+++ FAST CURING +++
Better plates in only 4 hours

DRYING CONVEING DEDUSTING

Curing chambers in production


Automated loading and unloading of plates

ConCure – Patented and in plant approved fast curing and drying process

Less production time, better plates

Curing and drying of plates for lead acid batteries within an overall process time of 4 hours has been approved at different battery manufactures and replaced the traditional curing and drying technologies. The patented ConCure process was developed to improve the performance of the positive and negative electrodes for VRLAAGM and GEL batteries. The ConCure process gives in situ control of humidity and temperature of the plates giving rise for a homogenous 3- or 4- basic lead sulphate crystal structure.

By use of additives e.g. TBLS+ a defined control of the size of the 4-basic lead sulfate crystal sizes is achieved and the fast drying avoids any shrinkage of the active material as in traditional chambers. About 5 to 8% higher porosity will save active material and reducing weight and production cost.

The short process time of 4 hours offers high flexibility in the production and abandonment of plate stocks. Moreover less floor space for curing and drying equipment and intermediates saves investment.

Automatization and plate handling has been approved and will close the gap to build a lead acid battery within less than a day. Similar to the new technology of acid circulation reducing the formation time to some hours ConCure will reduce the overall curing and drying time to at least 4 hours. Automatization of the whole process will be done by use of robots, loading and unloading the plate stacks for curing and drying. The unloaded plates can be forwarded directed to the assembly lines or to small buffer area. ■

Engineering Office Dr. Nitsche

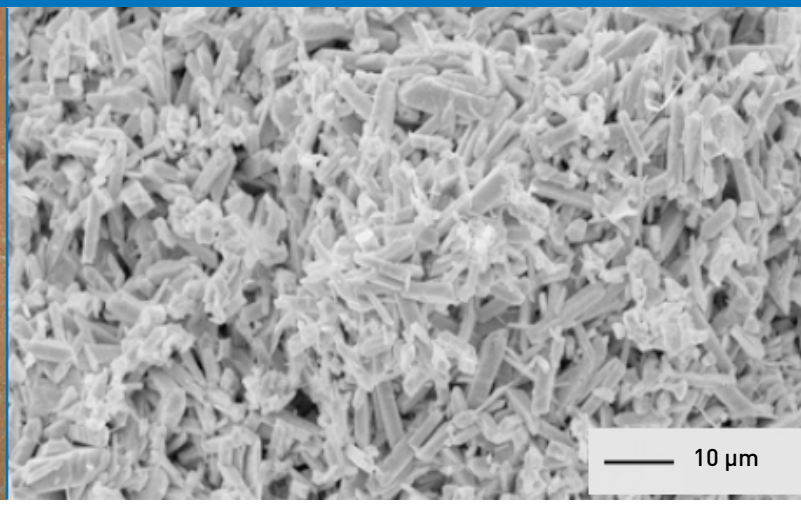
MÜNSTERMANN

INNOVATIVE PLANT ENGINEERING FROM GERMANY

WE DEVELOP SOLUTIONS

Plate comparison: with (left side) and without (right side) ConCure production process

Microscope image of crystal structure



ConCure chamber typical data

Dimensions

Height	approx. 7000 mm
Width	approx. 2150 mm
Depth	approx. 2250 mm

8 pallets per chamber

Height	475 mm
Width	1330 mm
Depth	1090 mm

Daily electrical energie consumption

Main vent	360 kWh
Exhaust vent	72 kWh
Electrical final drying	195 kWh
Steam generator	160 kWh

Estimation per ConCure chamber
Total energy / day: < 790 kWh

Traditional curing chambers
25 kW *24h*2 chambers = 1200 kWh

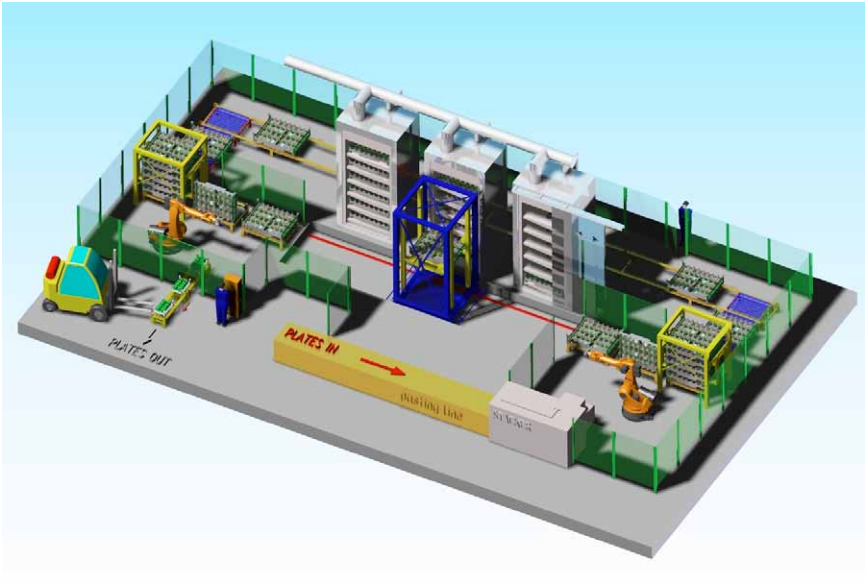
Production volume per day (3 shifts)

Stack height	226 mm
Stacks per palette	8 x 4 = 32

Example production calculation
Plate thickness 1.4 mm, 8 pallets with 6000 plates (80g of active material): 48 000 plates / chamber / 4 h cycle time = **288,000 plates / ConCure chamber / day**

ConCure chambers will be shipped in high cube sea container. Local fitting to water, electricity and air pressure is needed.

Drawing automated production line



Bernd Münstermann GmbH & Co. KG
Lengericher Str. 22 · 48291 Telgte · Germany
Phone +49 (0) 25 04-98 00-0 · Fax +49 (0) 25 04-98 00-90
info@muenstermann.com · www.muenstermann.com

MÜNSTERMANN
WE DEVELOP SOLUTIONS

MM · 002 08/2013