

## KORRFIELD DATABASE AND PREDICTION PROGRAM

KorrField consists of:

- A **database** containing field data for atmospheric corrosion of metals.
- A module for **predictions** of atmospheric corrosion of metals from environmental parameters.

KorrField can now be ordered from Swerea KIMAB.

**KorrField database** contains field data for the atmospheric corrosion of metals under unsheltered conditions. Only data from outdoor exposures under known conditions are included. Table I lists the metals included and the number of entries for each metal. The ambition has been that the database should include all relevant information published with respect to zinc. For other metals the amount of data included is smaller as indicated in table I.

Table I. The metals included in the database and the number of entries for each metal.

Metal/Alloy	Number of corrosion observations in the database
Zinc	2622
Carbon Steel	2581
Copper	1552
Aluminium	1293
Wethering Steel	570
Galvanised Steel	498
Cast Bronze	176
Aluzinc	59

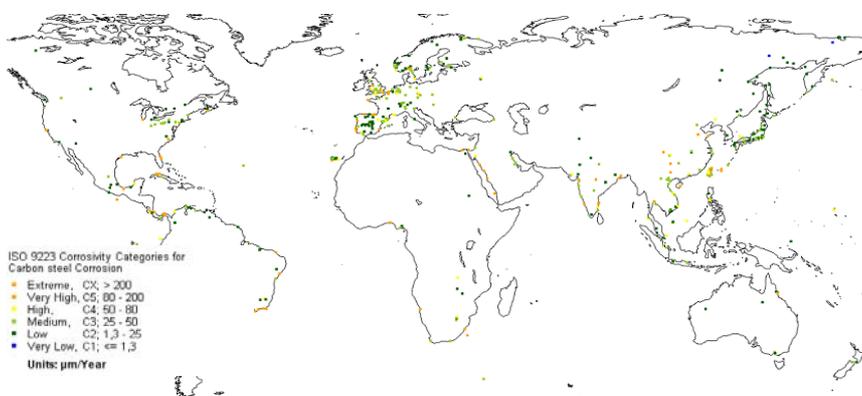


Figure 1: Corrosivity map for carbon steel.

The corrosion observations are indexed and linked to relevant published environmental parameters and literature sources. A user friendly program package has been developed for presentation of results to suit various categories of users. Output from a search may be a detailed list including all information from the database concerning a specific exposure. Output can also be in the form of a corrosivity map as illustrated in figure 1. In the map, corrosion rates of mild steel, during two years exposure, are divided into five categories according to the standard ISO 9223. By a mouse click on one of the coloured dots, a table with information about the exposure at the site is presented. This type of corrosivity maps is available for carbon steel, zinc, copper and aluminium. The graphics is easily copied to the Windows clipboard for pasting into other applications. Figure 2 shows an example output for zinc corrosion. Any part of the world can be expanded to similar map resolution.

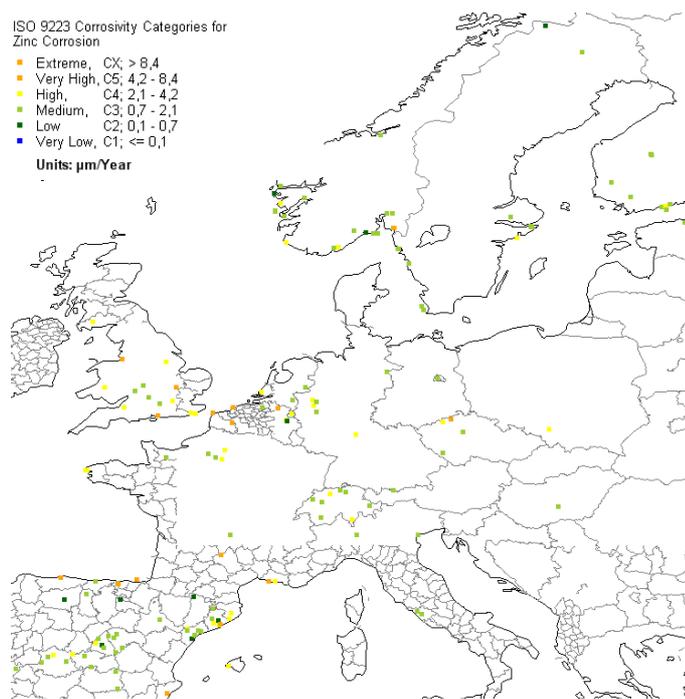


Figure 2: Map with exposure sites colour coded for zink corrosion. Details of Europe.

**KorrField Prediction** calculates the first year corrosion of metals from four environmental parameters using known dose-response functions. The parameters are the mean temperature, the relative humidity, time of wetness (TOW) and the deposition rates of chloride and SO<sub>2</sub>, respectively. For SO<sub>2</sub>, the gaseous concentration may alternatively be entered instead of the deposition rate. ISO 9223 corrosivity classes are used to illustrate the prediction results. If values are entered for all four parameters, a numerical value of the first year corrosion is presented (figure 3). If only three values are entered and the fourth field left blank, the predicted corrosivity class is plotted against the missing parameter (figure 4). If only two values are entered and the two remaining fields left blank, the predicted corrosivity class is plotted against the two missing parameters (figure 5). For this option to work, the temperature must be one of the fixed parameters. Dose-response functions are implemented for carbon steel, for zinc, for copper and for aluminium.

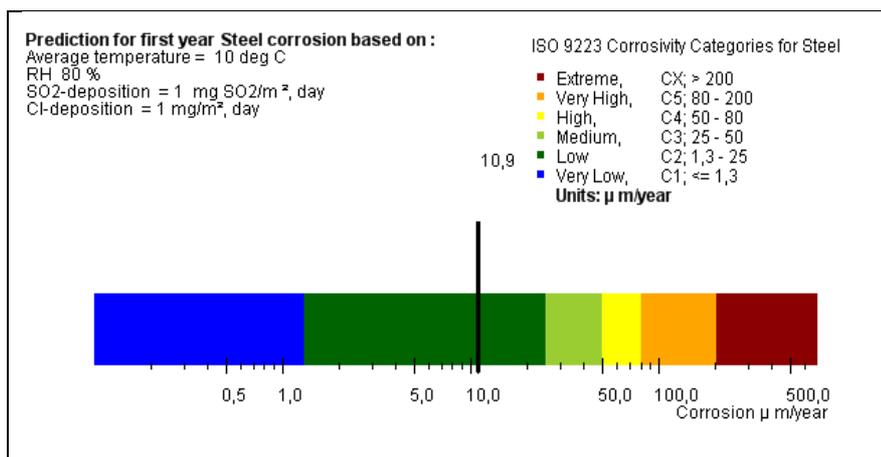


Figure 3. Sample output from KorrField Prediction. The black vertical line indicates the position of the predicted first year corrosion rate for steel. The numerical value is printed above the line.

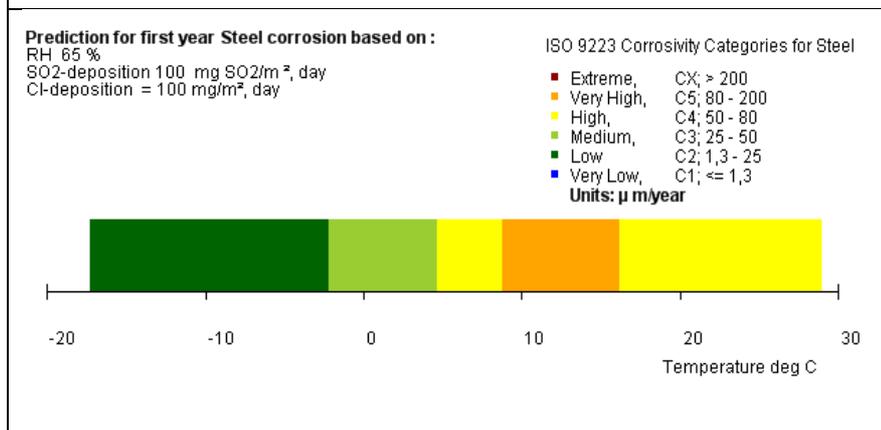


Figure 4. Sample output from KorrField Prediction. The temperature field was left blank so KorrField calculates the corrosion as function of that parameter. The diagram shows that the first year corrosion under the given conditions would fall into Corrosivity Category C5: Very High, if the temperature lies between +9°C and +16°C. Below -8°C, the Corrosivity Category would be C4: Low.

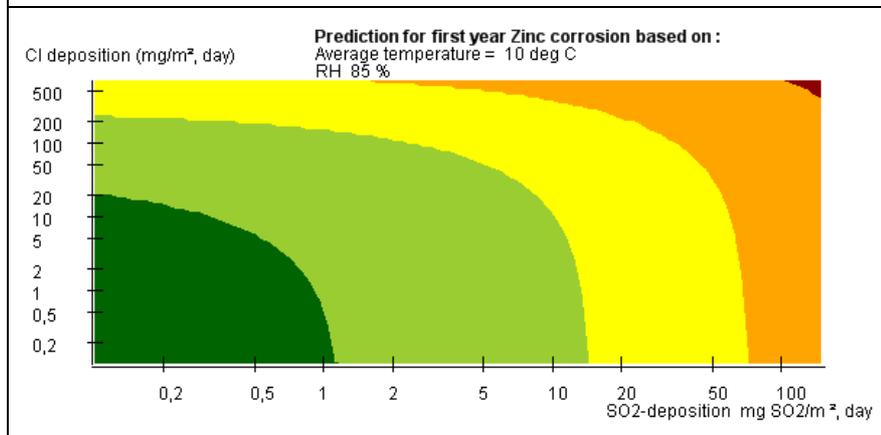


Figure 5. Sample output from KorrField Prediction. The fields for SO<sub>2</sub> deposition and Cl deposition were both left blank so KorrField calculates the corrosion as function of these two parameters. The diagram shows that, within the limits of the model boundaries, the corrosivity category for zinc would always be in the low to medium range under arid conditions. Only a combination of high SO<sub>2</sub> deposition and a high value for the Time

**KorrField version 3.0**

**System Requirements: Windows versions 98 and later, e. g. NT, ME, XP...**

**Platform: .NET. The program may require up to 90 MB disk storage.**

**Price 12 000 SEK. Single user license.**

**Contact: Johan Ahlström, johan.ahlstrom@swerea.se**