

Celebrating 43 Years of Service Excellence



Honorable DOST Secretary Estrella F. Alabastro delivering her inspirational message and Mr. Renato V. Navarete, Managing Director of Certification International Philippines Incorporated (CIPI), giving his congratulatory message prior to the handover of the ISO 9001:2008 certificate of registration to MIRDC

MIRDC marked its 43rd year with the theme “Molding the Future of Metal Industries.” A theme that exudes a general sense of passion, commitment and resolve by the men and women of MIRDC in providing the highest standards of quality service and for bringing about the realization of a modern, competitive and prosperous metals and engineering (M&E) industries. A first time for the MIRDC to celebrate a week long momentous event covered by Presidential Proclamation No. 1806 declaring the period from June 15-19, 2009 as “Metals and Engineering Week.”

The celebration highlighted the blessing and inauguration of the Industry Wing and the Business Center, unveiling of the MIRDC Marker, community outreach techno program, facility tour and soft launching of new/upgraded facilities, awarding of ISO 9001:2008 Certificate of Registration, recognition of outstanding MIRDC personnel, induction of officers of the MIRDC Provident Fund, and launching of the MIRDC strategic programs.

We Are Taking the Lead, We Are No. 1



DOST Secretary Estrella F. Alabastro (third from left), MIRDC Officer-In-Charge Arthur Lucas D. Cruz (second from right), MIRDC QEMR Dr. Agustin M. Fudolig (right), and MIRDC QMR Dr. Danilo N. Pilar (left) receive the ISO 9001:2008 Certificate from the CIPI Managing Director Renato V. Navarete (second from left)

MIRDC's tradition of excellence is further accentuated by the awarding of the ISO 9001:2008 Certificate of Registration. While the certificate was handed over formally on June 18, it already took effect on March 2, 2009. The MIRDC maintains a stellar role with its ISO 17025 accredited laboratories, ISO 9001 certified Quality Management System (QMS) and ISO 14001 aligned Environmental Management System (EMS).

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On 18 June 2009, the Center celebrated its 43rd Founding Anniversary, and we are glad to have the presence of our former key officials namely Engr. Rolando T. Vilorio (Executive Director, 1993-2008), Dr. Leopoldo V. Abis (Executive Director, 1990-1993) and Dr. Jesus Adolfo Gopez (Deputy Director, 1989-1990) together with Dr. Rogelio A. Panlasigui (Chairperson, Governing Council 1999-2005). In this joyous reunion, Engr. Vilorio was acknowledged for being instrumental in spearheading the establishment of Quality Management System in the whole of DOST. Dr. Estrella F. Alabastro, Secretary of the Department of Science and Technology (DOST), also graced the occasion and delivered an inspiring message highlighting this excellent accomplishment of the Center. Mr. Renato Navarete of Certification Internationale Phils. Inc., proudly announced that the MIRDC is the first government agency to be awarded with ISO 9001:2008 version. Such effort was commended by Sec. Alabastro who likewise have been very supportive in the establishment of Quality Management Systems in the entire DOST system in line with Executive Order no. 605 issued by President Gloria Macapagal Arroyo.

We appreciate very much the participation of M & E associations during the "Industry Hour" such as Messrs. Charlie Policarpio (MIAP), Virgilio Lanzuela (MIAP), Romulo Carmen Jr. (PWS), Jimmy Chan (PDMA), Ms. Luz dela Cuesta (PISI) and other representatives from Sankei Phils. Dr. Agustin M. Fudolig, Officer-In-Charge in the Office of the Deputy Executive Director for Industry Development presented the M & E Industry Week expounding on President Macapagal Arroyo's Presidential Proclamation Number 1806 signed on June 15, 2009. The M & E Week coincides with the founding anniversary of MIRDC. Dr. Fudolig proposed several activities for next year's M & E Week Celebration which will be detailed further by the 2010 M & E Week Celebration Steering Committee. The Center is looking forward to a more grandeur celebration next year involving the industry associations.

In like manner, Engr. Fred P. Liza presented the soft launching of the new MIRDC upgraded facilities. These




Arthur Lucas D. Cruz, CEO IV
Officer-in-Charge

upgraded facilities are evidences to the very strong support of GMA Administration to the Science and Technology Community realizing the dreams of MIRDC officials and personnel to have their facilities upgraded through the grant of the P71M. It resulted to increase in our technological capabilities in testing, design engineering, CNC machining, welding and fabrication, metalcasting and heat treatment services in which the beneficiaries will be the metals and allied engineering industries.

We also express our gratitude to the support of Mr. Eduardo Chua Co Kiong, Mr. Rolando Jaurigue and Mr. Gerardo Roberto Sison, the private sector representatives to the MIRDC Governing Council representing the metal, engineering and allied industries, respectively for gracing our MIRDC founding anniversary celebration.

The MIRDC's role is to open the Center to M & E industries to maximize usage of our facilities including those of the Industry Wing and the Business Center of MIRDC. We further invite the industry to avail the Technology Business Incubation program of the Science Department, to lower the production overhead of firms by providing the industry the access to technology through scientific facilities.

Our commitment to the metals and engineering industry for its development and progress remains steadfast. We look forward to more a strengthened partnership in molding the future of the metal industries.

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Progress Report: Nationwide Machine Shop Survey

MIRDC collected 938 filled out questionnaires from its nationwide survey which will be the basis of the Philippine Machining Sector Industry Study. Survey questionnaires were sent to about 3,000 identified machine

shops nationwide. However this number was trimmed down to 1,833 due to non-existing, closed or could not be located shops. The latest surveys that were conducted in the region by MIRDC personnel were at

Nueva Ecija, Tacloban City, Ilocos and Rizal.

The distribution of population were as follows:

REGION/PROVINCE	No. of Respondents/ Total No. of Shops	% Distribution
NCR (Metro Manila)	355/441	355*100/938=37.9
I Ilocos Sur/Norte; La Union, Pang.	102/102	10.9
II Cagayan, Cag. Val., Batanes, Isabela	4/59	0.4
III Aurora, Bataan, Bulacan, Pampanga	167/259	17.8
IV CALABARZON, MIMAROPA	136/251	14.5
V Bicol: Cam. Sur/Norte, Albay, Sorsogon	5/60	0.5
VI Western Visayas	17/126	1.8
VII Central Visayas	48/86	5.1
VIII Eastern Visayas	2/31	0.2
IX Zamboanga Peninsula	2/45	0.2
X Northern Mindanao	51/102	5.5
XI Davao	41/136	4.5
XII SOCKSARGEN	6/67	0.6
XIII CARAGA (Agusan S/N, Surigao)	1/36	0.1
ARMM Autonomous Region	0/2	0.0
CAR Cordillera Adm.	1/28	0.1
TOTAL:	938/1833	100

As of 30 June 2009

This industry study updates the previous study conducted in 1993. The survey was approved and duly recognized by the National Statistical Coordination Board (NSCB). The study will greatly benefit the metalworking industry nationwide. This will present the industry profile of the Machining Sector and highlights of its performances for the period 2005-2007 including the production and technical capabilities, among others. Most importantly, this will provide policy makers, policy implementers and the members of the industry with the primary data for policy study and recommendation in terms of facilities upgrading, personnel development and investment incentives.

Business Center of MIRDC

One of the highlights during the MIRDC's 43rd anniversary celebration is the inauguration of the Business Center on 17th June at the Metalcasting Technology building. The establishment of the Business Center is in response to RA 9465 or the Anti-Red Tape Act of 2007. The law directs government agencies to support the government's resolve to stomp graft and corruption in the bureaucracy as well as to hasten government transactions and provide stiffer penalties for those engaging in graft and corruption.

Likewise, the facility will serve as a one-stop-shop to attend to the needs of MIRDC clients specifically involving job orders in metalworking,

metalcasting, research and development, technical consultancy, and industrial training programs as well as billing and collection services. The Business Center is set up for the convenience of the MIRDC clients in accepting processing and completing their transactions with the Center. The MIRDC customers can transact their business in simplified procedures minimizing the time to complete and deliver required services.



MIRDC Business Center

In handing over the Certificate, Mr. Navarete emphasized that MIRDC is the first agency in government that they have awarded certification to the newest edition of ISO 9001. Secretary Alabastro also expressed her appreciation when she aptly said: “We look at MIRDC to provide guidance and advocacy for management systems being put in place in all our agencies. We should be very proud of this support that we got from MIRDC officials and staff who are way ahead of all DOST agencies in recognizing the worth of ISO certification in providing quality services to customers.”

MIRDC is the designated lead agency for the implementation of DOST-wide Program, entitled “Establishment, Implementation and Maintenance of Management Systems in all RDIs and Regional Offices.” Consultancy and training support were provided by MIRDC to the DOST agencies which enabled them to satisfy and demonstrate the requirements of ISO 9001 in the heart of their operations and see to it that the disciplines and controls that they have installed and exercised over their key processes are in fact implemented and maintained. To date, MIRDC has been very instrumental in the accreditation to ISO/IEC 17025 of 13 laboratories and certification to ISO 9001 of 20 agencies/offices of DOST.

With this strategic initiative and direction set by Secretary Alabastro and its implementation being spearheaded by the MIRDC in coordination with the Philippine Council for Industry and Energy Research and Development (PCIERD), the DOST continues to lead and surpass all

Departments in the implementation of the President’s Executive Order 605 calling for ISO installation and usage in government offices.

World-Class Facilities, Quality Services

Building and sustaining organizational excellence requires, among others, the continuous upgrading of facilities and capabilities to cope with the rapid technological advances and meet the growing sophistication in the demands and challenges of global economy.

For the past couple of years, the MIRDC has embarked on the extensive upgrading of its facilities through the support of PCIERD and DOST to a tune of 50 million. Another 30 million is expected during the third year of project implementation. It involved the replacement of worn out or obsolete equipment, renovation/improvement of existing facilities and the acquisition of new equipment/facilities to meet customers’ demand for new services and technologies.

This strategic move is geared towards enabling the Center to respond quickly and efficiently to the requirements of its customers who are in turn much pressured by market and regulatory requirements brought about by trade liberalization and globalization.

It is also meant to sustain and enhance the R&D activities, technological support, capacity building and provision of quality S&T services of the MIRDC to the various sectors of the economy, particularly the M&E and allied industries.

Repair, replacement and/or upgrading of worn-out equipment are urgently needed and inevitable for the Center to avoid disruptions in services, as well as, to maintain, sustain and improve the quality and effectiveness of its R&D undertakings and of the S&T services that it provides to the industry.

Moreover, compliance to government regulations and international requirements (e.g.,

relative to the establishment of management systems in accordance with ISO standards), deemed it necessary for the rehabilitation and/or improvement of the existing facilities. Renovation is also important to meet the customers’ demand for world-class facilities for R&D, processing and testing.

Following are the highlights of the 3-year upgrading program:

Analysis and Testing

- New range of testing services covering burst testing and air pressure testing for LPG cylinders, torsion testing, winding testing, pencil hardness testing, and chemical testing
- Expanded range of calibration and metrology services covering fixed gauges, standard glass scales, metal rules as well as testing services to include % elongation
- Reinstated testing services related to tensile and bend testing, hardness testing, impact testing, NDT, and metallographic testing

Design and Engineering

- Upgraded design facilities and engineering and prototyping capabilities for the development of machineries, parts and engineered products

Welding and Fabrication

- New R&D facility and fabrication capability for the development and production of equipment/ machines with component parts made of sheet metals and pipes

CNC Machining

- Expanded advanced machining services for the development and production of precise products, e.g., die and mold parts and components, using CNC lathe, CNC Optical Profile Grinder, CNC EDM Sinker, Digitizing, CNC Milling and CNC Surface Grinding

Metalcasting and Heat Treatment

- Upgraded metalcasting and heat treatment facilities for R&D and short-series production services



Engr. Fred P. Liza, MIRDC Upgrading Project Leader and Focal Person, presents the new/upgraded facilities of the Center

and support infrastructure to TBI tenants, including QA/QC facility for testing, inspection and analysis

We've Got the ACES!



Awardees of ACES: (from left) Eugenio R. Mercado, Romeo C. Bermudez, Eduardo V. Diasanta, Rommel N. Coroña, Fred P. Liza, Norma B. Garcia, Lito I. Dimaculangan, Linda G. Rivera, and Aurea T. Motas

Recognizing the importance of harnessing the abilities and potentials of human resources as the organization's greatest asset, the MIRDC through its Program on Awards and Incentives for Service Excellence (PRAISE) conferred the Award for Performance Excellence to thirteen outstanding personnel.

These high performing employees were recognized for their consistent outstanding performance and extraordinary service in the public interest for a sustained period of at least two rating period. Recipients of the award who are considered as the MIRDC's cream are proudly called as the Center's ACES or Awardee for Constancy of Excellence in Service.

Gold Award: 4 consecutive years outstanding performance (2005-2008)

- Engr. Fred P. Liza
Office of the Executive Director
- Mr. Lito I. Dimaculangan
Analysis and Testing Division
- Engr. Rommel N. Coroña
Analysis and Testing Division
- Mr. Eduardo V. Diasanta
Analysis and Testing Division
- Mr. Wilbert H. Balingit
Industry Assistance Division
- Mr. Randy S. Jimenez
Industry Assistance Division

Gold Award: 3 consecutive years outstanding performance (2006-2008)

- Mr. Romeo C. Bermudez
Metalcasting Technology Division

Silver Award: 2 consecutive years outstanding performance (2007-2008)

- Ms. Linda G. Rivera
Office of the Executive Director
- Ms. Mercedita B. Gelvezon
Administrative Division
- Mr. Eugenio R. Mercado
Administrative Division
- Mr. Macario R. Melendez
Metalcasting Technology Division

Bronze Award: outstanding performance for the year 2008

- Ms. Aurea T. Motas
Industry Assistance Division
- Ms. Norma B. Garcia
Analysis and Testing Division

We've Got Agents, Too!



Amado R. Jabrica

Maria Gracia M. Peralta

Two MIRDC personnel received their licenses of specialization as Patent Agents that will boost the Center's efforts in generating more property rights and ensuring protection for its intellectual assets, e.g., patents for in-house developed technologies and researches.

Engr. Amado R. Jabrica and Ms. Maria Gracia M. Peralta are MIRDC's first, and among, the DOST select personnel who passed the examination given by Intellectual Property Philippines (IPP).

We Value and Protect our Intellectual Assets

A reflection of the greater importance accorded by the Center for the protection of its intellectual assets is the award given to Engr. Jonathan Q. Puerto, Ms. Maria Gracia M. Peralta and Mr. Felix C. Banawa in recognition of their innovative ideas and valuable contribution as the makers of the "Utility Model: Non-Cyanide Gold Electroplating Solution" that was granted registration by the Intellectual Property Office (IPO) of DTI under UM Application No. 2-2008-000352.



Dr. Agustin M. Fudolig (extreme right) recognizes the Makers of Utility Model: (from left) Engr. Jonathan Q. Puerto, Ms. Maria Gracia M. Peralta, and Mr. Felix C. Banawa

New coating with reliable adhesive properties

ESK Ceramics, Kempton, Germany recently introduced a new coating for aluminum casting, traded under the name EKamold Cast-M, acts as an effective release agent wherever molten aluminum comes into contact with other metal, for example, on pouring ladles.

The coating produces a smooth, non-wettable protective layer on the surface of the pouring ladle, i.e. the metal trickles down from the ladle like water from the leaf of a plant. The coating provides reliable and durable protection. The molten aluminum is securely separated from the substrate, ensuring that no entrained foreign matter contaminates the final casting.

And not only the molten metal is securely separated. Also the oxide skin forming at the surface of the hot aluminum is prevented from adhering to the pouring ladle. The ladle remains clean after each pouring operation.

As EKamold Cast-M is water-based, it does not pollute the environment by hazardous or toxic emissions. In contrast to oil-based

coatings, it does not release any harmful fumes. Application and removal of the coating can be accomplished in a non-soiling way.

A coating in the basis of water has another advantage: it comes pasty enough to be brushed on. But, if thinned with water, it can also be sprayed. Thus a smooth surface can be achieved while speeding up the application process.

A newly developed binder gives the dried coating such high strength that it does not flake off even if applied in very thick layers. Thanks to this property the coating achieves very long lifetimes and the coating thickness is not a critical factor. Accidental variations in coating thickness are tolerable within broad bandwidths. Damaged coatings can easily be repaired at low cost. Simply brush on some coating material to fill any holes or cracks. After the pouring operation EKamold Cast-M can be easily wiped off with water.

Thermal conductivity of the new suspension is very low, therefore, the molten metal keeps its temperature longer. For the production process this means that the metal temperature can be set lower and there is more time



The innovative coating can be brushed or sprayed on

available for the pouring operation, avoiding that the metal must be reheated in the holding furnace and eliminating the risk of overheating.

Foundries using the new coating have reported that its lifetime is several times higher than that of conventional coatings and that more casting campaigns can be accomplished.

Source: *Casting Plant & Technology*, 1/2009, p.46

Successful market launch of two-plate technology

Whenever new instruments of production equipment are being launched, this is usually observed with certain scepticism and caution. Therefore Buhler AG of Switzerland is happy to report that initial scepticism about its two-plate Carat pressure die casting machines has disappeared very soon after its market launch.

The first two-plate pressure die casting machine was supplied to TCG Unitech in Austria. Commissioning was in March 2007. After a short training period, the operator was very satisfied with the performance of the new machine, like the operators of the other successively supplied machines, as the objective of producing a maximum number of good castings per time unit at low costs was met. These results were achieved; thanks to the shorter cycle times, more constant

quality of the castings and easier set-up for product changes. Additionally, the higher utilization rates of the machine and the lower space requirement of the casting cell have a positive effect on costs.

The engineers at Buhler have paid and are still paying special attention to the technological design of the Carat line of die casting machines. Parallel production using the same die on a conventional die casting machine with toggle lever design showed that the Carat technology provides superior performance. The two-plate technology generally produces less flaking and hence more stable production runs. These positive effects are due to the improved rigidity of the locking

system and better distribution of the locking forces in the Carat system. The system can compensate out-of-parallelism more effectively. This prolongs the lifetime of the dies and reduces the need for reworking.

Thanks to the design of the machine as changing the dies has become an easy job. In the event of a production change, the dies can be



Two castings produced on the Carat die casting machine: holding device for a steering column (left) and cam carrier (right)

introduced by a crane without the risk of collision since there are no columns or piping in the die zone. Moreover, during production all locking grooves and column threads are always completely covered and sealed by plates, avoiding soiling by spraying agents and flaky material. When flat castings are produced, the enlarged die opening stroke is able to accommodate the robot which sprays the fixed die half and the extracting robot at the same time, enabling both operations to be performed in parallel and several seconds of cycle time to be saved.

The footprint of an older casting machine featuring a locking force of, for example, about 9,000 kN (900 t), can accommodate a Carat machine of 10,500 kN or even 14,000 kN. The same relationship exists for larger units. The advantage is that larger castings can be produced without additional space requirements and that it is possible to change from single to double cavity dies.

All these advantages have materialized at the TCG Unitech foundry where production takes place in 16 weekly shifts, achieving a

utilization rate of over 80%. According to production manager Michael Thieser, standstills are primarily caused by die changes, die problems and trouble caused by peripheral machines, and hardly ever by the new casting machine.

Source: *Casting Plant & Technology*, 1/2009, p.43

High-resolution CT solutions for castings

At EuroMold 2008, GE Sensing & Inspection Technology, Wunstorf, Germany presented two high-resolution computer tomographs of its phoenix/x-ray product line. Computer Tomography has opened new dimensions in process control and part approval in casting production and it is likely to soon replace many destructive testing methods and time-consuming conventional, coordinate-based measurements of complex casting geometries. Thanks to innovative soft and hardware solutions it is now possible to obtain highly informative CT results in ever shorter times.

The v/tome/xs model on display at EuroMold is the first 180 kV nanofocus computer tomograph featuring an additional 240 kV X-ray tube for scanning highly absorptive materials with microfocus resolution. Another innovative product for up to 12-mm parts is the high-performance nano-CT system 'nanotom'. Using a nanofocus X-ray tube, a granite-based manipulation system and a multi-megapixel digital detector with expanded measuring range, the system provides excellent image resolution and magnifications with voxel resolutions <0.5µm.

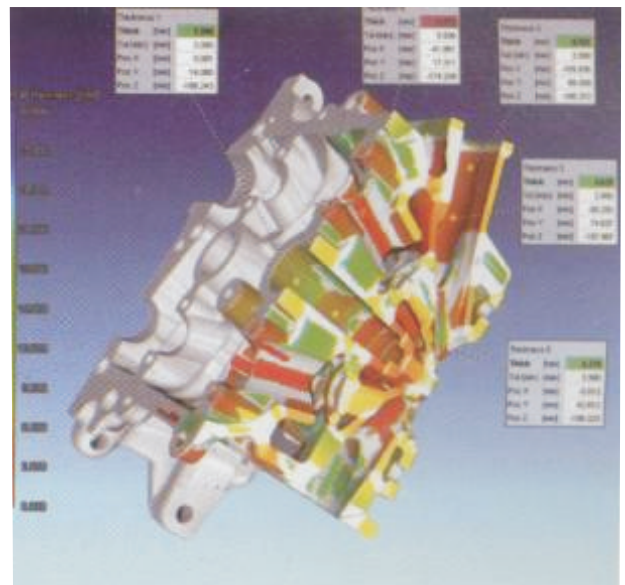
GE Sensing & Inspection Technology also supplies a wide range of computer tomographic equipment

for 3D measurements and analysis of specimens of up to 100 kg weight and 800 mm diameter. The user-friendly and highly efficient phoenix/x-ray CT software datos/x, which comes in many different modules, optimizes the CT results, providing excellent precision and quality. The new bhc/modul, for example, provides fully automatic beam hardening correction. The capability of compensating these undesired artefacts significantly enhances the precision of pore analysis or surface extraction for subsequent measurements.

The possibility of capturing complete castings in 3D image with excellent resolution and making any desired virtual section through the casting, makes computer tomography an extremely attractive analytical tool in quality assurance. Any variation in material composition or density can be visualized and analyzed in 3D. This provides exact information about the location of defects, such as shrinkage holes, without having to destroy the casting. The technology also enables 3D measurements of components which due to their complex geometries cannot be

captured unless through destruction-by optical or tactile coordinate measuring systems. Moreover, it is possible to compare CT-acquired volumetric data with the CAD data in addition to 2D wall thickness measurements. In this way the dimensional accuracy of the complete component can be analyzed in a very time-effective way, identifying length deviation as small as few µm.

Source: *Casting Plant & Technology*, 1/2009, p.44



Automatic wall thickness analysis of a scanned cylinder head

The closer, the better!

In support to the Center's Sectoral Intervention Program to the industry, MIRDC has integrated in its zoning and space utilization plan an "Industry Wing" to give the different industry associations an option to situate and locate within the MIRDC compound.

This communal office and business center intends to provide spaces, utilities and other amenities necessary to host the various M&E industry associations and for them to conduct official business at MIRDC. Proximity of these associations to MIRDC is of strategic importance in the delivery of MIRDC services and in the formulation and implementation of relevant and responsive intervention programs to industry. Close contact with these associations will help facilitate the exchange of information, direct interaction and immediate feedback.

Three (3) industry association offices intended for the Philippine Die and Mold Association (PDMA), the Philippines Iron and Steel Institute (PISI) and the Metals and Engineering Industry Foundation, Inc. (MEIFI) were inaugurated on June 18, 2009. In the pipeline are the offices of the Mechatronics and Robotics Society of the Philippines (MRSP) and the Original Equipment Manufacturers Association of the Philippines (OEMAP), among others.

Industry Representatives to the MIRDC Governing Council Mr. Eduardo N. Chua Co Kiong, Mr. Rolando A. Jaurigue and Mr. Roberto D. Sison led the ribbon cutting and blessing of the "Industry Wing" during the inauguration of the offices of PDMA, PISI and MEIFI



Community Outreach Technology Program Marks MIRDC Foundation Day

The community outreach technology program was conducted in line with the MIRDC's 43rd Foundation Day on 18th June 2009.

Themed as "Molding the Future of Metal Industries," the technologies developed by the Center were demonstrated to nearby Bicutan communities. It benefited constituents of several

barangays and also technical students. Among the showcased technologies were 'wrought iron and welding' and 'electroplating' which were conducted by Engr. Edilbert dela Peña and Engr. Wilfredo Lim, respectively, of the MIRDC's Technology and Business Advisory Section. Afterward, an open house tour to the Center's laboratories followed.

Meanwhile, the Center is charting for technologies to be showcased during the 2009 National Science and Technology Week (NSTW) in July along with the other agencies of the DOST.



Techno demonstrations on electroplating and wrought iron & welding benefited technical students and barangay constituents in nearby Bicutan community

Development of a Coco-Sap Still for Bioethanol

The Metals Industry Research and Development Center has developed a coco sap still for bioethanol, a devise that separates the ethanol content of a mixture at a higher purity compared to ordinary distiller. The input material is coco-sap, which is processed to yield crude bioethanol. Funded by the DOST-Technology Application and Promotion Institute, the Center fabricated another unit to be featured in the 2009 National Science and Technology Week Exhibition and Regional Cluster S&T Fairs.

The MIRDC project team led by Engr. Jose B. Ferrer designed and fabricated the bioethanol still. The size of the equipment can be accommodated in a 4-square meters area. The frame is made of commercially available structural steel thus making it very light.

The principle of operation of the equipment is based on difference in boiling point of liquids in a mixture. When a mixture of liquids, the more volatile components will tend to come off first. There is a bit of overlap (so it is never pure), but generally, ethanol can be separated from water and other impurities present. The more alcohol in the liquid, the more alcohol will be in the vapor, so multiple distillations enable to increase the strength & purity right up to 96.5%

The main components of the still are bubbler, cooling or reflux, condenser and instrument sections. The bubbler is responsible for the vaporization of ethanol from the mixture and condensing water upon impinging boiled liquid to a baffle plate. The cooler is a bed of marbles that further remove the water content of the vapor. The process is a series of vaporization and condensation through the layers of marbles resulting to vapor exiting with high ethanol content at the topmost layer. Embedded in the marbles is a system of copper coil for cooling the vapor. The cooling water runs counter to the flow of the vapor so that there is a gradual reduction of temperature from the topmost to the bottommost layer of the marbles.

The condenser is a chamber enclosing a copper coil for cooling the vapor, and likewise liquefies the ethanol vapor that flows to the fuel outlet. The instrument consists of a thermometer, thermocouple probe, thermo-controller and a solenoid valve. The thermocouple provides a quick sensing of the temperature of the vapor in the still once the set temperature is attained, while the thermo-controller opens the valve that allows water to flow to the coil to effect the condensation.

This research project is conducted by MIRDC with the aim to revitalizing the coconut industry and giving the farmers alternative income generating business. Eventually, this

technology could also add vigor to our local equipment fabricators in the metals and allied engineering industries.

The equipment is expected to yield two (2) liters of bioethanol out of 20 liters of coco sap with a 14% ethanol content. The project is now undergoing laboratory testing, according to Engr. Ferrer. The project ran from November 2008 to March 2009 covering design, fabrication and functional testing.



Utility Model Registration No. 2-2008-000352

Non-Cyanide Gold Electroplating Solution

By
Maria Gracia M. Peralta; Felix C. Banawa; and Jonathan Q. Puerto
Metals Industry Research and Development Center
Department of Science and Technology

I. Technical Field of the Utility Model

The present utility model relates in general to a non-cyanide gold solution to be used in electroplating process. Specifically, it relates to a sulfite-based gold plating solution.

II. Background of the Utility Model

Electroplating is a process whereby an object usually metallic is coated with one or more relatively thin, tightly adherent layers of some other metal by means of electrochemical process. In case of gold electroplating, the plating bath usually used contains toxic potassium auro cyanide. Cyanide and cyanide compounds are highly toxic to human and aquatic life even at low concentrations. However, despite of the harmful effects of these chemicals, they are still used in electroplating processes due to its favorable plating results. In copper electroplating as well as gold electroplating, the plating baths are composed of cyanide-based solutions. The cyanide-based copper and gold electroplating operations result in the generation of cyanide-bearing wastewaters from the rinsing of finished products. Cyanide bearing waste generated must undergo treatment to destroy cyanide before they can be treated with other wastes. The improper use, treatment and disposal of cyanide and cyanide compounds have disastrous effects on human health and the environment.

Currently, a government agency tasked to protect the environment has imposed restrictions in the purchase, storage, use and disposal of cyanide and cyanide compounds. The compliance to this regulation had posed additional financial, technical, and



operational burden to users of cyanide and cyanide-bearing compounds especially in the copper and gold electroplating industry.

There is a need, therefore, for a gold electroplating solution that could replace extremely toxic cyanide-based bath in the gold electroplating process.

III. Summary and Objectives of the Utility Model

The utility model involves a non-cyanide gold solution specifically a sulfite-based gold solution and the application is for electroplating operation.

Accordingly, the primary objective of the utility model is to provide a non-cyanide gold plating solution.

It also aims to promote the use of sulfite-based gold solution in gold electroplating. Further, it objects to have deposits from the gold plating

solution that are acceptable in appearance, corrosion resistant, and free from porosity and other defects.

IV. Process Flow Description

Figure 1 is the flow of producing a gold plating solution; Figure 2 is the flow chart of the gold electroplating process. (See Figs. 1 and 2 on page 11)

We Claim:

An aqueous solution which comprises solids resulting from the precipitation of trivalent gold salts solution with ammonia, said solids being dissolved in 16% to 25% of sodium sulfite in aqueous solution as to provide a gold concentration within said solution of about 1.5 - 3 g/l, with citric acid as supporting electrolyte and ethylenediamine as an organic polyamine wherein said electroplating solution has a pH of 7.5 to 8.5.

Figure 1. Preparation of Non-Cyanide Gold Solution

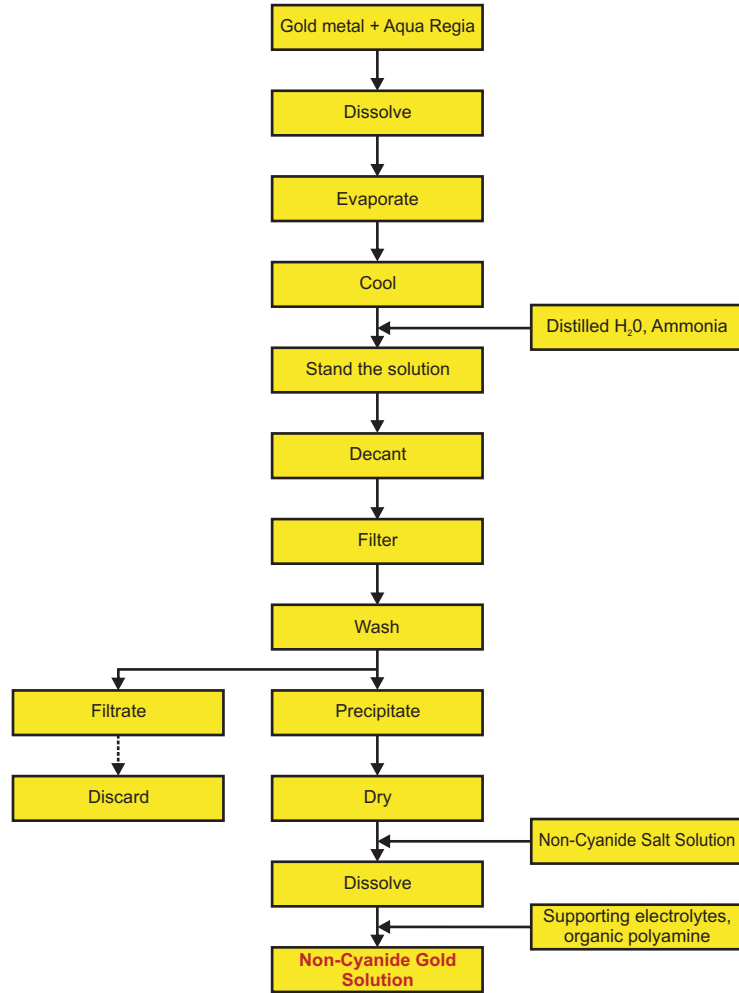
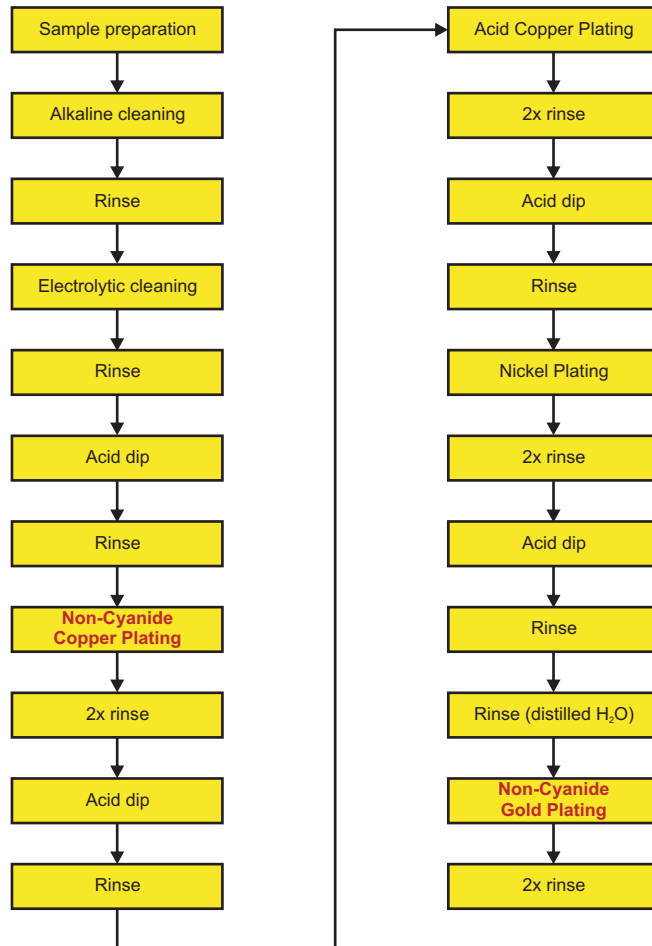


Figure 2. Process Flow Chart for Non-Cyanide Decorative Gold Plating Process



ENGR. ROLANDO T. VILORIA

1946-2009



After 38 years of his professional career serving at the Metals Industry Research and Development Center (MIRDC) with duty, honor and unwavering leadership, ENGR. ROLANDO T. VILORIA, 63, decided to retire from being an executive director on 04 March 2009. Much as he wanted to stay longer and contribute more to the Center, his declining health prevented him from doing so. Unfortunately, he passed away on Friday, 26th of June 2009. He is

survived by his loving wife, Teresita, and daughters Ma. Katherina (with son-in-law Victor Manuel and grandson Gabriel Victor) and Nikka and son Roland Benjamin.

Engr. Viloria was born in Sampaloc, Manila on 04 March 1946. He earned his bachelor's degree from the University of Santo Tomas in 1967. His distinguished career in public service began in 1969 when he joined the Board of Investments (BOI) as Staff Assistant and transferred in 1971 to the Metals Industry Research and Development Center (MIRDC) as Assistant Engineer.

As a member of the pioneering staff, Engr. Viloria has been instrumental in setting up the MIRDC Bicutan complex, from the ground up. He rose from the ranks and became the head of the MIRDC in 1993. He served for 15 years as the 5th executive director of MIRDC. Under an inspired and dedicated leadership, Engr. Viloria has relentlessly pursued the drive to make the MIRDC a catalyst and vital cog in the development of the metals and engineering industry. It was during his term that the MIRDC, under the aegis of the Department of Science and Technology (DOST), was able to achieve the distinction of being the first government agency in the country

with ISO-accredited laboratories and ISO-certified quality management system for its training section. The MIRDC now maintains a stellar role with its ISO 17025 accredited laboratories and ISO 9001:2008 certified centerwide Quality Management Systems (QMS).

A forthright confirmation of Engr. Viloria as truly exemplifying the excellent qualities of a Filipino worker while in the government and nation's service was the PRESIDENTIAL or LINGKOD BAYAN AWARD for outstanding work performance conferred to him at the Malacañan in September 1998. This award is the highest national award for public officials and employees given by the Civil Service Commission. Accordingly, his appointment to CEO rank III was confirmed on June 2001 by no less than Her Excellency President Gloria Macapagal Arroyo.

MIRDC is indeed very fortunate to have ENGR. ROLANDO T. VILORIA for his excellent leadership, leaving a remarkable legacy that will be left to the memories of MIRDC employees as well as his peers at the DOST and to his countless colleagues in the metals and engineering industry.

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