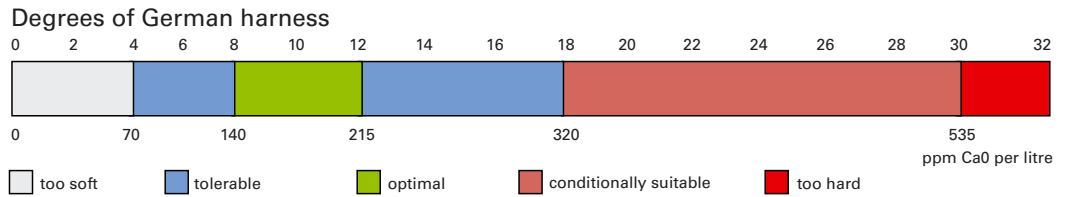




WATER HARDENER

As we all strive to standardize and eliminate many of the unknown variables, to ensure we can replicate the same quality all the time, WATER must be stable and at the right hardness...

- Paper
- Ink
- Fountain Solution
- Process Water (tap water)
- RO & DI Water
- Plates
- Blankets
- Printing Operators
- Environment



WATER AND WATER TREATMENTS:

Depending on the concentration of calcium and magnesium salts, water is classified from hard to soft. Hardness is expressed in degrees. One degree German hardness (1°dH) is equal to 10 mg of calcium oxide per liter water.

Calculate water hardness before any fountain solution additives are introduced.

Two types of water treatment methods:

In the RO process, the water is pressed through a membrane. Water treated like this, emerges with a very low residual salt content and with a 0° dH. It should be re-hardened until it reaches a degree of hardness ranging from 8° dH - 12° dH, with 10° dH being the preferred hardness for offset printing.

If a DI treatment is used, Calcium and Magnesium are removed and replaced by Sodium in an ion exchanger. After this process only "non hardness forming" salts or carbonates are left which will have an "alkaline" influence on the pH- value. Please note: After the softening it is only possible to determine the carbonate contents in form of sodium bicarbonate and potassium bicarbonate, however, not the carbonate hardness or total hardness. As no hardness formers are left, conventional carbonate hardness tester will supply distorted results.

It is very important that tap water is treated and re-hardened to 8° - 12° dH, as the quality of the water can vary from month to month, week to week, day to day, and from season to season. So what might be good to use today, might not be good to use tomorrow! If your incoming water is only conditionally suitable or fluctuates, then a water treatment system should be installed to ensure constant uniform and stable water for the printing process!

But if untreated tap water is being used, we recommend weekly water hardness tests, so a reliable water hardness curve can be maintained, as this might assist in trouble-shooting printing problems.

EFFECTS OF UNTREATED HARD WATER:

If untreated hard water is used some of the following problems or more, will occur:

- Ink roller stripping – the pores in the roller rubber will fill up with poorly soluble calcium compounds, causing the roller to become increasingly hydrophilic and will result in poor ink transfer in the inking unit, especially in the magenta unit!
- Calcium glazing of the dampening rollers, resulting in poor water transfer.
- Calcium deposits on the blanket.
- Scale build up inside all metal piping in the dampening system and piping within the press.



If rollers are left untreated and the calcium compounds continue to build up, the rollers will eventually have to be recovered, as ink and water transfer will be severely disrupted. If the blankets are left untreated, they will be damaged, and due to the build up of calcium, printing will become impossible, resulting in a lot of waste, stoppages and down time!!

EFFECTS OF UNTREATED SOFT TAP WATER OR SOFTENED WATER 0° - 4° dH:

As the soft tap water, or the treated softened water is unbalanced, i.e. all the minerals or most of the minerals are absent in the water, the water will look for ways to replenish the minerals, i.e. Calcium, Magnesium, Iron, etc. Where will the water find the minerals?

1. Iron will be found from the presses, causing corrosion to the metals in the press.
2. Calcium will be found in the paper and the inks, causing calcium leaching from both.
3. Magnesium will be found in the fountain solutions, causing disruption to the fountain solution.
4. Often calcium build-up on blankets and rollers can be observed within printing 1000 sheets, and printing needs to be stopped. Rollers and blankets need to be treated. This is caused by the soft tap water or treated softened water pulling calcium out of the paper and the inks.

The solution is to re-harden the water to 8° - 12° dH

Once soft water has been re-hardened, the following benefits will be and more are observed:

1. Improves the separation in filtration units.
2. Constant water hardness of 10° dH removing an unknown variable from the process
3. No alteration of pH-value
4. Stabilizes the ink-water balance.
5. Reduces emulsification.
6. Reduced and controlled dot gain.
7. Improved oxidation drying of inks, and less issues with printing plate surfaces.
8. Reduces or eliminates ink build-up on dampening rollers.

By ensuring the water being used is always stable with a hardness of 10° dH, we can ensure one unknown variable has been removed from the list of variables, and this will help to eliminate printing problems during the printing process.

If the tap water is left untreated, it fluctuates in quality and the printers will never know what kind of chemical reactions take place between the tap water, the fountain solution, the paper, the ink, and the press itself, and these are all chemical reactions which will have influence on the printing process and could affect the quality of the printed sheet.

If your press does not have a dosing system for Allied Water Hardener, then ask us about our small non-electric dosing unit.