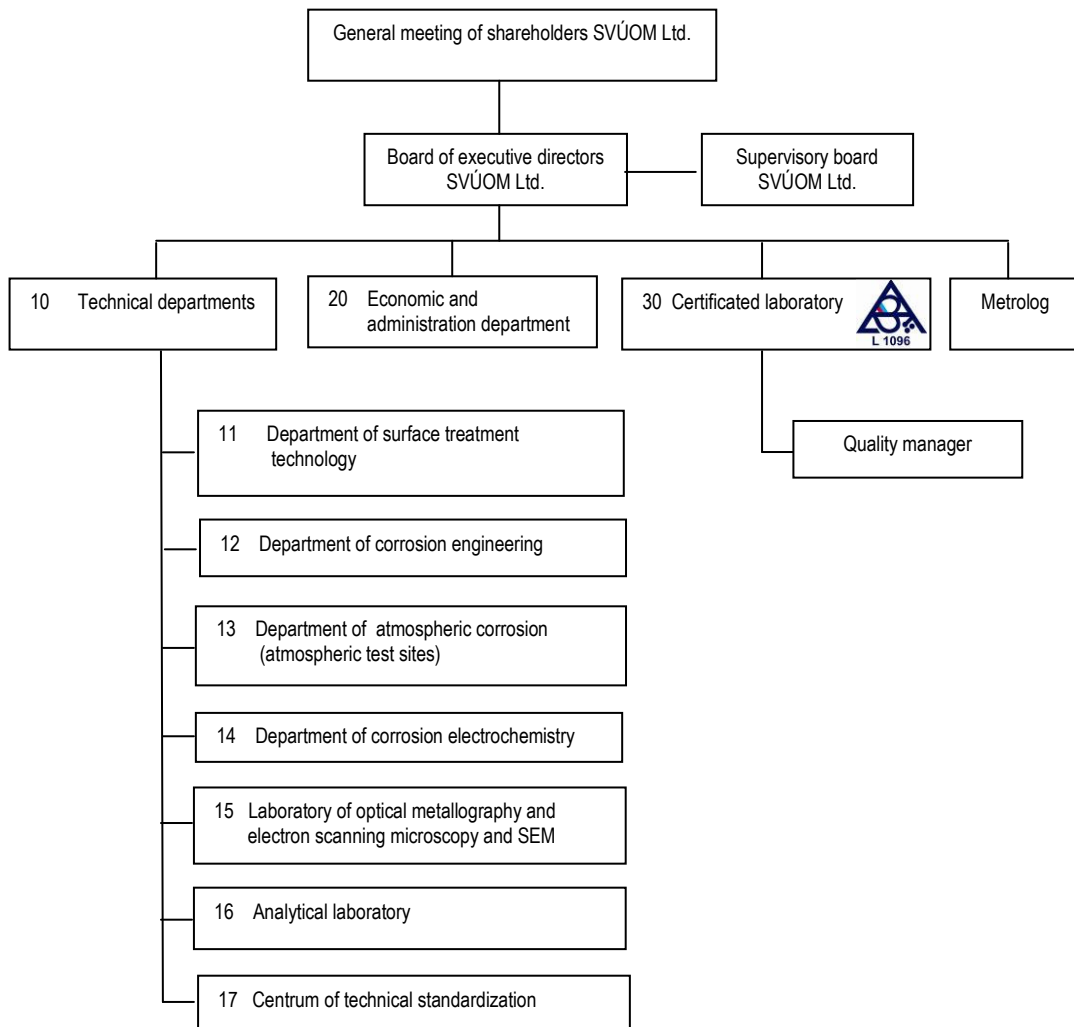
SVUOM revenues come from a number of different sources:

- ▶ commercial activities - R&D activity for industry, testing, laboratory assessment, expertising, inspection,.... SVÚOM Ltd. has many customers; a clear majority of them are small and medium-sized companies which cannot perform their own research resources.
- ▶ testing of climatic and corrosion resistance and physic-mechanical properties of materials and coatings in laboratory accredited according to EN ISO/IEC 17 025
- ▶ co-operation in the field of cultural heritage protection – metallic objects (corrosivity of microclimate of cultural objects, exhibitions, depositories; corrosion protection of decorative rails, evaluation, patination and conservation of copper and bronze roofs, statues, etc.)
- ▶ technical standardization – since 2009 SVUOM Ltd. had been licensed by the Czech Office for Standards, Metrology and Testing (ÚNMZ) as Centre for Technical Standardisation in the field of corrosion and corrosion protection,
- ▶ publication and lecturing,
- ▶ R&D national projects – publicly financed long-term basic and applied research, primary initiated by the Ministry of Education, Ministry of industry, Czech Science Foundation, Technological Agency of Czech republic, etc.,
- ▶ EU projects - R&D commissions for which financing is shared between the EU, industry and other research institutes.



Turnover per subsidiary (%) - 2013

Organization Chart of SVUOM Ltd.



SVUOM Ltd. Statutory Bodies

The Statutory Bodies (Executive directors and Supervisory Board) are elected by general meeting of shareholders for 3 years period.

Company Management: ing. Kateřina Kreislová, Ph.D.
 ing. Hana Geiplová

Supervisory Board: ing. Jaroslava Benešová
 ing. Dagmar Knotková, CSc.
 ing. Miroslav Přebyl

since 11/2013

pí Zuzana Blehová
ing. Luboš Mindoš
ing. Miroslav Přebyl

SVUOM's laboratories and equipment



Highlights of 2013

- realisation of project ITP03/1270 ICT in Horoměřice (2012-13)
- starting the reconstruction of Horoměřice laboratories

Company references in 2013

From the total number of work performed by the company for industrial bodies in 2013, the biggest or the most interesting projects were, e.g.:

- Metrostav a.s. – inspection of corrosion protection system of Troja bridge, Prague,
- ČEPS, a.s. – evaluation of conductors during long-term atmospheric exposure,
- Povodí Vltavy – evaluation of surface treatment and coating quality on weir flaps/shutters,
- EON, a.s. – evaluation of zinc galvanised coating on pole towers after long-term exposure,
- SPOLENA a.s. – analysis of failure of corrosion protection,
- HAWLE ARMATURY - analysis of failure of stainless steel coupling clamps,
- Sécheron Tchequie – control of coating quality.



Projects and programmes

The national programmes represent around per cent of activities of SVUOM Ltd. There are major multi-year programmes initiated mainly by the Czech Science Foundation, Ministry of Education, Ministry of Industry, etc., which concerns long-term basic and applied research and provide contacts between institutes, universities and industry. The information of on-going and finished projects can be found on e.g. www.atmofix.cz, www.bestproduct.cz or www.svuom.cz.

TA ČR 01031043 Quantification of specific pollution effect on materials and corrosion protection in tunnels (2011 - 2014)

The results of study give the completely new experience in specific microclimate - even inside the long tunnels temperature can drop below freezing point during the winter season.

The corrosion attack was visually evaluated in monthly intervals and corrosion mass loss will be estimated after 2 years exposure.

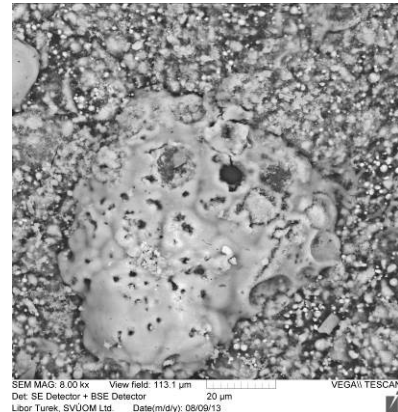
The laboratory modelling of corrosion attack of exposed metallic materials and protective coating in tunnel had been realised in various testing regimes.



Laboratory test in chamber with mixed air pollution

TA ČR 01010183 - Effective anticorrosive and special coatings with lower content of zinc for protection of constructional materials (2011 - 2014)

Zinc rich primers where a part of zinc dust was replaced by fillers like micaceous iron oxide and graphite were formulated. The preparation was based on a semisolid epoxy resin and polyaminoamide adduct like hardener. The primers were formulated with various pigment volume concentrations and the ratio between zinc dust and fillers was changed. The anticorrosive effect was determined after exposure in salt spray chamber. The micaceous iron oxide influenced positively the adhesion of coatings. Electrochemical and microscopic methods of verification of protective efficacy of newly formulated paints were also used.

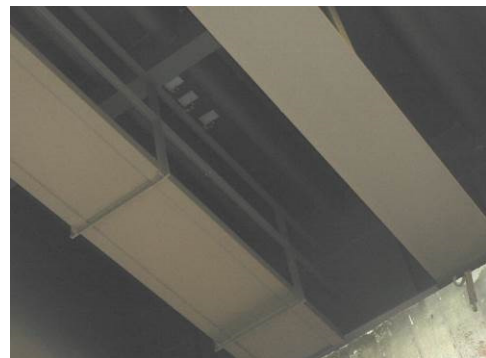


TA ČR 01031314 - Optimisation of Safety and Reliability for Existing Bridges (2011 - 2013)

The aim of the project is development of methodology for assessment of safety and working life of bridges.

The influence of the exposure and of the position and location of a surface in the structure on corrosion rates has not been systematically studied yet in the Czech Republic.

In 2013 some existing bridges were the evaluated as case studies.

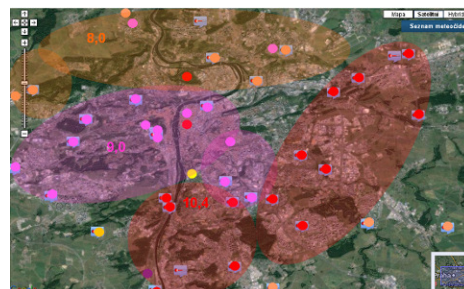


Exposure of samples under bridge deck

TA ČR 02021165 - Integrated assessment of risks and impacts on materials, ecosystems and population health from exposure to atmospheric pollution (2011 - 2013)

In co-operation with Charles University and ATEM Ltd. SVUOM participates in project aiming to develop an integrated assessment modelling software and methodology for assessment of the impacts from exposure of materials, buildings and transport infrastructure to air pollution caused by emissions.

For the commercial application of this model a computational methodology and full-operating software with user manual will be developed.



Modelling of temperature tunnel of Prague area

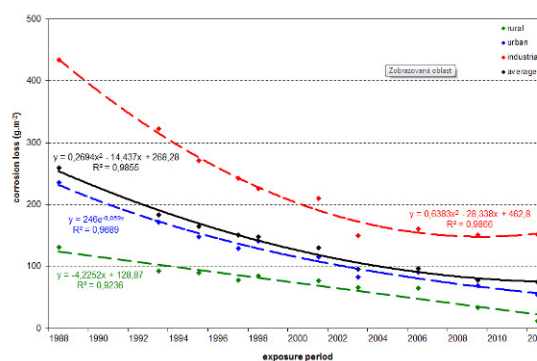


The international programmes, primarily within the European collaborative venture, give SVUOM specialists the opportunity to share the latest progress in the field of corrosion and corrosion protection research – new materials, technologies, methods of evaluation, etc. This also applies to international standardisation contexts where SVUOM is an active participant.

UN/ECE ICP on Effect on Materials Including Historic and Cultural Monuments (since 1987)

SVUOM participates as sub-centre for structural metals and corrosivity trends. In year 2013 ICP Materials has completed the 2011-2012 trend exposure resulting in corrosion data on carbon steel, zinc and limestone and soiling data on modern glass for the network of test sites from the most recent exposure programme for trend analysis.

SVUOM Ltd. is a subcentre of carbon steel and performed their evaluation. At test sites located in industrial areas the yearly corrosion mass loss of carbon steel increased somewhat in the last years' corresponding to a small increase of SO₂ pollution level. It can be seen that there is a tendency of decrease for all zinc corrosion loss values in the last three exposure periods although this decrease is relatively small especially by comparing the both last trend exposures.



Trends in yearly corrosion loss of carbon steel

Nearly all zinc corrosion products contain formate and/or acetate. This can be seen as a hint that formic and acetic acid could have an influence on the corrosion processes of the exposed zinc samples.



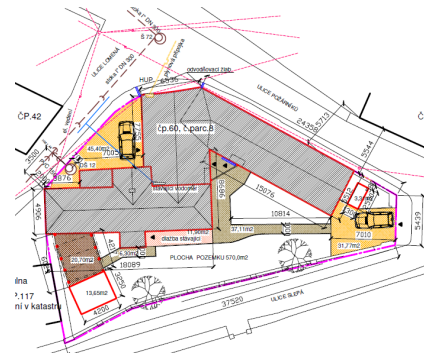
2.2 ITP03/1270 ICT in Horoměřice (2012-13)

In 2013 the project *ICT in Horoměřice* in frame of EU programme OP Enterprise and Innovation was finished. The project is focused on development of information and communication technology for SVUOM Ltd. as this company building a new department in Central Bohemia region, Horoměřice. The creation of web-net in building including the new web page of company is realised.



5.3 NM02/1366 Laboratory Horoměřice

Since 12/2012 the project *Laboratory Horoměřice* in frame of EU programme OP Enterprise and Innovation started in SVUOM Ltd. The project is focused on reconstruction of building for new department in Central Bohemia region, Horoměřice. During 2013 the heating system was renovated.



Centrum of technical standardisation

SVUOM represents the Centrum of technical standardisation for the field of corrosion and corrosion protection. This Centrum is responsible for international cooperation in standardisation in this field as well as co-operate on national level with many specialists for technical praxes.

The international technical cooperation in the field of “measurement – standardization – testing – quality assurance” is just as important for SVUOM. SVUOM’s experts contribute to the work of specialist committees, legislative bodies and standard-setting institute.

The 31 new or revised standards for corrosion and corrosion protection had been published in year 2013.



Collaboration with colleges, universities and other bodies

A wide range of contacts has been built up since many projects involve collaboration with the academic world as well as industry. Joint arrangements for lead personnel with universities generate and promote a new scientific impetus in key areas. SVUOM therefore cooperates with many Czech (and Slovak) universities, numerous non-university research establishments and other national research institute and relevant institutions abroad. SVUOM Ltd., and/or its employees personally, take part in national and international networks with colleges, universities, institutes, companies, and other bodies in various fields of activity.

SVUOM’s specialists cooperate with technical universities (e.g. VSCHT Prague, CVUT Prague, ZČU Pízeň, VŠB- TU Ostrava, TU Bratislava, VŠ Košice) and Academy of Science institutes (AV UTAM) in frame of research projects and as lectors in various type of postgraduate and special courses (ERASMUS projects):

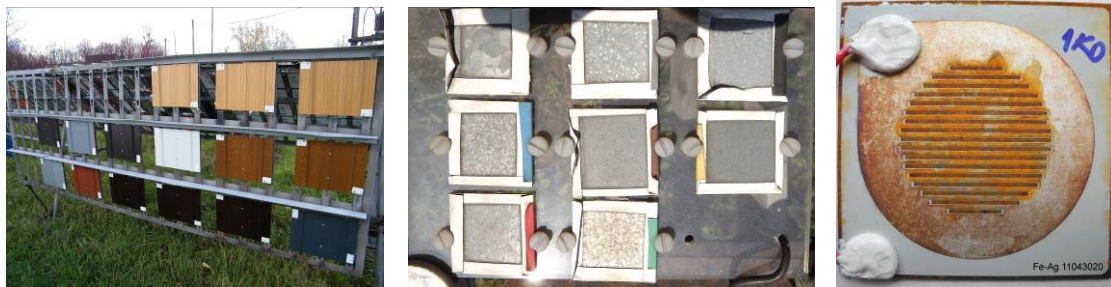
- CVUT, FS and VSCHT - postgraduate course Sd 401 *Corrosion engineer*,
- CVUT, FEL - course AE1M13EMP *Ecology of materials and processes*,
- CVUT, FSv - course SAHC *Advanced Masters in Structural Analysis of Monuments and Historical Constructions*.

Some students of technical universities elaborated their diploma studies and papers under supervision by SVUOM's specialists.

SVUOM and its specialists are members of European Federation of Corrosion (EFC), NACE International (National Association of Corrosion Engineers), Association of Corrosion Engineers (AKI) Association of Museums' Specialists (AMG). In the field of corrosion problems and corrosion protection SVUOM's specialists co-operated with many associations (Czech Association for Galvanizing, Czech Society for Surface Treatments, Czech Association of Scientific and Technical Societies).

The co-operation in the field of atmospheric corrosion, mainly the exposure of samples on Czech atmospheric test sites, continues with Institution of Corrosion, Brest, France.

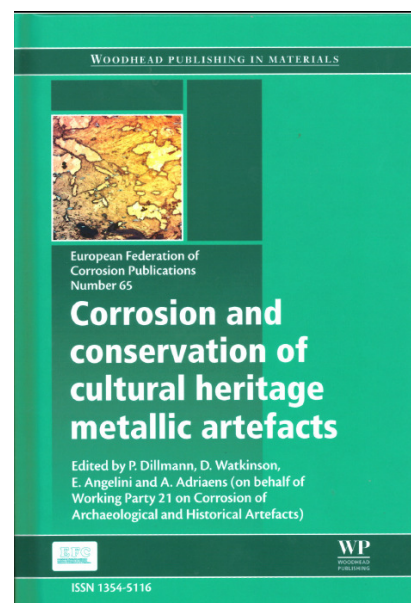
In 11/2013 the Round Robin test of ACM sensors started on atmospheric corrosion test sites Prague and Kopisty in co-operation with National Institute for Materials Science (NIMS), Japan. The ACM is a kind of the sensor with a sandwiched construction composing of iron, insulation paste and silver, for monitoring the atmospheric corrosion. This sensor can measure the galvanic currents between iron and silver electrodes when they are connected by wetting.



Publications

In 2013 SVUOM's specialists presented results of their research on many national and international conferences and in national and international journals, e.g.:

- K. Kreislova, D. Knotkova, H. Geiplova, Atmospheric corrosion of industrial structures of cultural heritage (Chapter 8) in Corrosion and conservation of cultural heritage metallic artefacts, P.Dillman (Eds.), EFC serie No 65, Woodhead Publishing, 2013, ISBN 978-1-78242-154
- K. Kreislova, H. Geiplova, R. Licbinsky, J. Jedlicka, J. Dohnálek, Degradation of construction materials in road tunnels, book of abstract 12th international conference Underground construction Prague 2013, 22-24 April 2013, Prague, pp. 130, ISBN 978-80-260-3867-2



- K. Kreislová, Contemporary condition of corrosion attack of metallurgical products and its evaluation, proceeding of METAL 2013 - 22. international conference of metallurgy and materials, 15. - 17. May 2013, Brno, Česká republika, Ostrava: Tanger, 2013, ISBN 978-80-87294-39-0
- V. Křivý, P. Marek, K. Kreislová, D. Knotková, Bestimmung der Dickenzuschläge für wetterfesten Stahl im Brückenbau, Stahlbau 82 (2013), Heft 8, 583-588, ISSN: 0038-9145
- R. Ličbinský, J. Huzlík, A. Frýbort, J. Jedlička, K. Kreislová, Specific Air Pollution in Road Tunnels, Transactions on Transport Science, Vol. 6, No 3, 2013, pp. 107 -113, DOI: 10.2478/v10158-012-0037-9
- L. Mindoš, The effect of rinsing water cleanliness after phosphatisating process onto durability of the powder protective coatings, proceeding of 55. MGK Kočovce, 12.-13.6, 2013, Slovak republic, , ISBN 978-80-227-3954-2
- B. Eremias, L. Mindos, L. Turek, L. Hochmannova, Possibilities of ENM to Evaluate Anti-corrosion Performance of New Types of Zinc Rich Epoxy Paints in Relation to ZRP Formulations, proceedings of conference EUROCORR 2013, Estoril, Portugal, 1.-5.9.2013.

Some publications are loaded on web page in Czech and English language www.svuom.cz.

Training

SVÚOM Ltd. offers training for professionals working in construction and engineering meeting the corrosion and corrosion protection problems.

In 2013 SVÚOM specialists gave lectures at courses in co-operation with Institute for International Research GmbH (Maintenance of poles), Czech Invest (Corrosion protection for export), ŠKODA WELDING, etc.

Special training for companies were realised for VIVA Kovárna Zlín, SERVIND Praha and HAWLE ARMATURY a.s. Jesenice.



Employees and competence

The most important asset of a knowledge-based institute like SVÚOM is its intellectual capital. Due to the economic situation in the ČR, there was a reduction in the number of employees. In 2013 the SVÚOM had a total of 20 employees from which 15 have university degree including 2 doctors.

SVUOM's specialists are members of international and national TC of standardization organizations (ISO, CEN) and active participate on elaboration of technical standards in the field of corrosion and corrosion protection specification and testing. SVUOM's specialist is convenor of ISO/TC156/WG 4 *Atmospheric corrosion testing and classification of corrosivity of atmosphere* and chairman of national technical committee UNMZ/TNK 32 *Corrosion protection*.

SVUOM's specialists are certificated as corrosion engineers according to Std- 401 APC.



SVUOM specialists are nominated by Ministry of Industry and Ministry of Environment as members of EU TWG for preparation BREF documents in categories 2.6 *Installations for the surface treatment of metals and plastics using an electrolytic or chemical process where the volume of the treatment vats exceeds 30 m³* and 6.7 *Installations for the surface treatment of substances, objects or products using organic solvents with a consumption capacity of more than 150 kg per hour or more than 200 tonnes per year.*

Economy

Survey of economy (in thousand CZK)

Balance sheet	2013
tangible fixed assets	8.104
revenues from sold goods	9.277
subscribed capital	5.488
consolidated profit of current accounting period	- 272

The SVUOM Ltd. does not distribute its profits, i.e. the financial results arising from the company business shall be re-invested in the company concerned. In 2013 the some new instruments and equipment had been purchased to improve the quality of corrosion and protective coatings measurement. The investment into Department of Corrosion Engineering, Horoměřice in 2013 was ca 500 thousand CZK.