

**Summary of TNO study 2002-2005
(TNO Report CA05.8041)**

”Experimental study of new lead alloys for atmospheric application III”

With the help of a literature study the corrosion behaviour of lead alloys under atmospheric conditions has been reviewed. This literature review has been carried out as a first step in the development of new alloys with better properties. To investigate the long-term run-off behaviour, four exposure programmes were executed in which lead sheets of these new alloys were exposed outdoors. Each month, rainwater from the exposed samples was collected and analysed for the contents of lead. In addition, the run-off from experimental roofs and two real houses was collected and analysed too.

Based upon the results of these four exposure programmes the following final conclusions are drawn:

- The run-off from both experimental and real roofs is 3 to 4 times lower than that of the reference (normally used lead sheet).
- The run-off of normally used lead is reduced by the addition of copper. With respect to the workability, economic aspects and compliance with the EN 12588 standard, the amount of added copper should be limited to 0.05. Therefore, the alloy Pb0.05Cu in normally used lead is recommended.
- A higher tin content, up to 0.1%, is also permissible as this also improves corrosion resistance.