



# Relco Induction Sealing Systems



# INDUCTION SEALING

- Originally established in 1969
- Specialist designer and builder of induction & high frequency equipment
- Global supplier to numerous leading food, beverage & pharmaceutical companies
- Pioneer of direct/capless induction sealing technology
- Granted European and US patents

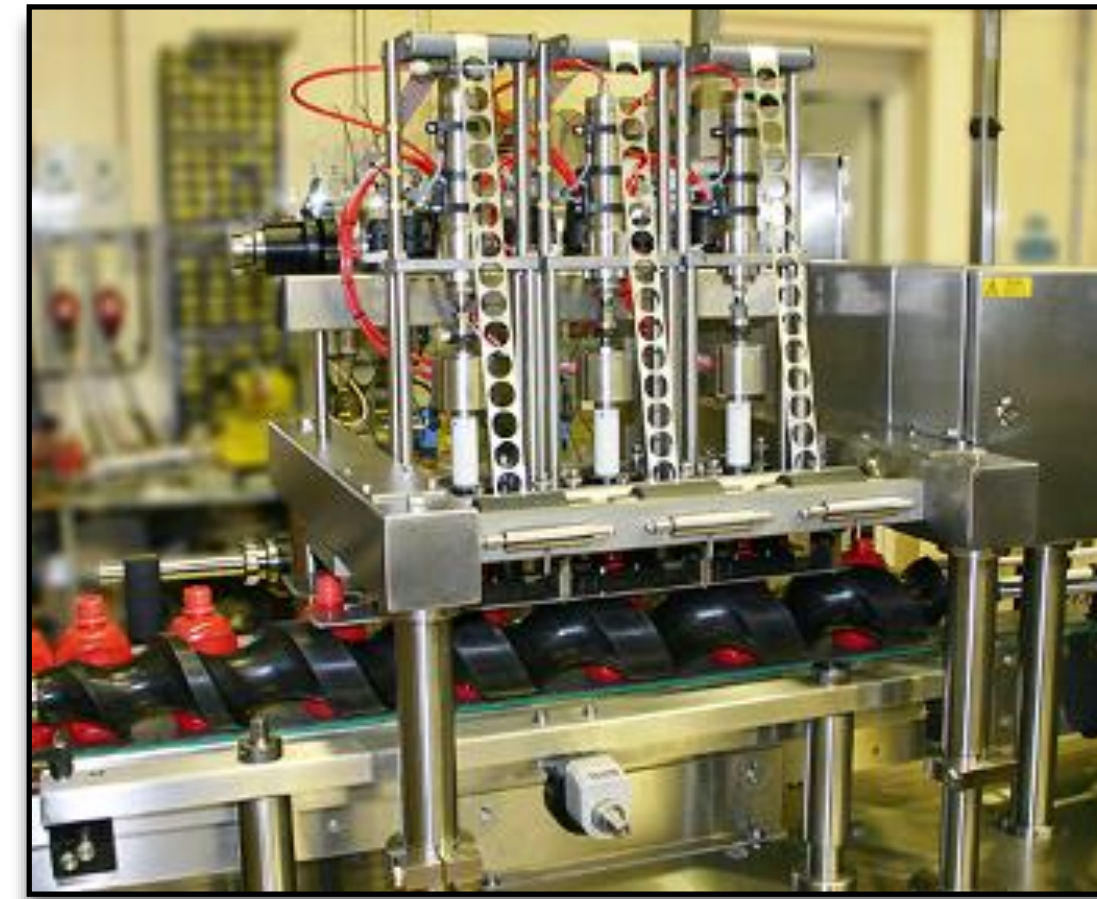
## Pioneering Developments including:

- World first ceramic foil punching & induction sealing system
- World first rotary continuous motion induction sealing machine
- World first continuous motion robotic foil punch&seal machine
- World leading OEM induction power supply for packaging industry



# HEADLINE BENEFITS OF DIRECT INDUCTION SEALING

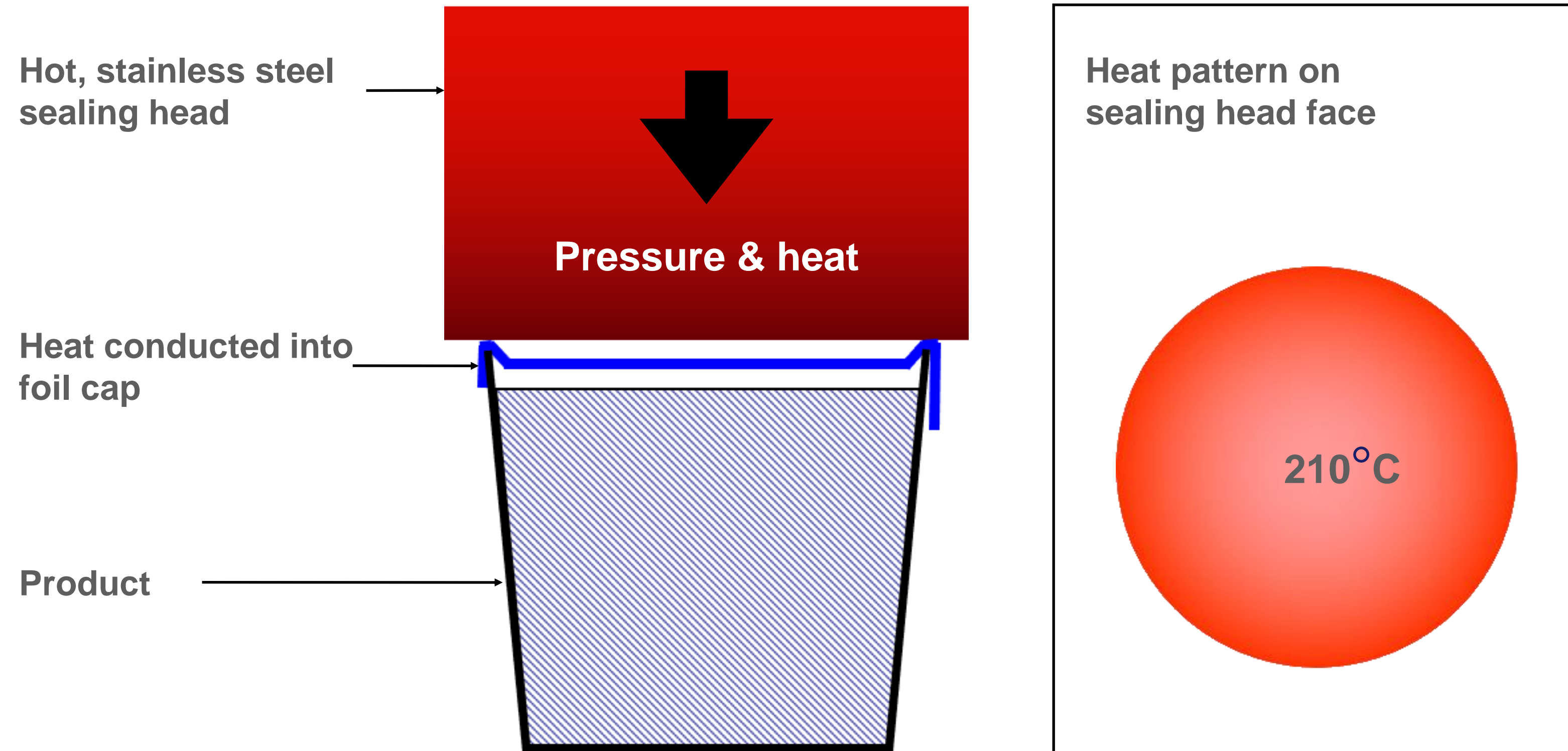
- Provides greater control over sealing process with digitally controlled induction heating time.
- Sealing pressure provided by induction head for consistent seal quality.
- Induction field precisely targeted at area where seal required.
- Cooling time can be provided by holding head down after induction cycle is completed.



Use of new sealing technology provides opportunity for efficiency gains, cleaner production, improved visual appearance of product and enhanced consumer experience with easy to remove foil.



# CONDUCTION SEALING



# COMPARING SEALING METHODS

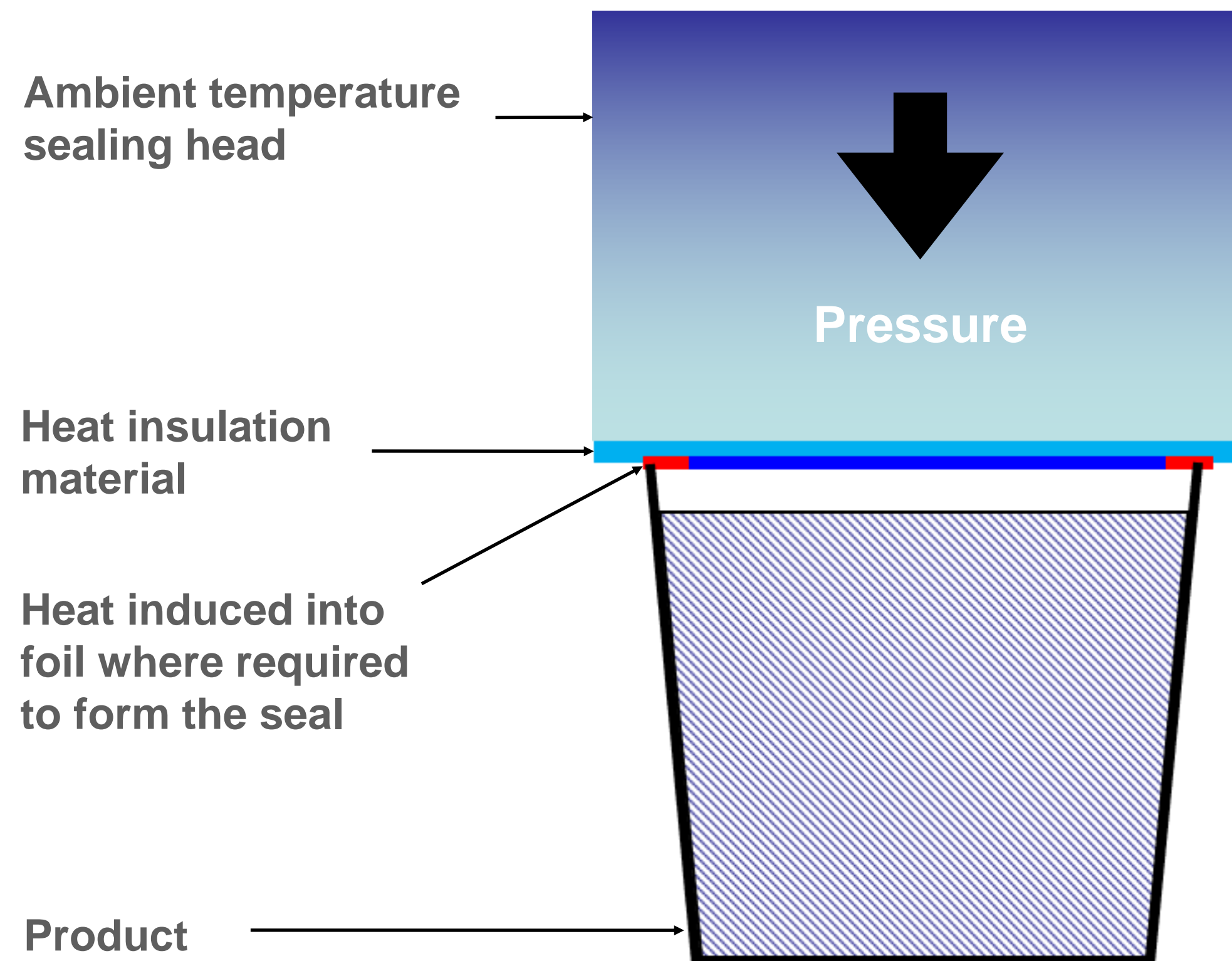
## CONVENTIONAL CONDUCTION

- Inefficient, most of the energy put into the head is lost into the atmosphere
- Poor reliability with regular element & thermocouple failures due to high temperature levels within head whilst operating
- Difficult to control with temperature time-lag
- Workplace safety issues with hot surfaces
- Lost production with warm-up & cool down
- Conduction seals typically difficult to peel as trade-off exists between seal strength and openability

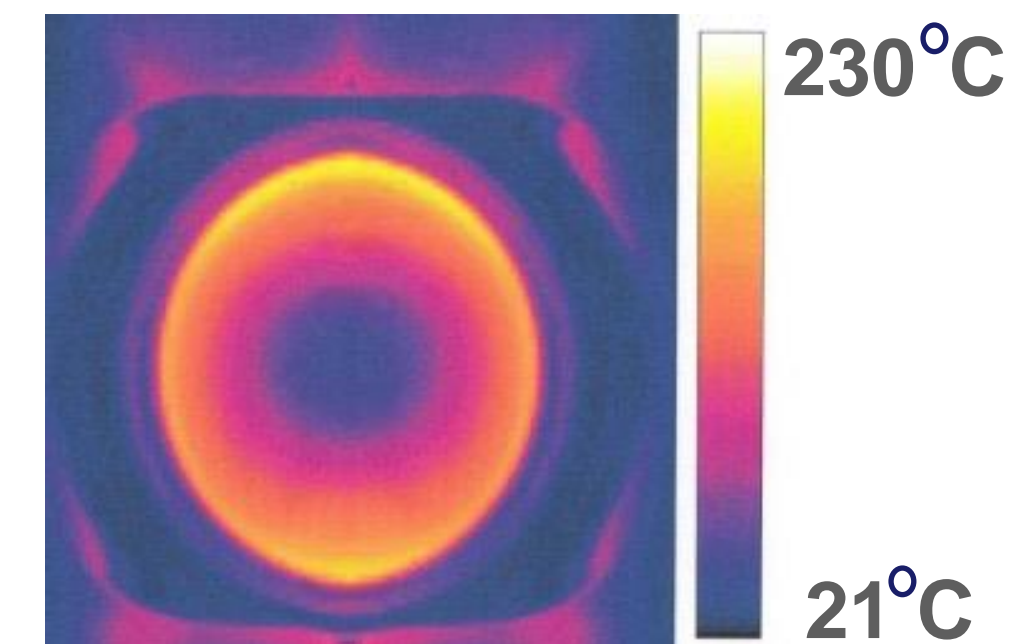
## DIRECT INDUCTION

- **Highly efficient, only the foil seal is heated during the sealing process**
- **Extremely reliable since system is solid state and sealing head remains at ambient temperature with no thermal stress**
- **Precise digital control over energy input to head**
- **Extremely safe as no hot surfaces present**
- **Instant start-up and shut down for optimum availability**

# DIRECT INDUCTION SEALING



Heat pattern on foil seal -  
only sealing area of foil is heated



THE BENEFITS OF

# DIRECT INDUCTION SEALING

## Increased Efficiency

- Electromagnetic heating within foil, no heat lost into environment
- Energy only used when machine sealing, zero consumption on standby

## Total Control

- Real time digital control over induction power level (temperature)
- Exact control of induction cycle time
- Precise control of sealing pressure via sealing head – compliant rubber sealing surface
- Ability to maintain pressure on foil during ‘cooling’ phase
- Measurement of induction power on each seal possible =100% QA validation

## Improved Productivity

- Significant reliability improvements as no heat is present in the components
- Instant start-up & shut-down
- Fast sealing cycle times
- Clean sealing
- Greater operator safety with cold sealing head

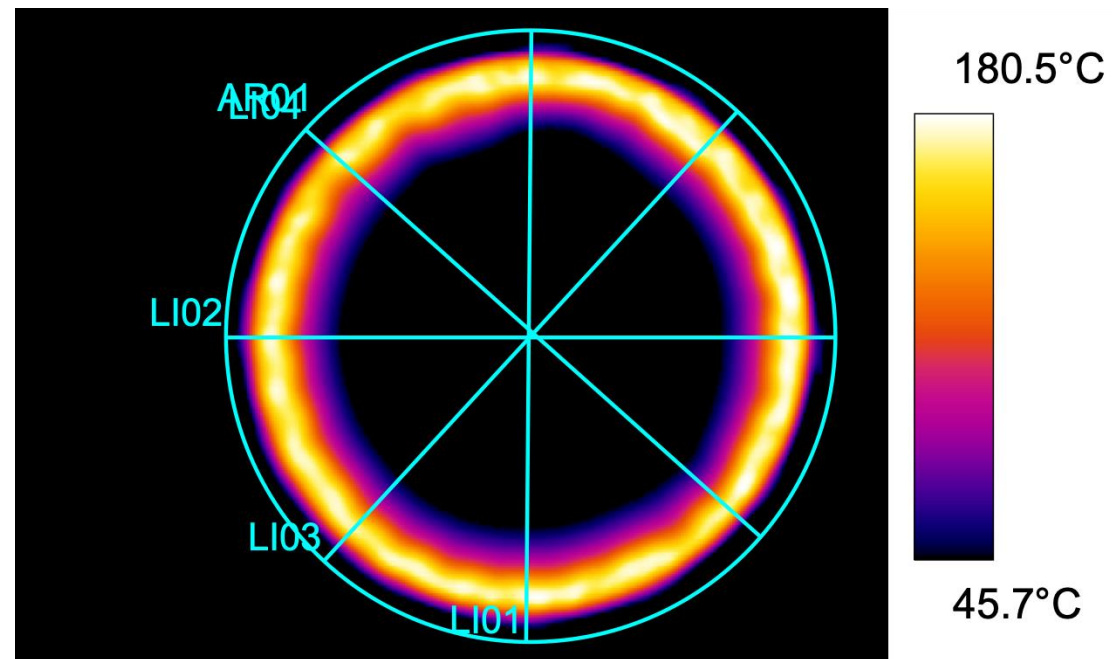
# PUNCH & SEAL SYSTEM

- Single-stroke die cutting and induction sealing of foil membrane
- Highly accurate seal formation and placement ( $\pm 0.05\text{mm}$ )
- Custom designed system to fit into any OEM equipment
- Provides high quality induction seal direct to container
- Allows use of thinner aluminium structures
- Multiple units can be deployed for increased output





# P800 COMPONENT SYSTEM



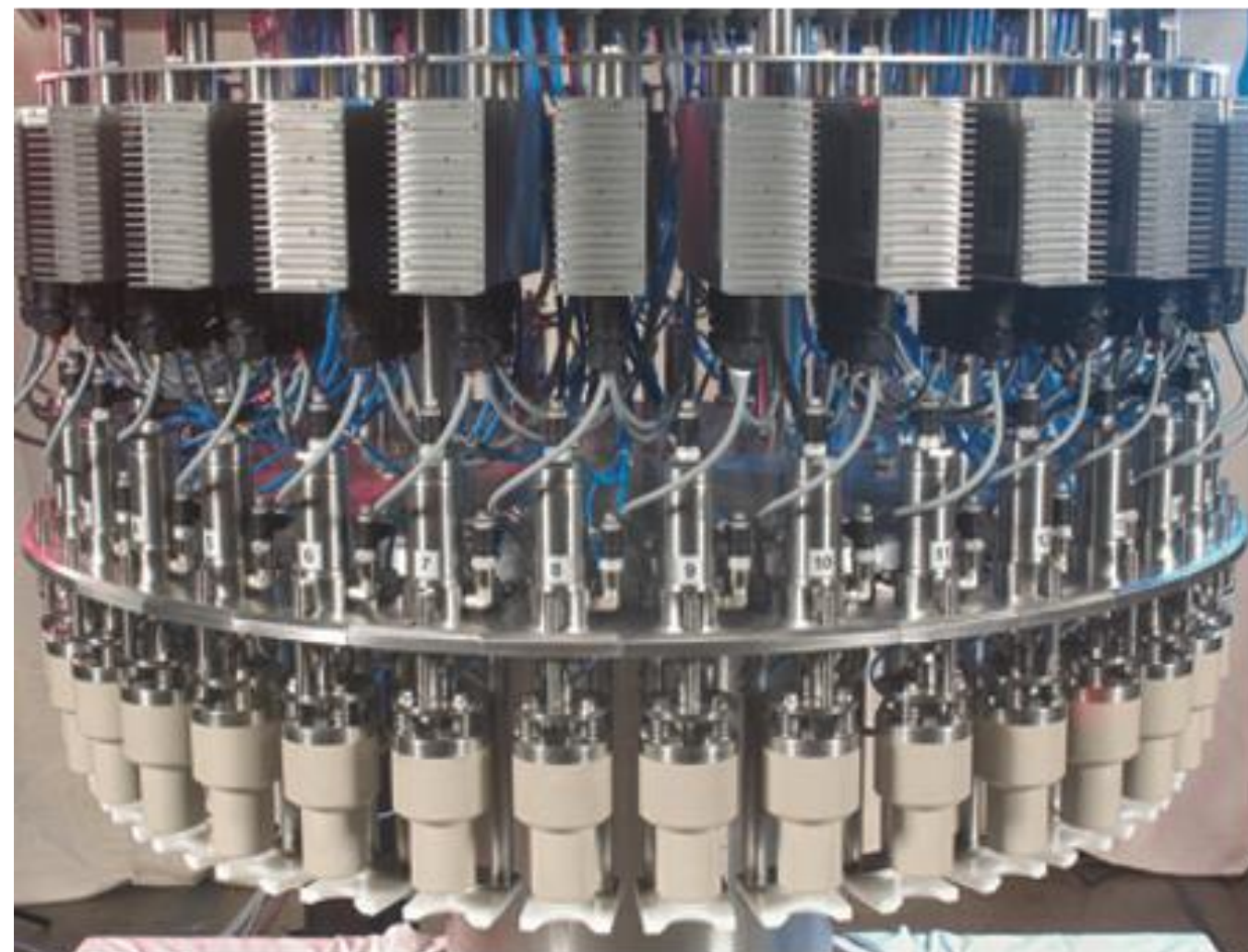
- Self-contained 800W PLC controlled induction generator
- Designed for rapid on/off switching
- Air cooled for ease of installation
- Compact design with high output power
- Unrivalled reputation for reliability (over 3000 units in service world-wide)
- Suitable for installation in a wide variety of OEM filling & sealing machinery
- Induction sealing heads custom designed by Relco to meet each application

# P800 COMPONENT SYSTEM

Relco can build both rotary turrets and linear systems for incorporation into third party filling equipment or stand-alone sealing machinery as required.

For over 20 years, our P800 based systems have been put into production equipment with a number of leading machinery manufacturers, including:

**Krones**  
**Tetrapak**  
**RA Jones**  
**IMA Life**



**Sidel**  
**IMS Machines**  
**ATS/Sortimat Automation**  
**Jewett Automation**



**KHS**  
**Alfill**  
**SIG**  
**Fords Packaging Systems**



# P800 COMPONENT SYSTEM

The P800 Induction System has been adopted in packaging applications by a wide variety of leading multi-national companies in production locations in Europe, North America, South America and Asia. Some of our satisfied customers include:



# EXAMPLES OF CAPLESS INDUCTION SEALING



Metal



Plastic



Non-round



BAP® Closures



Tubes, Valves & Fittings



Glass

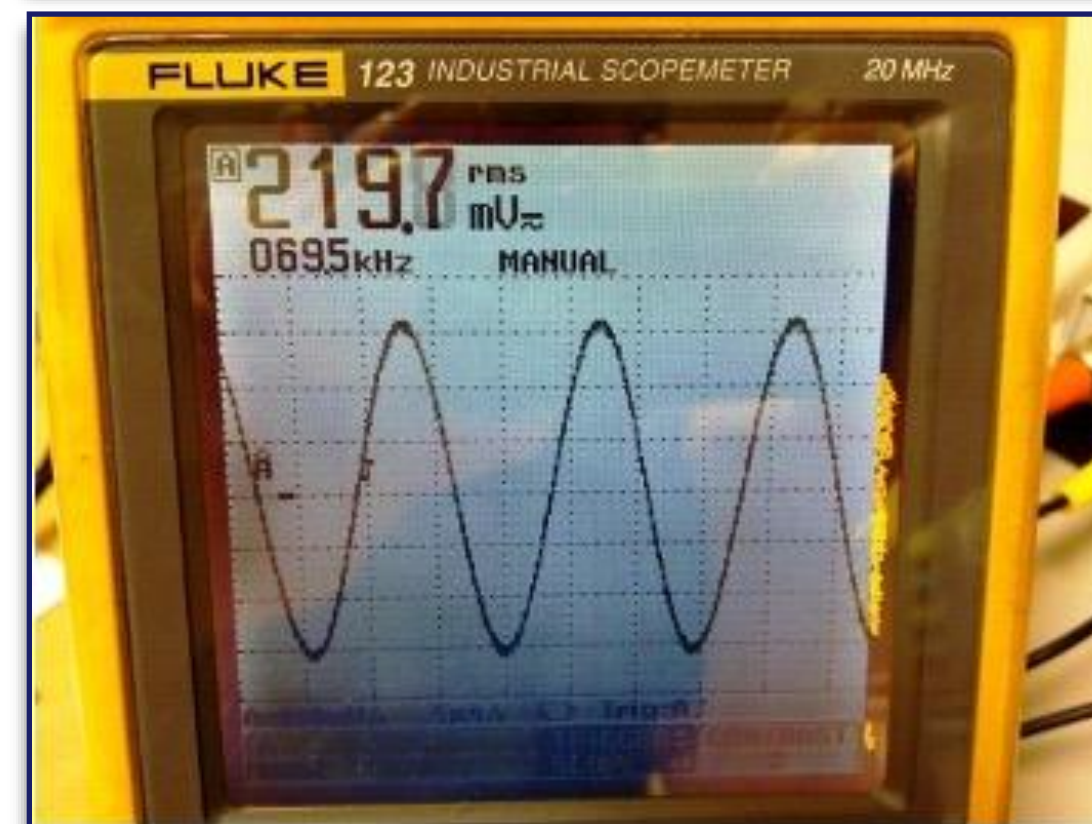


INDUCTION SEAL

# HEAD DEVELOPMENT

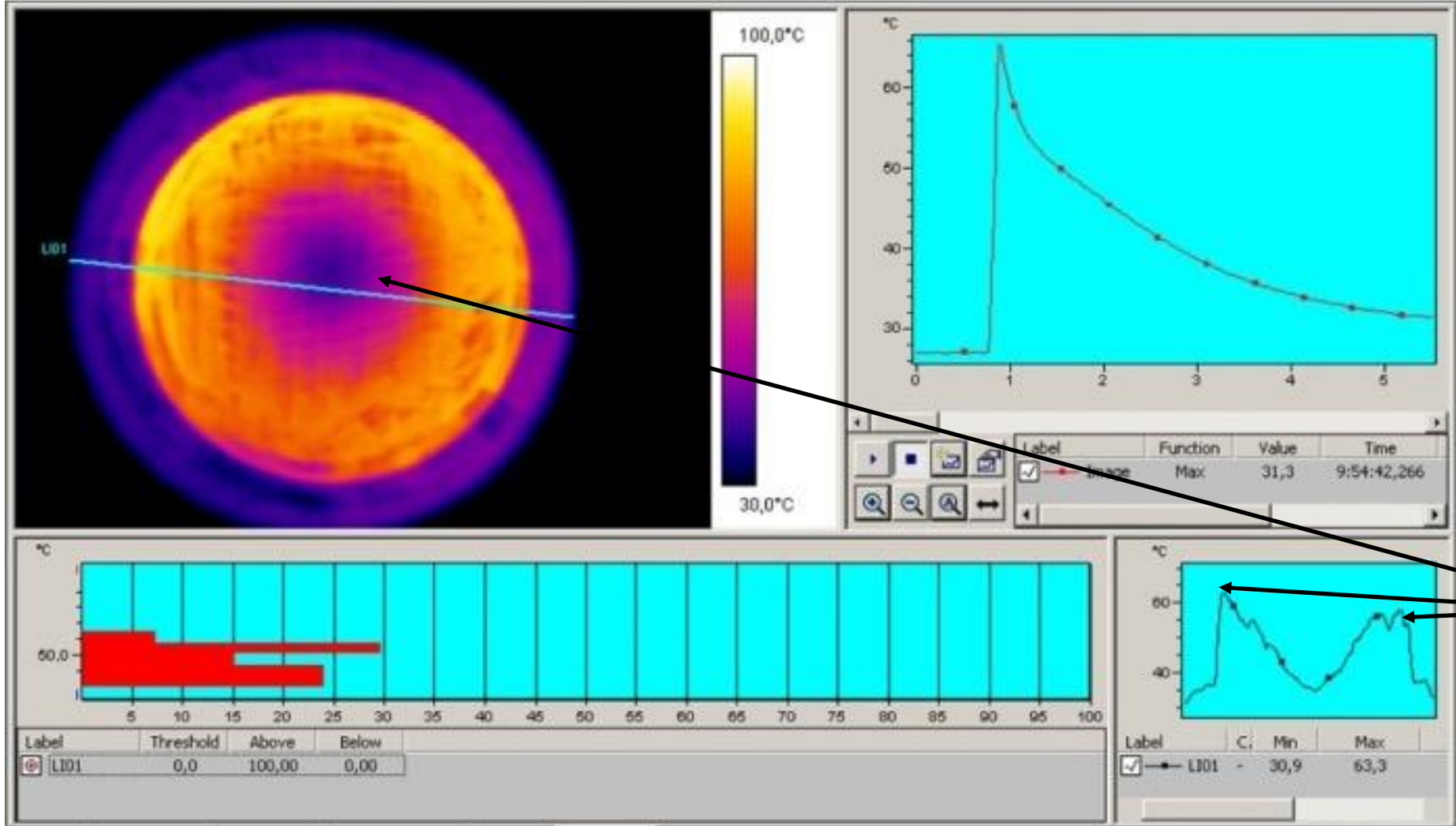
Our team of electronics engineers and induction specialists use the latest equipment to precisely define the operating parameters of each sealing head.

This allows precise control over the induction field and the capability to manufacture multiple heads to the same performance specifications



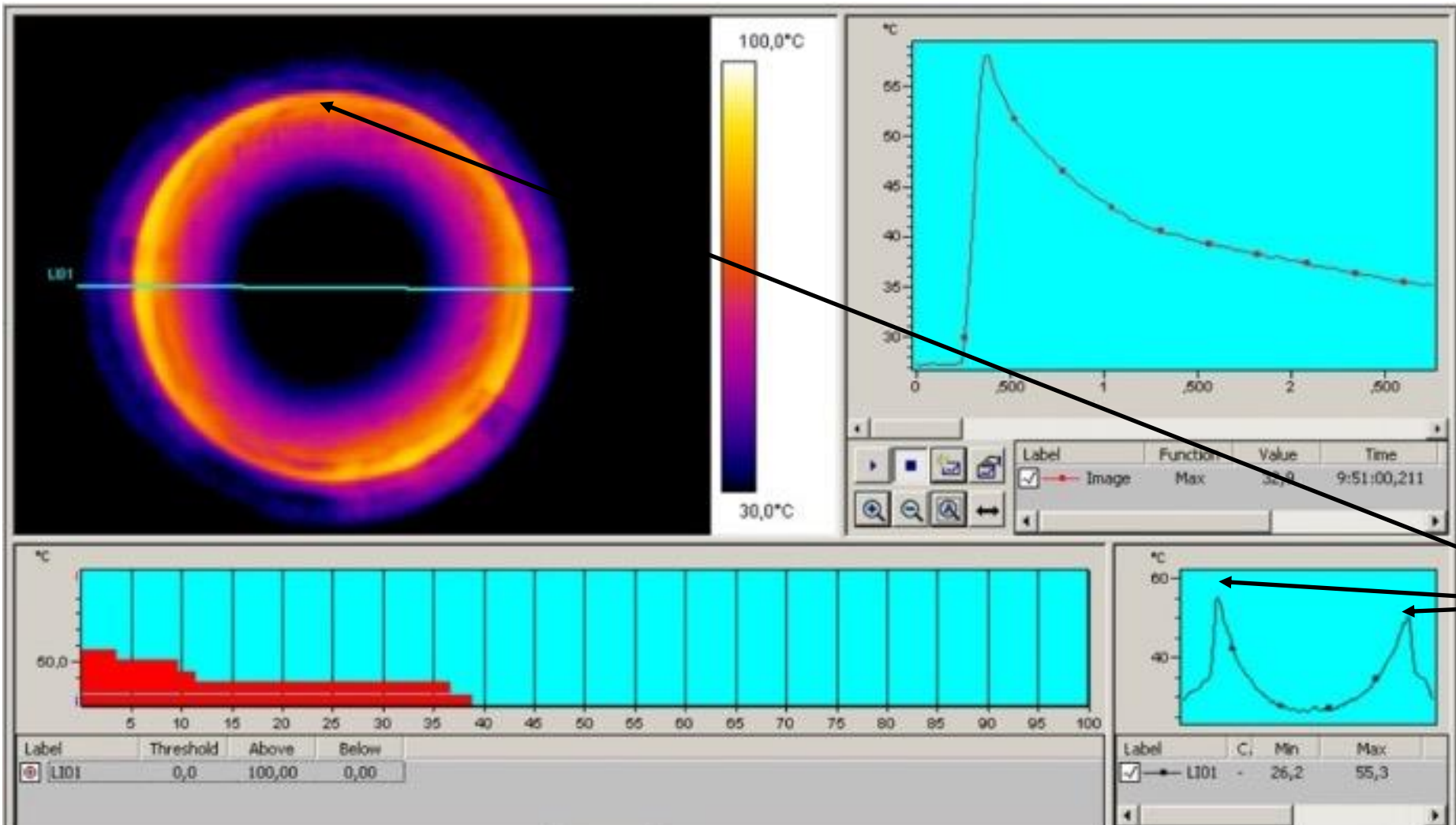
INDUCTION COIL

# PERFORMANCE OPTIMISATION



Use of our thermal imaging system to verify heating patterns and optimise seal head design focusing energy where required for seal formation

Initial seal head heating pattern, it can clearly be seen that the heat energy is dissipated quite widely across the foil.

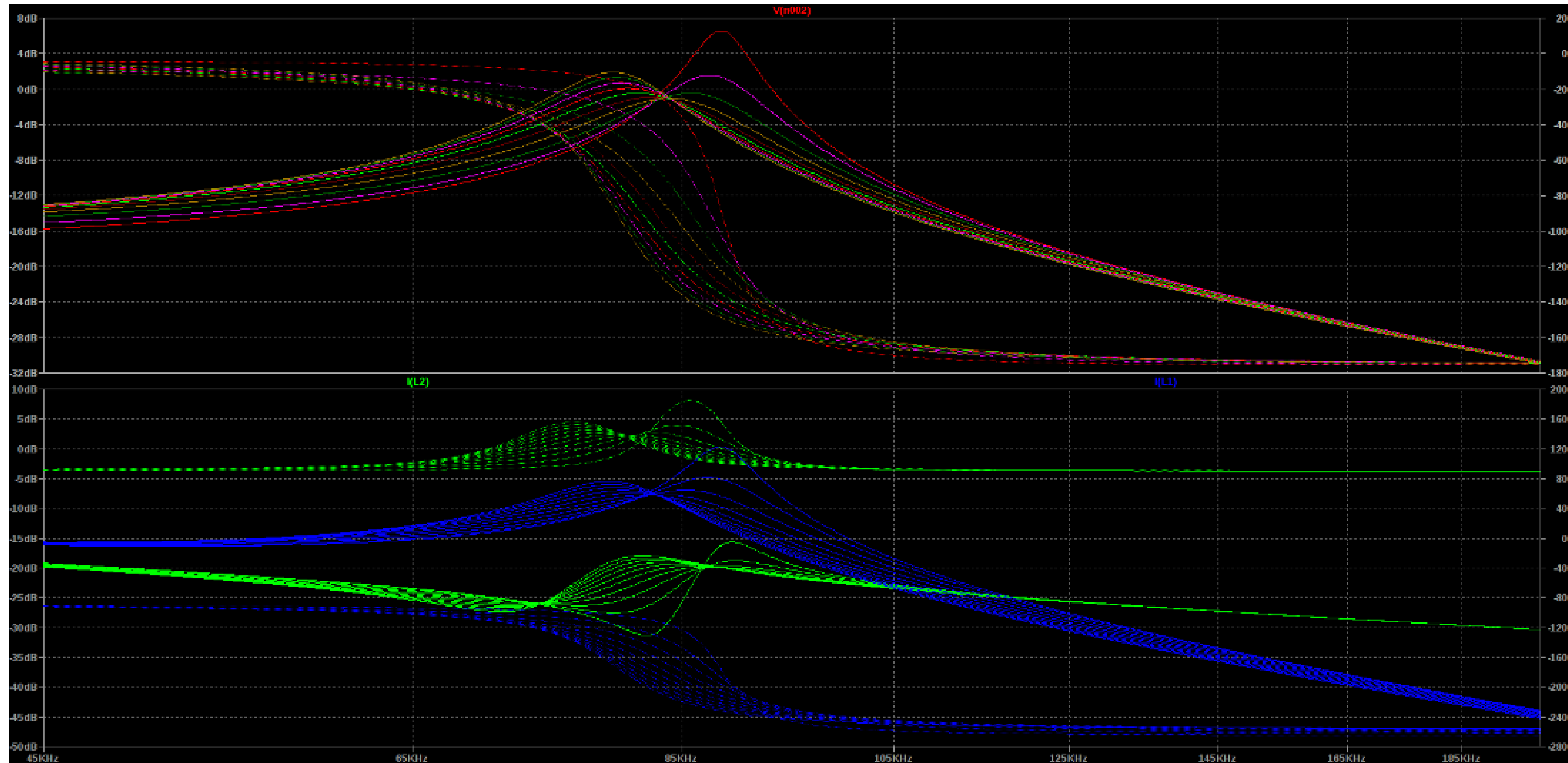


Optimised induction coil showing greatly increased focus of heat on the sealing area of the foil.



INDUCTION COIL

# PERFORMANCE OPTIMISATION



For complex projects, we use finite element analysis to model the optimum induction heating parameters including resonant frequency and distance from coil to seal. This ensures maximum energy transfer and produces the best sealing performance.



# DRAWING BOARD TO MARKET PLACE

Using Relco induction systems can take you from the development and proof-of-principle phase right through to high speed production for the marketplace using the same sealing technology.

MIT-2 test sealing machine utilises the same P800 induction generator and seal head as is provided in the final industrial production equipment allowing replication of lab results on full scale production equipment without having to change sealing process or technology. The FCS-1 is a single station semi automatic foil cutting and sealing machine which can be scaled up to multiple station automatic machinery for high speed production requirements.

This process provides a fast, safe and efficient route from the drawing board to the marketplace with each seal being made in the same controlled and monitored way, one at a time, just with multiple heads to provide the required output rates.



CASE STUDY

# Abbott Diagnostics

Development of Alere i / Abbott ID Now – Molecular Infectious Diseases Diagnostic System



Initial product development done using MIT-2



Clinical trials and FDA validation undertaken using FCS-1 semi-automatic system



Production at 200 parts/min done using 2x6 Head OEM system installed in automated filling line.



## CASE STUDY

# P&G 3MM

Development of Foil Sealed Closure for P&G's Aussie 3 Minute Miracle

Working with closure manufacturer Aptar, we developed a foil seal directly applied to the cap which looked and peeled like the original label but was induction sealed to provide leak-proof transit.



We then designed and built an automated machine which was capable of meeting the 8 million closures per year demand from the end user.



# CASE STUDY

# VALVOLINE

Design & Manufacture System for Sealing New Oil Bottle

MIT-2 machine used to develop closure and neck finish, conduct transport trials and consumer study



3 custom machines were then built using an iTrak to pick, place and weld the BAP closure directly onto the bottle at speeds of upto 120cpm





**Thank you**

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