

## Outokumpu

**Award:** Safety  
**Category:** Workplace improvement

# Has there been an increase in mortality in stainless steel production caused by occupational exposures or working conditions?

## Challenge

In stainless steel production, fine and ultrafine particles may be generated in the melting processes and also emitted from the use of fuels. It is known that long-term exposure to fine particulate air pollution is associated with cardiovascular mortality probably due to pulmonary and systemic inflammation and accelerated atherosclerosis. Other working conditions may also have impacts on mortality of employees.

Stainless steel has been produced for more than 100 years, but the number of published studies and data on cause-specific mortality in stainless steel production workers is very limited. As a responsible industry the stainless steel sector should be aware about occupational exposure impacts on employees. Also employees in stainless steel industry have raised legitimate concerns about potentially increased mortality caused by occupational exposures in the workplace air.

The main question was: Is the mortality from respiratory or circulatory diseases increased in stainless steel production workers?

## Action

Outokumpu conducted, in co-operation with the Finnish Cancer Registry, a cancer incidence study which was published in 2013 in the British Medical Journal. The same cohort consisting of all persons employed at Kemi chromite mine and Tornio ferrochromium and stainless steel mill during the period 1967-2004 was used in the present study. The cohort included a total of 8088 workers. The cohort was divided into sub-cohorts by production departments.

The causes of death for 1971-2012 were obtained from Statistics Finland.

Detailed exposure data covering the whole production chain have been published earlier in peer-reviewed scientific publications.

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### **Has there been an increase in mortality in stainless steel production caused by occupational exposures or working conditions?**

#### **Outcome**

The article “Cause-specific mortality in Finnish ferrochromium and stainless steel production workers” was published in Occupational Medicine in December 2015. The article can be downloaded via the following link: <http://occmed.oxfordjournals.org/content/early/2015/12/08/occmed.kqv197.full.pdf?keytype=ref&ijkey=ozafqg8sV3Led06>

First of all, the results of the cause-specific mortality study were definitely good. We found significant decreases in overall mortality and in particular in mortality from circulatory diseases, accidents and suicides.

Conclusion of the research project: The occupational exposures or working conditions in modern ferrochromium and stainless steel industry appear not to be associated with increased mortality from any cause of death. In other words, we don't have increased mortality in stainless steel production workers caused by occupational exposures or working conditions in Outokumpu's production chain in Finland.

Because the results have been published in a peer-reviewed publication they can be applied globally to any stainless steel production facility where the occupational exposures are at the similar levels.

The results have been communicated openly to Outokumpu's own employees and other stakeholders.