PIONEERING THE USE OF INDUSTRY 4.0 VR TRAINING FOR STEEP RAMP OF A COMPLEX VISUALIZATION CATHETER

THE ROLE OF VR IN MODERNIZING MEDTECH TRAINING

Augmented Reality/Virtual Realty (AR/VR) is acknowledged for its potential impact to transform industry in the coming years if utilized correctly.

Discussions with US and European industry[1] reveal that AR/VR[2] training is often regarded as promising yet not fully established.

AR/VR training offers significant advantages to companies within the medical device sector. The possibilities include overcoming space constraints, eliminating the need to halt production environments, and providing scalable employee training solutions.

AN INDUSTRY CHALLENGE

Facing the challenge of implementing complex manufacturing processes for EP imaging catheters, Freudenberg Medical sought effective methods to elevate employee on-boarding and workforce skills at its facilities.

ADVANCED TRAINING AT FREUDENBERG MEDICAL

To address the complexities of manufacturing advanced EP devices, Freudenberg Medical has implemented Virtual Reality (VR) training for employees. This immersive training method enhances learning by simulating real-world production environments, allowing operators to practice intricate steps and techniques in a controlled setting. As a result, employees gain precision and confidence before transitioning to actual production lines.

New hires in production roles begin their VR training at a desk, simulating their exact tasks on the production line. The training is gamified, requiring operators to complete their tasks and achieve a target score to pass. Although final training takes place in the live production environment, VR reduces overall training time by 75%.

Currently, only the most critical and technically complex steps are included in VR training. With the primary investment in VR equipment already made by Freudenberg Medical, the company is working to expand the program with additional training modules.

FREUDENBERG
MEDICAL

THE IMPACT OF VR TRAINING

VR training offers a cost-effective, scalable solution that has the potential to deliver rapid ROI by enabling data-driven performance validation while enhancing operator confidence and safety.

Key benefits include:

1. **Data-Driven Validation and Standardization:** VR training provides an objective scoring system to ensure operators are line-ready and enables consistent performance benchmarking over time.
2. **Enhanced Operator Confidence:** Trainees can practice their skills in a risk-free environment, building confidence without any safety concerns or added costs before working on the production line.
3. **Reduced Defect Rates:** Operators trained via VR demonstrate fewer defects, leading to significant long-term cost savings.
4. **Scalable Training Model:** The replicable nature of VR training allows easy scaling across different sites. Following a successful pilot in Ireland, Freudenberg Medical expanded VR training to its U.S. facilities.
5. **Cost-Efficient Module Expansion:** With the initial investment in VR technology already covered, adding new training modules incurs minimal additional cost.

KEY METRICS

75% ↓
Training Lead Time

50% ↓
Scrap Rate

CONCLUSION

The real-world application of AR/VR will continue to evolve as it integrates into the production facilities of medical device manufacturers worldwide on a commercial scale. As an early adopter, Freudenberg Medical has proven the potential of AR/VR training to efficiently and effectively scale commercial production of complex EP catheters. EP catheters are universally recognized across the Medtech industry as some of the most intricate and challenging minimally invasive devices to manufacture at scale.

Freudenberg Medical has demonstrated that the adoption of AR/VR as part of a smart manufacturing approach for complex EP catheters is more sustainable, minimizes risks, and ultimately enhances product quality and operational efficiency. Efficiencies created in the workplace and the gamification element of training improves the overall job on-boarding process for tasks that could otherwise be considered laborious or manual.

"Statistically, we show the operator level required...the gamification and scoring is also very appealing. Our operators want to top the leaderboard." Freudenberg Medical Representative

References: 1. *Virtual and augmented reality: Implications of game-changing technologies in the services sector in Europe*, Eurofound: https://www.eurofound.europa.eu/system/files/2019-11/wpef19004.pdf. 2. *Research Institute Joins EU Virtual Reality Project to Revolutionize Healthcare*, Hungary Today - November 12th, 2024: https://hungarytoday.hu/research-institute-joins-eu-virtual-reality-project-to-revolutionize-healthcare/

Written by Seamus Maguire, VP GROWTTH & Lean Systems at Freudenberg Medical.

For more information, visit www.freudenbergmedical.com

Freudenberg Medical is a leading partner for Minimally Invasive catheter design, development and manufacturing, facilitating access, delivery and visualization in the most complex clinical applications. Working in collaboration with its customers, Freudenberg Medical has enabled countless innovations in cardiovascular, electrophysiology, structural heart, peripheral vascular and neurovascular therapies.

Contact us today to explore how we can support your next EP catheter program.

© 2025 Freudenberg Medical, LLC

FREUDENBERG MEDICAL