

Corrosion-inhibited fount solution additives

The fact that printing presses are constantly in contact with aqueous media means there is always a risk of corrosion developing. This risk applies particularly to galvanic nickel-plated plate cylinders, bearer rings and components made of machine steel (roller cores, bearings). Important factors in this regard are the corrosion resistance of the materials used and the corrosiveness of the fount solution. The latter, in turn, depends primarily on the pH value, the conductivity, the concentration of corrosive ions and the fount solution additive used.

In countries such as the USA where printing is for the most part performed without alcohol in the fount solution, solution pH values are as a rule very low. What's more, aggressive fount solution additives with a high conductivity or a high corrosive ion content are frequently used. Accordingly, corrosion damage to presses is not unusual in the USA, in contrast to Europe.

Since we in Europe are now also pursuing the objective of reducing the amount of alcohol in fount solution, there is a risk here, too, of aggressive fount solution additives being employed and corrosion damage arising in the future.

The study group known as the "Arbeitskreis Korrosion" (corrosion study group), which is made up of the printing press manufacturers MAN, Heidelberger Druckmaschinen and KBA, the FOGRA and the "Feuchtmittel-Initiative" (Fount Solution Initiative) started by the manufacturers of fount solution additives, has therefore drawn up corrosion guidelines for fount solutions and measuring.

Limits laid down for ready-mixed fount solution:

pH value	min. 5.0 ±0.2, max. 9.0 ±0.2
Conductivity	max. 1.500 µS/cm (sheet-fed offset 1.700) higher than the water used for the preparation
Concentration of corrosive ions	Chloride max. 25 mg/l Sulphate max. 50 mg/l Nitrate max. 20 mg/l

At the prescribed operating concentration, a **certified fount solution additive** must lie within these limits. In addition, a series of different corrosion tests on nickel and steel must be passed. These are to be performed by an independent testing institute, which confirms successful conclusion of the tests and approval of the solutions by the press manufacturers by issuing a **certificate**.

The new corrosion guidelines and test methods for fount solution additives apply to all printing processes and also replace the corrosion certificate required for some time now for newspaper printing presses. Different limits apply respectively to sheet-fed offset, heatset and newspaper printing.

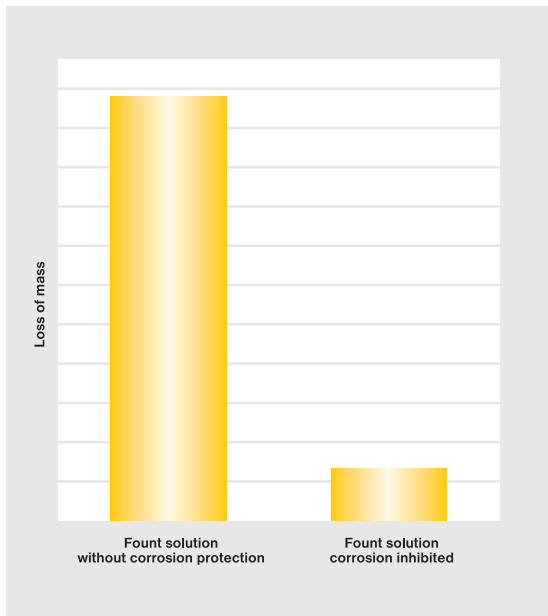


Diagram 1
Loss of mass of steel
in submersion test 1

The present machine handling regulations of the printing press manufacturers stipulate that the limits specified for fount solutions must be met and that only certified fount solution additives may be used in new presses (from construction year 2000 onwards).

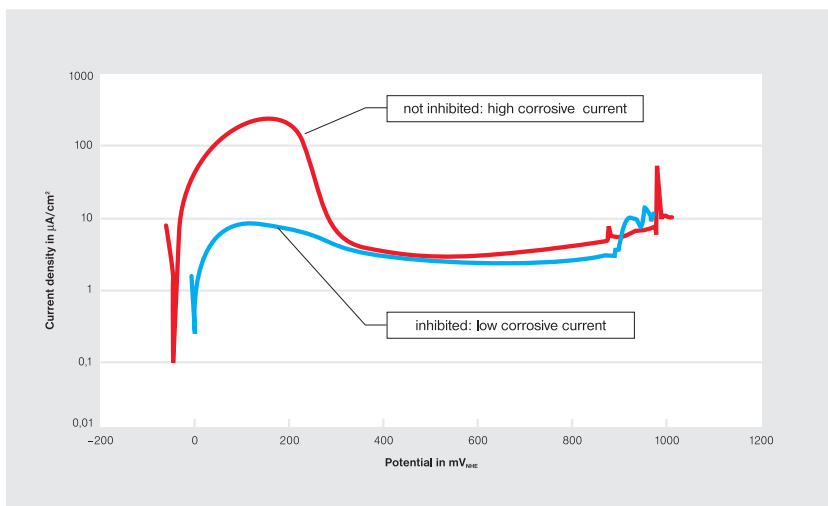


Diagram 2
Corrosive current
on nickel

The **hubergroup** operates its own test laboratory with an electrochemical corrosion test stand to enable it to continuously optimize and develop its fount solution additives. The **hubergroup** is also a founder member of the “Feuchtmittel-Initiative” and offers certified fount solution additives in its product range.

Important: Tested water quality

Well water and tap water sometimes contain more than the allowed concentration of corrosive ions, chloride, sulphate and nitrate. You can obtain an analysis from your water supplier. Often, the quality of the water supplied is not constant and can vary according to the season or in even shorter intervals. Variations in the degree of hardness of the water also lead to varying pH values in the fount solution, which can become noticeable when printing.

To prevent this incalculability, we recommend you invest in a water treatment plant that removes both the hardening salts and the corrosive ions from the water by means of reverse osmosis. The water hardness must then be increased to the optimum hardness of 8 – 12°d for printing. We recommend our hardening agent SALINOFIX for this purpose.

Important: Machine maintenance

Ensuring the consistent quality of the water used and correct metering of a certified fount solution additive are important steps towards protecting printing presses against corrosion. However, further measures are still necessary as part of an overall concept to prevent corrosion damage. Of crucial importance are, in particular, regular maintenance of the press, especially maintenance of the cylinders and the bearer rings, and the use of corrosion-inhibited cleaning and maintenance agents. The handling instructions laid down by the press manufacturers must be followed at all times.

The diagram below shows an example of the results of submersion tests conducted on steel test specimens. It becomes clear that a test specimen that has not been treated with anticorrosive oil corrodes in a non-inhibited fount solution and therefore suffers a relatively high loss of mass. In contrast, after treating the test specimen with protective oil, a loss of mass is obtained that is less than one-tenth of the original value.

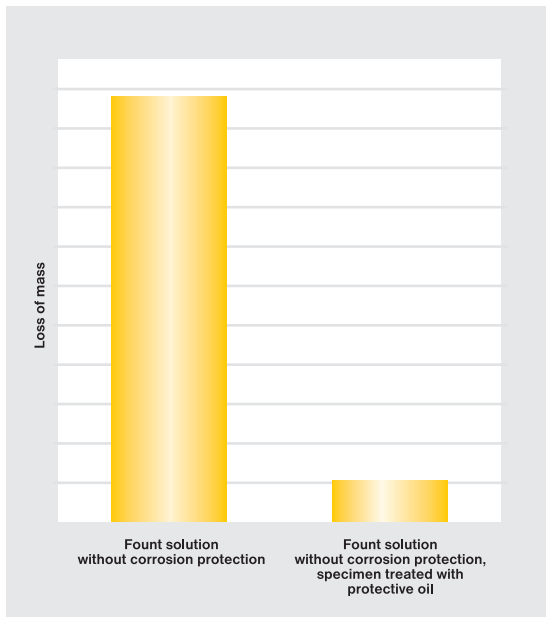


Diagram 3

Loss of mass of steel
in submersion test 2

Consequently, regular application of protective anticorrosive oil is just as important as the corrosion inhibitor in the fount solution. A combination of both measures provides real protection.