

## CARBOLUX 50<sup>®</sup>

THE NEW GENERATION  
PERSONNEL-FREE FREEZING-OUT UNIT  
REMOVES EXCESS SODIUM CARBONATE - SULFATE



## Problematic

A major challenge is, to be able to keep the carbonate content constant at the desired value, during ongoing production without having to rebuild or dispose of a certain volume of the bath and to comply with the laboratory values.

A number of factors play a major role, such as the introduction of air from drum units, filter units that have not been vented or have been incorrectly piped, and even scooping parts that have not been properly fitted to the product carrier. As well as incorrect piping in the dissolving tank, whereby the medium flows into the basin in free fall.

In the case of poor bath circulation or goods movement, additional air injection has also been used. This should be avoided as far as possible, since carbonate can form in a short time. Due to decreasing current yield, the bath dwell times are increased or higher voltages are applied to the contacts. As a result, some rectifiers now reach their performance limits and, in the worst case, have to be replaced. Additions of brighteners must also be adjusted in order to comply with the standards.

High demands and great price pressure from customers, as well as growing competition on the surface market, require production and cost optimization more than ever. Despite improved efficiency, however, quality must not be neglected.

## Consequences

Excessive carbonate content can lead to clogging of the heat exchangers, because the carbonate already precipitates in the heat exchanger. Pumps can run dry because the impeller becomes clogged or bearings / shafts jam. Formation of irregular layer thicknesses as well as rough coatings on parts are possible. Increasing costs for additives which have to be dosed additionally. Due to the change in viscosity, a higher carryover occurs and a stronger cooling capacity is required. Additional energy costs add up. Lower anode solubility, staining or burns on the customer parts are the consequences. The time-consuming question of quality assurance, which customer parts are found to be good or bad. As well as expensive new or partial approaches and their disposal costs can be a headache.

## General Concept

In the past, production was forced to stop. The liquid to be treated was pumped over in a container and it was waited for the cold season. With a shovel and a pick, the salts were crumbled and disposed of. This is neither the state of the art nor up-to-date. The result is high costs. Today, economically successful companies use the technique of cooling-crystallization of the baths by means of Carbolux. The interfering salts, carbonates and sulfates are continuously frozen out. A certain quantity of max. 70 liters of medium is taken from the bath to be treated without influencing the production.

This is cooled down to a precisely defined temperature. The crystals remain on the belt filter and subsequently fall into the collection container. After the fully automatic recirculation of the cleaned medium, the cleaning cycle of the machine takes place. The filtered-off salts can now be disposed of. With the technology of the Carbolux, the exact discharge per day and per week can be defined to achieve a constant good result of your customer parts.

With this process you always have the constant costs.

## Control System

We have continuously developed the control system with experience. The simple and reliable technology according to the motto "as simple as possible and as technical as necessary", ensures longevity and low maintenance costs. The new CARBOLUX® generation is equipped with pre-programmed options and can be extended with low costs, at any time for your needs.

A fundamental highlight is the freezing out with A - hours and the saving of Co2. This can be done with every batch. From this we have forced the "CO2 neutral" icon to make the freezing out even more economical. For companies that want to set a green footprint or are even in possession of the requirements to save Co2 in your company, this is realizable with the Carbolux. A batch discharge according to batch counter is also possible. This is done automatically by switching from automatic to manual operation.

## Key data

The discharge quantity per day depends from the flow and ambient temperature.

The solubility limit in connection with the carbonate content also plays an important role. At optimum setting, the discharge amounts to approx. 240 kg per day.

In general, high-quality materials such as stainless steel 1.4404 were used in the construction. The machines can be set up analogously and flexibly in your plant at any time. For the smaller budget but still high-quality product, we recommend instead of the CARBOLUX®, the "low cost" version CarboJet 300. This version is a semi-automatic machine.

## Optional

We can meet customer requirements with additional options:

The conveyor **Filter Plus** offers a longer drip pad to save residual liquids such as chemicals and their costs, is equipped with a belt cleaning device.

The **conveyor XXL** is equipped with rollers and can be removed in a few simple steps. This is available from a length of 3 meters, has improved dripping properties because the carbonate can remain on it longer.

The **additional conveyor** is used as a cross connection to parallel connected machines, thus only 1 collection container of the carbonate is used.

A **pre-cooling tank** can be used to pre-cool the medium. This increases the discharge by 30%. With certain media, even the bath temperature must be lowered so that the Carbolux can work optimally and without malfunctions.

## Areas of application

To ensure that the Carbolux can precipitate carbonate or sulphate from your chemistry, there is a simple procedure. Fill a certain amount of your chemistry into a suitable container. Label it and put it in the freezer for a few hours. (Caution: health hazard!) If crystals have settled, you can filter off the liquid. The medium is now ready for analysis. The Carbolux is suitable for the following baths; zinc - nickel, zinc - iron, cyanide baths, alkaline zinc and pickling baths. Chemical data sheets also provide information on this.

## Disposal

Some customers dispose of the discharged carbonate as dry as possible and others collect it in dissolving containers. We ask for your feedback so that we can show you the most cost-effective variants/solutions.

## Talks

Discuss with your plant builder the possibility of including Carbolux in the budget when planning a new surface treatment plant, or of already noting it on the installation plans. Alternatively, you can involve the chemical supplier. You, as the customer, and your supplier know that sooner or later carbonate enrichment will take place and this can lead to problems. Ideally, the chemical supplier would provide you with a machine for as long as you purchase their chemistry. Both parties would have the following advantages; you as a customer would have your problem solved and the chemical supplier would have gained a satisfied customer for many years. To be fair, a percentage buy-back would have to be agreed upon if the chemistry is replaced by competitors.

## Amortisation

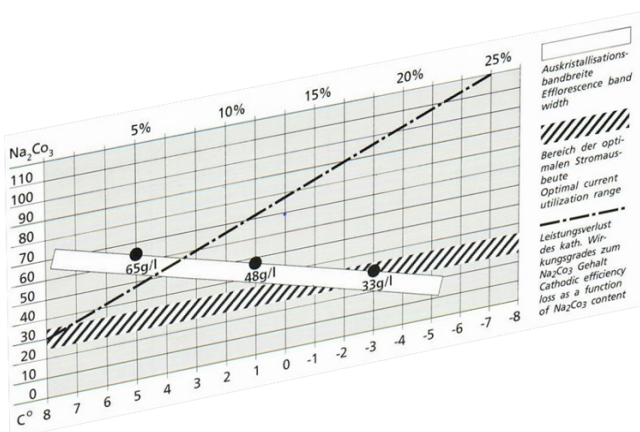
The following points should be considered for the payback period:

Chemistry, brighteners, disposal, personnel, energy, downtime or shut down costs.

You get a performance loss of 18 %, with a carbonate content of approx. 100 g/litre.

New approach e.g. zinc nickel with an amount of 100 000.-, saving of 33% with a Carbolux, namely 17% chemistry, 4% disposal and personnel as well as 8% energy.

The Carbolux works unattended and fully automatically, so there are almost no personnel costs. In addition, the CarboJet and CARBOLUX® are absolutely standardised, which allows particularly efficient production and is reflected in a good price-performance ratio. Spare parts can also be kept to a minimum and are available in our factory at all times.



14% power loss at 80 g/liter carbonate

18 % power loss at 100 g/liter carbonate

## Product features Carbolux

- Type Carbolux 50
- Fully automatic operation without supervision
- Low maintenance and user-friendly
- Colour control, touch screen
- Standardised and space-saving
- Operationally efficient and programmed with options
- Freezing out with A-hours
- Co2 neutral freezing
- Material properties 1.4404 / 1.4301 / PVC / PP
- Voltage 3x400V 50Hz / 3x460V 60 Hz
- Coolant R452-A, capacity 2,5 kg
- Weight 325 kg
- Filling and emptying pump
- Dimensions 1300 x 1600 x 630 mm
- Reactor 70 liter with splash ring
- Documentation D/ E

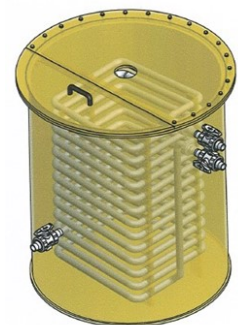
## Function description

- Batch operation
- Medium from the main bath or pre-cooling tank is filled into the cooling tank by means of a magnetic pump.
- The cooling tank is filled at a controlled level.
- When the level is reached, the filling pump is switched off, the agitator and the cooling unit are switched on simultaneously.
- The medium is cooled to the set temperature with continuous stirring; the set temperature depends on the carbonate or sulfate content.
- After reaching the set temperature, the cooling unit is switched off and the agitator continues to rotate.
- Suspension care becomes active.
- When the Suspension care is finished, emptying takes place. Flap opens, flap and conveyor filter the carbonate in the pulse pause system.
- After emptying (time-controlled), rinsing (time-controlled) takes place with medium and the magnetic pump.
- In automatic mode, step 1 then takes place again.
- The cleaned medium in the intermediate tank, under the conveyor, is pumped back to the main bath by the submersible pump.
- Note: Cooling tank has a safety overflow and level high alarm.
- The conveyor also has a safety overflow.

## Accessories / Options

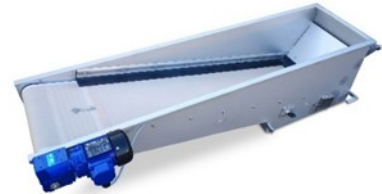
### Pre-cooling tank

- Together with a pre-cooling tank, you can increase the output of the Carbolux by up to 30%.
- Pre-cools pickling baths from 60°C to 25°C
- Several Carbolux 50 can be connected
- Tank sizes 400 litres and 800 litres
- Level is controlled via Carbolux
- Incl. cooling coil, agitator, filling pump



## Conveyor Plus

- Dryer cristal
- Optimised draining
- Reduced chemical discharge
- Automatic belt cleaning
- Simple conversion



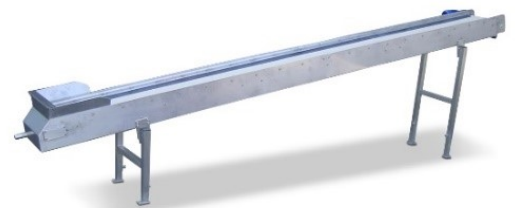
## Conveyor XXL

- Dryer cristal
- Optimised draining
- Reduced the chemical discharge
- Automatic belt cleaning
- Simple conversion and mobil
- Available in lenghts from 3 - 5 m
- Suitable for filling larger tanks



## Additional conveyor

- Used to connect several Carbolux in parallel, to set up a disposal station.
- Controlled via Carbolux 50
- Available in different lengths



## Conclusion

Those who know their hidden costs remain competitive. Energy, chemicals and waste water costs are factors that are becoming increasingly important when it comes to optimising or reducing production costs. Companies that choose the Carbolux 50 have the following advantages: Consistent quality and thus satisfied customers, easy handling, bath cooling, extended service life, no production downtimes, lower electricity costs, regular layer thickness distribution, low maintenance. With the Carbolux 50, your overall operating costs are reduced.

Times change, but our business philosophy has remained the same since the company was founded.

**Quality is when the customer comes back and not the goods!**

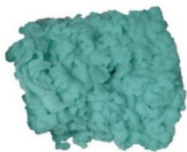
## Carbonate / Sulphate possibilities



cadmium carbonate



cyanide zinc bath carbonate



ferrous sulphate



zinc-nickel carbonate





## Information

In the field of plant engineering, TECGA has the best references and over 30 years of experience in electroplating. It is successfully represented in many countries and guarantees the highest quality at reasonable prices.

We offer a wide range of efficient and optimal solutions for many applications. We recognize your problem by acting intelligently, by means of a conscious thought process we eliminate your problem.

Our worldwide good name, our services and our innovative spirit oblige us to accept new challenges in the electroplating industry and to develop ourselves further every day.

**This is also our greatest goal for the future.**



Carbolux patent Germany



Carbolux patent USA

## Extract from reference list

- Zeschky group
- Thyssenkrupp
- SR Technics
- Schirmer Galvanotechnik
- CECO - Mefiag group
- Mac Dermid
- Galvanotechnik Holbe
- Ju Project
- Gotec
- Collini group
- Atotech group
- Schlötter group
- Hilti
- Holder Oberflächentechnik
- LHT Landing Gear Services UK
- Further references from request



**Product video and all-round views of the Carbolux 50 are available and can be requested.**

