

Instituto Nacional de Tecnología Industrial



Secretaría de Industria y Desarrollo Productivo

Heritage and Sites of Memory

Technological Capabilities at the Service of Memory, Truth and Justice



••

Heritage and Sites of Memory

Technological Capabilities at the Service of Memory, Truth and Justice



Instituto Nacional de Tecnología Industrial



Secretaría de Industria y Desarrollo Productivo

	NATIONAL INSTITUTE OF INDUSTRIAL TECHNOLOGY				

AUTORIDADES

- **PRESIDENT OF THE ARGENTINE REPUBLIC** Alberto Fernández
- CHIEF OF THE CABINET OF MINISTERS Juan Manzur
- MINISTER OF PRODUCTIVE DEVELOPMENT Matías Kulfas
- PRESIDENT OF THE NATIONAL INSTITUTE OF INDUSTRIAL TECHNOLOGY

Ruben Geneyro



Instituto Nacional de Tecnología Industrial

Technological Capabilities at the Service of Memory, Truth and Justice : Heritage and Sites of Memory / compilación anónima.

- la ed. San Martìn : Instituto Nacional de Tecnologìa Industrial
- INTI, 2023.

Libro digital, PDF

Archivo Digital: descarga ISBN 978-950-532-491-0

1. Derechos Humanos. 2. Tecnologías. 3. Restauración. I. Título. CDD 323.02

Foreword

The National Institute of Industrial Technology (INTI), as a technological referent of the Ministry of Productive Development and through ongoing coordination with the Science and Technology system, assists and transfers its capabilities to the productive network throughout the country. Consisting of 46 technological centers and more than 2,700 highly trained technicians and professionals, the Institute has over 200 accredited laboratories across the country.

It currently has over 150 R&D projects in progress and 26 pilot plants throughout the country, promoting more than 20 international cooperation projects and offering a unique equipment to assist and support the productive sector and the National State.

Since the beginning of our administration, we have striven to make INTI rise up to the challenge to support a model of industrial, technological, federal, and inclusive development.

On that path and with a comprehensive view, supporting the processes of Memory, Truth and Justice is central to the country's sovereignty. That is why we would like to share with you this document, which provides an overview of the Institute's technological capabilities. It also offers a brief review of the assistance provided by our technicians, who are professionals committed to their technological vocation and to Justice, contributing to an issue of special relevance for our country.

Ruben Geneyro, president of INTI





Introduction

INTI's goal is to assist the national industry and the State through technology generation and transfer initiatives. At the same time, it has the widest range of capabilities to extensively collaborate with and provide assistance to the judiciary and to sites and spaces of memory as regards experts' reports, heritage conservation and restoration, and training, among others. All this is possible through our mature line of work, which on account of its scientific rigor can provide answers leveraging our interdisciplinary team of technicians and professionals specialized and trained in the field.

At present, in addition to making its technological capabilities available to society, INTI supports the judiciary in several human rights cases and supports the ESMA Museum and Site of Memory in its application to be included as a World Heritage Site by UNESCO.

Within this framework of historical institutional support and through the signing of a collaboration agreement between the Institute and the National Human Rights Secretariat, technical assistance actions were strengthened in order to contribute to the process of Memory, Truth and Justice.













Our technological offer

Archives, libraries, and paper heritage

- Technical assistance for the conservation and enhancement of paper documents and book collections.
- Advice on the preservation of documentary and archival collections.
- Evaluation of ambient conditions (temperature, humidity, etc.) in storage and reading rooms of libraries and archives.
- Study and evaluation of preservation and/or deterioration conditions of library and archive collections.
- Document dating and diplomatic analysis.
- Training on related topics, mainly those pertaining to the preservation and training of human resources for the organization and enhancement of documents related to human rights.
- Preventive conservation procedures and recommendations for archives and libraries.
- Accelerated aging treatments and evaluation of paper permanence.
- Quali-quantitative analysis of paper fibers (identification of species and percentages). Measurement of pH in paper support.
- Evaluation of fibers for their use in paper manufacturing.
- Evaluation of paper permanence for documents. IRAM-ISO 9706 Standard (permanence requirements).
- Paper identification through observation.
- Evaluation of ISO 11108 Standard, archival paper (requirements).

Preventive conservation and restoration

- Evaluation of contamination by bacteria and fungi on surfaces.
- Elemental analysis to assess the composition of surface products, patinas, metals, and alloys.
- Determination of chromaticity coordinates in house and professional paints.
- Technical specifications for repainting works.

A STRONGER INTI, CLOSER TO SMES AND SOCIETY · PÁGINA 7





The **optical microscope** at the Paper Technology Center is one of the devices that is part of the research center and can be used, for example, to characterize fibers in papers.



The Conservation and Restoration team during their visit to the Güiraldes Museum, located in San Antonio de Areco, Buenos Aires. They carried out a conditions assessment and diagnosis of the museum's heritage.

Contact: Facundo Araujo and Carlos Rozas

- Determination of stability and environmental corrosion resistance.
- Pigment, filler, and resin identification through FTIR, RAMAN, and SEM/EDS.
- Organic coating identification through FTIR.
- Assessment of the efficacy of disinfection treatments.
- Especificaciones técnicas para trabajos de repintado.
- Recommendations for the correct use of illumination for the preservation of the cultural heritage.

Conservation of textile materials

- Structural analysis of yarns and/or fabrics.
- Advice for the dyeing of yarns or fabrics, with natural and synthetic dyes, for the intervention in heritage textiles and textile supports used for exhibition.
- Identification and evaluation of physical aspects and measurement of structural parameters of carpets and textile coverings.
- Characterization and evaluation of carpets and textile coverings.
- Evaluation of animal, vegetable, and manufactured fibers.
- Characterization of textile fibers found in upholstery furniture and seat tensioning systems.





- Qualitative and quantitative composition analysis of support fabrics, characterization of textile fibers, and structural analysis of yarns and/or textile supports.
- Characterization of physical aspects and measurement of structural parameters in upholstery fabrics.
- Determination of chromaticity coordinates in carpets and textile coverings.
- Determination of mechanical behavior (resistance, wear, abrasion).
- Complete evaluation of textile performance for restoration, conservation, or exhibition supports: qualitative-quantitative composition.
- Color fastness analysis. Yellowing testing. Dimensional stability.
- Suggestions for the cleaning of heritage textile pieces.
- Recommendations for the cleaning and maintenance of carpets and textile coverings.

Contact: Mónica Pinto, Milagros Córdova and Ana Laura Garcia

Structure, geology, and architectural heritage

- Diagnosis of existing pathologies in the assets to be enhanced.
- Characterization of materials in terms of performance, durability, and compatibility.
- Development of innovative materials, substitution of exhausted original materials, and substitution of imported materials.
- Repair recommendations and solution proposals.
- Drafting of technical specifications.
- Re-functionalization of spaces: new structural challenges (heliports, engine rooms, concert halls).
- Compliance regarding new environmental control parameters: hygrothermal control solutions for exhibition halls, archives, and libraries.
- Telemetry for monitoring environmental conditions in cultural spaces.
- Adaptation to current regulations: accessibility, fire protection, occupational health and safety.
- Retrofitting for energy efficiency in heritage buildings.







- State-of-the-art technology to provide a systematic, interdisciplinary, and qualified response: RAMAN spectrophotometers, atomic absorption spectrophotometers, electron microscopes, petrographic microscopes, Weather-Ometer environmental simulation chambers, UV exposure chamber, thermographic chamber, X-ray diffraction.
- Elemental analysis to assess the composition of surface products, patinas, metals, and alloys.
- Structural analysis through industrial radiography and ultrasound.
- Technical advice for structural and environmental conservation of heritage buildings.
- Recommendations for the adaptation of heritage buildings for energy efficiency.
- Soil characterization.
- Geotechnical characterization of sites.
- Diagnosis of construction pathologies and advice for solutions.
- Testing of masonry and coatings (simile stone, ceramic, lime mortars).
- Analysis of structural components.
- Tests on stone materials for applications.
- Study of ornamental stones from the quarry.
- Fire safety assessment.
- Accessibility studies in heritage buildings.
- Evaluation of environmental characteristics for the knowledge on and conservation of heritage buildings.
- Missing stone replacement techniques.
- Recommendations for the patching of coatings.
- Quali-quantitative survey of pathologies in buildings of architectural historical heritage, including supports and substrates.
 - Electrical structural evaluation and recording.
- Thermographic survey of facades.

- Analysis for determining the presence of asbestos.
- Replacement and maintenance of exterior and interior plaster.

The binocular magnifying glass and the petrographic microscope are part of the equipment that the Geology Department of INTI-Constructions has. They are helpful for observing very small objects through lenses, scopes, and light beams that zoom in or enlarge the image to an observable size for the human eye. Among other applications, they have been used in the mineralogical study of samples of human skeletal remains to characterize the crystalline species present in them.

Contact: Inés Dolmann, Fabio Luna, Silvia Velázquez, José Salminci and Claudia Ferragut



Metalworking

- Structural analysis through industrial radiography and ultrasound techniques for board support.
- Identification of metals and alloys, constituents, and impurities through XRF.
- Quality assessment of metal films on surfaces (patinas, corrosion products) through XRF, XRD, and electrochemical techniques.
- Recommendations for the repair, cleaning, inhibition, and preservation of metallic components.
- Selection of rehabilitation methods for structures with metallic components.
- Metallographic analysis to determine the type of material, the manufacturing process, and the morphology of the corrosion process.







INTI has an Engineering Department equipped with an X-ray fluorescence spectrophotometer. This device can be used to identify the chemical elements that are present in solid (metals, rocks, powdered samples, tissues, etc.) and liquid samples, which need no prior preparation. The only requirement is that the sample must be smaller than the size of the sample holder.



INTI also has a Laboratory for the analysis of mechanical failures or components. Through this and other areas of the Mechanics and Logistics Submanagement, the Institute provides expert technical reports at the request of the judiciary, such as is a case about metal drums with fossil remains located in the *tosquera*¹ of San Fernando.



Contact: Jorge Schneebeli, Pablo Taboas and Cecilia Carnevali

 \bullet

¹A *tosquera* is an artificial lake that is formed in abandoned mining sites where the tosca (a type of tuff stone) is extracted. The resulting depression in the ground surface can be as deep as 50 meters and is progressively flooded with rain or groundwater. Their muddy soil resembles quicksand, which can result in a deadly trap. They are common in Argentina, especially in Buenos Aires.



Other tests and transversal capabilities that can be applied to different supports (metal, paper, photographic, pictorial, architectural, among others)

- Analysis of contamination by bacteria and fungi on surfaces.
- Identification of execution techniques through metallographic analysis.
- Structural evaluation through industrial radiography and ultrasound.
- Characterization of corrosion products, patinas, and contaminants through FTIR, XRF, and XRD.
- Determination of stability and resistance to environmental corrosion.
- Quality assessment of metal films on surfaces (patinas, corrosion products) through XRF, XRD, and electrochemical techniques.
- Analysis of the efficiency of disinfection treatments.
- Identification of the main polymer present in intervention adhesives and organic coatings through FTIR.
- New technologies in restoration (furniture, flags, curtains, documents, books, statues, replicas, cave and rock paintings).
- Prevention of biological degradation of paper, wood, and textile assets.
- Identification and authentication of cultural assets (coins, paintings, documents).



 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I
 I



Scientific and technological contributions to the protection and promotion of human rights

In assisting the judiciary, INTI is not only involved as a technical expert in different court cases affecting public safety, but it is also called upon to provide support, on account of its expertise, in cases of crimes against humanity or that affect human rights.

An example of this is the research conducted by INTI's Technical Direction of Advanced Materials' specialists in order to **analyze the paint schemes applied on the walls of the Capuchita space at the Navy Petty-Officers School of Mechanics (Escuela Superior de Mecánica de la Armada, ESMA)**, a former clandestine detention center where torture and extermination took place during the last military dictatorship. These walls had peeled off, leaving visible inscriptions that could reveal important data for open cases involving detainees.





INTI's technical team visited the site because inscriptions, marks, and drawings had been discovered on the walls after the outer layers of paint had peeled off.

Based on the inscriptions detected, and as additional information to that required by the Court, the conservation team was able to reconstruct a telephone number, confirm the identity of some of the detainees who had been held in the clandestine detention center, and contact relatives of disappeared detainees who had been there (and who had written the numbers on the walls). In the same premises, a team of technical professionals from the Construction and Infrastructure Department, specifically from the Structure Sector, worked on the structural evaluation and survey of the buildings that make up this Site of Memory.

Also, at the request of the National Attorney General's Office, INTI's Department of Structures and Geotechnics and the Department of Building Rehabilitation joined forces with the Argentine Forensic Anthropology Team (in Spanish, EAAF). A remarkable example of this endeavor is the work



2

carried out in the province of La Rioja, together with the Prosecutor's Office for Trafficking and Exploitation of Persons, in the case of the disappearance of Marita Verón. INTI was required to identify and evaluate buildings that were part of the case files in search of building alterations that could contribute data to the investigation.

Collaboration between the EAAF and INTI can also be seen in other initiatives. In 2013, professionals and technicians from INTI's research and development centers of Construction, Mechanics, Plastics, and Surface Processes provided assistance in the context of the case around **the Orletti Automotive Garage**, a clandestine center that served as the main base in Argentina for the socalled "Operation Condor". **They helped characterize the metallic drums and mortars found in a premise in San Fernando, province of Buenos Aires, as part of the investigation for the kidnapping and death of Cuban diplomats in 1976. Through its geological expertise, INTI identified and correlated the earthy sediments adhered to the drums.**

In the framework of an international collaboration, the EAAF staff requested INTI to conduct a mineralogical exploration and study of human bone samples they had collected. This study made it possible to detect the crystalline species present in the bone remains through petrographic and electron microscopy, X-ray diffraction, infrared spectroscopy, and qualitative XRF analysis.

CANAL DE SAN FERNANDO, BUENOS AIRES.









•

TECHNOLOGY, HERITAGE AND MEMORY

The relationship between technology and other areas such as History and Cultural Heritage enables the study, preservation, protection, and discovery of evidence by professionals and technicians specialized in architectural works, paintings, textiles, wood, rubber, plastics, ornamental rocks, metals, and thermo-mechanical installations, among others. It also helps us to provide a comprehensive response ensuring the technical assistance required by the complexity of all disciplines.

An example is the assistance requested by the Congress of the Argentine Nation, which involved conducting a pathology survey, characterizing stones, identifying a replacement quarry, dosing a patching mortar, and assessing the corrosion and aging conditions of a dome for intervention. INTI also provided assistance to Estancia Los Talas, specifically to the Jorge Martín Furt Library, located in Luján, province of Buenos Aires. There, the Institute performed a comprehensive assessment to enhance the value of the ranch, which dates back to 1824, and submitted a proposal for a thermal conditioning and fire prevention project in the Library and the Archive (comprising the sectors of Spanish-American, Argentine, and European literature; history and geography; newspapers and magazines collections; incunabula, untraceable *editiones principes* and antiphonaries).

Recently, a team of specialists from the Institute received a request to assist the **Site of Memory "Imprenta del Pueblo Roberto Matthews"**, located in the province of Córdoba, in the recovery and enhancement of the Site, a former clandestine detention and extermination center.











WE SUPPORT THE ESMA MUSEUM AND SITE OF MEMORY IN ITS CANDIDACY SUBMITTED TO UNESCO

INTI supports the ESMA Museum and Site of Memory in its application to be included as a World Heritage Site by UNESCO, in an attempt to make internationally visible the crimes against humanity committed by the last military dictatorship in Argentina and to raise awareness on social consensus as a means to achieve justice.

ESMA was one of the most emblematic clandestine detention, torture, and extermination centers, where nearly 5,000 men and women were held captive and more than 30 children were born.

Through graphic and audiovisual material, the Museum's exhibition seeks to evoke and bring closer the events that took place in the former clandestine detention center and to report the historical development of the institution itself, starting from the global context in which those events took place, the resistance around them, the process of Memory, Truth and Justice, and its subsequent transformation from a clandestine center to a Museum and Site of Memory. At the same time, it seeks to give international visibility to the exemplary justice process achieved in democracy that was prompted by the struggle led by Human Rights Organizations.









+ Information institucionales@inti.gob.ar archivomemoria@inti.gob.ar





Instituto Nacional de Tecnología Industrial



Secretaría de Industria y Desarrollo Productivo



Instituto Nacional de Tecnología Industrial



Ministerio de Economía Argentina

Secretaría de Industria y Desarrollo Productivo

