Summary

Fracture surface analysis is a technique for figuring out the cause of the fracture of a product by determining the process of the occurrence of the fracture and the defective area by conducting SEM observation of the fractured surface of the product. Here is an actual case in which the fracture surface analysis of a fractured tube was performed to identify the starting point of the fracture, and the cause of the degradation was determined by microscopic infrared spectroscopy.

At the air leakage part, an approx. 5-mm crack was found in the lengthwise direction of the tube.

When the cracked part was enlarged and observed, it was found that a micro crack had occurred in the circumferential direction as well.

• Starting point of fracture was identified from fracture surface observation.
• Starting point was in the inside of the tube, and the fracture proceeded toward the outside in fan shape in the inside of the tube. (Fragile fracture surface where the resin showed little elongation)
• Many cracks were found in the tube inside and in the lengthwise tube direction.
• From microscopic infrared spectroscopy, it was found that there was absorption of carbonyl in the vicinity of the starting point. → It was presumed that the fracture was due to the oxidative degradation.