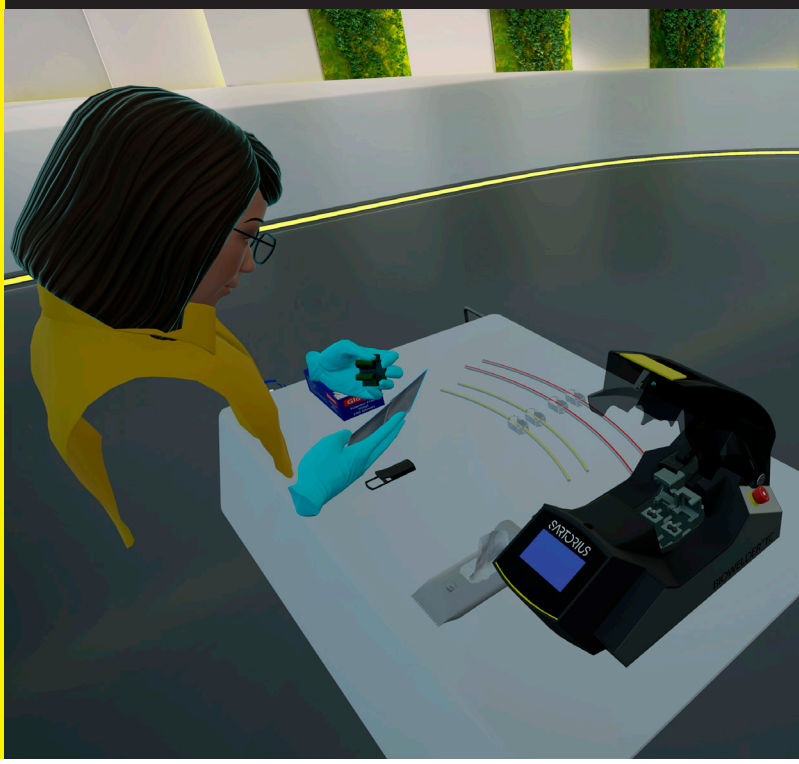
SARTORIUS

Product Datasheet

Biowelder® TC Virtual Reality Training and Assessment

On-demand digital training and assessment in a safe virtual environment, independent of trainer and system availability.



Benefits

- On-demand training and assessment with the flexibility to train operators at their own pace and convenience
- Cost efficient training alternative, by eliminating the dependancy on trainers, systems and venues
- Accelerated operator qualification with a standardized training
- Safe and controlled environment for operators to practice their skills without risk of contamination or product damage
- Improved engagement and retention for operators through interactive and immersive training
- Decreased carbon emissions associated with training by eliminating the need of travel

Product Information

The Biowelder® TC Virtual Reality Training provides fully immersive virtual reality training for making sterile connections between thermoplastic elastomer (TPE) tubing elements using the Sartorius Biowelder® TC. The training is designed to provide a realistic and interactive experience, allowing operators to practice their skills and gain confidence in a virtual environment before final qualification on the actual Biowelder® TC.

Product Description

The Biowelder® TC Virtual Reality Training has three interactive training modules that allow operators to practice and assess their skills:

- Self-guided training: The self-guided training mode provides flexibility for operators, enabling them to learn at their own pace, from anywhere in the world. Guiding elements guide the trainees throughout the training by giving detailed information on the training steps.

- Live instructor-led training: This mode provides an opportunity for operators to collaborate with a live trainer in a virtual classroom setting. This allows trainees to ask questions, seek clarification and receive feedback in real-time, eliminating the need of travel.

- Assessment: The assessment mode enables operators to assess their knowledge and skills. A completion certificate can be downloaded upon completion of the assessment module.

Benefits of training operators with the Biowelder® TC Virtual Reality Training

Training your operators with the Biowelder® TC Virtual Reality Training comes with several advantages.

- **Reduce operational costs.** Biowelder® TC Virtual Reality Training provides on-demand training independent of the availability of trainers, systems and venues. It allows you to train your operators without interrupting the production process, eliminates the need for expensive equipment, travel costs and venue rentals, making it a cost-effective option for organizations of all sizes.

- **Bring qualified operators faster to the shop floor.** The Biowelder® TC Virtual Reality Training allows you to qualify your operators more quickly by eliminating the need to wait for trainer or system availability.

- **Increase engagement through fully immersive training.** The Biowelder® TC Virtual Reality Training allows operators to fully immerse themselves in realistic and interactive simulations of establishing sterile connections between thermoplastic elastomer (TPE) tubing elements, creating a highly engaging and memorable learning experience which leads to better retention of information.

- **Train your operators in a safe environment.** The Biowelder® TC Virtual Reality Training provides a safe virtual environment for trainees to learn and explore without the risk of contamination or product damage.

- **Get firsthand experience while waiting for your systems to arrive.** The Biowelder® TC Virtual Reality Training allows operators to become familiar with the Biowelder® TC equipment and its functionalities, even before your systems are delivered. Your operators will have time to practice, increasing their confidence and competence through realistic simulations and feedback.

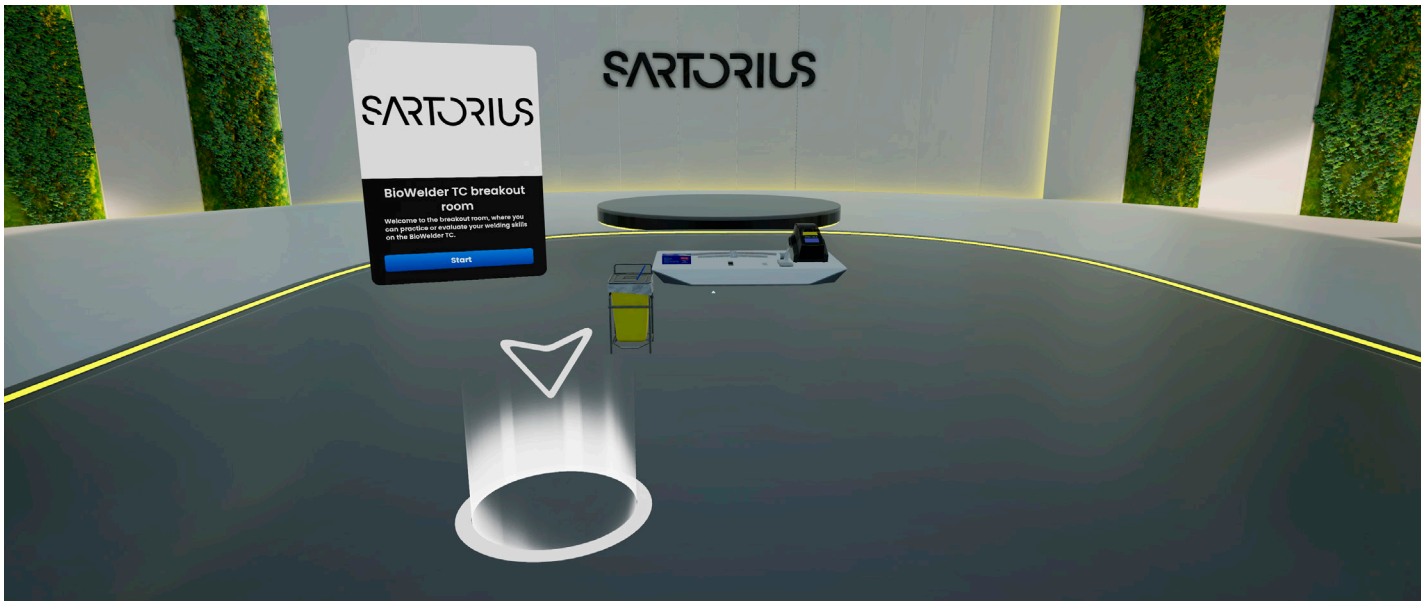
- **Evaluate the knowledge of your operators.** The Biowelder® TC Virtual Reality Training enables you to assess knowledge of your operators and create a standardized certification process throughout your organization.

- **Ensure standardized training throughout your organization.** The Biowelder® TC Virtual Reality Training can be accessed from anywhere in the world, ensuring a standardized learning experience for your operators and trainers alike.

- **Train operators in a classroom setting.** The Biowelder® TC Virtual Reality Training enables you to train up to seven operators simultaneously in the same virtual training room, accompanied by a live trainer. Operators have the opportunity to collaborate with a live trainer in a virtual classroom setting, without depending on the availability of the systems, venues.

- **Decrease carbon emissions associated with training.** Operators can access the Biowelder® TC Virtual Reality Training from anywhere in the world, without the need to travel to production or training sites, reducing the carbon emissions associated with transportation for training.

- **Retrain your operators on a regular basis.** The Biowelder® TC Virtual Reality Training enables you train and qualify your operators at regular intervals ensuring consistent experience with the standardized training.



Technical Requirements

For taking the Biowelder® TC Virtual Reality Training, you need:

- A VR headset that is compatible with the VR training software.
- A computer or device that meets the minimum requirements for running the VR training software.
- A stable internet connection to download and access the VR training software.
- A physical room with sufficient space.

Supported Virtual Reality (VR) Headsets

HP Reverb G2
Oculus Quest 2
Oculus Rift S /Oculus Rift

Room Requirements

Size	The area for each VR station including desk, PC/laptop, and head-mounted display (HMD) should be at least 2 x 2 m. Be sure to mark the individual areas on the floor and to leave some space between each area. The user may use these boundaries to set up his/her guardian area to prevent any collisions with other users while using VR.
Floor and ceiling	For the sensors of the HMD to function properly, choose a room in which the floor doesn't reflect light. Marble or tiled floors may impact equipment performance. Other reflective surfaces, such as mirrors or windows, may also interfere with the tracking sensors. The ceiling should not be too low or have low-hanging lamps/fans, so that the user has enough space to move without the danger of collision.
Installation	The PC/laptop requires sufficient air supply while running. Ensure that it is installed in an open area, e.g. on a laptop stand, shelf, table, or similar.
Ventilation	As heat will be generated, the room itself should be equipped with a strong ventilation system or windows that can be opened.
Power plugs	Ensure all VR stations have sufficient power supply. Up to three power outlets are required per station: One for the laptop power plug One for an external screen (optional) One for the HMD power plug if you are using HP Reverb G2.
Cable management	Set up a cable management system to keep the cables in order and prevent any tripping hazards. We recommend a ceiling-mounted cable management system.

Computer Requirements

Component	Recommended specifications
Processor	Intel core i5, i7, Intel Xeon E3-1240 v5, equivalent or better. AMD Ryzen 3 3300U equivalent or better
Graphics card	NVIDIA RTX 3060 (Alternatives: RTX 2070 / NVIDIA GTX 1080) / NVIDIA Quadro RTX 3000 or greater. AMD Radeon™ RX 6600 XT equivalent or better
Memory	8 GB + RAM (16 GB RAM recommended)
SSD storage	1 TB
Operating system	Windows 10 Pro (May 2019 update or later for HP Reverb G2)
USB ports	1 X USB 3.0 TYPE C
Video output	DisplayPort 1.3
Screen size (for laptops and notebooks)	17" or higher

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