

Minimise downtime and gain real-time insights for locating heat exchanger leaks without the need for a shutdown

Tracerco's specialised chemical and isotope tracers are used for detecting leaks in heat exchangers, no matter how small the potential leak.

The Approach

Tracerco's chemical leak test tracers offer precise, reliable leak detection specifically engineered for challenging process conditions. Our tracers meet all relevant criteria, selected for their solubility, chemical inertness, thermal stability, and faithful flow with the process medium, ensuring they remain stable and do not precipitate, minimising contamination risks or interference with the process.

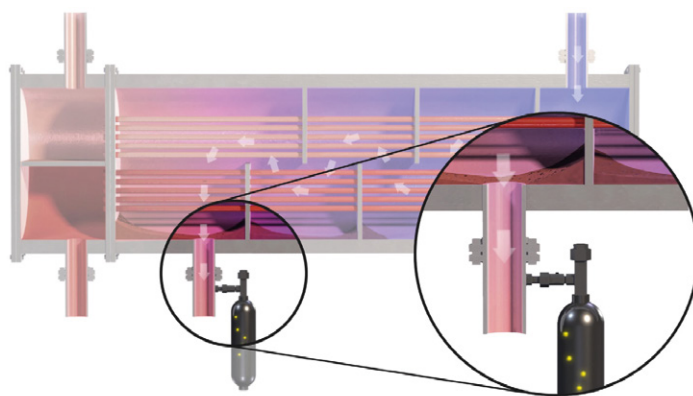
With the capability to detect leaks as small as 0.5%, Tracerco's solutions have already proven, effective globally and exceeding industrial standards. However, in response to increasing demands for detecting even smaller leaks that can affect product quality, Tracerco has developed specialist chemical tracers that are detectable in samples at concentrations as low as 1 ppb, meaning that extremely small leaks can be detected. This allows manufacturers to monitor for leaks that might otherwise compromise quality or impact regulatory standards.

The techniques used to complete an injection program with tracers entail the introduction of the system-compatible tracer into the process medium that is unique to the system and sample for its presence downstream of the potential leak sources.

The Field Test

These tests were conducted to support our customer's efforts in ensuring operational integrity and reducing Total Organic Compound (TOC) concentrations to meet the integrity operating window (IOW) standard of 50ppm. Based on historical data, heat exchangers E-21006A/B and E-11006 were identified as potential sources of leakage.

The detailed results, displayed both graphically and in tables below, reveal that chemical tracers were detected in seven samples from E-21006A and four samples from E-21006B. This provides a high level of assurance that both exchangers are active sources of leakage, enabling targeted actions to protect system performance and environmental standards.



After carefully considering in-situ conditions Tracerco's subject matter experts (SMEs) decided to undertake a Tracerco Diagnostics™ Leak study.

Based on our customer's data, the leak rate for E-21006A was determined to be 6500 kg/hr, while E-21006B exhibited a rate of 6900 kg/hr. No chemical tracer was detected in any samples from E-11006, confirming that this exchanger was not leaking during the testing period.

The Analysis

Samples were collected onsite in suitable containers and chemical analysis and chemical analysis was carried out in Tracerco's laboratory.

Figure 1 - Sample analysis results from E-21006B heat exchanger.

Cylinder no.	Sample number	Sample date	1,4 – chemical tracer(ppb) w/w
571	1	5-Dec-23	0.00
572	2	5-Dec-23	0.00
573	3	5-Dec-23	0.00
574	4	5-Dec-23	40.45
575	5	5-Dec-23	102.69
586	6	5-Dec-23	23.68
587	7	5-Dec-23	6.66
588	8	5-Dec-23	0.00
589	9	5-Dec-23	0.00
590	10	5-Dec-23	0.00
Bottle	11	5-Dec-23	0.00

Figure 2 - The dilution curve of E-21006B displays a textbook concentration peak indicating a leak.

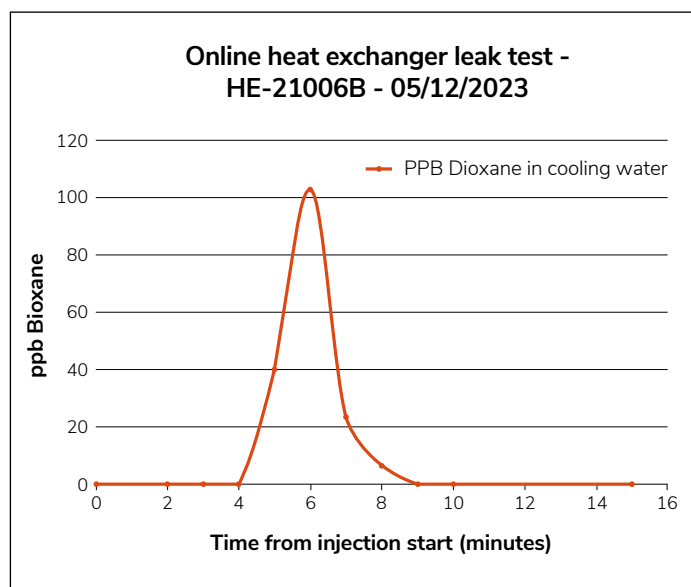
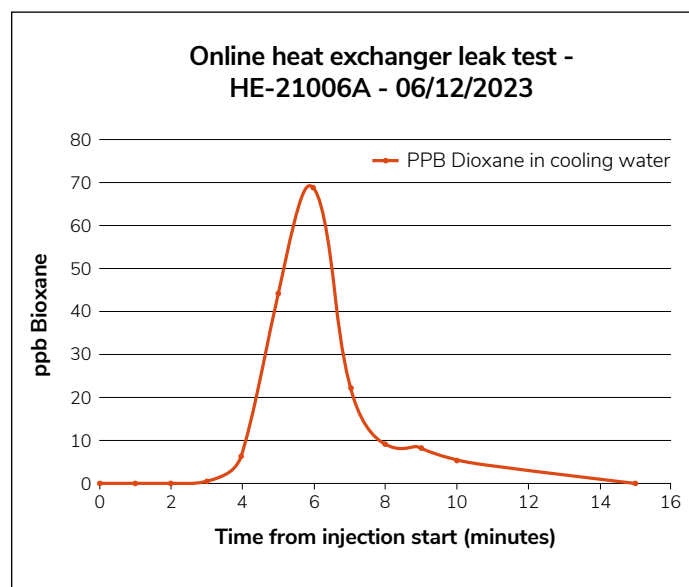


Figure 3 - Sample analysis results from E-21006A heat exchanger.

Cylinder no.	Sample number	Sample date	1,4 – chemical tracer(ppb) w/w
585	1	6-Dec-23	0
584	2	6-Dec-23	0
583	3	6-Dec-23	0
582	4	6-Dec-23	6.05
581	5	6-Dec-23	44.09
580	6	6-Dec-23	68.98
579	7	6-Dec-23	21.9
578	8	6-Dec-23	9.18
577	9	6-Dec-23	7.87
576	10	6-Dec-23	5.2
Bottle	11	6-Dec-23	0

Figure 4 - The dilution curve of E-21006A displays a textbook concentration peak indicating a leak.



The Conclusion

The results of the test indicate two of the three exchangers tested were leaking, as summarised in the table below.

These findings provide actionable insights for targeted repairs, allowing our customer to address the identified leaks efficiently and maintain operational standards.

Exchanger	Date	Leak	Leak size
E-21006B	05/12/23	Yes	6900 Kg/hr
E-21006A	06/12/23	Yes	6500 Kg/hr
E-11006	07/12/23	No	NA

Our innovative work gives customers the insights they need to help solve their problems. To learn more, read our case studies at tracerco.com/downloads/case-studies