



Leading designer and manufacturer  
of testing machines  
Made In France



Universal  
testing machines

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# DESIGNER OF UNIVERSAL TESTING MACHINES

Founded in 1987, the French company 3R specialises in the design and manufacture of materials testing machines. Undisputed leader for more than 20 years in the French market for testing equipment in the field of Civil Engineering (with 80% market share), the company has gradually established itself in the world of universal testing machines (UTM), with a growing market share, gathering the most prestigious references, in the field of mechanics, aerospace or nuclear. Its assets for establishing itself have remained the same since its creation and are based on on three axes:



*Recherches & Réalisations Rémy sas*

- 1** - A definitive desire to produce only high-quality machines, without compromising on the choice of technical solutions, materials and suppliers. This strategy allows us to offer our customers an exceptional lifespan of their 3R machine, for a guaranteed return on investment. This approach is fully in line with the reparability index and ahead of the new sustainability index of 2025.
- 2** - A dedicated R&D department, with talented engineers and technicians, capable of innovating and customizing any technical solution, in order to precisely meet our customers' specifications. In addition to our standard range of machines, we regularly manufacture custom-made machines with unconventional dimensions (see our Syntium range).
- 3** - A team of dynamic and highly mobile technicians, for the commissioning and maintenance of our machines, capable of responding within 24/48 hours to the slightest request from our customers, on site or in remote maintenance. This is one of the induced (and unbeatable) advantages of Made in France!

We manufacture all our machines (machining and welding, painting, mechanical assembly, electrical and hydraulic wiring), and control systems (electronic boards, computer systems and software) in our 10,000 m<sup>2</sup> factory in Montauban, equipped with modern production machines

Since September 2015, we have integrated the machining of our metal parts, with the creation of a new company (USR – Usinage Soudure Rémy), equipped with high-capacity CNC machines, installed in a 2,500 m<sup>2</sup> building, equipped with three 5-ton overhead cranes and a 10-meter long paint booth.



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# MAXIMIZING OUR CUSTOMERS' SUCCESS THROUGH CUSTOMIZED SOLUTIONS

Our goal is not only to sell testing machines, but to offer solutions that can ensure and maximize your success.

That's why we support you throughout the entire lifecycle of your investment.



*" Engineering is not enough, we accompany the customer from the request to the end of commissioning, with an open, future-oriented system "*



Our strength, beyond our ability to design a range of machines perfectly adapted to our customers' expectations, is our ability to manufacture high-tech machines in small series.

We are able to respond to the current trend of systematic customization of customer solutions.

This customization is not a cosmetic criterion, but reflects our desire to satisfy 100% of our customers' needs.

## THE FRENCH SOLUTION

Since June 6, 2012, 3R has been credited with the "ORIGINE FRANCE GARANTIE" label (the first industrial company to be labelled in Midi-Pyrénées).

This label was issued by Bureau Veritas Certification and then by CERIB.



*" Origine France Garantie" is the guarantee for the consumer that the product bearing the logo was made in France "*

The award of this "Origin France Garantie" label is defined by two cumulative criteria, checked each year during a rigorous audit carried out by the certifying body :

- 1- the product takes its essential characteristics in France (= the product is designed in France),
- 2- 50% to 100% of the unit Added Value of this product is acquired in France.

**It is with great pride that we affix this label to our products designed and manufactured in our factory in Montauban (82).**

# Our relationship: neither buyers nor sellers, but PARTNERS

The acquisition of a test machine is a global action.

Throughout the life of the machine, 3R ensure a complete follow-up and promotes interactions with the customer. The customer is not only buying a 3R test machine, they are investing in a long-term partnership with dedicated supplier, and because 3R has everything to prove, we are very motivated to give more and more to our customers.

We don't just see ourselves as machine sellers, but above all as system and solution providers. We provide added value tailored to our customer's business.

*" We always imagine how we would like to be treated as a customer "*

## **Customer satisfaction is the cornerstone of our development strategy.**

Making every task simple and intuitive, every day, thanks to our expertise.

Our business approach and the care we put into maintaining our products throughout their entire lifespan are directly aligned with this goal.



## **Our after-sales service is responsive.**

He will be at your side to accompany you throughout the life of your equipment.



## **Our 3 "Customer Commitments" :**

- 1** - Benefit from a complete range of machines and accessories to achieve the best performance.
- 2** - Partner with a responsive and proactive team to ensure timely and effective support.
- 3** - Take advantage of the expertise of a French designer and manufacturer, at the most competitive price.

# OUR DNA : DESIGNING OUR MACHINES

To best meet market demands, 3R is expanding its range of testing machines.

The premium SYNTECH range, featuring the exclusive RIGI-DRIVE drive system, has been thoroughly redesigned. The SYNTAX economic range has been introduced, while the SYNTHÉZ range is dedicated to low-capacity testing. Finally, the SYNTIUM range addresses custom and non-standard requirements.

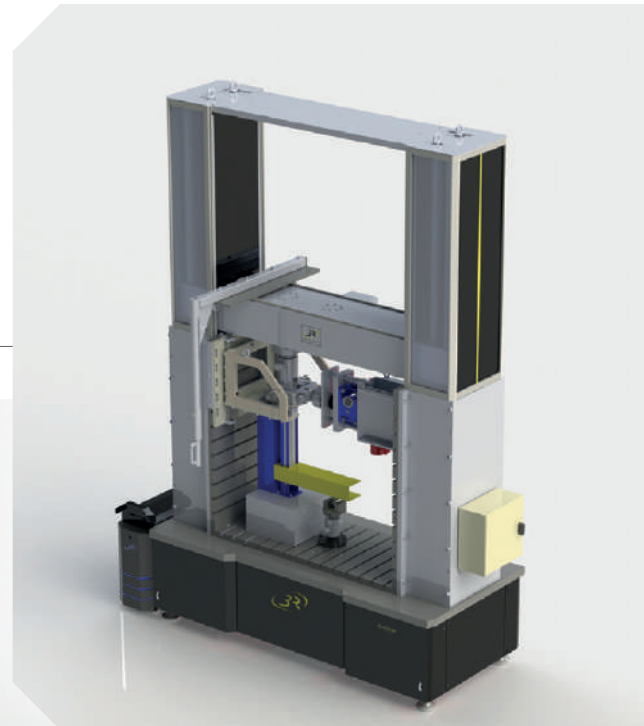
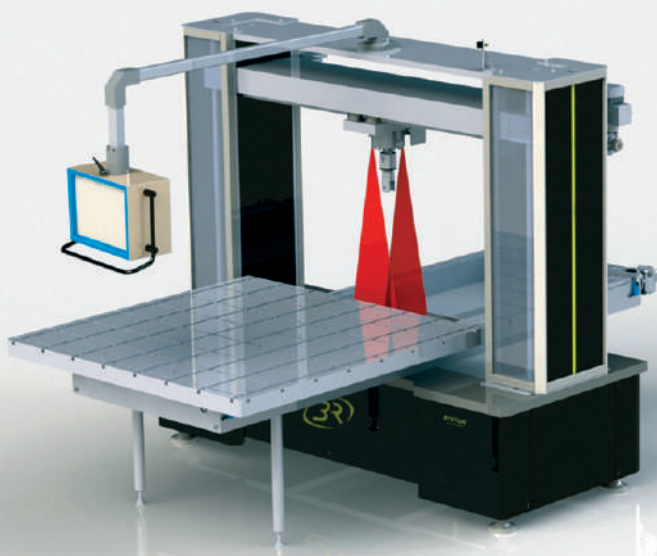
3R positions itself as an innovative player and strengthens its ambition to become a market leader.

*"Design innovant"*

Our four current product ranges are the result of a comprehensive approach.

Everything has been optimized to provide our customers with the most high-performance and user-friendly equipment.

*Custom dual-axis 350 kN / 50 kN*



*Machine with a motorized worktable for easy positioning of heavy specimens.*

# By choosing 3R, you are making a committed choice for a sustainable future.



## BUYING FRENCH IS MUCH MORE THAN JUST A GESTURE :

- **Strengthening our industry:** We reduce our dependence on imports by relying on manufacturing largely carried out in France.
- **Supporting local jobs:** With every purchase, you support jobs and expertise rooted in our regions.
- **Ensuring reliable supply:** Our local production networks ensure consistent quality and minimize the risk of supply disruptions.
- **Contributing to reindustrialization:** We promote partnerships with French industrial companies.

## OUR CSR COMMITMENTS :

*"REAL ACTION, LOCAL IMPACT, SUSTAINABLE FUTURE !"*



### **French Manufacturing and In-House Production**

Our products are designed and, for the most part, manufactured in our factory, ensuring rigorous control at every stage of the production process.



### **Exceptional Durability**

Thanks to high-quality materials, our products are designed to last over time, reducing the need for replacements and minimizing waste.



### **Local Partnerships and Short Supply Chains**

By relying on local partners, we reduce our carbon footprint and support the local economy. Our short supply chains reflect our commitment to responsible development.



### **Responsible Consumption**

With a reduction of 150 tons of CO<sup>2</sup> over the past 10 years, we are doing our part for the environment. This is equivalent to the emissions of a car driving around the Earth 30 times.

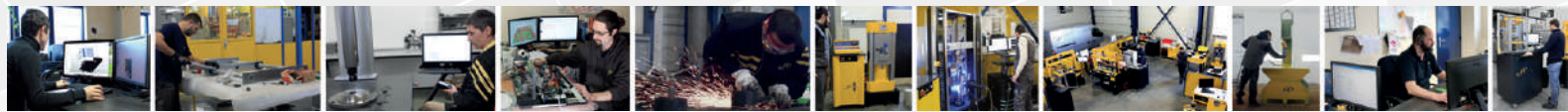


### **Repairability and Upgradability**

Our machines are designed to be easily repaired and upgraded, providing robust and sustainable solutions that adapt to the evolving needs of your industry.

**We also support :**





# 3R is also...



## FATIGUE TESTING

*Very High Cycle Fatigue (VHCF) Testing Machine*

High-frequency fatigue testing at 20 kHz for metallic materials

## EDUCATION

*Synthon 25 ATF*

Universal testing machine for material characterization: tensile, compression, bending, hardness, shear, stamping...



## CREEP TESTING

*Dead Weight*

Wide force range for creep testing on different materials, with test durations of up to 99 years, depending on variations in Earth's gravity over the coming decades...



## CREEP TESTING

*Hydraulic*

Automatic or manual hydraulic adjustment for long-duration testing. Tests with high loads from 100 kN to 1000 kN. The frames are specially designed for your application.



# The RIGIDRIVE Concept

## The most powerful solution on the market

### **Rigid transmission combined with a high-stiffness frame providing minimal deformation.**

To improve frame rigidity and therefore guidance quality, SYNTECH frames are equipped with 2 to 4 columns (depending on the maximum load) and up to 4 ball screws for models above 400 kN

- The encoder is directly connected to the servomotor for highly responsive and stable control.
- The constant-speed transmission and its low elasticity coefficient ensure exceptionally smooth motion across the entire speed range.
- Bevel gear transmission with efficiency  $> 90\%$  compared to  $30\%$  for standard systems, providing space and energy savings.
- Quiet and smooth operation for greater operator comfort.

*"Proven and controlled technology"*

The exceptional stiffness of the transmission significantly limits the energy stored and released during the fracture of brittle materials.

The design of our SYNTECH frames is based on three key principles:

- Easy and reliable assembly enables a significant reduction in labor, and therefore lower costs

Transmission efficiency is tripled! The power delivered by RIGI-DRIVE greatly improves system responsiveness and increases the lifespan of components

#### Compact frame design

Our engineers have paid particular attention to the compactness of SYNTECH frames. Most of them can be transported upright (depending on maximum capacity). They can pass through a standard door and be handled with a simple pallet jack. This greatly simplifies handling during delivery and facilitates integration into your laboratory.





## MAXIMUM PRECISION

Our challenge is to achieve maximum control accuracy across the widest range of crosshead speeds.

Each machine configuration must enable fast, precise, and controlled motion, allowing compliance with numerous standards while also performing slow tensile tests with instantaneous speeds below one micron per minute over several weeks.

The remote electronics provide direct access and improved electrical isolation (reducing interference).

Operators have easy access to connect their peripherals.

Upgrading your equipment is simplified.

### Technical Specifications:

- Closed-loop control: stress, strain rate, speed, load.
- Closed-loop control frequency: 2500 kHz and 10 kHz.
- Input/Output expansion boards: strain gauges, LVDT, SSI scales, automatic and video extensometers...
- Supplied with an LCD remote control and a speed adjustment knob.
- Automatic recognition of connected force sensors with EEPROM connector.



**Speed control accuracy**

**0.01  
 $\mu\text{m/s}$**

The lowest loading speed is available on all 3R universal testing machines.

**At this rate, the machine displacement is 3 mm per week.**

*We offer a complete range of high-resolution and standard load cells.*

# SYNTAX Range

## SYNTAX models 5, 12, 25, 100 and 300 kN

Thanks to the streamlined design of its frames, the SYNTAX range allows you to perform all your tests efficiently, within a limited budget, without compromising precision or quality.

# syntax

### *Mechanical Specifications*

- **High-stiffness** frame
- 2 preloaded ball screws.
- Hybrid transmission with a high-stiffness reinforced belt and a backlash-free gearbox.
- Special preloaded bearings, high stiffness, long service life, maintenance-free.



Syntax 5



Syntax 12



### *Control*

- Brushless servomotor with encoder and brake.
- Closed-loop control of speed, force, stress, and strain.
- Actual crosshead resolution: 0.01  $\mu\text{m}$ .
- External black box containing all acquisition and electronic control systems, with forced ventilation and filtration.
- Drive control with a sampling frequency of 12 kHz.
- Synchronous measurement channels, adjustable acquisition up to 1000 Hz.
- Power supply: 230V + PE for models from 5 to 100 kN, and 3  $\times$  400V + N + PE for the 300 kN model.
- Intuitive remote control with LCD screen and adjustable controller (optional)

	Syntax 5	Syntax 12 S	Syntax 12 SW	Syntax 25 S	Syntax 25 SW	Syntax 25 SW HA	Syntax 100 S	Syntax 300 S	Syntax 300HA
Overall width (in mm)	400	700	850	865	1 450	1 450	865	1 000	1000
Overall height (in mm)	1 300	1 480	1 480	1 705	1 705	1 970	1 805	2 030	2 350
Chamber width (in mm)	120	450	600	450	1 000	1 000	450	500	500
Chamber height (in mm)	1 000	1 130	1 120	1 230	1 200	1 540	1 300	1 200	1 500
Net weight (in kg)	120	140	160	285	450	500	285	950	1 050



Syntax 25 & 100

### Protection and Design

- Side columns made of robust structural steel for enhanced stiffness.
- Lower frame and metal structure.
- Ball screws protected by a Kevlar bellows.
- Flush lower crosshead, protected by a stainless steel cover.
- Protective doors (optional) with hinged or sliding opening.
- Transparent polycarbonate with aluminum frame, equipped with a safety switch.



Syntax 300



### Ergonomics

- Ergonomic working height, with storage base and optional ergonomic workstation.
- Large crosshead travel and wide horizontal space to accommodate all types of fixtures and accessories
- Easy front handling with a pallet jack or forklift; fits through a standard door.
- Wide range of tools: tension, compression, bending, shear, peeling, friction, furnace, thermal chamber...
- Compliant with EN, ASTM, DIN, ISO standards...

**Compliant with the Machinery Directive 2006/42/EC**

# RIGI-DRIVE Range

## SYNTECH models 150, 400, 700, 1200 and 1600kN

**Rigid Rigi-Drive II transmission for precise speed and positioning, with a compact design for easier integration into your laboratory.**

### *Mechanical Specifications*

- 2 massive guide columns for 150 kN and 4 columns for higher capacities.
- 2 preloaded backlash-free ball screws for 150 kN & 400 kN, and 4 ball screws for higher capacities.
- High-performance RIGI-DRIVE transmission, maintenance-free and backlash-free.
- High-efficiency bevel gearbox.
- Machine-tool grade bearings, sealed and lubricated for life, maintenance-free.



	Syntech <b>150S</b>	Syntech <b>150 HA</b>	Syntech <b>400 S</b>	Syntech <b>400 HA</b>	Syntech <b>700 S</b>	Syntech <b>700 HA</b>	Syntech <b>1000/1300</b>	Syntech <b>1600/2000</b>
L1 Overall width (in mm)	1 200	1 200	1 500	1 500	1 500	1 500	1 850	1 850
H1 Overall height (in mm)	2 020	2 520	2 500	2 850	2 650	3 550	3 400 / 4 600	3 500 / 4 300
L2 Chamber width (in mm)	650	650	750	750	750	750	850	910
H2 Chamber height (in mm)	1 300	1 800	1 555	1 900	1 700	2 500	2 000 / 3 200	2 000 / 2 800
Net weight (in kg)	1 100	1 200	2 100	2 300	3 400	4 200	7 000 / 8 000	9 000 / 10 000

### *Protection and Design*

- Ball screws protected by stainless steel and transparent polycarbonate covers.
- Ball screw protection with rigid Kevlar bellows.
- Worktable covered with a stainless steel sheet for protection and daily use.
- Protective doors (optional) with hinged or sliding opening.
- Transparent polycarbonate with aluminum frame, equipped with a safety switch.

## Control

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- Brushless servomotor with encoder and brake.
- External black box with full acquisition and electronic control, including forced ventilation and filtration.
- Crosshead displacement resolution:  $\pm 0.01 \mu\text{m}$ .
- Minimum speed:  $0.05 \mu\text{m/s}$  up to maximum speed.
- Drive control with a sampling frequency of 12 kHz.
- Synchronous measurement channels, adjustable acquisition up to 1000 Hz.
- Intuitive remote control with LCD screen.



## Ergonomics

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- Working height: 450 mm (150 kN) or 550 mm (above).
- Large crosshead travel and wide space between columns to accommodate all types of accessories for your tests.
- Easy front handling with a pallet jack or forklift.
- Wide range of tooling: tensile, compression, bending, shear, peel, friction, furnace, thermal chamber...
- Compliant with EN, ASTM, DIN, ISO standards...



# RIGI-DRIVE Range

## SYNTIUM models from 10 kN to 2000 kN

Our R&D department can design fully custom machines to meet your specific requirements in terms of :

- dimensions
- vertical test space height
- horizontal test space width (space between columns)
- tooling
- ergonomics
- stiffness
- speed
- precision

The mechanical components, controller, and software are identical to those used in standard SYNTECH range models.

Here are a few examples :

### *ROPES AND TEXTILES*

Frame : 400 kN, horizontal test space of 1500 mm × 1500 mm, vertical crosshead travel 3500 mm

Location : Malaysia

Type of tests : Harnesses and climbing equipment, large-scale testing with dummies

Specific features : High energy stored during tests on products exceeding the speed of sound (ropes) at rupture.  
Special protection with energy absorbers.

# syntium



### *FOUNDRY*

Frame : Testing machine with X-Y-Z movement. Horizontal test space 1500 × 1500 mm, vertical travel 700 mm, with a slotted table and motorized transverse movement of the load cell.

Location : France

Type of tests : Testing of cast iron manhole covers in accordance with the new EN 124 standard for the European market.

Specific features : No manual handling required by the operator thanks to motorization of the 3 axes, allowing force to be applied to any part of the structure. Measurement using 4-point non-contact laser sensors (integrated into the software).





Frame : 600 kN tensile testing machine

Location : France

Type of tests : Multi-material and structural testing

Specific features : Low-height machine designed for integration into laboratories with low ceilings.

Our R&D department has developed a specific frame, featuring a slotted table and special fixtures for quick changeover of 600 kN tooling.



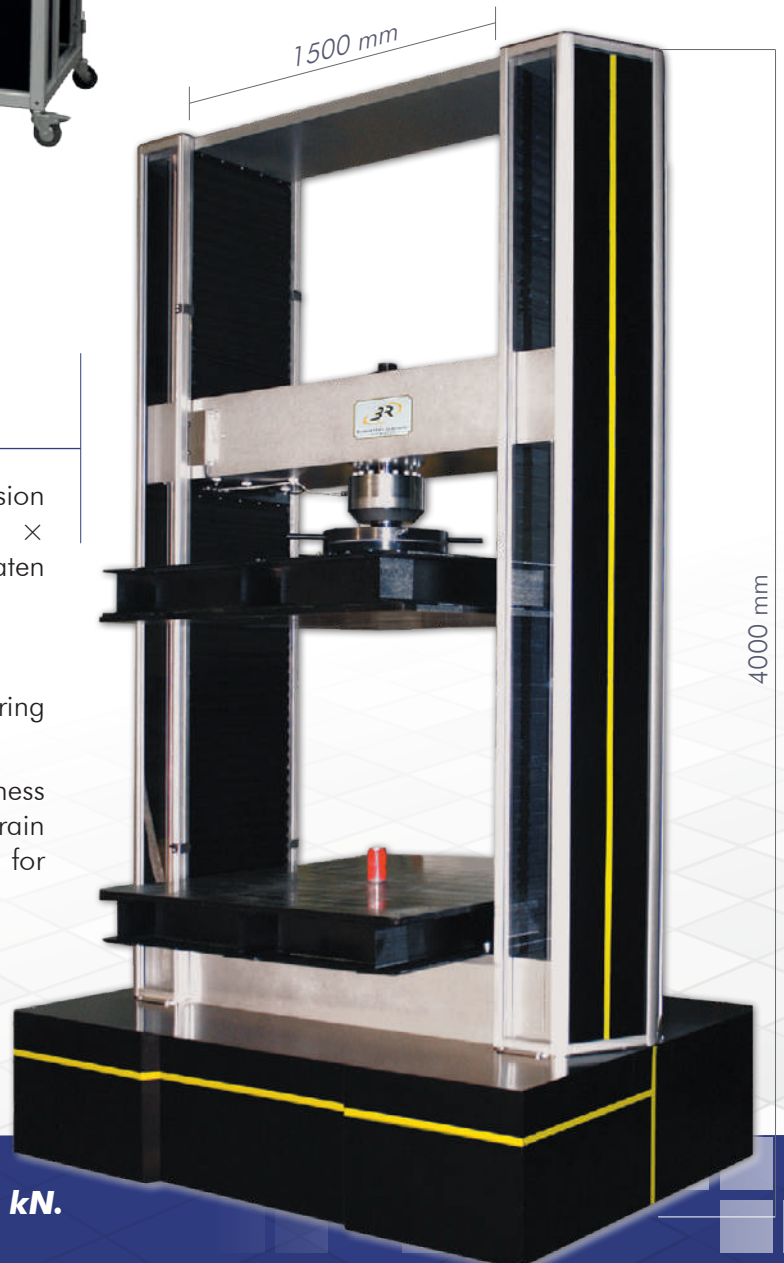
## COMPOSITES

Frame : Oversized 500 kN compression testing machine with a 1400 × 1400 mm articulated upper platen and 1500 mm vertical travel.

Location : France

Type of tests : Composite tanks for civil engineering

Specific features : Oversized frame with high stiffness for exceptionally accurate strain measurement without the need for an extensometer.



**12**

**TONS**

*This is the weight of the Syntium 1500 kN.*

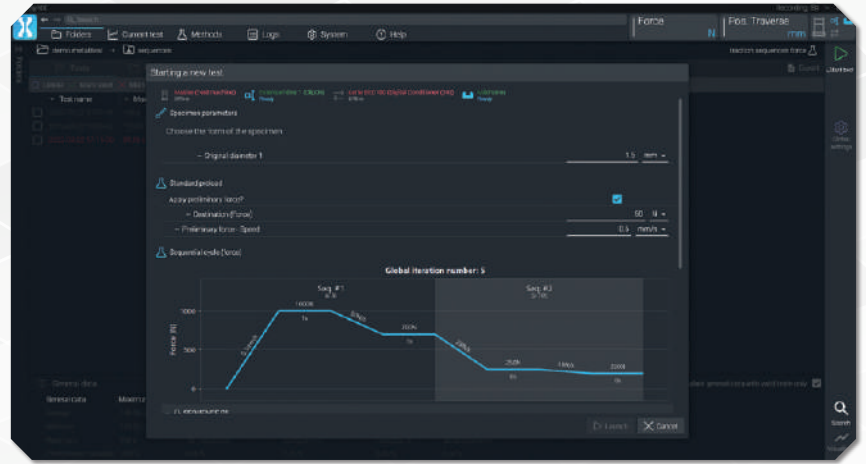
# Control SOFTWARE

3R has developed a “full touch-screen” software in line with today’s market demands: **user-friendly, quick to access, and high-performance**

# synt-x

## Efficiency

The software settings provide instant access to testing in just a few clicks, leaving little room for error. It also allows users to create and modify their own test cycles and reports. All test samples can be pre-programmed.



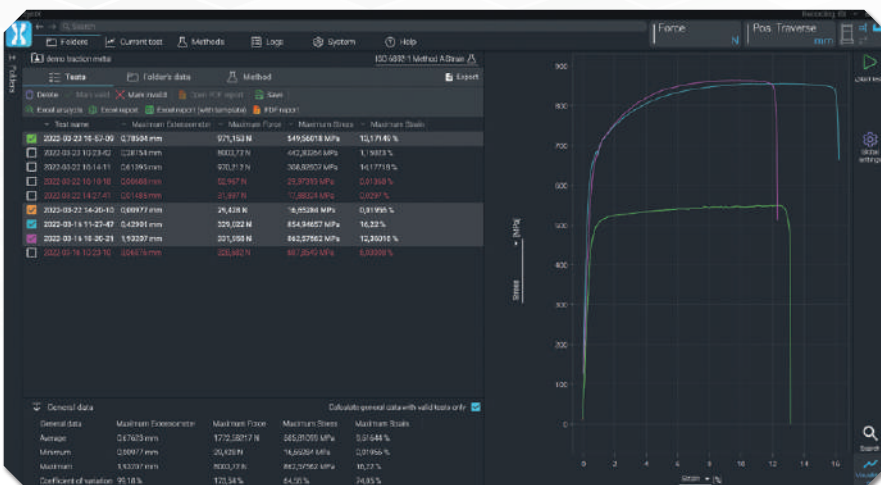
Batch test manager

## Performance

The software includes an assistance program for calibration and control interface setup.

## Ergonomics

The configuration interface is highly intuitive, allowing test selection and parameter adjustment in just a few clicks.

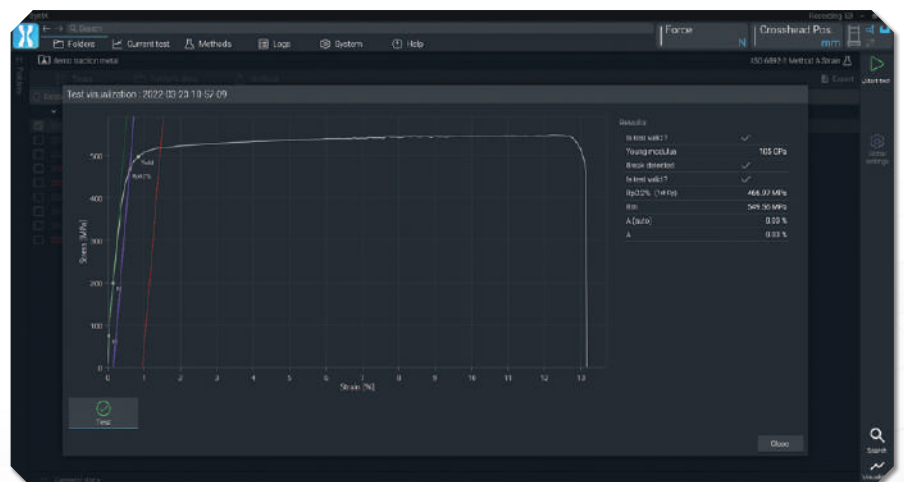


Stress calculation settings screen

Main screen

## Features

Combining all control and monitoring functions, Synt-X enables load- or strain-controlled cycles, as well as hold stages in stress, displacement, or strain, in closed-loop control using all connected sensors.

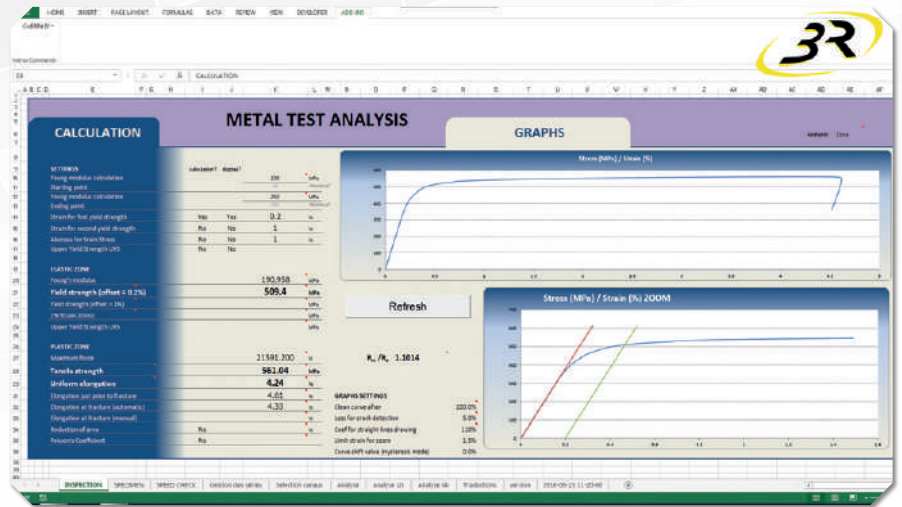


# REPORT EDITING

## Flexibility

Test analysis is performed through an integrated interface that can be customized and adapted to your needs using Excel. The software places no limits on the analysis of standard and specific results. All major standards are available in just one click.

All test data is easily accessible and can be integrated into the database. It can be transferred and viewed on remote workstations.



## Tensile test report

	Test 1	Test 2	Test 3			
Date	18/11/2011	18/11/2011	18/11/2011			
Time	14:33:14	14:37:35	15:04:32			
Test type	Tensile test	Tensile test	Tensile test			
Test speed (mm/min)	60	60	60			
Detection value (N)	5	5	5			
RESULTS	Max value	Rupture	Max value	Rupture	Max value	Rupture
Load (N)	643,713	529,959	632,980	484,764	635,912	505,682
Displacement (mm)	59,263	67,244	56,826	69,093	59,342	75,021
Strength (Mpa)	364,267	299,896	358,194	274,320	359,853	286,157
Strain (%)	26,222	29,754	25,144	30,572	26,258	33,195

New sequential calculation tools have been added, allowing users to perform more complex operations.

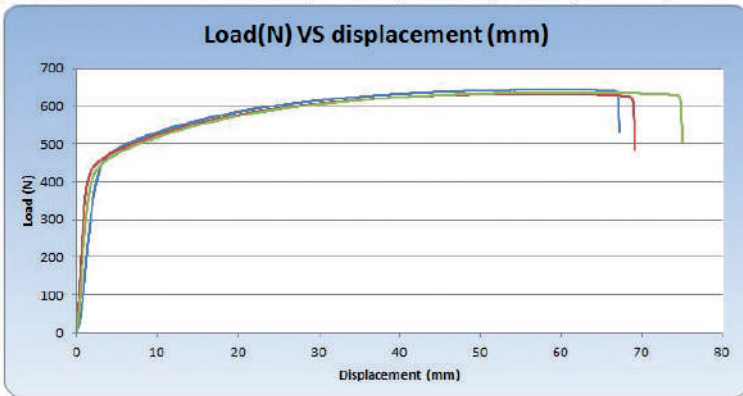
Report editing can be carried out easily and integrated into Word documents, PowerPoint presentations, web pages, and other media.

*The ADVANTAGES of the Synt'X software*

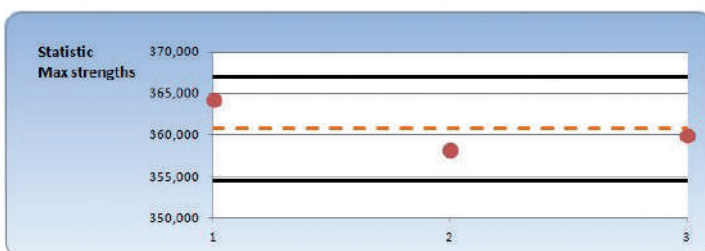
Fully compatible with Microsoft Office.  
Fully configurable, easy to set up and customize.  
Network-connectable.

*The ADVANTAGES of 3R remote maintenance*

All our machines benefit from our remote maintenance service (free during the warranty period), enabling rapid resolution (within a few hours) of your technical inquiries.



Statistic		
Average of strengths at breaking point	286,79	MPa
Average of Max strengths	360,77	MPa
Standard deviation of max strengths	3,14	
Average of strains at breaking point	31,174	%



Inspector signature

Date  
18/11/2011

# RETROTECH

## Machine modernization



### You own :

- An old machine out of order, taking up space in your laboratory?
- A machine that is unreliable, inaccurate, or malfunctioning?
- An aging machine lacking performance?
- Do you need to perform new tests or cycles that your current machine cannot handle?

3R offers the **RETROTECH** solution to upgrade your machine technologically:

- ➔ **Closed-loop control in load, stress, displacement, strain...**
- ➔ **Complex cycles, test analysis, reporting, and database integration**
- ➔ **Improved reliability and safety standards for your equipment**

### *Performance*

The highest level of modernization on the market, with a complete inspection of all critical mechanical components and full replacement of the machine's electrical and electronic systems, regardless of age or brand.

### *Efficiency & performance*

Each machine is handled individually by our technicians, under the supervision of our R&D department. The new control system is compatible with existing strain gauges and accessories, and allows the addition of new equipment and accessories.

### *Cost savings*

Reuse of your sensors and tooling.

### *Reliability and Durability*

Equipment fully refurbished with the latest generation of electronics and software. All replaced parts are now available through our after-sales service.

### *Adaptability*

The RETROTECH service can include the supply and/or design of a new dedicated support, a protection system, and upgraded safety standards.

### *Safety*

Custom protective doors with safety sensors can be installed on your existing frame.



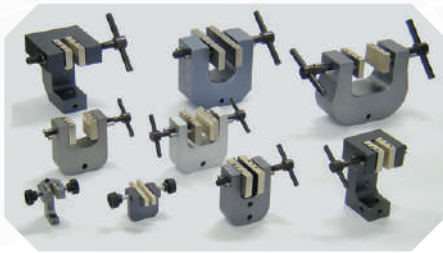
A free assessment is carried out following a visit to your site.  
Feel free to contact us!

# TOOLING

A wide selection of standard and custom accessories is available for all types of testing :

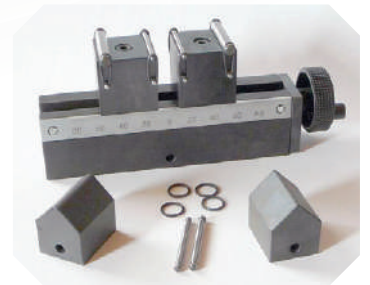
- Compression testing,
- Tensile testing on bars, tubes, ropes, straps, cables, chains, strands...
- Bending testing
- Peel testing
- Shear testing
- Non-exhaustive list...

We offer standard tooling compliant with international standards for materials such as steel, alloys, copper, cast iron, plastics, composites, polymers, etc. We also provide thermal and environmental chambers for testing under controlled temperature and humidity conditions. Our R&D department also designs custom tooling to meet your specific needs

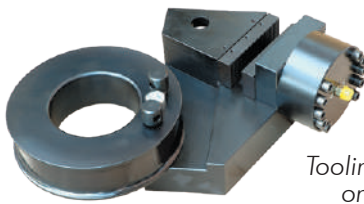


A wide range of tooling for tensile testing on specimens of various shapes and sizes

Thermal chambers and furnaces



Tooling for bending tests

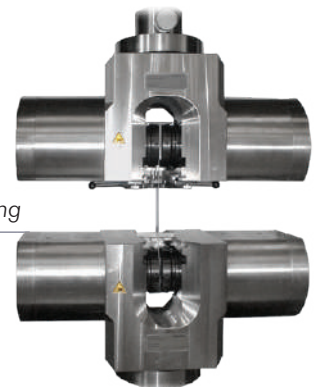


Tooling for tensile testing on ropes, cables, etc.

Tooling for peel tests



Hydraulic grips for high-load tensile testing



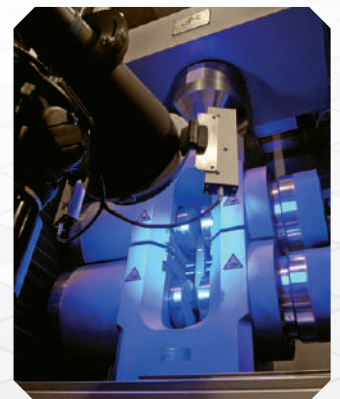
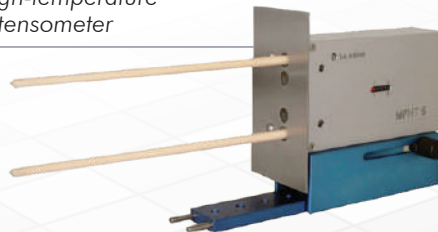
# EXTENSOMETERS

The range of extensometers available at 3R includes models designed to test a wide variety of materials, including metals, plastics, composites, and ceramics, meeting all international standards requirements in terms of strain and displacement. The range, gauge length, and accuracy can be defined to meet specific needs.



Laser extensometer

High-temperature extensometer



Video extensometer



Clip-on extensometer



Automatic extensometer

# DESIGNER OF UNIVERSAL TESTING MACHINES

*Find us, contact us*



MONTAUBAN (82)



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