Coopetition in leather engineering education - a strategy for a win-win situation for concerned stakeholders

Sayeed Sadulla, Chennai-600020 India

Leather continues and will continue to play a decisive role in the growth of many countries over the next few decades. Engineering education in leather in countries/continents across the globe caters to the demand for the technical talent to run and manage the leather and allied industries. Globalization is now reckoned a big factor in education as it is in an eminent position in business, finance etc., throwing open fresh challenges mostly in higher education administration and management. Partnership and twinning seems to be the answer at national and international levels. Co-opetition (short for “Cooperative Competition”) in which different leather engineering institutions spread across the globe work towards a common goal of sustainable leather industry but at the same time seek to achieve and maintain individual objectives and “vision and mission” accomplishments seem to be in perfect order. A mechanism to sustain healthy cooperation and simultaneous competition, in which the academic and research and other strengths of the individual institutions will be maintained will be highlighted.

New Dimensions in Children’s Shoes

Md Sadiq, Chennai, INDIA

Anthropometric serve has been done at the outset. Foot Dimensions of 500 school children in the age group 5-10 years were “DIGITALLY CAPTURED” using “3D Foot Scanning” technique and Statistical Analysis of the data was done for “grouping” of the foot dimensions and five ‘cluster groups’ for children containing the ‘Last’ parameters for each of these groups were derived. The Modelling of the ‘LAST’ for ‘COMFORT Footwear for Children’ was also carried out. Eco-friendly leathers have been used for the construction of shoes. Footwear was fabricated on the lasts thus derived and children’s shoes with good fit and comfort properties were designed and produced. Testing of materials used for making the shoes was also done. Gait analysis of the children wearing the comfort shoe was carried out. With the results, improved products were fabricated that would fit exactly and provide good comfort to the children’s foot.

His Excellency Bogale Feleke, State Minister for Ministry of Industry’s Textile and Leather Sector addressed the gathering:

“Ethiopia has abundance of raw materials and hence great potential for enhancing leather production in the country. Ethiopian government is focusing on leather and leather products sector under the growth transformation process. I take this opportunity to invite you all to the IULTCS Congress to be held in Ethiopia in 2021”.

34th IULTCS News Letter
Water usage and wastewater generation in industrial processes would be a sensitive issue in future and it is imperative to develop ‘zero water use technologies’. Use of no water for chrome tanning does not only facilitate minimization of water but also provides a viable solution to the problem of chromium pollution. However, ‘waterless chrome tanning’ is highly challenging, as water is the best solvent for the transportation of chromium into hide network. The strategies adopted for waterless tanning include exploiting the matrix water for achieving the penetration of chromium into hide network. The developed technology has already been validated and commercialized and translated to many tanneries. The benefits are many folds, which include cost reduction, pollution reduction, avoidance of pickling and basification and finally improved quality of leather. In addition to the above benefits, the developed approach would provide a new paradigm in ‘leather science’, in particular, to the century old ‘chrome tanning’.

**Redefining Chrome Tanning: A waterless approach**

P Thankavel, Chennai, India

**Concept of Sustainability: Looking Forward**

Anne L. Northampton, United Kingdom

The concept of sustainability is not new and can be dated back to the late 19th Century. Within the leather industry evidence of growing concern regarding effluent issues was recorded in the late 1860s/early 1900s in various articles published during that period. Over the decades, perspectives and practices of effluent treatment have changed in many ways. In the 21st Century, leather industry has moved beyond just treating effluent. Focus on certification and authentication has increased; Corporate Social Responsibility has become an integral part for many organisations. For a sustainable business strategy it is important to measure the social and financial impact along with the environmental aspect. Therefore, it is becoming critical to adopt the concept of ‘triple bottom line’ and consider all three aspects that is social, environmental and economic sustainability, to ensure a sustainable leather industry.

**The elimination of effluent from liming, acid/salt pickling, and chromium tanning, verified by five years high-volume wet blue leather manufacture**

Richard Daniels, Shangqui City, China

The poor efficiencies of existing tanning processes result in many chemicals polluting the environment. Waste reduction at source is difficult to achieve especially since technologies in common use have basically remained unchanged for decades. A radical new approach to leather manufacture is described. The investigations required slight changes within the building of a full scale wet blue manufacturing plant, and five years of development before the technology was introduced to industry. The practicality and value of this technology - known as BIO-cycle - has since been verified by continuous full scale manufacture that commenced in 2011. The technology involves the complete retention and reuse of used floats from liming, pickle and tanning in self-contained loops. This ensures the complete uptake of processing chemicals, a significant reduction in water use, and zero effluent discharged from these critical manufacturing stages.

**Probiotic solutions for sustainable leather**

Juan-Carlos Castell, Kansas City, USA

Probiotics or beneficial microorganisms produced from renewable resources can have clear applications in the beam-house operations, as well as in wet-end and finishing. These are not toxic, environment friendly for handling, fully biodegradable with a positive influence on the efficiency of the biological reactors in the effluent treatment plants. Probiotic metabolites are hydrotopes that help to cleave off from the collagen the non-leather making substances, including fats, and to disperse chemicals and activate the ionic groups in the side of the protein chain, thus their affinity to the processing compounds. Consequently, biochemicals can eliminate, reduce or be combined with soaking and wetting agents, enzymes, degreasers, dispersing agents and dye auxiliaries. They are compatible with all chemicals used in the leather making process and do not require to adjust the conditions (pH, temperature, etc) beyond those required in the manufacturing operations. Also, they can reduce bad odors or putrefaction and soaking of raw hides or skins can be carried out free of bactericides.
**Green bio-polymers for eco-friendly leather**

Dr. Valentina Beghetto

Major shift can be expected in the use of leather auxiliaries moving towards bio-polymers. The protein intermediates can be used as retanning agents instead of conventional petro-chemical based products. Different condensation chemicals have been used and the products of condensation of the condensation agents and the protein intermediates have been characterized using NMR. The molecular weights of the products have been ascertained using gel-electrophoresis. And further products have been characterized following GPC-SEC technique. The three products thus produced namely biopolymer 1, 2 and 3 were found to render all the necessary physical properties to the leather.

**Controlling emission in leather production: How can we make a difference?**

Jürgen Christner, Basel, Switzerland

Leather production is a highly complex process involving solid, liquid and volatile gas emissions. Over the past decades significant progress has been made developing technologies, which help reduce emissions, be it chemicals with very good uptake and biodegradability or various biological and mechanical technologies to clean up wastewater and exhaust air. Designing the best process is often not easy for tanners particularly if it comes to complying with various local, national and international regulations or with eco-labels. The most efficient practices and technologies satisfying future regulatory needs have just one goal in mind: production of sustainable leather, which is marketed as a premium product.

**Clean Salt recovery and water recycling using Nanofiltration and Reverse Osmosis**

Wolfram Scholz, Vienna, Austria

Conventional Reverse Osmosis and Evaporation for implementing Zero Liquid Discharge systems have inherent difficulties. Nanofiltration membranes retain bivalent ions and residual organics and leave salty water permeates. Nanofiltration operates at a lower pressure of about 8-10 bars, and achieves higher recovery rates of up to 80%. Separation of scaling compounds improves the performance of Reverse Osmosis and the subsequent Evaporators. The residual salt, after evaporation is pure Sodium Chloride. This combination of Nanofiltration with Reverse Osmosis and Evaporation can improve the overall performance of Tertiary tannery effluent treatment allowing for clean salt recovery and consistent high quality water re-use.

**Biodecolorization and biodeotification of leather dyes from aqueous solution and dyecontaining effluents by native white-rot fungi strains**

Santiago Ortiz-Monsalve, Porto Alegre-RS, Brazil

A strain isolated and identified as Trametesvilllosa PR-001 was used to investigate the biodecolorization potential, enzymatic activity and biomass production during the treatment of six leather dyes from aqueous solution. Results were compared with data obtained with other strain of T. villlosa previously isolated in a different local. Both strains were tested in different culture conditions to assess its real potential for treatment of dye-containing effluents produced in pilot scale and real tannery effluents from dyeing operations. The two strains of T. villlosa, PR-001 and SC-10, achieved more than 85% of dye removal within 144 h of treatment under submerged fermentation. The increase in the extracellular enzymatic activity laccase (≤350 UL–1) was directly linked to the bio-decolorization.

**Novel formaldehyde scavenger containing active methylene for efficient removal of formaldehyde in leather**

Ting Zhang, Xi’an, Shaanxi, China

Chemical methods for scavenging formaldehyde can cause secondary pollution due to its reversible reactivity. Methylene hydrogen of α-hydrogen containing compound type which has high activity can react with formaldehyde at normal temperature and is irreversible. A hyperbranched polymer containing active methylene (HAMP) was prepared by transesterification reaction. This has high functionality with excellent reactivity; the unique structure can scavenge formaldehyde by physical adsorption via the molecular cavity. Formaldehyde-removal of 88.4% using HAMP in leather retanning process has been achieved.

**Analysis of flow and energy aspects of zero liquid discharge (ZLD) technology in treatment of tannery effluents in Tamil Nadu, India**

Jakov Buljan

Precarious situation with water and soil pollution in the prompted the environmental authorities in the After the state of Tamil Nadu imposed a Zero Liquid Discharge (ZLD) concept across the tannery clusters along the Palar river, some of the existing Common Effluent Treatment Plants (CETPs) servicing tannery clusters and following the conventional treatment technology have been supplemented by RO and MEE. The ZLD concept attempts to eliminate the problem of high TDS waste streams by removing most of dissolved solids and reclaiming water. The analysis investigated raw and equalized effluent inflows, RO feed, permeate and reject, evaporator feed and condensate and the yield of recovered, reusable water. Data about energy consumption were consolidated, analysed and correlated. Estimates of the carbon footprint increase caused by the ZLD operations were made.

**Studies on simultaneous removal of nitrogen and organic carbon from tannery wastewater using Airlift sequencing batch reactor**

Aysanew Gorems Melesse, Addis Ababa Ethiopia

An airlift sequencing batch reactor system was investigated for the simultaneous removal of nitrogen and organic carbon from synthetic tannery wastewater by seeding with conventional tannery CETP aerobic sludge taken from Ranipet CETP. The reactor (working volume of 5L) was run for 200d at different HRT’s by automated control of the SBR cycles, pH, DO and temperature for a minimum of two weeks for each cycle times. The result shows a 97% removal in terms of COD and a 94% removal in terms of ammonial nitrogen. Cycle time control helps to change the characteristics of the effluent from complete nitrification to partial nitrification which is one of the important steps to link the reactor with anammox reactor system where in the presence of nitrite, ammonical nitrogen is anaerobically oxidized to nitrogen gas by anamox bacteria.

**Microbial fuel cell a novel technology for effluent treatment and electrical energy generation**

P Divyalakshmi, Chennai, India

A vertical MFC reactor has been used in order to simulate the real effluent treatment plant which is partitioned into two sections by proton exchange membrane. Electrons move through external circuit whereas protons migrate towards proton exchange membrane thereby generating a potential difference which is used for current generation. A new approach was adopted by introducing diligent mechanical disintegration that improved the Coulombic and COD removal efficiencies to 13 and 90% respectively.

**Technological developments for total dissolved solids (TDS) management and environmental sustainability in asian leather sector**

S Rajamani, Chennai, India

Environmental challenges have necessitated in special membrane systems to be engineered in many individual and Common Effluent Treatment Plants (CETPs) in India, China and other leather producing countries. The sustainability of saline reject management is one of the major challenges for which viable technological solutions are being developed under pilot and commercial scale system. Recent developments on the environmental protection techniques in tannery wastewater treatment with focus on water-recovery for reuse, salt recovery, marine disposal of saline reject with proper bio-control system, etc. were presented. Details of applied innovative treatment technologies in India, China and other countries, sustainability of the Asian Leather Sector due to enforcement of new and stringent environmental regulations was also discussed.
Leather Chemicals and Auxiliaries – Future

The manufacturing of leather involves the use of a considerable number of chemicals and auxiliaries, generally in an aqueous system. To meet tomorrow’s requirements for an environmentally friendly and sustainable manufacturing of leather, there will be a continuing introduction of new chemicals and application procedures. However, the pace of introduction and ultimately the success of new chemicals often depends on a number of typical market factors: does it fit into the current processing system, how are the cost and performance compared with existing products.

The environment will continue to be a dominant factor in determining the future trends of leather auxiliaries. We have already seen in a presentation on the first day, the need to focus on measuring the chemical substances are emitted into the effluent. The improvement of the fixation of chemicals to leather and the consequent reduction of contaminants in the effluent will be a continuing application target. These call for the need of process related interventions.

There will be a continuing demand for safe, efficient processes with low impact on the environment, for example in the beam house increasing use of enzymes and biochemicals, products from renewable raw materials and products sourced from the fermentation of natural components may gain importance. Alternative tanning processes will continue to be the challenge. No doubt, some of these systems will be successful, especially those that are intended for the production of a specific high-value leathers.

In the retanning, fatliquoring and dyeing the immediate focus will be on minimizing residual chemicals to comply with increasing MRSL restrictions such as formaldehyde, phenol, and naphthalene. There will be the further utilization of products from renewable resources and further investigation of polymeric chemicals. The need to look over the fence at what other industries are doing will be needed, especially for trends in coloration.

Water-based finishing systems will continue to advance, the trend is towards lower add-on and natural finishes that are free of restricted substances. Techniques for better upgrading and specific performance requirements like soil resistance will be part of the natural progression.

Auditing of tannery processes and analyses of the manufactured leather for RSL substances is already introduced in many tanneries and is part of their everyday program. The demands by the brands to introduce an RSL control at an early stage has lead to the introduction of the MRSL (Manufacturing Restricted Substances List) compliance for the chemical products. The influence of the brands with their Zero Discharge of Hazardous Chemicals (ZDHC) program will grow with further with more extensive testing and auditing likely.

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Nature’s Marvel

Leather lives longer than the skin does and imbines the characteristics of the nature’s architectural marvel. Leather manufacturing is one of the earliest activities of mankind and yet it is one of the most traded commodities in the world today, commanding a global annual turnover of about 200 billion US$. Leather and leather products sectors are people-intensive and therefore it provides significant employment that facilitates inclusive growth. The theme of this 34th IULTCS being ‘Science and Technology for Sustainability of Leather’, this article attempts to prognosticate the future of leather industry and trade that aspires to attain sustainability.

Environmental Footprint

Though leather industry is known to be one of the key sectors boosting the development, it is also recognized as a major polluting industry. The importers of finished leathers in the past had been concerned much about the quality of the leathers. The requirements and expectations have been inflated. In the recent past the consumers have been concerned about how friendly the leather would be to the user. Today, they are not only concerned how the leathers they buy are, and whether these would be precarious or not, but the way they are made. The consumers of the future will certainly prefer the leather products that would be manufactured with a minimum damage to the environment and adhering to the social norms. In a way, Indian tanners are forerunners in the pursuit of environmental protection. In this part of the country (Tamilnadu), Zero wastewater discharge has been mandated by the court of law. The other parts of the country have also been exploring the possibilities of attaining zero wastewater discharge through different means. They have taken a position that without the practice of all possible in-process pollution reduction measures, it would seldom be possible to attain sustainability solely through end-of-pipe treatment. The future course will be the preparation of cluster-specific sustainability road map. And sustainability programs will be developed and implemented as per the roadmap. It is envisaged that it would not only happen in India but also in all the developing countries in the coming decade.

Is it Leather or not?

Over the decades, there has been a tremendous raise in the use of non-leather materials for the manufacturing of footwear and other life style products. The advancement in the area of non-leather materials is such that it has become hard even for leather technologists, to distinguish non-leather from leather. Whether non-leather materials are competing with or complementing leather? We need to recognize that the increasing global demand cannot be met solely by leather. Therefore, use of non-leather materials is inevitable to fill the gap, and eventually leather will find a way to niche segments with greater scope for higher value realization. Already there has been a shift from leather being used extensively for footwear manufacturing to the manufacturing of high-end products such as upholstery. Therefore, leather will become a material for the manufacture of niche products of higher value. Hence, there will not be much demand for leathers made from low-grade hides and skins. The low-grade hides and skins may not be used for leather production but will be used for the production of high-value protein based materials. This trend may break the millennium old scenario of ‘one product - one raw material’ to a possibility of ‘many products - one raw material’ case.

New Age Tannery

Mahatma Gandhi in 1938 recognized the untapped opportunity for value addition and employment generation because of the export of raw hides and skins. Today, Mahatma Gandhi’s dream of tapping the opportunity and value addition is being realized. Nevertheless, the value addition has been happening, the question, “Has the value addition reached the ultimatum?” needs to be answered. There are so many avenues that could be explored for still enhancing the proportion of value addition. One of such avenues


Dr B Madhan, Principal Scientist

could be an integrated approach of utilization of skin and hide. The ‘New Age Tannery’ may not be akin to what it is today. The tannery of the future, either by self or through conglomeration would explore all the possibilities to generate revenue from all the components of the raw hides and skins. The establishment of new age tanneries should be geared up in utilizing the proteinous hides and skins to the fullest. The new age tannery in a nutshell shall produce various products along with leather putting to use all the skin components. This will result in reaping increased financial returns while minimizing the inputs. Starting from trimming of raw materials (hides/skins), one of the first steps in leather manufacture, to the buffing dust, valuable proteins are lost in the form of solid wastes. Presently, not only these valuable materials are wastes but resources are further spent upon these ensuring secured disposal. There is a greater opportunity in tapping these solid wastes for making high-value products such as collagen, gelatin and moderate-value

Smart Leather Products

Leather has the imminent need to break the convention and come out from the classical tag, both leather and its products have to become functionally smart and need to fit in for newer applications. Newer design and technology interventions in leather products might pave way for fulfilling value added requirements such as ‘footcare’ for healthy living instead of ‘footwear’.

This article is written jointly by Dr B Madhan, Principal Scientist and Dr B Chandrasekarn, Director, CLRI. Dr Madhan may be contacted through e mail: madhanclri@gmail.com

Dr B Madhan, Principal Scientist

Interview Dr Tegtmeyer

(Principal Scientist and
Director, CLRI)

Interview of
Dr Li Yuzhong

(President of CLIA)

Interview Dr Tegtmeyer

(President of IULTCS)

What is the significance of the theme of the present congress?

As I have stated in my welcome address, the theme is much important to the global leatherr sector. And this forum in my opinion, may serve a perfect platform for the research communities across the world to network. It is extremely important to educate the technologists and practitioners to understand the best available technologies in the world and to take all possible efforts to progress through complete sustainability. Therefore in that sense, the present theme assumes great significance.

Can you share with us your opinion on the course of the congress?

I am pleased totally. The preceding day of the congress was filled with meetings of the society and concluded with a delicious dinner. The event is organized very professionally. The venue is of top class. The qualities of the presentations are commendable. The arrangements of projection and seating, food and other aspects are admirable. During the first day of the congress, we could get to witness the authentic and traditional Indian dance, which was rejuvenating and the participants from the overseas could get a glimpse of art and culture of India. I am very happy the way the congress is organized.

What is your opinion about the avenue and focus of the presentations made?

The topics of the presentation have been wide and covering the spectrum to a greater extent of the theme. The quality of the presentations made as I stated are laudable.

What would be the focus of the forthcoming congress to be held in Germany?

The next congress will also be focusing on sustainability. It does not mean that there is a dearth of themes and topics. But sustainability is something relevant to all times and also sustainability as a theme cannot be addressed in couple of congress proceedings. The generation of my father aimed at economic development the baton of the same has been taken further by us. And the present and the future generations shall focus on sustainability for which we need to set the direction. Therefore, sustainability cannot be the theme for a congress but for a generation.

Can you provide an account of the future plans and program of the society (IULTCS)?

IULTCS is a very well structured organization and the programs are very well set. As I president of the society would like to ensure that the organization is steered in the same path.

Your message to the participants of the congress.

I would like to convey to all the participants not to leave any stone unturned in founding bilateral and multi-lateral research and translational cooperation.

How do you feel attending this 34th IULTCS congress?

It is always fascinating to visit India. The congress has been the opportunity to meet and listen to the great scientists and professionals of the leather science. I believe strongly that there are many intellectual treasure to take back home from the congress.

How significant and important the theme of this congress is to the Chinese leather sector?

It is indeed very important to the global leather sector and the Chinese leather industry as well. I could recognize the benevolence the presentations could bring about to the Chinese leather sector by providing the valuable research directions to the researchers of our country. Moreover, the congress may bring about collaborations of the research organizations in China with other research institutions all over the world.

What are the kinds of collaborations and cooperation do you envisage between the research institutions in China and CLRI?

India and particularly CLRI has been a leader in leather research. The Chinese leather trade is much greater in volume and value. Therefore the cooperation between the research institutions of China and India specifically CLRI will result in benefits to both the countries. Therefore, it is my desire that China and India shall not only cooperate in the areas of leather research but also in the avenue of leather trade for the benefit of both the countries.

What would be the likely theme of the Asian congress to be held next in China?

As the theme will be collectively finalized, I am not able to suggest the likely theme of the next Asian congress. However, this will be communicated as soon as possible.

What is the message that you would like to communicate to the participants of this congress?

Lets us all take the best benefit of the congress as much as possible and aim for a collective endeavour to tackle the impending and future issues. I wish the congress all the very success.
Dynamic plantar pressure analysis of persons with diabetes: an approach to improve the design of therapeutic footwear
G SathishBabu, Chennai, India
The aim was to improve the sole design of therapeutic footwear for persons with diabetes by analyzing dynamic plantar pressure profile of diabetic patients without (Group I) and with (Group 2) neuropathy. The plantar pressure analysis was done using HR-Mat plantar pressure analyzer, BTS P-walk, at Gait analysis laboratory, CSIR-CLRI. Distinct variations were observed between the two groups as well as control (without ailments). These observations will be helpful to design therapeutic footwear for persons with diabetes for enhanced pressure dissipation and increased comfort.

Reduction of skin disorders by HCHO in leather products
Daisuke Murai, Osaka, JAPAN
To assess the long-term effects of natural and synthetic tanning agents, HCHO content was measured at the beginning and end of major weathering tests. Combinations of tanning agents suitable low levels of HCHO were investigated. Our database registers more than 400 opinions and complaints about leather products every year totaling over 10,000 opinions from 1996 and this information indicates tendency of reducing the incidence of skin disorders over these years.

Comparison of Visual Asorting Process and Spectral Photo meter Usage in Leather Apparel Production
Mehmet Mete Mutlu, Izmir, Turkey
The properties of leather apparel are important as well as design, pattern, well fitting, sewing and handiwork on the garment. Assorting process plays an important role on quality of a leather garment. In this study visual colour assessments (goat nappa leathers) by experts were compared with the data obtained from a spectral photometer and evaluated with CIE76, CIE2000 and CIE94 colour difference formulas. The CIE2000 colour formula matched best with the results of the human experts with 73% success.

E-learning and Blended Training in the Leather Professional Education
Ivan Král, Vienna, Austria
E-Learning is a computer and electronic network enabled transfer of knowledge and skills that offers flexibility at the same time requires certain basic computer knowledge and infrastructure to operate. UNIDO is building a range of courses and e-learning content (LCD) for the leather value chain such as: Introduction to treatment of tannery effluents (5 modules), How to deal with hydrogen sulphide gas (module & test & certificate), First Aid (9 modules) and Sustainable leather processing (course planned). Participants from more than 60 countries use this training material individually.

Role of CSIR-CLRI in Skill India initiative : enriching primary level human resource through artisanal skill development
B Kanimozhi, Chennai, India
CSIR-CLRI, as a societal empowerment initiative, hosts skill training programmes for the needy artisans below poverty line in different leather trades pan India. A detailed study of the skill training needs analysis, etc was undertaken and the trainees’ perceptions on elements such as course material, etc have been gathered through feedback mechanism. The primary objectives of the project include tapping the talent potential of Indian youth, improving productivity and improving quality of life of the needy. A role model for skill development initiatives from CSIR-CLRI is proposed for many such programmes to be taken up in future.

Indo-Ethiopian Alliance for Transformation of Ethiopian Leather Sector
Wondu Legesse, Addis Ababa, Ethiopia
The Federal Democratic Republic of Ethiopia aims for a giant leap in leather and leather products by providing favourable policy environment and strategic incentives for the sectors. The capacity building programme comprised 1) Benchmarking programme where CSIR-CLRI deputed project team to undertake technology upgradation programme at selected tanneries in Ethiopia and 2) Twinning programme to twin the capabilities of CSIR-CLRI by Leather Industry Development Institute (LIDI). The accomplishments include modern infrastructure creation, joint R&D programs, Consultancy projects, HRD programs, among many others. This programme is a role model for capacity building of institution and industry and is expected to grow stronger in the coming years.

Development of an International Proficiency Testing by Inter laboratory Comparison Applied to Physical and Chemical Test Methods for Mineral Tanned Leather
Carlos Amador Meza Moya, Guanajuato, México
Through the United Nations Development Program, supported by the governments of Mexico (AMEXID) and Uruguay (AUCI) and the participation of more than ten countries in America and Europe a project was developed for two international rounds of proficiency testing by inter laboratory comparison according to the guidelines of the ISO / IEC 17043:2010, in order to demonstrate competence in carrying out the test methods with some of the following objectives: 1) demonstrate consistency of results between laboratories, 2) determine the performance of individual laboratories for specific tests or measurements, etc.