

# ANNUAL REPORT 2017



**dictuc**  
INGENIERÍA QUE TRANSFORMA





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## PRESENTATION

For 80 years, Dictuc has propelled its work to become the engine of the country's technological development.

Dictuc offers high impact solutions and well being for society, through innovation and knowledge transfer.

The professional and ethical excellence that characterizes the work of Dictuc today shines with a new image, a new way of showing itself to the world; which adapts to the current times, but keeps the excellence trademark of Engineering UC that characterizes its services.

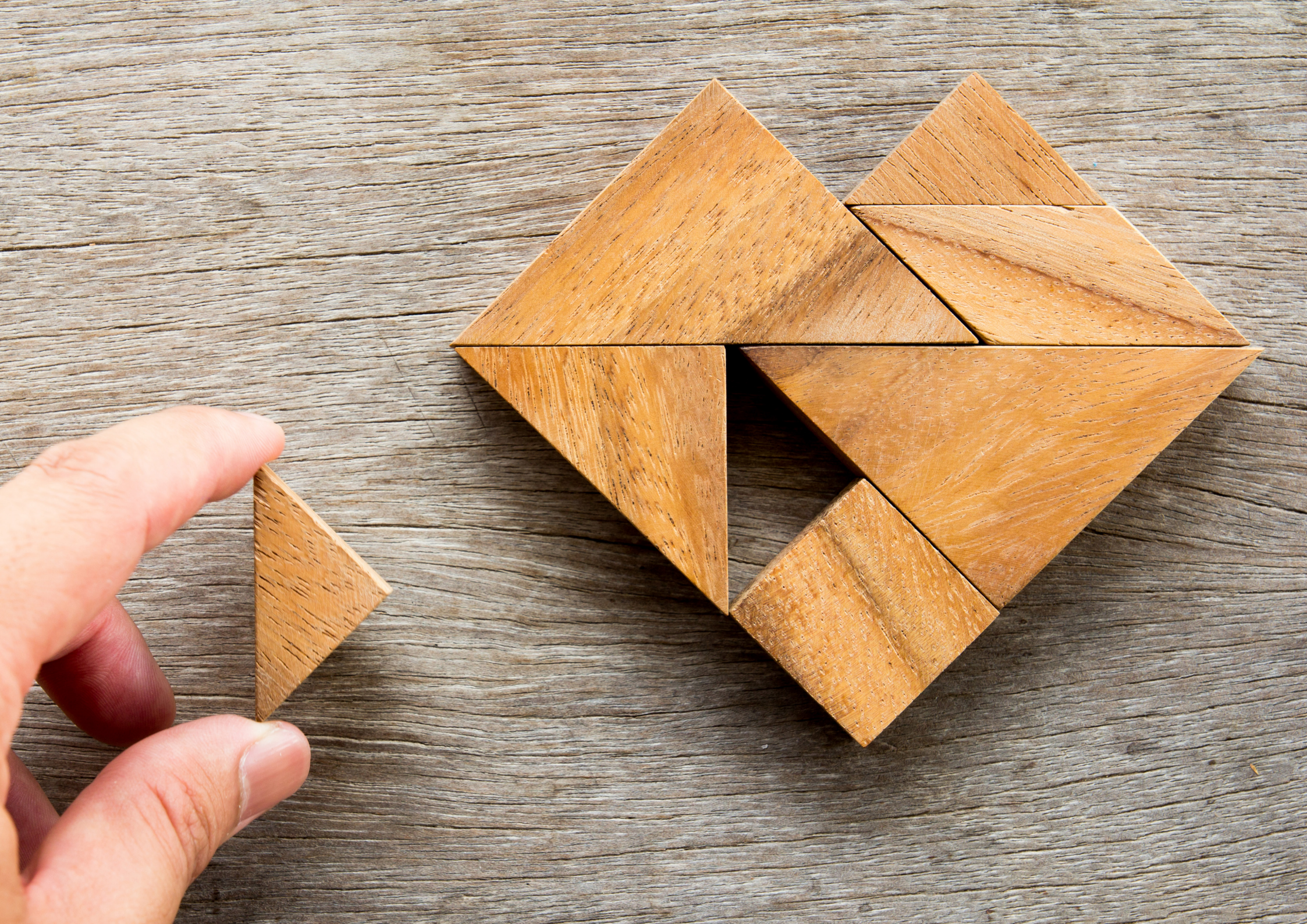
At Dictuc there is the conviction that with originality, innovation and scientific accuracy, what seems unlikely can become achievable. Each challenge increases the passion for making the world a better place, sustainable and welcoming for everyone.

Services are performed by specialist units, whom draw inspiration from the power of science and technology to take care of the needs from different productive sectors in the country.

At Dictuc we are inspired by the possibility, through engineering, of creating the future, expanding development possibilities and contributing in a significant way to the quality of life, of both, people and society.

Dictuc is... engineering that transforms.







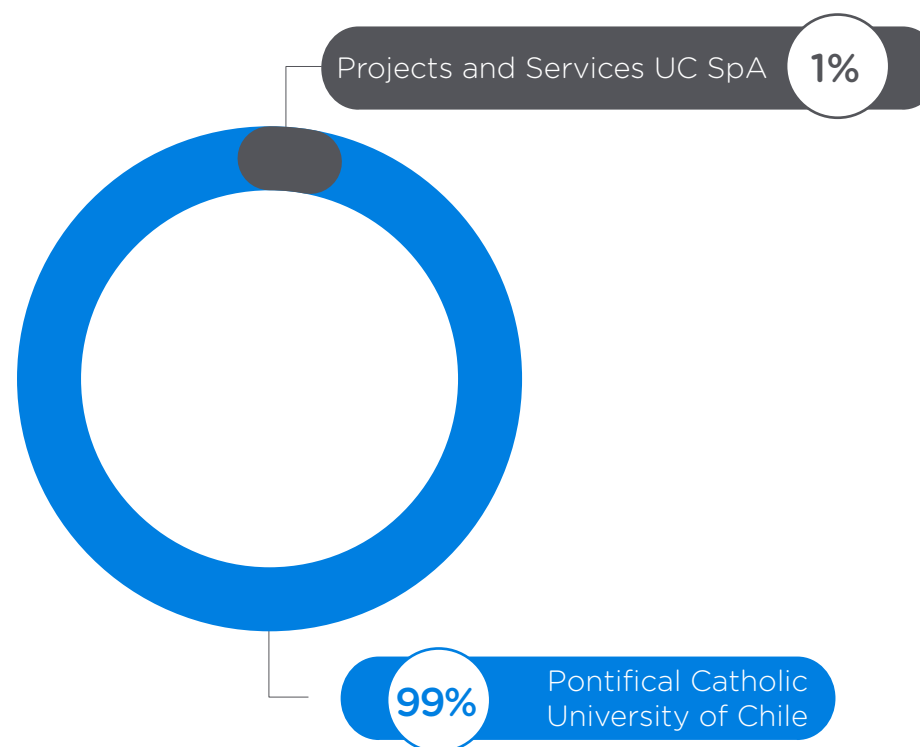


# 01. | CORPORATE INFORMATION

## 1.1. CORPORATE STRUCTURE

Dictuc is a Closely-Held Corporation incorporated by public deed on January 21st of 1994 before the Notary Public of Santiago, Mr. Sergio Rodriguez Garces. The extract was published in the Official Gazette dated January 29th of 1994 and registered in page 1898 N° 1535 of the Registry of Commerce, of the Real Estate and Commercial Registry of Santiago.

The Pontifical Catholic University of Chile owns 99% of the shares of Dictuc S.A., and Projects and Services UC SpA owns 1% of the shares.













## 1.2. GENERAL INFORMATION ABOUT THE COMPANY

- Company name: Dictuc S.A.
- Tax Id. Number: 96.691.330-4
- Line of Business: Consultancy, Technological and Laboratory Services in Engineering.
- Legal address: 4860 Vicuña Mackenna Avenue, Macul.
- Entity type: Closely-Held Corporation.
- Securities registry listing: Registry number 1535, January 29th, 1994.

## 1.3. CONTACT INFORMATION

- Address: 4860 Vicuña Mackenna avenue, Macul.
- Telephone: +56 2 2354 4886
- Website: [www.dictuc.cl](http://www.dictuc.cl)
- E-mail: [comercial@dictuc.cl](mailto:comercial@dictuc.cl)
- Postal Code: 7820436





02.

02. | OUR  
COMPANY



## 2.1. AT A GLANCE

During our 80 years of continuous work, we have managed to implement the Third Mission of the Pontifical Catholic University of Chile (UC) sustainably, which means: Being the link between the academy and research with the community, through the creation of knowledge and technology transfer.

We take engineering as the foundation to deliver multidisciplinary services, solve specific issues and develop large-scale projects for the country. By doing so, we come closer to our dream of creating a significant impact on every person's life, thus achieving a positive impact on society.

Dictuc's operating model is a virtuous circle where our specialized services benefit people and, at the same time, we generate financial resources for the development of the educational project of the UC School of Engineering.





- From our base, we face the challenges presented by the country: **334 collaborators who are specialized in their areas.**
- We have **254 services** available, conceived according to our clients' needs.
- More than **2,000 served clients** in 2017.
- In 2017, we offered **58,803 solutions** to the different productive sectors of the country.
- The diversity of our solutions is seen through our **30 service units.**
- We rethink the world through our work in **17 countries.**



## 2.2. MESSAGES

### 2.2.1. PRESIDENT OF THE BOARD

A very important decade, within the 79-year history of Dictuc, drew to a close this year. During this period, we faced vertiginous technological and scientific advances, which allowed us to challenge and innovate in our capacities, for finding new and better solutions to the needs of Chile's productive sectors.

For Dictuc is very important to offer new approaches and provide answers to country's problems. We know we have the capabilities to do it and we count on the support of the Pontificia Universidad Católica de Chile and its School of Engineering to achieve this goal.

Our company is composed by multidisciplinary teams, with more than 30 business units of specialized services in different areas of engineering. Through these specialized units, we develop new projects and present new services daily, in both the public and private environments.

In this way, we get closer to the dream of becoming the engine of Chile's technological development and the leading agency in technology transfer of Latin America.

At the end of this year, our commitment is to continue offering quality services that produce a direct and positive impact on society.



**ALDO CIPRIANO**

Chairman Dictuc





### 2.2.2. CEO

Through the constant development of innovative ideas, implemented by units that are specialized in multiple areas of engineering, we manage to maintain our quality and impartial point of view, which are Dictuc's trademarks.

This is supported by different works and achievements that we, as a company, are conducting in order to impact society in a more direct and positive way.

This is why we were acknowledged as a Best for the World company, after only one year of receiving the certification as a B company. This means we are not only focused on being the best company in the world, but also for the world.

The foregoing is complemented by the presentation of the Dictuc Crime Prevention Model, developed to maintain and protect the highest ethical standards in business and the integrity in all types of transactions and interactions.

These milestones are only one part of what we will present for 2017. I invite you to come closer and learn more about our work.

Welcome to Dictuc.



**FELIPE BAHAMONDES**  
CEO Dictuc



## 2.3. BUSINESS MODEL

Our business model is based on identifying the country's needs and finding solutions through specialized services, which include all of the specialties presented by UC Engineering.

Thus, we create a link between the academy and society in a speedy and effective way, showing our

commitment to people, as well as to the excellence and values of the Pontifical Catholic University of Chile.

Through our work, we serve society with UC Engineering's knowledge and technology, in order to achieve an early impact on people and create an added value to the UC School of Engineering.

Dictuc supports the sustainable development of UC engineering.

In order to contribute to a sustainable growth of UC Engineering, Dictuc generates approximately \$8.7 million annually by each ordinary staff scholar.





## 2.4. HISTORY

From the beginning, the Pontifical Catholic University of Chile (UC) had the goal of adapting to the country's needs at its core, looking for ways to transfer the knowledge and technology generated at the education center to society, thus contributing to improving the quality of life of people and the country.

In this context, during the decade of the 1930's the UC put its school laboratories for material testing to the service of the country's productive sectors. This vision is aligned with the creation of the Production Development Corporation (CORFO) in 1939, stating the existent synchronicity between the Catholic University and the technological development required in Chile.

As a part of this policy to strengthen bonds with society, in 1938 the

Institute of Material Research was created at the UC School of Engineering, which objectives were to provide certification of high-quality products, training, advanced courses, studies and project development in different engineering specialties.

In 1947, looking for a wider and more specialized service offering, the Directorate for Scientific and Technological Investigation of the Pontifical Catholic University of Chile, Dictuc, was created. The growing development of a more professional, industry-oriented work, encouraged the incorporation of Dictuc S.A. in 1994, as a subsidiary to the Pontifical Catholic University of Chile. Thus, a more fluid operation was achieved, under the concept of a private institution, which allowed the service offering to expand to sectors that were not exploited previously.

At the beginning of the year 2000, the country's new scenarios prompted Dictuc to incorporate innovation management and support to entrepreneurship, through the systematization of said services of creation, support and participation in R+D+I projects.

Nowadays, Dictuc puts the expert knowledge and the technology generated by the UC School of Engineering at the service of society. Dictuc shows its commitment to technological development through solutions that were created to cover for the country's needs, as well as a new image, and with its certification as a B type Company, it shows their concern and good practices performed on each one of their activities.





03.

03. | CORPORATE  
GOVERNANCE

## 3.1. BOARD



**ALDO CIPRIANO**

Chairman



**JAIME  
BELLIOLO**

Director



**JUAN CARLOS  
DE LA LLERA**

Director



**PATRICIO  
DONOSO**

Director



**JUAN CARLOS  
FERRER**

Director



**RENATO  
RAMÍREZ**

Director



**LORETO  
SEGUEL**

Director





## 3.2. DICTUC ADMINISTRATION



**FELIPE BAHAMONDES**

CEO



**GABRIELA  
MORAGA**

Finance and Administration  
Manager



**MARIELA  
SILVA**

Corporate Affairs Manager



**JULIO  
LAVARELLO**

Personnel Manager



**VIDAL  
RODRÍGUEZ**

Information Technologies  
Manager



**MARÍA ISABEL  
GALLARDO**

Quality and Environmental  
Assurance Manager



## 3.3. AREA MANAGERS



**VICTORIA  
LEIGHTON**

Food, Water, and Chemical  
Analysis Manager



**ÓSCAR  
PARADA**

Construction Manager







04.

04. | OUR  
PEOPLE



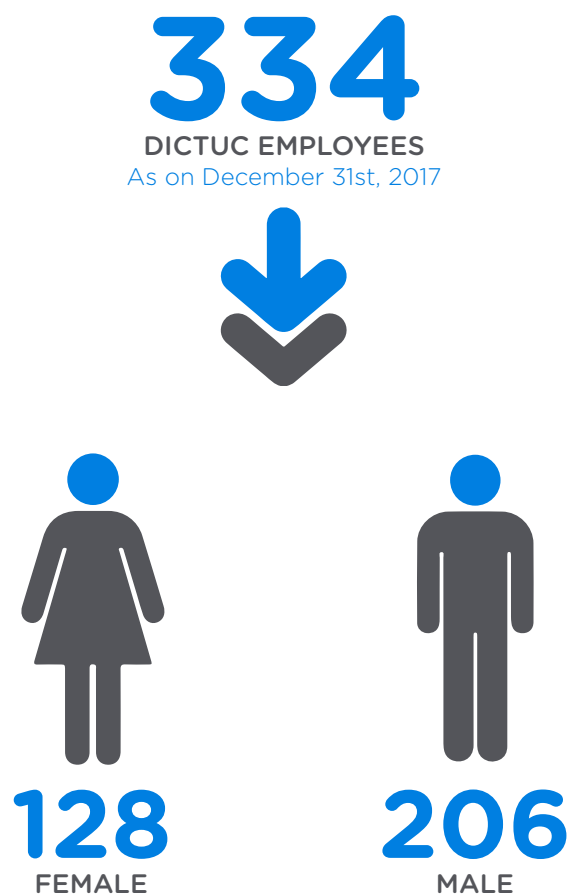
At Dictuc, we always seek to improve people's well-being and quality of life and, in this context, the concern for the collaborators has an essential place in the company's duty.

It is Dictuc's collaborators who devote their skills on a daily basis to carry forward the historical path of quality, objectivity, and trust. It is because of each one of the members of our

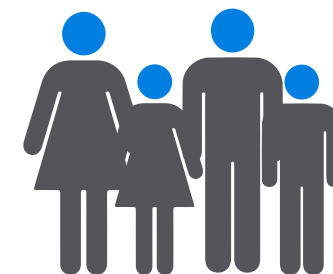
organization that Dictuc currently possess an important capacity to face the country's requirements and adapt to changes.



## 4.1. EMPLOYEE PROFILE



### AGE GROUP (AGE)



### SENIORITY (YEARS)



### LOAD PROFILE



## 4.2. RELATIONSHIP WITH EMPLOYEES

### 4.2.1 CORPORATE ENVIRONMENT



At Dictuc, we are convinced that a good corporate environment is fundamental to achieve the objectives and challenges set as a company.

In 2017, the Dictuc board decided to update the 2014 proposed goal of reaching a 70% approval in the Working Environment Survey, moving it up to a 75% in 2018's evaluation.

Through this type of challenges, we make an effort to create and improve the daily experience that our collaborators live inside our company.



## 2017 SURVEY RESULTS

The 2017 version of this survey was done with the participation of 380 collaborators who represented 91% of the company. 16 dimensions of the Working Environment were evaluated

through 48 questions, thanks to everyone's opinion.

By means of this evaluation, it was possible to define that we have a 75%

approval in the Working Environment Survey. In order to achieve these results, we worked all year around to correct the shortcomings observed in the previous assessment.



## WORKING ENVIRONMENT-RELATED ACTIONS

The actions implemented for the improvement of the Corporate Environment are a series of measures that were planned according to the relevant topics observed during the survey. According to the needs posed in 2016, the implemented actions during 2017 were:

### TRAINING AND DEVELOPMENT

Training for employees, technical as well as other cross-disciplinary themes (English, Basic Finances), free of charge for them.

### COMMUNICATIONS

Mass meetings with units and their managers, in order to present results and goals to accomplish.

### SOCIAL SUPPORT

Financial support for collaborators in difficult situations, be it family, economic or health-related.

### PERFORMANCE

The launch of a new online platform for Performance Assessment, along with an adaptation of skills that is defined by position profiles and the possibility for each employee to perform self-assessment.

### BENEFITS

New agreements regarding recreational, health and financial matters. In addition, the location for the Christmas Party was changed, again being celebrated in a country club, in a family-oriented recreational manner.



### UNITS WITH A LOW LEVEL OF APPROVAL OF CORPORATE ENVIRONMENT:

The three units that showed the lowest levels of approval in 2016 were supported in their management, insisting in the importance of communication, leadership, and compliance with the commitments as a foundation for the improvement of their results regarding the working environment.



During the 2017 survey, these units substantially increased their levels of approval, due to their own work during the year.

UNIT 3  
**49,4%**

UNIT 2  
**47,6%**

UNIT 1  
**42,8%**



Level of Approval  
**NOV 2016**

UNIT 3  
**65,5%**

UNIT 2  
**74,7%**

UNIT 1  
**72,6%**



Level of Approval  
**NOV 2017**

#### •ACKNOWLEDGMENT:

Establishment of the Acknowledgement Committee, formed by the collaborators of different units and

positions, where the focus was to set forth the most important aspects and how to acknowledge our people. An

online acknowledgment platform was developed via our Intranet, which will be launched in 2018.

## 4.2.2. BENEFITS AND AGREEMENTS

### A.- BENEFITS

- **NATIONAL HOLIDAYS AND CHRISTMAS BONUSES**

We grant a bonus on the last working day before festivities.

- **ACKNOWLEDGMENT FOR SENIORITY**

In 2017, we awarded 20 people for their years of service in a formal ceremony. The collaborators who had been in the company for 20 to 25 years received a two-night stay at a hotel as an award.

#### Years of permanence

10 years

15 years

20 years

25 years

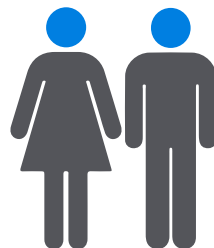
#### Employees per year

08 employees

05 employees

03 employees

04 employees





### • SUPPLEMENTARY HEALTH, CATASTROPHIC AND LIFE INSURANCE

Health insurances cover both the employees and their families, and the premium is paid by the company in its entirety; there is no co-payment made by the collaborators.

In 2017, a bidding for the renewal of the policies was made for the first time, with different companies and agents being invited to participate. Finally, we chose to stay with the company that has been with us for more than 15 years.

### • SUPPORT BONUSES: MARRIAGE, BIRTH, AND DEATH OF A PARTNER OR CHILDREN.

During the year 2017, we granted a total of 45 bonuses to our collaborators. Details are presented below:



 | **27**  
BIRTH

 | **09**  
DEATH

 | **09**  
MARRIAGE - CIVIL UNION

#### • PAID LEAVE OF ABSENCE

Collaborators can apply for special paid leaves of absence, in case of marriage, birth, change of residence, death, birthdays and administrative days.

#### • STUDENT SUPPORT BONUSES

This bonus can cover for pre-school, school and university tuition expenses. It applies to both the collaborator's children and/or collaborators who are currently studying.

During 2017, we granted 207 Student Support Bonuses, between the months of March and April. Below, the number of bonuses is detailed by educational level and month of payment:



**69**  
BONUSES | MARCH  
Elementary  
Education

**38**  
BONUSES | MARCH  
Secondary  
Education

**53**  
BONUSES | MARCH  
Professional  
Education

**25**  
BONUSES | APRIL  
Elementary  
Education

**12**  
BONUSES | APRIL  
Secondary  
Education

**10**  
BONUSES | APRIL  
Professional  
Education



**207**  
BONUSES 2017

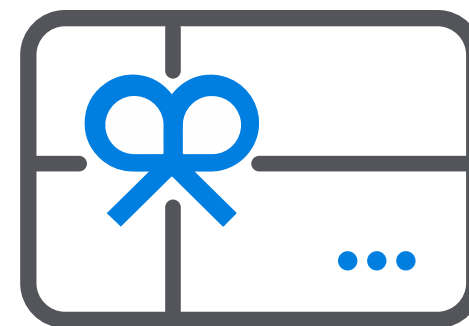


## • GIFTS, CELEBRATIONS AND OTHER ACTIVITIES

During the year, we conducted various recreational activities to share within the community, we gave gifts during important life moments and celebrated important dates:

### GIFTS

<b>383</b>	<b>76</b>	<b>114</b>	<b>22</b>	<b>150</b>	<b>304</b>
Mampato's Tickets	Mother's Day	Father's Day	Administrati- ve Professio- nal's Day	Christmas gifts for the employee's children	Christmas gift



### CELEBRATIONS AND OTHER ACTIVITIES

- **Christmas party** : On the 25th of November, at Casona Lonquen, the employees and their families had a recreational day and a lunch picnic in the countryside.
- **Agreements and bonuses fair**: On the 15th of December, companies that share an agreement with Dictuc presented each one of their benefits in detail. Additionally, a draw was held, as well as a gift giveaway.
- **Personal finance workshop**: On the 29th of September, a workshop related to the organized and responsible management of income and personal expenses was held.
- **Administrative Professionals' Day**: On the 1st of December, the Administrative professionals' day was celebrated, including a meal and a dance show.
- **Personal finance workshop**: On the 29th of September, a workshop related to the organized and responsible management of income and personal expenses was held.

## • COMPENSATORY BONUS FOR NURSERY AND DAYCARE BENEFIT

### COMPENSATORY BONUS FOR NURSERY:

With this bonus, the employees who cannot bring their children to a nursery due to health issues receive financial support until their child is 2 years old. **4 employees who received the benefit.**

### DAYCARE BENEFIT:

Financial support is offered to employees who cannot pay for the total monthly fee related to daycare, through an allowance equal to 1/3 or 2/3 of its cost.

The details regarding the number of employees who used the benefit are listed below:

**7 Employees who received the benefit PUC / 3 Employees who received the benefit External collaborators**

## • FINANCIAL SUPPORT:

This support was offered to those employees who presented their cases to Personnel Management. Overall, when employees have faced high-cost health circumstances, the company pays the service provider directly, where the employee contracts a soft credit agreement with Dictuc.

The details regarding the employees and the amount granted by item are listed below:

**04**  
BENEFITED  
EMPLOYEES | SUPPORT  
SOCIAL

**04**  
BENEFITED  
EMPLOYEES | SUPPORT  
HEALTH



**18.389.323 CLP**  
TOTAL AMOUNT  
GRANTED/OFFERED

## B.- AGREEMENTS

In 2017, a series of new agreements were added to those that were already available for our collaborators:

### • HEALTH

Isapre Consalud: collective agreement to offer health plans at a preferential cost. This in addition to the collective plans we already provide with Cruz Blanca and Colmena.

### • STUDIES

UC Engineering Professional Education: discount percentage in the cost for specialization degrees and study programs.

### • FINANCIAL

BCI NOVA Bank: the agreement that offers loans alternatives for personal purposes or debt reorganization is now reactivated.

### • ENTERTAINMENT

Preferential prices for activities such as Comic-Con and Planeta Juguete (Toy Planet). Additionally, a sports workshop including Dance and Pilates was conducted with a discount price.





### 4.2.3. PROFESSIONAL DEVELOPMENT

#### • DICTUC SCHOLARSHIPS

Scholarships of financing shared between the Unit, Dictuc and the employee, covering up to 58% of technical, undergraduate and graduate studies, in a field related to their position.

2014	2015	2016	2017
<b>11 SCHOLARSHIPS</b> 16 APPLICANTS	<b>12 SCHOLARSHIPS</b> 19 APPLICANTS	<b>07 SCHOLARSHIPS</b> 11 APPLICANTS	<b>07 SCHOLARSHIPS</b> 08 APPLICANTS



#### • TRAINING

During 2017, **274 training activities** were conducted, representing **15,044 hours of training**.

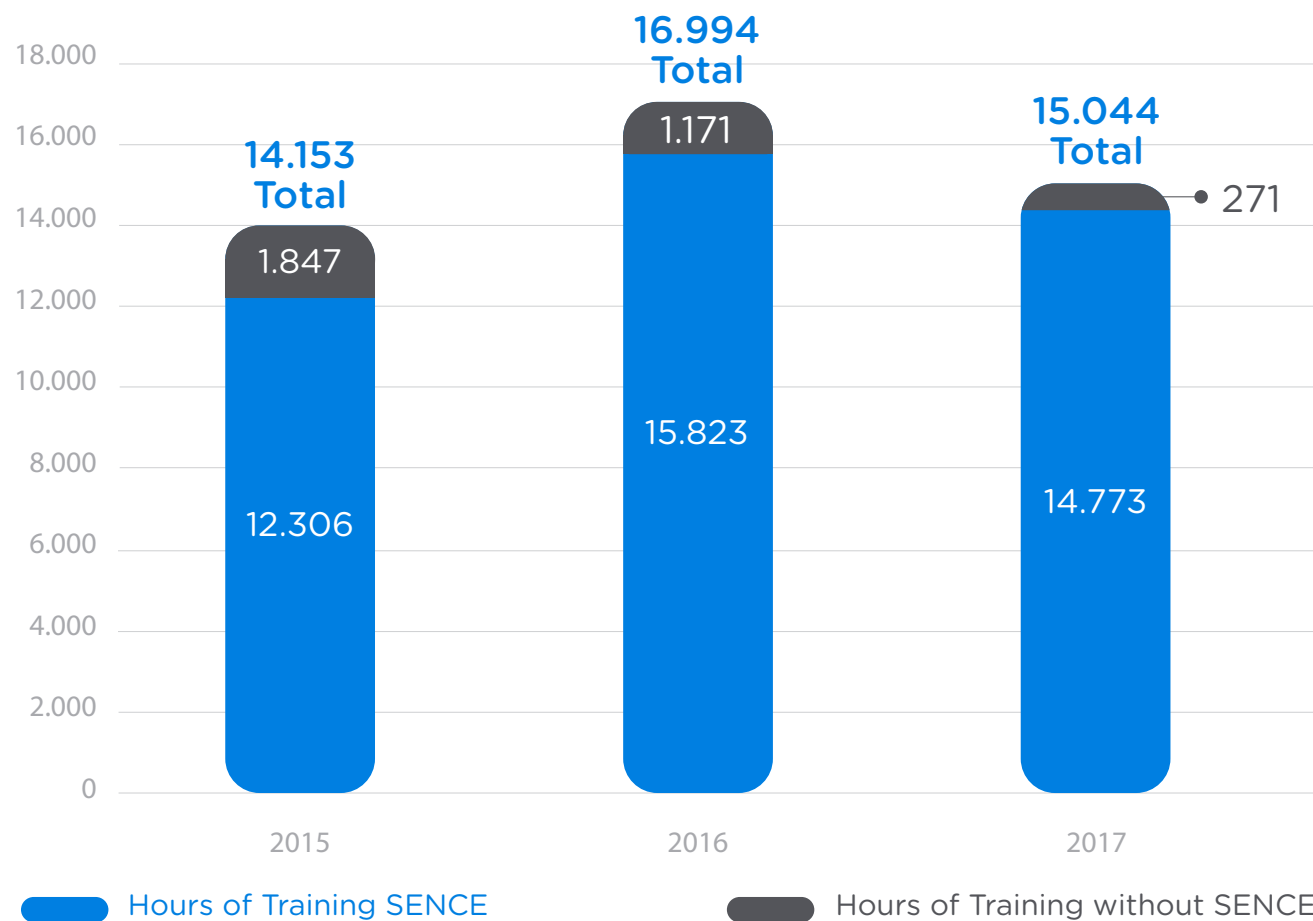
Employees benefited:

**40**  
WITH SENCE

**49**  
WITHOUT SENCE



## Training Hours



#### 4.2.4. OCCUPATIONAL HEALTH AND SAFETY

The measures we took to improve Occupational Health and Safety during 2017 were:

- **THE “I LOOK AFTER MYSELF, DICTUC LOOKS AFTER ME” PROGRAM**

Safety education plan.

Safety Reflections on an ongoing and rigorous basis.

Safety observations.

Planned inspections.

Safety (and other specific) training.

- In-class training courses conducted by Mutual de Seguridad: 364 hrs
- E-Learning training courses conducted by Mutual de Seguridad: 288 hrs



**Yo**  
**me cuido**   
**Dictuc me cuida**  
Aquí la seguridad la hacemos todos



• **COMPETITIVE COMPANY PROGRAM (PEC - PROGRAMA EMPRESA COMPETITIVA):**

Training for PEC supervisors of each unit.  
Internal audit in every unit.

• **JOINT COMMITTEE:**

Accident investigation.  
Unit tours and inspections.



<b>14</b>   WORK ACCIDENTS	<b>125</b>   LOST DAYS	<b>0</b>   FATAL ACCIDENTS	➔	<b>2015</b>
<b>08</b>   WORK ACCIDENTS	<b>138</b>   LOST DAYS	<b>0</b>   FATAL ACCIDENTS	➔	<b>2016</b>
<b>14</b>   WORK ACCIDENTS	<b>54</b>   LOST DAYS	<b>0</b>   FATAL ACCIDENTS	➔	<b>2017</b>

Source: Mutual de Seguridad C.Ch.C.



05.

05. | OUT  
WORK



## 5.1. SECTORS

To achieve our dream of being the country's engine for technological development, we have defined nine sectors or national concern topics, in which Dictuc puts their different specialists to the service of society, in order to offer solutions that stand out because of the quality of its results and the innovation applied in them.



Food and Health



Education



Energy



Management



Industry and Mining



Infrastructure and  
Construction



Sustainability and  
Natural Resources



Transport  
and Logistics



Information  
Technology

## 5.2. TYPES OF SERVICES

Complying with the definition of the Sectors Dictuc serves, there is also a service structuring according to the type. According to this, currently at Dictuc, the following types of services are developed:



**Consultancy and Studies**



**Certification**



**Technical Training**



**Technical Assessments**



**Laboratory Test**



**Technology Transfer**



**Inspections**

## 5.3. SERVICE UNITS

Dictuc performs its work through service units, which are led by a managing professor or an academic department of the UC School of Engineering. Likewise, other units are under the administrative management of Area Management of Dictuc.

The Units also provide services to an endless number of specialties in engineering, related to different issues of national concern, and they are formed by teams of professionals, technicians, and administrative, committed to Dictuc's mission to face the challenges the country requires.

The work in these units is backed by a management system that ensures quality in their processes and results.









## FOOD AND CHEMICAL ANALYSIS

✉ [alimentos@dictuc.cl](mailto:alimentos@dictuc.cl)



This unit is specialized in offering solutions to the food industry, by performing services which allow the quality assessment of food and food elaboration facilities.

In order to achieve this, the unit has specialized Food, Microbiology and Chemical Analysis laboratories, where everything from the food's nutritional value tagging to their microbiological features are evaluated.

Additionally, this unit is responsible for carrying out comprehensive environmental contamination analysis in locations where food is elaborated, which includes their handlers, utensils, and surfaces.

## WATERS AND LIQUID INDUSTRIAL RESIDUES ANALYSIS

✉ [aguasyriles@dictuc.cl](mailto:aguasyriles@dictuc.cl)



This unit has the specialized equipment to carry out certification processes about the quality of water, in order to ensure compliance with the regulations established by the sanitary and health authority.

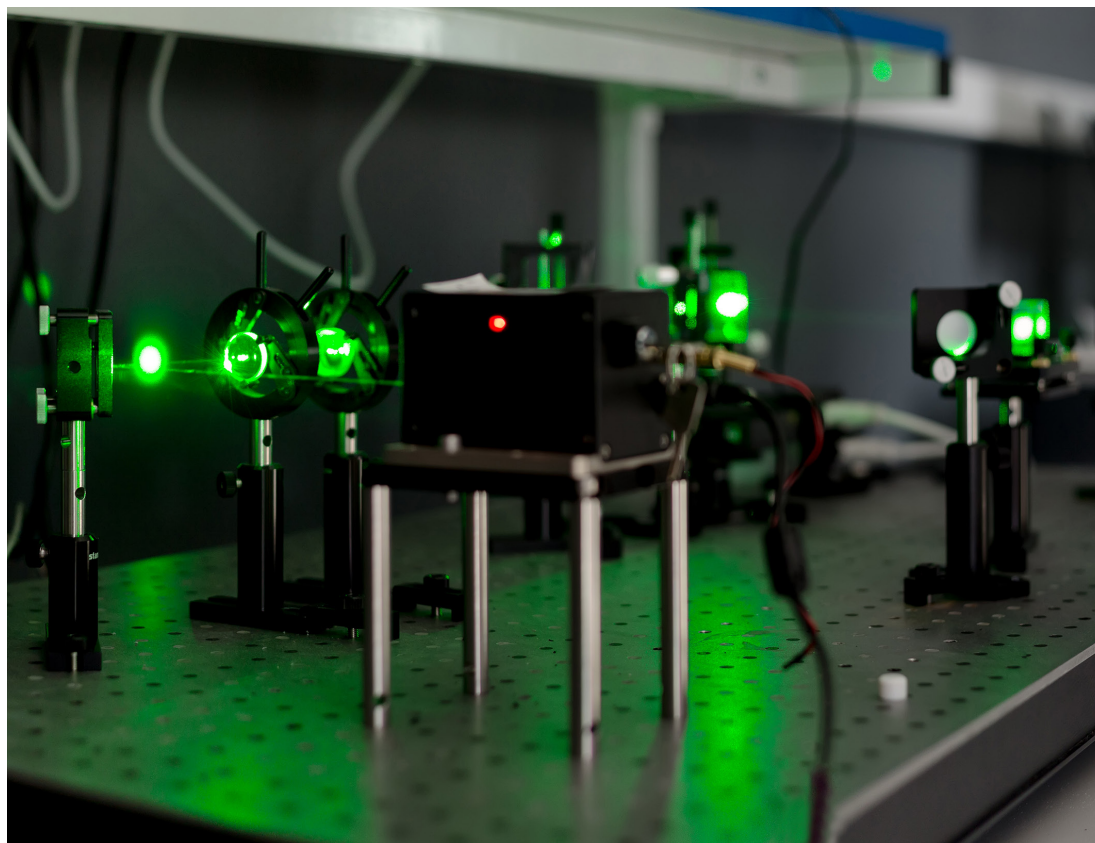
Thus, all services conducted by this unit represent an effective solution for industries that require to guarantee the quality of water destined for drinking use, irrigation, residuals, and dialysis.

All these processes are performed through a variety of tools the unit has in its premises, such as spectrometers, chromatographs, spectrophotometers, specific electrodes, autoclaves, furnaces and thermo-regulated water baths.



## ANDES SCIENTIFIC INSTRUMENTS

✉ [asi@dictuc.cl](mailto:asi@dictuc.cl)



This unit focuses its work on the development of prototypes that will later be transformed into products, which are specially designed to respond to technological demands in society, such as sensors, devices, and instruments capable of measuring subtle variables in optics, electronics, mechanics, cryogenics, and software.

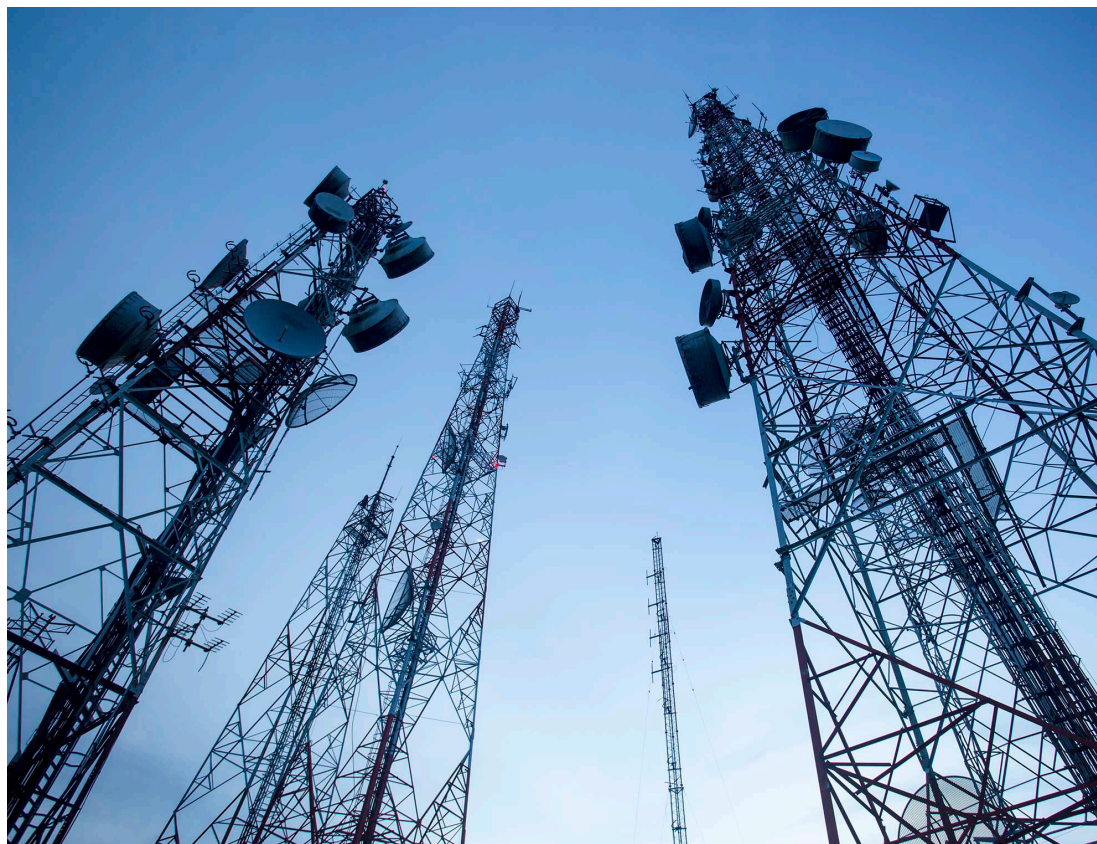
Nowadays, the unit is vastly experienced in developing and creating comprehensive solutions for clients involved in the elaboration of supporting tools for the mining industry, astronomical sciences, and life sciences.



**01**  
CUSTOMERS  
serviced 2017

## CONSULTANCY AND POWER SURVEYS

✉ [serviciosyperitajeselectricos@dictuc.cl](mailto:serviciosyperitajeselectricos@dictuc.cl)



A unit specialized in offering solutions for the field of electricity and electronics, through reports made by experts, consultancies, studies, inspections and laboratory tests, in areas related to electrical power, telecommunications, industry, construction, mining, and electronics.

This unit has the specialized equipment to perform the needed measurements in order to answer questions about equipment failure, fires, and accidents caused by electricity. Additionally, the unit can perform calculations in order to verify the quality of power supply in different circumstances.

The services provided by this unit are subjected to the Department of Electrical Engineering of the UC School of Engineering.

## SCENTS AND FLAVORS CENTER

✉ [aromas@dictuc.cl](mailto:aromas@dictuc.cl)



This unit keeps their focus on chemical, sensory and hedonic components of food and drinks, in order to analyze the features of their raw materials and develop improvements, both in the properties of the product and the sensory experience of the end consumer.

The unit's extensive experience, as well as their advanced technological equipment, offers solutions to industries that need to test the durability of their products in many different conditions, to know their consumers' preferences and to develop new products.

The Scents and Flavors Center unit has acknowledgment and certifications granted by the Chilean National Standardization Institute (INN) and SGS, according to international regulations in force.

 **139**  
CUSTOMERS  
serviced 2017



## CETIUC

✉ [cetiuc@dictuc.cl](mailto:cetiuc@dictuc.cl)



This unit contributes to the country's development through the study and promotion of subjects related to the strategic use of Information Technologies inside organizations. Within this field of work, it delivers objective information and it is a source for broadcasting new knowledge, offering a valuable experience so that every institution accomplishes the objectives they set out.

CETIUC makes different types of studies available for all their clients, which assess satisfaction and responsible practices that are needed to apply to Information Technologies, thus ensuring an efficient, trustworthy and excellent performance.

 **70**  
CUSTOMERS  
serviced 2017

## CORPORATE INFORMATION TECHNOLOGY

✉ [computacioncorporativa@dictuc.cl](mailto:computacioncorporativa@dictuc.cl)



This unit boosts business processes of small and medium enterprises through the development of custom-made software. Additionally, it enters the educational field thanks to their work with Carnegie Learning Inc. (Pittsburg, USA), to implement support systems for school learning through cognitive tutor technology.

The Corporate Information Technology unit offers different modern methodologies of software engineering, such as design and implementation of relational databases, the development of custom software, computer systems, consultancy services, and mentoring for school-level mathematics teaching.



## SOLAR POWER

✉ [energiasolar@dictuc.cl](mailto:energiasolar@dictuc.cl)



This unit is specialized in the development of projects that promote the use of sustainable energy, stating its benefits and reducing financial risks for their clients to a minimum. By doing so, the unit directly contributes to the development of a more environmental-friendly society.

The solar power unit mainly offers assessment services for the feasibility of solar power projects, solar power systems performance assessment and diagnostics, technical inspection and auditing plants that work with this type of energy, measurements of the solar resource through satellite stations and images, and calibrating sensors with the help of radiation meters.

In order to carry out these services, the unit has a laboratory spanning over 150 m<sup>2</sup>, which includes robotics equipment for solar panel maintenance, tracking systems for direct radiation research, performance assessment tools, weather analysis, data storage, and observation devices.



## INNOVATION MANAGEMENT

✉ [gestiondelainnovacion@dictuc.cl](mailto:gestiondelainnovacion@dictuc.cl)



This unit advises public and private institutions in the implementation of innovation programs, acting as a management tool. With a team formed by national and international experts, who are entrepreneurship specialists, they work using models that help organizations to achieve a high level of profitability.

The Innovation Management unit offers diagnostics, workshops, and training especially focused on reinforcing their capacities for the creation of value in these organizations. This is why Dictuc is regarded as a leading company in subjects related to competitive strategy, processes, corporate management, mobilization and innovation environments.

## GREENLAB

✉ [greenlab@dictuc.cl](mailto:greenlab@dictuc.cl)



This unit focuses its efforts in subjects related to sustainability, environmental management, energy and climate change, elaborating proposals that aim at a more environmentally responsible country, which is seen in studies and consultancy instances offered by both public and private institutions.

GreenLab offers a wide range of tools used to solve many different issues associated with sustainability. Among these issues, environmental decontamination, climate change, risk analysis and prevention, and the research for alternatives that compensate emissions, as well as strategic consultancies.

In order to conduct these studies, they use specialized software to offer visual references about the creation, analysis, and communication of decision-making models, and promoting the capacities for handling Geo-referenced data.

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## HYDROGEOLOGY

✉ [hidrogeologia@dictuc.cl](mailto:hidrogeologia@dictuc.cl)



This unit is in charge of elaborating rigorous hydraulic studies to offer solutions to issues regarding superficial and underground waters and their distribution and evolution in time and space, always within the framework defined by the geology of the zone under study.

The projects implemented by the Hydro-geology Unit are conducted by a team of highly trained professionals with an extensive career in the fields of hydraulics, hydrology, and hydrogeology.

From this space, valuable solutions and contributions are delivered, which are observed in services related to the measurement of environmental variables in hydro-geology and hydro-geological modeling.



# FIRE PROTECTION ENGINEERING

✉ [fuego@dictuc.cl](mailto:fuego@dictuc.cl)



This unit covers subjects associated with safety in case of fire and the most appropriate practices for their prevention by using an engineering approach. For that purpose, Dictuc possesses a complete set of equipment that allows conducting trials according to the requirements of national and international regulations.

In that way, the unit advises companies for the development of products or premises that guarantee more safety regarding fire prevention. Additionally, they perform risk assessment in order to identify and rationalize the measures to be used in different types of premises, focused mainly on people's safety, protection of property, and operational continuity.

Likewise, in order to define causes, sources, fire spreading methods, as well as other losses, the Fire Protection Engineering Unit conducts detailed research and assessment about the incidents.

# TRANSPORTATION AND LOGISTICS ENGINEERING

✉ [transporte@dictuc.cl](mailto:transporte@dictuc.cl)



This unit offers solutions for a wide range of issues related to transportation planning and management, delivered by specialized professionals in the field of comprehensive traffic analysis, the calculation of transport services demand, transportation networks design and modeling, and also operations in the logistics chain.

Studies regarding road impact (EISTU - Impact over Urban Transportation System Studies), fleet analysis, accident investigation, road safety counseling and preference studies, among others, are offered by the Transportation and Logistics Engineering Unit as services.

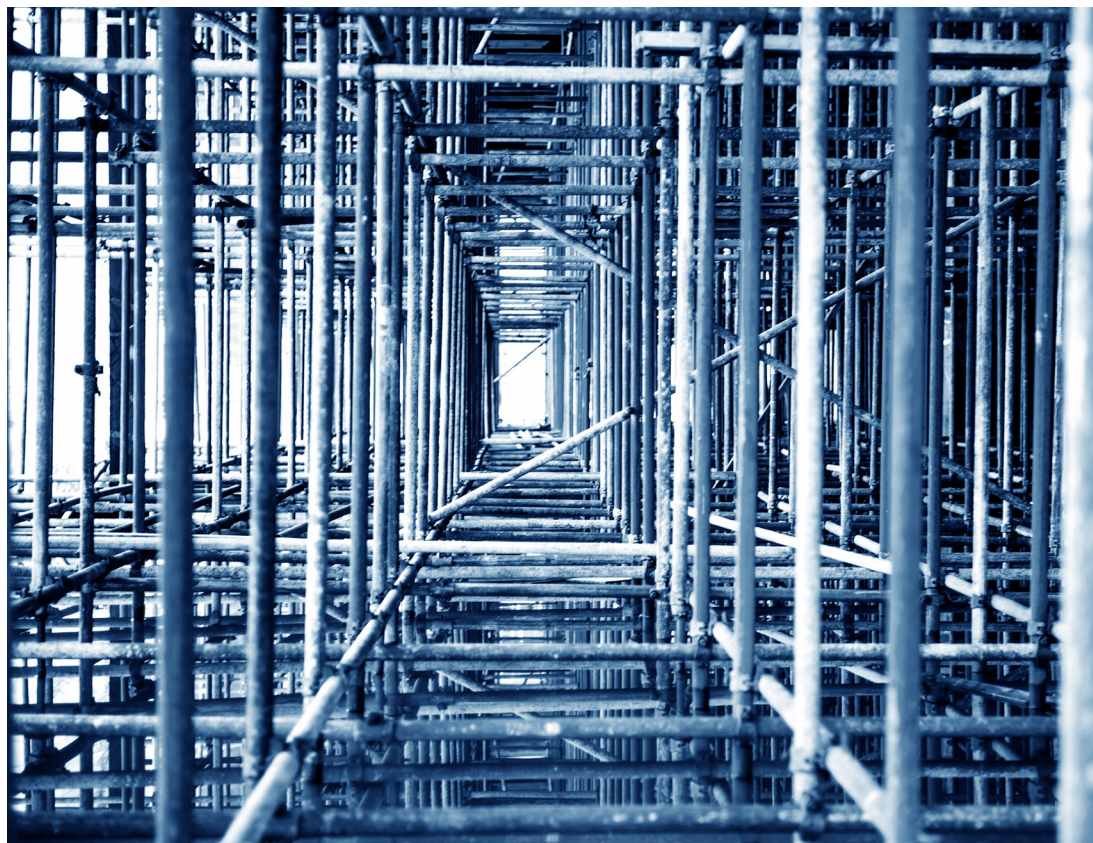
The unit possesses a wide variety of simulation software, geographic information systems, and special photo cameras, to develop strategies that guarantee smooth, safe and efficient vehicular and pedestrian traffic.

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# STRUCTURAL ENGINEERING

✉ [ingenieriaestructural@dictuc.cl](mailto:ingenieriaestructural@dictuc.cl)



This unit offers specialized solutions for the assessment, verification, and reinforcement of different types of structures and buildings. Within its main features, we observe the vast experience seen in the professionals who form the teams regarding emblematic projects.

Additionally, the unit has a modern Static Test Laboratory, equipped with a reaction flagstone and wall, including three 60/30-ton actuators, and a vibration table of four-ton capacity.

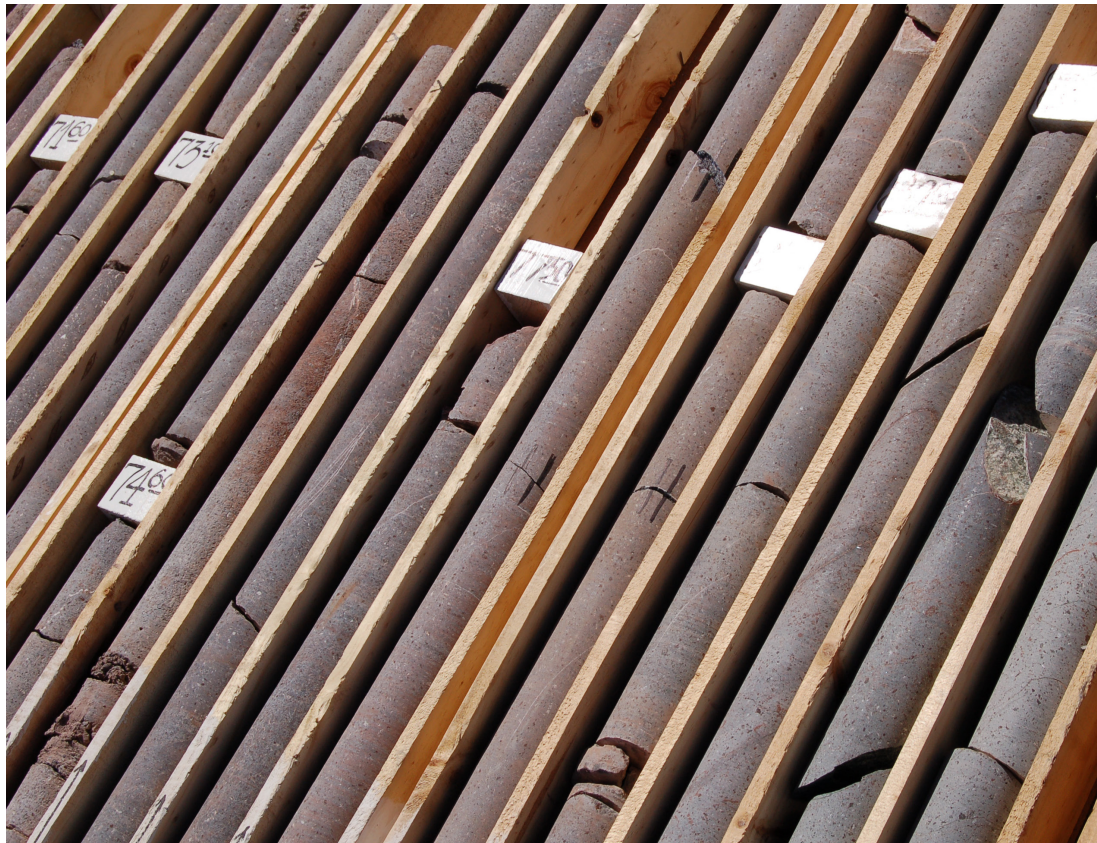
In order to guarantee the projects covering the client's needs completely, the Structural Engineering Unit performs its services both within its premises as well as on the field.

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## GEOTECHNICAL ENGINEERING AND SOIL MECHANICS

✉ [mecanicadesuelos@dictuc.cl](mailto:mecanicadesuelos@dictuc.cl)

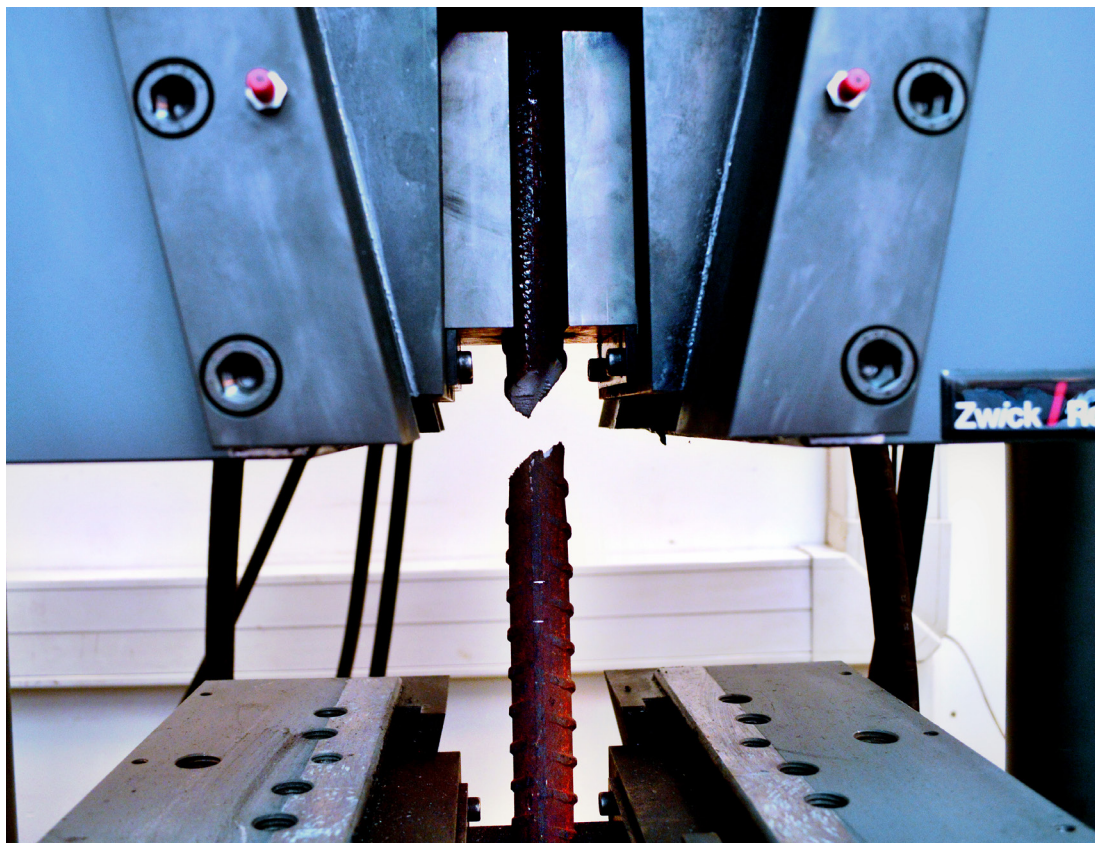


This unit conducts research on site to prove the feasibility of developing civil projects, highways, and pavement floors. Solutions are offered to companies in the fields of mining, construction, and energy in the form of consultancy, Geotechnical surveying, special soil trials and compression control.

Within its premises, the Geotechnical Engineering and Soil Mechanics Unit has a certified laboratory in place for its use in trials in compliance with LE343 - LE344, in agreement with INN and the Ministry of Housing and Urban Development (MINVU). Thus, the unit ensures the needed technology to meet today's engineering requirements.

## MECHANICAL ENGINEERING

✉ ingenieriamecanica@dictuc.cl



This unit focuses its services on the certification, testing, and inspection of a wide variety of products related to the construction, safety, agriculture, fuel and sanitary facilities industries.

The Mechanical Engineering Unit's modern equipment allows the conduction of trials to test features like traction, folding, hardness, bending, compression and accelerated aging in different types of materials.

Additionally, the unit serves as a Certification Entity for steel, safety, drinking water and gas products, as well as agricultural irrigation and hyperbaric chambers.

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## THERMAL ENGINEERING AND ENVIRONMENT

✉ [ingenieria-termica@dictuc.cl](mailto:ingenieria-termica@dictuc.cl)



This unit performs counseling and studies focused on offering solutions related to the process of conversion and the use of thermal energies. In order to complement the team of specialists that form this unit, they have the support from the UC School of Engineering scholars who can contribute from more specific areas on each one of the subjects, all of this in order to offer a comprehensive service that is tailored to the client's needs.

The Thermal Engineering and Environment unit performs energy balances during thermal processes, thermo-graphic studies, and measurements related to heating and contamination capacity caused by stoves in households.

Additionally, it delivers training on gas burners, air conditioning equipment, energy efficiency and safe handling of fuels and steam boilers.

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# ROAD ENGINEERING

✉ [ciiv@dictuc.cl](mailto:ciiv@dictuc.cl)



This unit performs consultancies, studies, and laboratory tests for public and private institutions which require solutions in the road engineering field. Due to the features in the services offered, their main customers are institutions involved in the fields of construction, highway concessions, forestry, and mining.

Within their activities, this unit also performs an important technological Research and Development work, keeping an active participation in the development of relevant projects for the unit, which benefits the scientific community, productive services and, above all, the society.

Additionally, the Road Engineering unit has a special focus on knowledge transfer. By doing so, it makes use of their expert knowledge to conduct training activities, such as courses and seminars, intended to promote the unit's own knowledge and make a difference on the subject, both for national and international education.

## DYNAMIC TEST LABORATORY

✉ [lead@dictuc.cl](mailto:lead@dictuc.cl)



This unit, which specializes in seismic base isolation and energy dissipation, focuses their work on the study of structural and mechanic vibration reduction systems, aiming to offer real solutions to decisions required by their clients about this subject.

In order to perform these studies, the Dynamic Test Laboratory Unit has all the necessary instrumentation for the measurement of shifts, speeds, and forces. All these with diverse systems of load application, which allows it to have a great flexibility in the configuration of different trials to be performed.

Thus, with the equipment available at the laboratory, it is possible to simulate seismic action, through real or cyclic seismic movements in structural elements of any kind, be it on a real or reduced scale.



## HYDRAULICS LABORATORY

✉ [labhidraulica@dictuc.cl](mailto:labhidraulica@dictuc.cl)



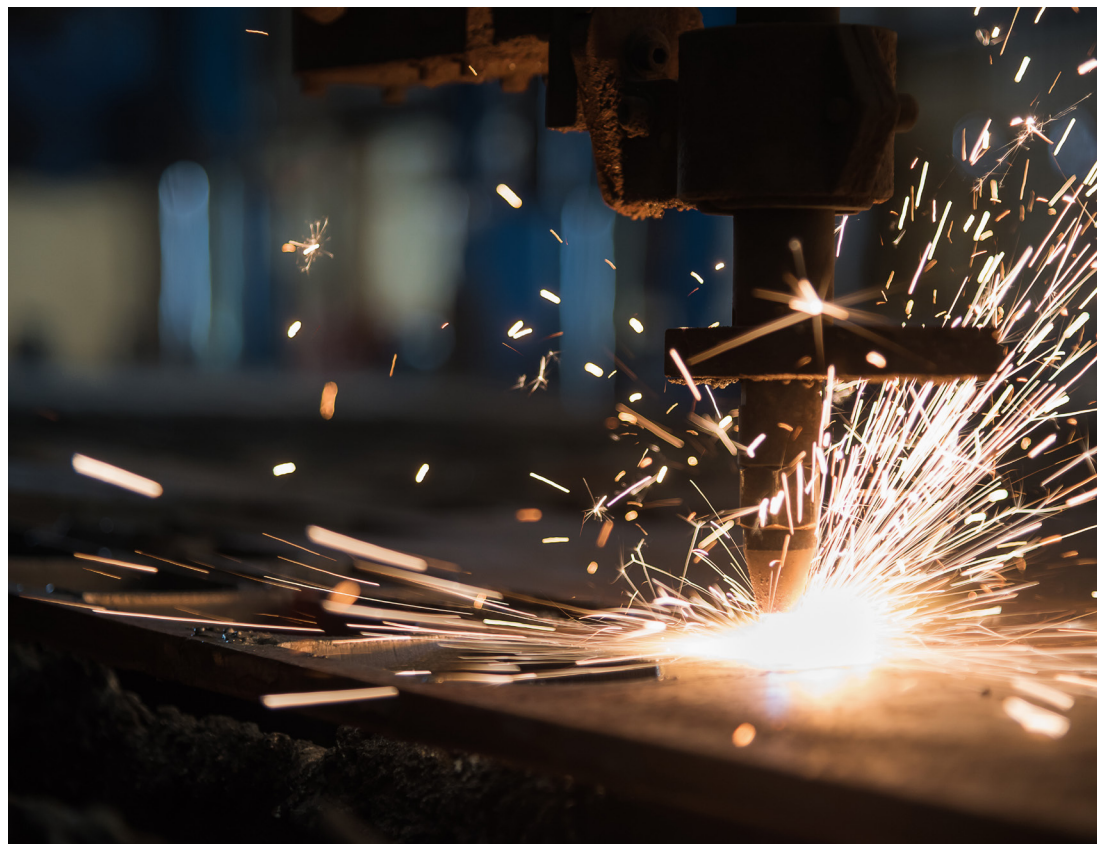
This unit is not only backed up by the professionals who form the team, but also a long career beginning in 1923, in the Pontifical Catholic University of Chile's Main Campus and keeping in a large number of physical models on their records for their use in important hydraulic works.

Through the use of the physical models, the unit offers a trustworthy instrument for the research of hydraulic and non-conventional structure behaviors. By doing so, experts analyze, design, and optimize engineering works, perform research that is specifically applied to the subject; and deal with the mechanics of fluids and hydraulic machines, in order to develop projects that are tailor-made to the client's needs.



## METALLURGY AND MATERIALS LABORATORY

✉ [metalurgica@dictuc.cl](mailto:metalurgica@dictuc.cl)

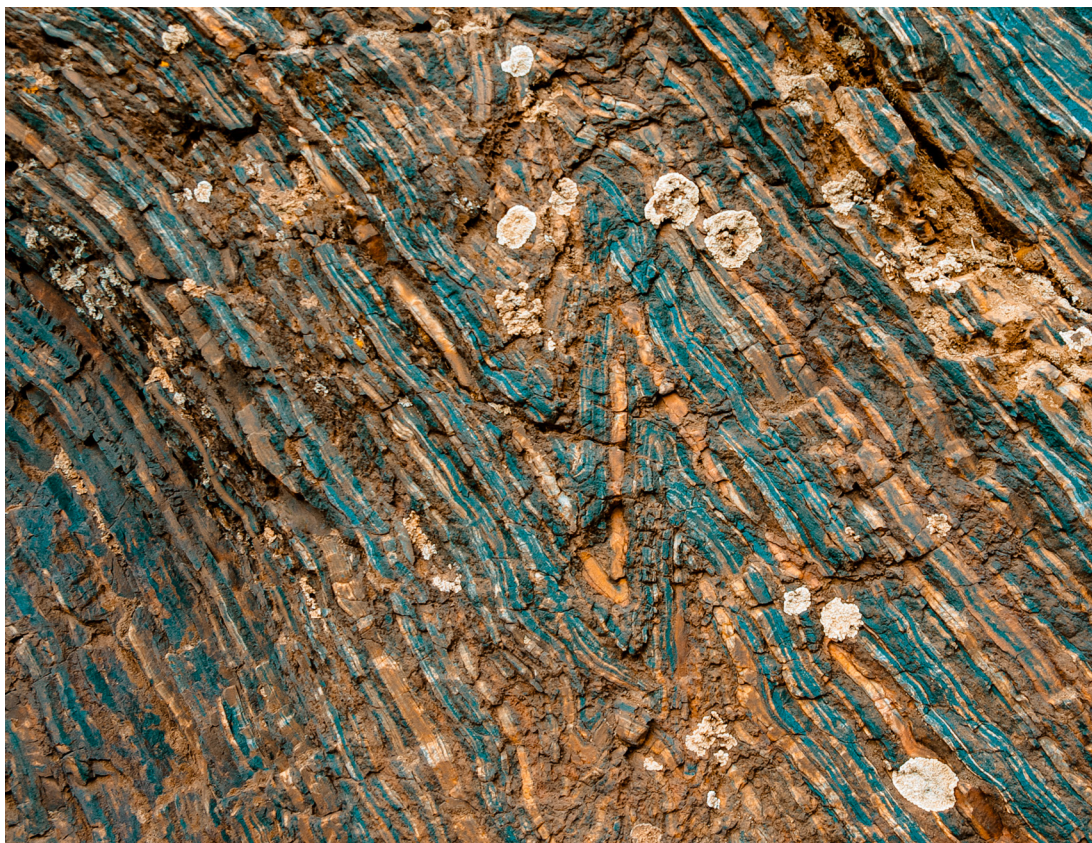


This unit performs laboratory tests to define the characterization of materials in mechanic services needed by their clients. Additionally, it has all the necessary equipment available to analyze failures caused by broken parts or machine elements, by material wearing, or metal corrosion.

Another field covered by the unit is related to measuring mechanical properties that are linked to metallic alloys, as well as micro and macro-graphic observations of different types of engineering materials.

## ADVANCED TECHNOLOGICAL LABORATORY FOR MINING

✉ [labmineria@dictuc.cl](mailto:labmineria@dictuc.cl)



This unit has more than 15 years of experience in the areas of Mining and Environmental Protection, as well as a solid backup given by their capacity for technological research and development. This is considered a strong foundation to support the initiatives of companies and small entrepreneurs, and also encourage the technological development needed in the mining industry.

The unit provides knowledge and advanced technology services to the industry and society, always ensuring the preservation of the quality of information being analyzed, in order to eliminate hidden losses and maximize the available resources in mining operations.

Additionally, various regulated trials are conducted for the certification of common use consumables and solid residues in mining, such as the NSF-NSI 61 Norm for the classification of materials in contact with drinking water, the NSF-ANSI 50 Norm for the classification of materials in contact with water for recreational use, the application of the Chilean 1330 Norm for the use of irrigation water, an analysis of solid residuals for their elimination, according to the 148 supreme decree, among others.



## MECHATRONICS

✉ [mecatronica@dictuc.cl](mailto:mecatronica@dictuc.cl)



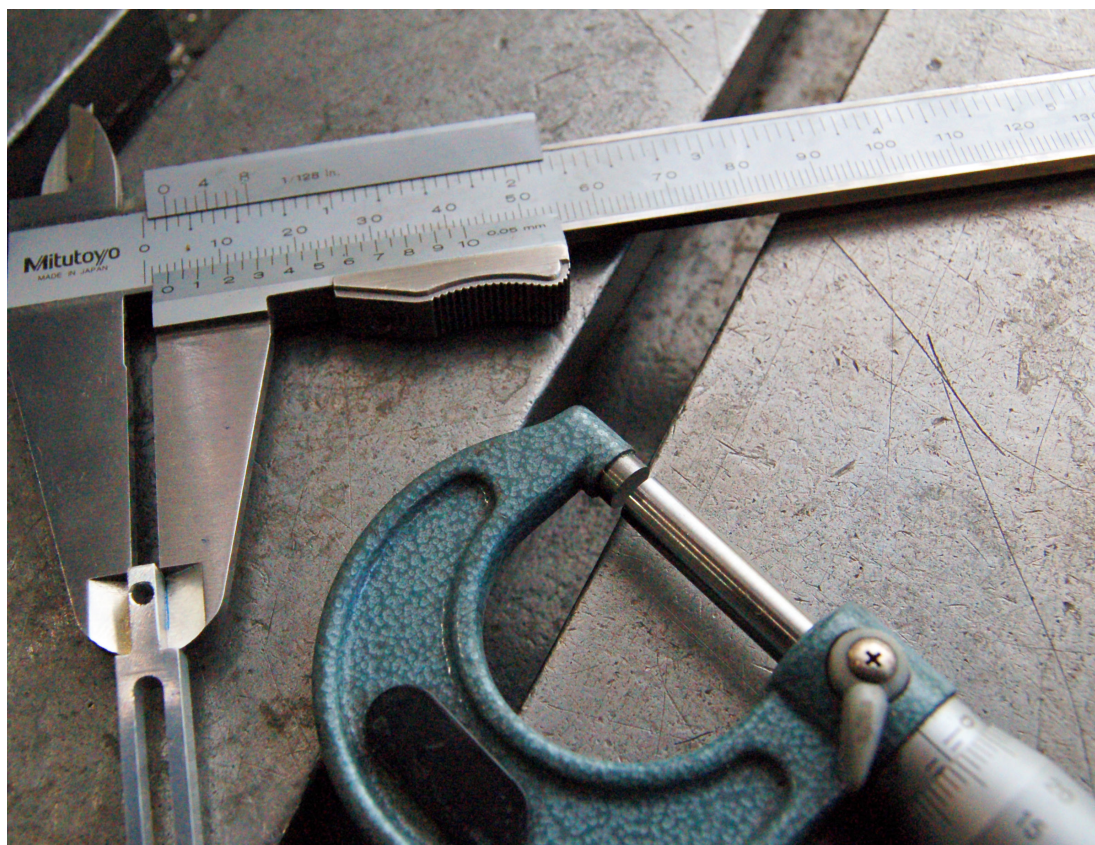
This unit is specialized in offering technological solutions to complex industrial problems, which need to be solved through methods and technologies with advanced design and elaboration processes, coming from the fields of mechanical, electronic, structural and computer engineering.

Thus, the solutions offered by this unit are focused on research and development projects related to mechatronics, as well as the design, elaboration, and operation of mechanisms, and robotic systems.



# METROLOGY

✉ [metrologia@dictuc.cl](mailto:metrologia@dictuc.cl)



This unit is specialized in calibrating instruments and measuring patterns. In order to do this, a team of professionals defines the flaws observed on instruments and patterns used in the productive processes of their clients, and make the necessary adjustments to the control systems that regulate them.

The metrology laboratory has properly traced, advanced technology equipment for the application of measurements for dimension, torque, pressure, and temperature. Additionally, the unit has the Dakks certification from Germany and the Best Measurement Capabilities (measurement uncertainties), recognized and published on the International Bureau of Weights and Measures (BIPM) database.

Moreover, the unit manages the National Standards Custodian Laboratory for Magnitude and Length, appointed in 2001 via decree N°96 of the Ministry of Economy. By these means, they can guarantee the measures taken within the national territory are compatible and comparable to those of any country, in order to enable domestic and foreign trade.

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## ASSESSMENTS, CONSULTANCY, AND INSPECTIONS

✉ [pai@dictuc.cl](mailto:pai@dictuc.cl)



This unit is responsible for the systematization of the multidisciplinary capacities of Dictuc's units related to Construction, in order to develop consultancy, inspection and certification services that prevent shortages in consumables, processes, and products; and when observed, it is also responsible for the creation of reports made by experts that help to discern the most probable causes.

In order to complement the entire range of fields covered by Dictuc, it is supported by scholars from the UC School of Engineering who can contribute to the development of even more comprehensive solutions, based on the client's needs



## MATERIAL RESISTANCE

✉ [resmat@dictuc.cl](mailto:resmat@dictuc.cl)



This unit covers a wide variety of services related to materials, habitability and energy efficiency. By doing so, it offers solutions to anomalies in construction projects through the consultancy, inspections, and assessment.

Furthermore, it conducts quality controls for construction materials, especially focusing on monitoring the age and retraction of concrete, in order to define its durability. Dictuc has a full laboratory available, allowing the conduction of state-of-the-art trials, which was considered a relevant aspect in its certification granted by NCh ISO 17,025.

The unit is formed by professionals spanning different experience and specialties; they are responsible for various requests and the design of specific methodologies used to solve anomalies in construction projects.



## RE-SOUL

✉ [resoul@dictuc.cl](mailto:resoul@dictuc.cl)



This unit makes innovative technologies available for the wine industry, which favors the presence of fragrances in wine, by making it richer or recovering it. Additionally, the unit sells aromatic wine concentrates by strain, as well as the equipment needed to prevent the loss of fragrances in alcoholic fermentation.

During 2017, this unit experimented a key moment in their development by participating in expositions in 3 continents to showcase their technology, as well as achieving their first international sales. Furthermore, in 2016, it was recognized for being awarded the benefit of the Innovation Validation and Packaging line by Corfo, and also receiving \$360 million pesos for the development of a commercial line for it.

## MECHANICAL WORKSHOP FOR DESIGN AND MANUFACTURING

✉ [tallermecanico@dictuc.cl](mailto:tallermecanico@dictuc.cl)



This unit is focused on the design and elaboration of mechanical parts for various uses, such as astronomical equipment, structures, mechanical components in robotics and solar power equipment, among others.

Aside from the elaboration of parts, they are assessed for their use in the mining industry, as well as special types of welding including MIG and TIG, for materials including aluminum, stainless steel, and smelting.



## TRANSIT

✉ [transit@dictuc.cl](mailto:transit@dictuc.cl)



This unit provides services that are focused on public transportation and sustainable mobility. Due to the development of information technologies and geographical information systems, Transit was awarded the certification of technology operator, granted by the Chilean Ministry of Transport and Telecommunications.

The technology offered by Transit is a bridge between the academy and the industry, which allows offering solutions that will directly benefit the society. The development of an application, available for Android and iOS, that predicts waiting time for buses, presents different routes for arrival at a destination and estimates time of arrival on a planned location is an example of this.

Additionally, the unit develops other programs that register the flow of people moving in buses at certain time frames, in real time. The foregoing allows creating more complete estimations when analyzing the subject.



## TRIBOLOGY

✉ [tribologia@dictuc.cl](mailto:tribologia@dictuc.cl)



This unit, located in the city of Antofagasta, provides technological innovation services associated with the development of condition monitoring and Mining tribology. Additionally, this unit is qualified to perform consultancy in the management of physical assets, flaw analysis, and mechanical component assessment.

These works are supported with services focused on maximizing the component's useful life and inspect the providers' premises awarded in tenders or other award processes, in order to assess compliance to the technical bases. All these services add value to the clients' business process, through predictive tools and training for solutions to tribological problems.

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## 5.4. CONSULTANTS PROFESSORS



An essential part of the work at Dictuc is specialized consultancy services, which is performed by UC School of Engineering scholars according to the clients' specific requirements.

During 2017, 72 scholars performed engineering consultancy through Dictuc:

### **Engineering and Construction Management Department**

- Claudio Mourgues
- Luis Fernando Alarcón
- Mauricio López
- Pablo Guindos
- Ricardo Serpell

**Structural and Geotechnical Engineering Department**

- Carlos Ovalle
- Christian Ledezma
- Esteban Sáez
- Gonzalo Yáñez
- Hernán Santa María
- José Luis Almazán
- José Cembrano
- Juan Carlos de la Llera
- Matías Hube

**Hydraulic and Environmental Engineering Department**

- Bonifacio Fernández
- Cristian Escauriaza
- Francisco Suárez
- Ignacio Vargas
- Jorge Gironás
- Pablo Pastén
- Rodrigo Cienfuegos
- Sebastián Vicuña

**Transportation and Logistics Engineering Department**

- Felipe Delgado
- Juan Carlos Muñoz
- Juan de Dios Ortúzar
- Luis Ignacio Rizzi
- Ricardo Giesen

**Industrial and Systems Engineering Department**

- Alejandro Mac Cawley
- Enzo Sauma
- Gonzalo Cortázar
- Juan Carlos Ferrer
- Julio Pertuzé
- José Pedro Prina
- Luis Cifuentes
- Mathias Klapp
- Michael Leatherbee
- Pedro Gazmuri
- Sergio Maturana
- Tomás Reyes

**Mechanical and Metallurgy Engineering Department**

- Catalina Cortázar
- Constanza Miranda
- Diego Celentano
- José Montecinos
- Jorge Ramos
- Luciano Chiang
- Magdalena Walczak
- Rodrigo Escobar

**Chemical and Bioprocesses Engineering Department**

- Cesar Sáez
- Eduardo Agosín
- Franco Pedreschi
- Héctor Jorquera
- José Miguel del Valle
- Loreto Parra
- Loreto Valenzuela
- Néstor Escalona
- Pedro Bouchon
- Ricardo Pérez



### Electrical Engineering Department

- Aldo Cipriano
- Christian Guzmán
- Christian Oberli
- David Watts
- Sebastián Ríos

### Computer Science Department

- Álvaro Soto
- Jaime Navón
- Jorge Baier
- Karim Pichara

### Mining Engineering Department

- Álvaro Videla
- Carlos Marquardt
- Eduardo Córdova
- Gustavo Lagos

### Mathematics and Computer Engineering Department

- Carlos Sing-Long



## 5.5. ASSOCIATED CONSULTANTS



**PATRICIO  
GUZMÁN**

Industrial Operations  
Management Specialist



**JOSÉ  
MONTECINOS**

Mechanical Systems  
Design and Analysis  
Specialist



**DIEGO  
VEAS**

Electricity and Electronics  
Specialist



## 5.6. SPIN-OFFS COMPANIES



Our model accelerates the knowledge and technology transfer process even further through the creation of spin-offs companies. These companies are formed from the units or projects lead by professors from UC Engineering.

**We have an average of 30% ownership over the property of these spin-out companies.**



**5.6.1 SIRVE S.A**

- [www.sirve.cl](http://www.sirve.cl)
- Incorporation year: 2003
- Associated professor: Juan Carlos de la Llera
- Dictuc share percentage: 17,5%

**5.6.2 SERVICIOS TRIBOLÓGICOS DEL NORTE GRANDE S.A.**

- [www.dictuctribologia.cl](http://www.dictuctribologia.cl)
- Incorporation year: 2009
- Associated entrepreneur: Pedro Cancino
- Dictuc share percentage: 70%

**5.6.3 TEKEMI**

- [www.tekemi.com](http://www.tekemi.com)
- Incorporation year: 2010
- Associated professor: Pablo Irarrázaval
- Dictuc share percentage: 21,2%

**5.6.4 GESTIÓN DE LA PRODUCCIÓN ASESORÍAS SPA**

- [www.gepro.cl](http://www.gepro.cl)
- Incorporation year: 2014
- Associated professor: Luis Fernando Alarcón
- Dictuc share percentage: 28%

**5.6.5 PRICING SPA**

- [www.pricing.cl](http://www.pricing.cl)
- Incorporation year: 2014
- Associated professor: Juan Carlos Ferrer
- Dictuc share percentage: 28%

**5.6.6 SHIFT SPA**

- [www.shiftlabor.com](http://www.shiftlabor.com)
- Incorporation year: 2014
- Associated professors: Juan Carlos Ferrer, Juan Carlos Muñoz
- Dictuc share percentage: 28%

**5.6.7 RISKAMERICA SPA**

- [www.riskamerica.com](http://www.riskamerica.com)
- Incorporation year: 2015
- Associated professors: Gonzalo Cortazar, Nicolás Majluf
- Dictuc share percentage: 27,2%

**5.6.8 NOTUS SPA**

- [www.notus.cl](http://www.notus.cl)
- Incorporation year: 2017
- Dictuc share percentage: 33,3%

**5.6.9 ROUTING SPA**

- [www.routinguc.com](http://www.routinguc.com)
- Incorporation year: 2017
- Associated professors: Juan Carlos Ferrer, Ricardo Giesen
- Dictuc share percentage: 35%

## 5.7. REMARKABLE PROJECTS PER SECTOR

### 5.7.1 FOOD AND HEALTH



- Water quality control services for dialysis equipment, Critical Adult Patient Unit (UPCA). El Carmen Metropolitan Clinical Hospital.
- Development and validation of a functional beverage as a natural alternative treatment for the symptoms of menopause and as a health reinforcement ("AMENO"). Roberto Tamm y Cia. Ltd.
- Sensory information platform of the dietary experience of Chilean senior citizens, an instrument for the design of tasty and healthy food. Innova Chile.
- An increase in the consumption of hydrolyzed collagen, a functional ingredient, through its addition into tasty, natural water. Della Rovere SPA.
- Demineralized water sample analysis in the Cogeneración Project in the city of Aconcagua. Operation and Maintenance, Andina Ltd.
- Chemical and sensory data modeling in Cabernet Sauvignon grapes and wines. UC Davis Foundation Chile Life Sciences Innovation Center.

### 5.7.2 EDUCATION



- Training program for the promotion of entrepreneurship and innovation related to technical-professional labor at the Likán Antai Agricultural & Farming High School. Foundation for Agricultural Innovation.
- Technical-Pedagogical Consultancy for the Maria Ponce de Zoffoli Ltd. Education Company.- Santa Juliana School. Maria Ponce de Zoffoli Ltd.

### 5.7.3 ENERGY



- Education Company.
- Implementation and assessment of Cognitive Coaching Program in the Mathematics Classroom. Sociedad Educacional Alicia Veliz Vera E.I.R.L.
- Training and education week for school education staff. Renca Municipal Corporation.
- Natural Gas Transportation Network Risk Analysis Gasvalpo S.A.
- “Solar Power Development in Chile” Project German Society for International Cooperation (GIZ).
- Technical-Financial research regarding alternatives for the reduction of atmospheric emissions at the Angamos Plant. Aes Gener S.A.
- Development of a logistics optimization model for gas plants supply. Empresas Lipigas S.A.
- Proposal for a new law regulating electrical distribution. Inter-American Development Bank.



#### 5.7.4 MANAGEMENT



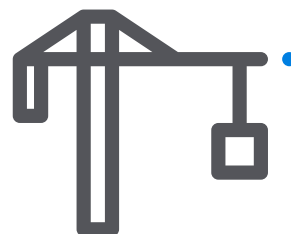
- Implementation of a simultaneous replication for offer assessments, through the use of a Combinatorial Optimization Mathematical Model. National Board for School Support and Scholarships (JUNAEB).
- New operations simulation at the La Farfana Distribution Center. Sodimac S.A.
- Traceability audit for incineration processes. Cinerarium - Hogar De Cristo Parque del Recuerdo Ltd.

#### 5.7.5 INDUSTRY AND MINING



- Facilitation, tutoring and tracking service for Module 1 of the “Experimenta” skills creation program for public innovations development at the Government Innovation Lab. Corfo.
- Process standardization at Hogar de Cristo. Hogar de Cristo Charitable Foundation.
- Research service, agglomeration drum mounting bolt failure assessment, and solution proposal. Minera Spence S A.
- Research, development and industrial trial of the Monitoring Suite, Agglomeration Assessment, and Control (AGLOM).Minera Spence S A.

### 5.7.6 INFRASTRUCTURE AND CONSTRUCTION



- Dosage study service for Emulsifying Agent in Aqueous Vehicle, and Hydrocarbon Matrix Emulsion. Codelco Tec SPA.
- Oil Assessment at CMDIC Laboratory. Doña Ines De Collahuasi Scm. Mining Company.
- Dust suppressant efficiency assessment in steep slope mining roads at the Codelco Ministro Hales Division. Gestion Ambiental Consultores S.A.
- Seismic geophysical study for the Candelaria-Los Diques project. Amec Foster Wheeler International Engineering and Construction Ltd.
- Research and development of new, high mechanical and acoustic performance sustainable pavements through wet-basis recycling of high amounts of unused tires and plastic residuals. Sacyr Chile S.A.
- Certification of 13,293.831 tons of ribbed steel for the elaboration of reinforced concrete, manufactured by Diler in Turkey. Francisco Petricio S.A.
- Reinforced concrete wall testing. Central Bank of Chile. Central Bank of Chile.
- Cau Cau Bridge assessment. Fiscalía Metropolitana Oriente (East Metropolitan District Attorney).
- Technical study of terms and costs in Supply, Manufacture, and Assembly Contracts for Mounting of Phase I and II Casing, Linings, and Coatings, in the "Teno Chile Pet Food Plant" operation. Ingenieria y Construcción Icam Limitada.

### 5.7.7 SUSTAINABILITY AND NATURAL RESOURCES



- Improvement program proposal for environmental management for general public administration. Undersecretariat of the Environment.
- Consultancy on the atmospheric dispersion of polluting agents model, using CALPUFF. Aqualogy Medioambiente Chile S.A.
- Contingent assessment for the calculation of environmental benefits related to proprietary product residuals, as set forth in the Extended Producer Responsibility law. Undersecretariat of the Environment.
- Development of a packaging-related environmental information system used to calculate the impact of containers on the ecosystem, through an analysis of the life cycle, to improve sustainability and competitiveness of the sector. Centro de Envases y Embalaje de Chile (Chilean Container and Packaging Center).

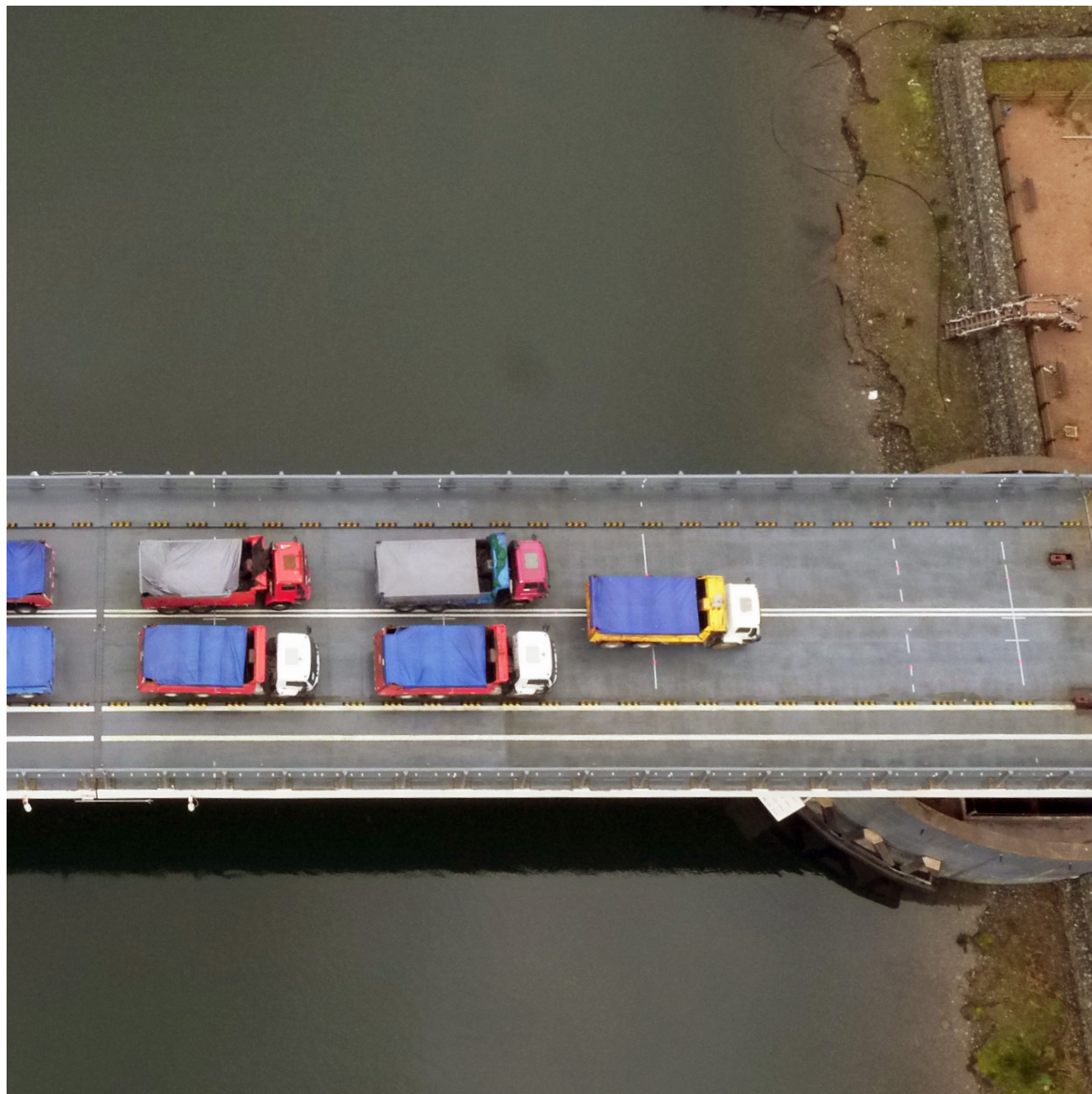
### 5.7.8 TRANSPORTATION AND LOGISTICS



- Traffic management consultancy at the Quilicura intersection. Vespucio Norte Express S.A. Concessionary Company.
- A study to assess the possible causes of the reduction of passenger flows and frequencies at the Santiago-Osorno route, from an economic, operational, and regulatory perspective. National Civil Aeronautics Board.
- External transport routes optimization through mathematical simulations. Doña Ines De Collahuasi SCM. Mining Company.



- Route Planning Service. Dimerc S.A.
- Technical statement about the situation regarding the pneumatic element of the truck fleet at ENAP Magallanes, regarding four recent incidents involving tire failures in its operations. ENAP.
- Demand research update at Camino Farellones, G-21 Road Icafal Inversiones S.A.
- Lime and Concentrate Transport Simulation Services Angloamerican Sur S.A.









## 06. | SUSTAINABILITY





Throughout our history, we have not only learned to observe the country's needs in order to offer solutions to different productive sectors, but we have also become aware of our responsibility as a company within the society.

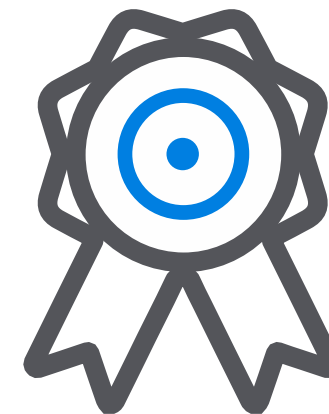
For this reason, at Dictuc we are responsible for the impact our decisions have and it is in our best interest to manage our business in a way that creates value for the following groups: Governance, Collaborators, Providers, Clients, Community, and Environment.

Under this premise is that we have grouped these axes in three large work areas:

- **Compliance**
- **Integrity**
- **Responsibility**

## 6.1. COMPLIANCE

The quality of our services and the preparation of our professionals is clearly one of the main reason our clients choose us. Nevertheless, we know that in order to be the best, we have to be focused on ensuring the highest standards of quality and transparency in our procedures.



### 6.1.1 REPORTS VERIFICATION

As a part of our commitment to provide the best service to our clients, we implemented a system for electronic document issuance in order to streamline the access to the information generated from the different units on the company.

The documents issued through this system are certified with advanced electronic signature.

This tool is currently active in our web site: [www.dictuc.cl/conformidad/verifica](http://www.dictuc.cl/conformidad/verifica)

### 6.1.2 TRANSPARENCY TOWARD THE CONSUMER

We have made available to the community the scopes of the certifications, tests, and consultancies our units perform, as a part of our policy for responsibility and transparency toward the consumer.

The information communication has been agreed upon with the owner for advertising purposes and it is very important to us to inform in detail about the scope of the works held, in order to have it available at all times to confirm information.

According to the objective of keeping society informed about our work, we also expose companies that wrongly use our brand and create confusion about the actual scope of our services.

This information is available at:  
[www.dictuc.cl/conformidad/transparencia-al-consumidor](http://www.dictuc.cl/conformidad/transparencia-al-consumidor)

### 6.1.3 CERTIFICATION OF COMPLYING PRODUCTS

Thanks to the several capacities of our units, we perform different certifications of products, always taking into consideration the requirements of the client and the regulatory authority concerning every product in particular.

Thus, after a review and verification process by our units, Dictuc certifies that a product complies with the demands from the

corresponding technical standards or regulations.

**We ended 2017 with 38 products certified as complying.**

The certified products are available at:

[www.dictuc.cl/conformidad/certificacion-de-productos-bajo-norma](http://www.dictuc.cl/conformidad/certificacion-de-productos-bajo-norma)

### 6.1.4 TERMS AND CONDITIONS FOR SERVICE PROVISION

One of our main objectives is the satisfaction of the clients toward the services provided, along with a clear definition of the scope for that work.

The 14 points comprised by the terms and conditions for the service provision of Dictuc are shown below:

- On the services provided by Dictuc
- On the results
- Confidentiality
- Safety requirements at client and Dictuc's facilities
- Delivery times for reports and certificates
- Authorized communication of the report

- Intellectual and industrial property
- Independence of the hiring parties
- Non-interference commitment
- Advertisement and trade name use
- Responsibility of customers and suppliers
- Dictuc exclusion of liability
- Suggestions and complains management system
- On service payment

Terms and conditions for service provision are available at:

[www.dictuc.cl/conformidad/terminos-y-condiciones-para-la-prestacion-de-servicios](http://www.dictuc.cl/conformidad/terminos-y-condiciones-para-la-prestacion-de-servicios)

### 6.1.5 QUALITY MANAGEMENT SYSTEM

We have a Quality Management System establishing the general guidelines to ensure quality of the service provision.

This system covers the activities of consultancies and studies, certifications, laboratory tests, inspections, and surveys.



- The Chilean ISO 9001 Standard “Quality management systems – Requirements”.
- The Chilean NCh-ISO 17025 Standard: “General requirements for the competence of testing and calibration laboratories”.

- The Chilean NCh-ISO 17065 Standard: “Conformity assessment - Requirements for bodies certifying products, processes, and services”.

## 6.1.6 ACCREDITATION AND CERTIFICATIONS

We have been certified for 10 years by the ISO 9001 standard, and we currently have the certification under the ISO 9001:2015 standard.

The obtention and maintenance of this certification follow the historic commitment of Dictuc of performing high-quality

standard works and meeting the expectations of our clients. Since 2007, Dictuc is certified with the ISO 9001:2000 standard.

**It currently maintains the certification with the ISO 9001:2015 standard, valid until January 2nd, 2019.**

### CERTIFICATIONS

The units included on the ISO 9001:2015 certification are:

#### TEST LABORATORY SERVICES:

- Material Resistance
- Waters and Liquid Industrial Residues Analysis
- Geotechnical Engineering and Soil Mechanics
- Mechanical Engineering
- Food and Chemical Analysis
- Scents and Flavors Center
- Thermal Engineering and Environment
- Engineering of Fire Protection
- Dynamic Testing Laboratory

#### CALIBRATION LABORATORY SERVICES:

- Metrology

#### CERTIFICATION OF PRODUCTS:

- Mechanical Engineering

#### CONSULTANCY SERVICES:

- Fire Protection Engineering
- Thermal Engineering and Environment

## ACCREDITATIONS

Dictuc has units that are accredited as test laboratories, under the NCh ISO 17025 standard. Also, it has a unit accredited as product certifying organism under the NCh ISO 17065 standard.

These accreditations have been granted by the Instituto Nacional de Normalización INN (National Standardization Institute) to the units of Dictuc shown on the following table.

DICTUC UNIT	ACCREDITATION CERTIFICATE	ACCREDITATION AREA
<b>Food and Chemical Analysis</b>	<ul style="list-style-type: none"> <li>• INN LE 090 Test Laboratory NCh-ISO 17025</li> <li>• INN LE 091 Test Laboratory NCh-ISO 17025</li> <li>• INN LE 093 Test Laboratory NCh-ISO 17025</li> </ul>	<ul style="list-style-type: none"> <li>• Area for food microbiology</li> <li>• Area for food chemistry</li> <li>• Area for Microbiology in tools, surfaces, environment, and handlers</li> </ul>
<b>Waters and Liquid Industrial Residues Analysis</b>	<ul style="list-style-type: none"> <li>• INN LE 149 Test Laboratory NCh-ISO 17025</li> <li>• INN LE 150 Test Laboratory NCh-ISO 17025</li> <li>• INN LE 742 Test Laboratory NCh-ISO 17025</li> <li>• INN LE 743 Test Laboratory NCh-ISO 17025</li> <li>• INN LE 744 Test Laboratory NCh-ISO 17025</li> </ul>	<ul style="list-style-type: none"> <li>• Microbiology and water sampling, according to agreement INN-SISS</li> <li>• Physicochemical characterization and water sampling, according to agreement INN-SISS</li> <li>• Chemical characterization for air pollution control devices</li> <li>• Soil chemistry</li> <li>• Microbiology for sludges and compost</li> </ul>







**Scents and Flavors Center**

- INN LE 220 Test Laboratory NCh-ISO 17025
- INN LE 963 Test Laboratory NCh-ISO 17025
- Chemical characterization for wines and enology supplies
- Sensory assessment for food and food supplies

**Geotechnical Engineering and Soil Mechanics**

- INN LE 343 Test Laboratory NCh-ISO 17025
- INN LE 344 Test Laboratory NCh-ISO 17025
- Construction Area - Soil mechanics according to agreement INN-MINVU.
- Construction Area - Aggregates according to agreement INN-MINVU.

**Mechanical Engineering**

- INN LE 104 Test Laboratory NCh-ISO 17025
- INN LE 062 Test Laboratory NCh-ISO 17025
- INN LE 064 Test Laboratory NCh-ISO 17025
- INN CP 014 Product Certification Organism NCh-ISO 17065
- INN CP 015 Product Certification Organism NCh-ISO 17065
- Mechanical tests
- Products for Fuels - Products for fuels according to agreement INN-SEC
- Water meters
- Products for Fuels according to agreement INN-SEC
- Construction Materials



### Material Resistance

- INN LE 510 Test Laboratory NCh-ISO 17025
- INN LE 511 Test Laboratory NCh-ISO 17025
- INN LE 221 Test Laboratory NCh-ISO 17025
- INN LE 636 Test Laboratory NCh-ISO 17025
- Construction Area - Asphalt and asphalt mixtures, according to INN-MINVU agreement.
- Construction Area - Parts and components, according to INN-MINVU agreement.
- Construction Area - Concrete and mortar, according to INN-MINVU agreement.
- Construction Area - Environmental conditioning, according to INN-MINVU agreement.

In addition, the National Laboratory for Length is certified as a calibration laboratory compliant with ISO/IEC 17025

standard, certification granted by the German institution DAkkS.

### 6.1.7 QUALITY SEAL FOR HOUSING

In Dictuc, we have developed and implemented the Dictuc's Quality Seal for Housing, which is a resource aimed to obtain a certification on quality, pursuant to a set of pre-established requirements for the design and construction stages, including habitability aspects.

This allows users having access to a house built according to 'good practices', based on national and international requirements and standards, as well as on the current legislation. Besides, it reduces failure or loss risks.

Up to date, 11 certification projects have been executed in total, in the Ñuñoa, Providencia, and Las Condes districts.

The detailed information about the projects is available at:  
[www.dictuc.cl/conformidad/sello-de-calidad-para-la-vivienda](http://www.dictuc.cl/conformidad/sello-de-calidad-para-la-vivienda)





## 6.2. INTEGRITY

### 6.2.1 VALUES

The concern about the impact of our actions and operations, both internally and externally, is a key aspect in our way to face the world. We are certain our values, policies, and protocols set the foundations of our work, and make us a referent of public will.

- **RESPONSIBILITY:** We take responsibility for the different tasks with commitment and high-quality-result orientation, being aware of the consequences of our actions.
- **RESPECT FOR PEOPLE:** We recognize people's dignity, we look after about and we integrate diversity.

• **EXCELLENCE:** We make our best to do the job well, being effective, efficient, and constantly looking for improvement and innovation opportunities in our own management, both in our working teams as well as in the quality of the services we offer to our customers.

• **TRANSPARENCY AND ETHICS:** We perform our work in a reliable way, fulfilling our agreements and commitments.

Dictuc Values are available at:  
[www.dictuc.cl/integridad/nuestros-valores](http://www.dictuc.cl/integridad/nuestros-valores)

### 6.2.2 CODE OF CONDUCT

Through this code, we define Dictuc's position on behaviors which do not respect people's dignity in different aspects. Thus, we promote measures ensuring respect for fundamental worker's rights and caring for their life quality.

The issues addressed are the following:

- Non Discrimination
- Workplace Harassment
- Sexual Harassment
- Alcohol and Drugs Policy



### 6.2.3 DICTUC POLICY

Dictuc of the Pontifical Catholic University of Chile develops, from the field of Engineering, certification activities, inspections, calibrations, laboratory tests, multidisciplinary consultancies, technological development, information management, continuous education, innovation and entrepreneurship support, and the creation of new businesses.

Dictuc's activities comply with the requirements of its Quality, Safety, and Occupational Health Management System, maintaining a permanent concern for the impact its work may have on the environment and the community.

Through its management system, Dictuc constantly seeks for the satisfaction of their customers', workers', the University's and the community's expectations, while generating resources to invest in physical and technological infrastructure, which allows it to develop its activity in a sustainable way and to support with resources the achievement of the academic project of the Pontifical Catholic University of Chile.

In this context, the Policy at Dictuc is supported by:

- The development, implementation, and continuous improvement of the management systems based in current legislation, regulations, and standards regarding quality, safety, and occupational health, which allow it to work with excellence, maintaining the integrity and well-being of its workers, minimizing the negative impact the activity may have and preventing pollution.
- The permanent commitment of its managers is to promote the compliance by the whole organization with the requirements

of the current regulations of Dictuc's management systems, stipulated and communicated through manuals and corporate documents.

- The commitment of the supervisors regarding the compliance with this policy, generating a motivating working environment and ensuring the necessary resources for the correct performance of its workers on each level of the organization.
  - The establishment of specific goals and objectives in all of Dictuc's units and the work of management in supervising its compliance.
  - The encouragement for developing tools for selection, assessment, and training ensuring a competent staff across the different levels of the organization.
  - The implementation of internal means of communication to inform in an efficient and effective way of the mission, the goals, policies, and results of the operations at Dictuc.
  - The communication to the community of Dictuc's works, protecting the brand's value and the institution's prestige.
  - The execution of activities in an unbiased way, not allowing commercial, financial, or any other sort of pressures that may compromise impartiality.
  - The implementation of a code of conduct and a Model for Crime Prevention, that ensure the compliance of high integrity, transparency, and ethics standards in processes and businesses.
- In the light of this policy, Dictuc carries out its work aiming for excellence in its procedures and results to satisfy the expectations of its clients, workers, the University, and the country.

Felipe Bahamondes  
Dictuc's CEO





### 6.2.4 CRIME PREVENTION MODEL

In order to maintain and protect the highest ethical standards in business, and the integrity in all types of transactions and interactions, we look out prevention of crimes stated on Law N° 20,393, through our Crime Prevention Model (CPM).

The CPM is comprised by a set of policies and procedures designed to prevent the commission of crimes: asset laundering, terrorism financing, bribery to national or foreign public officer, and concealment of stolen goods.

The Dictuc's Crime Prevention Model is available at:  
[www.dictuc.cl/integridad/modelo-de-prevencion-del-delito](http://www.dictuc.cl/integridad/modelo-de-prevencion-del-delito)



**Modelo de  
Prevención del  
Delito**

### 6.2.5 WHISTLEBLOWING CHANNEL

Since we consider reporting suspicious situations is the responsibility of everybody, we have a whistleblowing channel open for Dictuc's internal and external individuals.

Through this channel, anonymous or identified reporting could be done on the following crimes:

- Asset Laundering
- Terrorism Financing
- Bribery

- Concealment of Stolen Goods
- Forgery
- Disclosure of Confidential Information or Non-Authorized Use of Intellectual Property

The Dictuc's Whistleblowing Channel is available at:  
[www.dictuc.cl/integridad/canal-de-denuncia](http://www.dictuc.cl/integridad/canal-de-denuncia)



#### 6.2.6 B CORPORATION

After one year from our certification as a B Corporation, we show a strong commitment to making the dream of a better Chile for the people a reality, since we were granted the 'B Corp Best for the World 2017' award.

This award is the result of a working rationale which seeks to generate a positive impact on society, performing specialized engineering services in order to solve specific issues of the

country. But we also seek to generate an impact on the community, generating financial resources for the development of the educational project of the UC School of Engineering.

Although this year we were awarded in the Community category, we continue working in order to make progress in areas such as Environment, Governance, and Workers.

## 6.3. RESPONSIBILITY

Being aware of the needs currently affecting our country and the World, at Dictuc we assume with responsibility the challenge of generating a positive impact on society. New questions challenge our passion for keep on going and making our country a better place.

### 6.3.1 INTERACTION WITH THE ENVIRONMENT

#### FORUM WITH MASSIVE CONSUMERS

We perform consumer preference research studies, through our Scents and Flavors Center unit. For these studies, the general public is invited, as well as collaborators, Catholic University students, neighbors of the campus, website and social media users, among others.

Besides making a contribution to these important surveys focused on improving the quality of the food produced by the industry; the neighbors and the community participate in the projects developed by Dictuc, and in our mission of transferring technology to society.

#### SENSORY PANEL WITH NEIGHBOR WOMEN

The Trained Panel is comprised of women between 35 and 55 years old from the Macul District, who have been trained to identify a wide range of sensory features.

They are a part of surveys for different target products, such as wines, alcoholic beverages, fruits, sweeteners, chocolates, among others. The service they provide is paid, and they are part of the technical team of the Scents and Flavors Center Unit.

The methodologies used on the Trained Panel are based on international standards and regulations, which ensure a reliable measurement tool to customers, in terms of accuracy, and precision. In this sense, it is worth mentioning that the panelists have more than 2,000 hours of experience in the assessment of different kind of products.



### 6.3.2 ELECTRONIC WASTE RECYCLING

Since the collaboration agreement we signed with CHILENTER in 2016, for recycling electronic waste entered into force, we internally encourage at Dictuc providing computer and electronic equipment to be donated to the Foundation.

In December, we developed the second campaign to Recycle Electronic Devices

During the reception period of the campaign, CHILENTER provided two sculptures made of electronic waste, belonging to the Transformate exhibition.



### 6.3.3 WASTE MANAGEMENT

As a part of our commitment to the Environment, we implemented a policy on Hazardous Waste and Construction Management for the service units with Laboratories, in 2016.

All this was implemented to ensure the internal handling, transport, and disposal of such wastes is performed in the safest way possible, and pursuant with the regulation in force.

These wastes are divided into Hazardous and from Construction, which have to go through a series of different processes.

#### Hazardous waste:

- Identification of hazardous waste
- Hazardous waste collection
- Storage in a Warehouse with Sanitary Resolution Permit
- Disposal through authorized vendors
- Contingency plan

#### Construction Waste:

- Collection
- Stocking
- Disposal through authorized vendors
- Reporting to SINADER (Ministry of the Environment's National System for Waste Declaration)









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