VIRTUAL WELDING

/ The welder training of the future

VIRTUAL WELDUCATION BASIC APP

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BECOME A WELDING EXPERT WITH VIRTUAL TRAINING.

Many professions are already exploiting the advantages of virtual training in order to prepare for the real world. That's how pilots train, practising countless take-offs and landings in a simulator before they fly a real plane. The bigger, more expensive and more dangerous the equipment used, the more often training is carried out in the virtual world. So why not facilitate welder training with virtual tools as well?

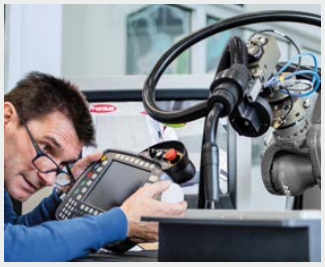
Virtual training is the ideal instrument to realistically simulate complex processes and difficult situations in a risk-free and cost-effective way and to practise them again and again. This is why it is also ideally suited to welder training.

The safety risk for beginners, which is significantly higher for welding than other professions due to the hot arc, disappears entirely when welding virtually. With Virtual Welding, trainees can learn and practise basic welding skills step-by-step on typical workpieces. Furthermore, virtual training allows expensive consumables such as metal, wire and shielding gas to be saved.

Fronius Virtual Welding is available with four function packages allowing three process variants to be practised:

/ MANUAL METAL ARC WELDING 111
/ MAG WELDING 135
/ MAG WELDING 135 MECHANISED
/ TIG WELDING 141

Mechanised MAG welding enables users to take part in risk-free and cost-effective welding robot training without the need for significant structural alterations. No extraction, eye protection or fireproof floor is needed – just a standard seminar room with a functional robot.



Look for the icons throughout this folder and use your **Virtual Welducation Basic App** *for getting more interesting content.*

LET THE "GHOST" GUIDE YOU TO THE PERFECT WELD SEAM

The first step is always the training sequence where the trainee welds under the guidance of the "Ghost". Next the real welding situation is simulated.

In the **training sequence**, the virtual trainer or "Ghost" shows trainees the optimum welding speed, the distance to the workpiece, the tilt angle for the welding torch or the electrode holder, and the filler metal. Traffic-light colour signals on the screen and real-life welding noises give the trainees real-time feedback, showing them where and how they are on-target or deviating from target. This allows them to make corrections in real time.

The **variable "Ghost"** lets trainers store their own know-how and manual skills in a few steps and provide them to their trainees to use as a training guideline. This allows the trainer to pass on their welding style one-to-one.

In the **simulation sequence**, the trainee practises in a real welding situation – with no help from the "Ghost". The result is a virtual weld seam, displayed in a true-to-life three-dimensional way. After the simulation, this can be replayed and analysed with the help of the "Ghost".

MANUAL METAL ARC WELDING

In manual metal arc welding, the training focuses first on igniting the electrode. The user then practises the other motion sequences. Two types of electrode can be used; a long one for practising ignition and a short one for welding, whereby the electrode virtually melts off.

The trainee can also practise with different electrode diameters. After welding, the slag can even be removed virtually.

MECHANISED MAG WELDING

Trainees practise programming the optimal welding torch position with a robot welding torch. The "Ghost" provides feedback about the welding speed and the distance and tilt angle to the workpiece.

The simulation enables the trainee to experience a virtual representation of the programmed welding results. The filling volumes and position of the weld seam on the sample workpiece are shown realistically.

MAG WELDING

Welding beginners learn the skills involved in MAG welding in separate training steps. A real MIG/MAG welding torch is provided for this.

The focus is on the various set values for MAG welding – more precisely with the dip transfer and pulsed arc – and the effects they have on the welding results. In the first step, the arc is simulated and in the second trainees can (must) set the parameters themselves.

TIG WELDING

In addition to the special TIG welding torch guidance, a separate sensor helps teach the user to apply the optimum amount of filler metal. The addition of the filler metal is individually adjustable, depending on the task.

With further practice, the steady hand guiding the torch and the addition of the filler metal are consolidated. All imperfections in the weld seam are shown realistically.

Three process variants, four function packages

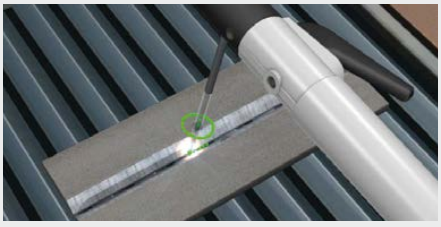
Efficient use of time and higher training intensity

No safety risk for welding novices

YOUR BENEFITS

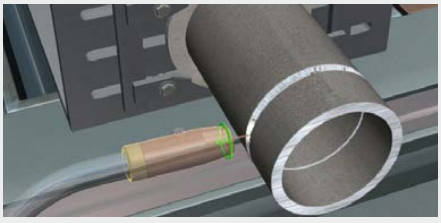
Variable “Ghost” for passing on the trainer’s know-how

Positive group dynamic and comparability of results



Manual metal arc welding training sequence

Manual metal arc welding simulation sequence

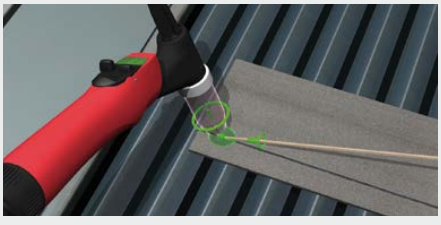


MAG training sequence

MAG simulation sequence

Mechanised MAG simulation sequence

Mechanised MAG training sequence



TIG training sequence

TIG simulation sequence

VIRTUAL WELDING
THE PERFECT TRAINING SYSTEM

EXTREMELY INTUITIVE OPERATION

Ultra-simple menu navigation and touchscreen option-selection combine to make Virtual Welding very easy to use.

SERVICE

Fronius offers high-quality and professional services for Virtual Welding. From customer-specific planning and advice, to tailored support and selected service packages, we create the perfect solutions for our customers and ensure everything runs smoothly.

EASY TO UPDATE

Virtual Welding can easily be updated with the latest version of the software and new processes using an external DVD drive.

DATA SECURITY

Ranking lists, welding results, curricula and courses, and the variable "Ghost" can be transferred and saved to a USB flash drive. The results can also be used for certificates.

FLEXIBLE

Thanks to the Mobile Case, the system can be used flexibly, for example in external training rooms.

ANALYSIS TOOL

Every welding process is recorded and can be replayed at any time, meaning it can be closely analysed against the optimal target.

REALISTIC PERSPECTIVE

The headband and sensor determine the position of the welder's head. Wearing a real welding helmet with an enlarged viewing window and integrated 3D glasses (optional), the trainee is virtually in the welding environment.

NO LANGUAGE BARRIERS

Available in many languages, so language barriers are non-existent during training.

EXTENSIVE TRAINING OPTIONS

/ Variety of workpieces for different welding requirements; single-V butt weld (multi-pass), fillet welds (multi-pass), square butt weld, pipe-pipe joints and pipe-plate joints
/ Different welding positions: PA (1G), PB (2F), PC (2G), PD (4F), PE (4G), PF (3G, 3F) and PH (5G), PJ (5G)
/ Different weld seam types: single V-butt welds (single and multi-pass), fillet welds (single and multi-pass), melt runs and square butt welds (single-pass)

MAKING LEARNING FUN WITH QUIZZES

One question, three possible answers – welding beginners can have fun testing and expanding their welding knowledge, alone or in a group. The questions can be individually configured and updated. The integrated glossary acts as a reference aid for the welding novice.

POSITIVE GROUP DYNAMIC

A pedagogically sophisticated points system means that comparable training results can be achieved again and again; this allows the trainees to be assessed objectively and transparently. By spurring one another on and interacting in this way, as well as being assessed professionally, trainees learn swiftly and effectively.

INDIVIDUAL CURRICULA AND COURSES

The trainer can personally create curricula and courses, allowing the training to be individually tailored to target groups and specific skills.

REALISTIC WELDING TORCHES

The right, ergonomically designed welding torch (or electrode holder), faithfully modelled on the original, for every process.

GERHARD ZUBER

Head of the Welding Technology department, Fohnsdorf Training Centre

"Fohnsdorf Training Centre uses 'Virtual Welding' for MMA and MAG welding qualifications. It is an exceptional tool that enables the user to improve their skills. The simulators are fully integrated into the training content. First, the individual welding positions are practised on the simulator and then you implement what you' ve learned in practice. The playback function provides a constant analysis of errors from the system, allowing the user to continually improve their skills. The training modules are designed to create an interplay between virtual and real applications."

INPUT DATA	VIRTUAL WELDING TERMINAL	VIRTUAL WELDING MOBILE CASE
Dimensions W x H x L	62.8 x 190 x 60.8 cm	66.6 x 67.9 x 56.8 cm
Weight	92.17 kg	52.77 kg
Current consumption	1.2 A	1.2 A
Mains voltage	110 V - 230 V 50/60 Hz	110 V - 230 V 50/60 Hz

/ Perfect Welding / Solar Energy / Perfect Charging

THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 3,800 employees worldwide and 1,242 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

Further information about all Fronius products and our global sales partners and representatives can be found at **www.fronius.com**

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