



KARABUK UNIVERSITY IRON & STEEL INSTITUTE



History

2011

Founded

2012

Admission of Karabuk University
Iron & Steel Institute Council
Guideline

2013

Many laboratories start testing
within MARGEM (Materials
Research & Development
Center)

Today

I&SI keeps conducting its activities
by gaining more strength day by
day with specified missions and
visions towards the University –
Industry Cooperation.

MISSION & VISION



MISSION & VISION

Mission

- 1 Contribute to Public politics related to basic issues in Iron & Steel Industry.
- 2 Educate employees in Iron & Steel sector on new technologies and processes.
- 3 Provide information on Labor Health and Safety as well as sustainable environment.
- 4 Interpret on industrial data for decision makers and iron & Steel Sector. Suggest on production processes, energy efficiency, investments and global tendencies.

Vision

- 1 Create a platform to share difficulties in Iron & Steel Industry and other industries and seek for scientific solutions.
- 2 Support research on new technologies for sustainable development
- 3 Create public awareness on emission reduction by utilizing new technologies
- 4 Support use of steel based products as the most recyclable material in the world, by increasing its market share.

—QUALITY— MANAGEMENT


As the executives of MARGEM Laboratories, we hereby commit to effectively conduct and continuously enhance the Quality Management System with the contribution of all our staff by following the standards of TS EN ISO/IEC 17025, TURKAK guides, customer and legal conditions.

Akreditasyon Kapsamı

 TURKAK T.C. EKİŞ AKAD. BİLİMSEL VE TEK. UZMANLIK KURULU	KARABÜK ÜNİVERSİTESİ DEMİR ÇELİK ENSTİTÜSÜ Malzeme Araştırma Ve Geliştirme Merkezi Laboratuvarları (MARGEM) Akreditasyon No: AB-065-T Revizyon No: 00 Tarih: 23 Şubat 2018	
	Deney Laboratuvarı	
Adresi : Karabük Üniversitesi Demir Çelik Enstitüsü Demir Çelik Kampüsü 100. Yıl 78050 KARABÜK / TÜRKİYE	Tel : 0 370 433 88 30 Faks : 0 370 433 88 32 E-Posta : doe@karabuk.edu.tr Website : www.doe.karabuk.edu.tr	
Deney Yapılan Malzemeler / Ürünler	Deney Adı	Deney Metodu (Ulusal, Uluslararası standartlar, Yatırım, İç Metotler)
Metallik Malzemeler	Çekme Deneyi	TS EN ISO 6893-1 TS EN ISO 6892-2 ASTM A370 TS EN ISO 4136
Metallik Malzemeler	Eğme Deneyi	TS 225-1 EN ISO 3428 ASTM A273 TS EN ISO 5175
Metallik Malzemeler	Çentik Darbe Deneyi	TS EN ISO 148-1 TS EN ISO 9016 ASTM A274
Metallik Malzemeler	Birimli Sertlik Deneyi HB 2,5/187,5	TS EN ISO 6506-1
Metallik Malzemeler	Rockwell Sertlik Deneyi	TS EN ISO 6508-1
Metallik Malzemeler	Vickers Mikrosertlik Deneyi HV 30	TS EN ISO 6507-1
Baylar	Raylızda Kalite Geliştirme Ölçümü	TS EN 13874-1
Metallik Malzemeler	Yorulma Deneyi	TS EN ISO 15639-1 TS 708 TS EN 13874-1 ISO 4449

KAPSAM SONU




Dr. H. İbrahim ÇETİN
Genel Sekreter

I&SI-INDUSTRY COOPERATION

In MARGEM Laboratories; testing and quality control, consultancy services, education of qualified human resources, performing R&D within University – Industry cooperation, developing further cooperation with other R&D centers are aimed.

17 of 28 Laboratories are presently active.

Laboratories	ACTIVE
Heat and surface treatment Lab.	√
Nano Technology Lab.	X
Refractor/Ceramics Lab.	X
Static Testing Lab.	√
Dynamic Testing Lab.	√
Machining Lab.	X
Spectral Analysis Lab.	√
Elemental Analysis Lab.	√
Energy and Environment Lab.	X
Tribology Lab.	√
Polymer Materials Lab.	X
Physics Lab.	X
Intermetallic Compounds Lab.	X
Non-destructive testing Lab.	X
Coating Lab.	X
SEM Lab.	√
XRD/XRF Lab.	√
Optic/DTA/DSC Lab.	√
Residual Stress Testing Lab.	√
Hardness Testing Lab.	√
Metallography Lab.	√
Metrology Lab.	√
Chemical Analysis Lab.	√
Powder Metallurgy Lab.	√
Mechanical Forming Lab.	X
Welding Lab.	X
Alloys Lab	√

OUR TEAM



OUR TARGET



Educate qualified human resources for Iron & Steel sector with certification and graduate programs



Serve with accredited laboratories for testing and analysis activities that are supported by quality assurance systems for Iron & Steel sector



Improve and develop product quality in Iron and Steel sector



Become a center for excellence in R&D of value added products in Iron and Steel sector, and in metal alloys

MARGEM LABORATORIES

Three-Step Sample Analysis Process



Fill the Analysis Request Form



Get an appointment from
Sampling Admissions Unit

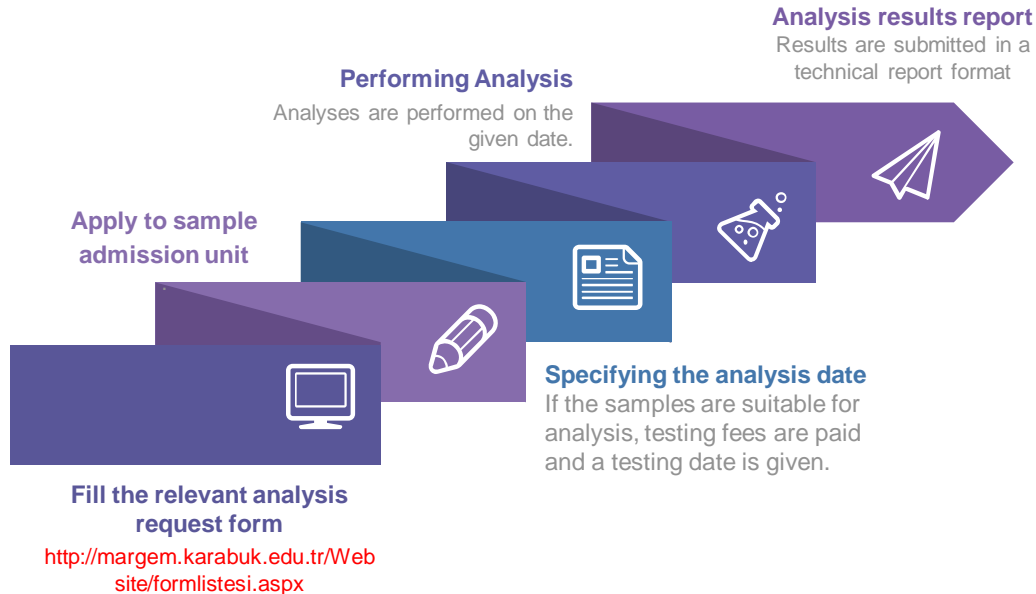


Testing of the sample on an
appropriate date



MARGEM LABORATORIES

Steps in sample analysis



Metallography Laboratory

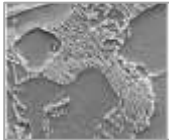


Metallography Laboratory

Sample preparation by using many methods as cutting, abrasion, lapping, bakeliting, and etching.

Image capturing in an optical microscope at a maximum of 2000X zooming.

**Metallographic Processes ve Optical
Microscopes Laboratory**



STATIC Test Laboratory



Static Test Laboratory (ACCREDITED)

Tensile Test (max. 600 kN, max 1100 °C)

Compression Test (max. 250 kN, 250 °C)

Bending Test (max. 250 kN, 250 °C)

ZWICK ROELL

Fatigue Test (max. 100 kN,)

Fracture Toughness Test (max. 100 kN)

Notch Impact Test (max. 450 J, -80 °C-100 °C)



DYNAMIC Test Laboratory



Dynamic Test Laboratory (ACCREDITED)

Tensile Test (max. 600 kN, max 1400 °C)

Compression Test (max. 100 kN)

Bending Test (max. 100 kN)

MTS (100kN Servohydraulic Dynamic Testing Device)

Fatigue Test (max. 100 kN,) (ACCREDITED)

Fracture Toughness Test (max. 100 kN)



Residual Stress Measurement Laboratory

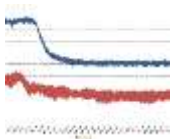


Real and safe unit strain distribution

Residual stress calculations based on strain distributions

Rail residual stress measurement within EN 13674-1 standards.

Vishay Residual Stress Measurement Device



SEM Laboratory



SEM Laboratory

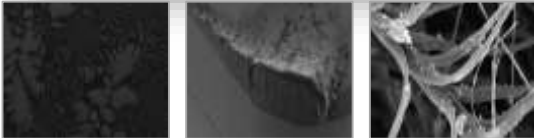
Receive SEM images by increasing the sample temperature up to 750°C by Hot-Stage

Point, linear and map type chemical composite analysis using EDX detector.

ZEISS ULTRA PLUS FESEM

SE2, Inlens, STEM, EsB detectors.

Coating of dielectric surfaces with Au, Au/Pt ve C usinf coating device.



XRD-XRF Laboratory



X-RAY DIFFRACTION (XRD)

- Crystal structure and phase specification of powder, bulk, thin film and metal samples.
- Non-destructive residual stress measurement
- Crystal tendency degree analysis
- High temperature analysis (25-1500 °C)
- Thin film analysis (GIXRD and XRR)
- Micro area point analysis (down to 400 μ area)

XRD-XRF

X-RAY FLUORESCENCE (XRF)

Qualitative and semi quantitative analyses of all types of samples (liquid, mineral, rock, polymer, oil, petrol, soil, glass etc.) from Boron to Uranium.

Full quantitative analysis can be made for stainless and low alloy steel.



FTIR-UV-Atomic Absorption Laboratory



FTIR (Fourier Transform Infrared Spectroscopy)

FT-IR analysis specifies the type and property of metals.

UV-VIS (Ultraviolet Visible) Spectroscopy

UV-VIS generally used for measurement of molecules in solutions or inorganic ions and their complexes..

BRUKER-THERMO

Atomic Absorption

Utilizes flame method for chemical elemental analysis.



Spectral Analysis Laboratory



Elemental analysis of following alloys and many more;.

Cast iron
Low alloy steel
Stainless steel
Tool Steel etc.

ATLANTIS

DTA/TGA/DSC Laboratory



Differential Thermal Analysis (DTA)
Thermogravimetric Analysis (TGA)
Differential Scanning Calorimetry (DSC)

Mass loss,
Dehydration,
Quasi glass transition temperature analysis,
In metals, alloys, ceramics, glass, polymers etc.

HITACHI

Melting Point designation
Evaporation method
Phase change
Oxidation/Reduction



OTHER ACTIVE LABORATORIES

**1****Heat Treatment Laboratories****2****Powder Metallurgy Laboratories****3****Tribology Laboratory****4****Corosion and abrasion Laboratories**

THANK YOU



Phone

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Website

<http://dce.karabuk.edu.tr>



Symposium

International Iron and Steel
Symposium



Adress

KARABÜK ÜNİVERSİTESİ
DEMİR ÇELİK
ENSTİTÜSÜ
78050 KARABÜK

