

BINDER

Best conditions for your success

Case Studies

KEFO

PROMOCIJA

Cocoa beans hitting the spot



The USA-based company Seguire Cacao Cocoa & Chocolate Advisors carries out extensive research into studying and assessing cocoa beans and their flavors.

Cocoa beans are his life:

When it comes to evaluating the quality and flavor of cocoa beans and chocolate, Ed Seguire is the leading specialist in the field. Ed Seguire is the chairman of various international organizations of countries that produce and import cocoa and sits on several committees. In 2013, he founded Seguire Cacao Cocoa & Chocolate Advisors, headquartered in Hanover, Pennsylvania, in order to meet the demand for consul-

tancy services across the entire cocoa industry and among chocolate producers. The company specializes in the evaluation – i.e., the study and assessment – of cocoa beans and their flavors. The results are required by producers (cultivators), collectors, exporters, and end consumers of cocoa. The company's investigations and liquor (unsweetened chocolate) and chocolate samples are also used by international committees for the evaluation of cocoa and chocolate. What's more, the company also supports small farming operations by assessing the quality of cocoa bean samples at nominal cost. This is because being able to maximize the taste potential of a bean requires extensive measures

Tasks and objectives

- Reproducible conditions
- Stable and even temperature conditions
- Absolute unit reliability
- Good insulation

BINDER solutions

- Drying and heating chambers with forced convection (FD)
- Drying and heating chambers with natural convection (ED)
- High temperature uniformity thanks to APT.line™ technology
- Identical test conditions throughout the entire usable space
- Short heating up and recovery times
- Excellent thermal insulation



› Roasting process in a BINDER drying chamber

– from selecting the tree, harvesting, fermentation and drying, roasting, and the processing methods that follow.

Chocolate producers each have their own criteria for assessing the quality of how cocoa tastes. In the past, there was little agreement within the industry about how flavors (apart from foreign flavors) could be assessed, as different terminology and interpretations were being used all across the sector. For this reason, various international initiatives came together to identify the flavors and develop an understanding of the effects of genetics, the environment, and processing after harvesting.

One important aspect of these initiatives was the introduction of shared protocols and terminology with the result that a standardized aroma evaluation was able to be carried out. For these processes, Seguire Cacao Cocoa & Chocolate Advisors uses two ED-series drying and heating chambers with natural convection and a FD-series drying and heating chamber with forced convection from BINDER. Both ED-series units are primarily used to preheat the broken pieces of the cocoa beans before grinding and to keep the grinding stones warm. During this process, the ED runs continuously for 6 to 24 hours – at a temperature of between 38 and 52°C depending on the cycle selected. For a qualitative assessment of the beans to be possible, they must be



› Cocoa beans are pre-heated before grinding

roasted first. This roasting process is performed in an FD 53. The beans are roasted at temperatures between 110 and 155°C for 20 to 45 minutes.

“In pre-defined roasting processes, the results are always the same.”

”

Ed Seguire,
Seguire Cacao Cocoa & Chocolate Advisors

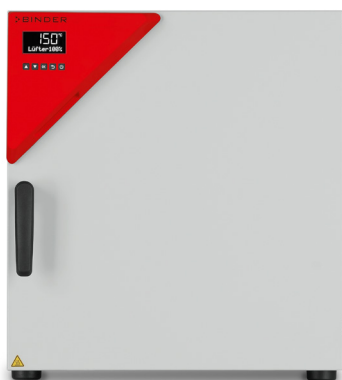
„The unit meets all the criteria necessary for evaluating cocoa bean quality,” says Ed Seguire. „It also meets the standards defined by CoEX and FCIA-HCP for cocoa bean production. These are single internationally recognized documents and protocols for evaluating bean quality and flavor in laboratories in the cocoa

industry. The FD 53 is explicitly recommended in these documents.“

In addition, it meets the criteria set forth in the internationally accepted ECA/CAOBISCO/FCC Cocoa Quality Guide. In order to achieve valid results, the tests need to be reproducible. „Our trust in the stability BINDER drying and heating chambers knows no bounds,” says Ed Seguire. „In pre-defined roasting processes, the results are always the same; we have so far been unable to detect any variability in the roast flavors in a test series. The oven has near perfect temporal and spatial temperature accuracy and uniformity. “

New Drying and heating chambers Avantgarde.Line

- Excellent temporal and spatial temperature accuracy
- High energy efficiency
- USB connection for recording data
- Temperature range up to 300 °C



› New FD series, Avantgarde.Line

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Carbon frames for racing bikes with BINDER technology



Carbon comes into play when something has to be extremely lightweight and highly stable. In Grenchen, Switzerland, automated manufacturing is used with the help of BINDER technology to produce carbon frames for racing bikes for the first time ever. In 2011, Australian Cadel Evens won the Tour de France on a BMC racing bike thanks to the enthusiastic support of his team members, who contested the world's most difficult stage race on carbon racing bikes.

They call it „Stargate“ and what comes out of it almost seems to come from another planet. A wheel with a diameter larger than a person with outstretched arms produces one of the strongest and lightest materials known to man today: finely woven carbon –

the wonder material of racing bike frames. Strictly speaking, „Stargate“ is a high-tech braiding machine and part of a complex automation system. The racing bike manufacture BMC headquartered in Grenchen, Switzerland, manufactures the world's first carbon frames using a completely automated process. 100 percent automation is synonymous with 100 percent consistently high quality. With perfection in series production, its BMC designers have called it „the impeccable bike“ or „impec“ for short.

Seamless tube

Where carbon frames had to be painstakingly laminated, shaped and glued by hand from individual layers until now, production at BMC runs cleanly and

Tasks and objectives

- Drying and curing of formed carbon tubes
- Drying and curing varnishes, overprints and assembly adhesives
- Constant drying climate
- Constant atmospheric humidity
- Low energy consumption
- Low heat dissipation
- Easy operation

BINDER solutions

- FED heating chamber with forced convection
- Homogenous temperature conditions
- Uniform air circulation with digitally adjustable fan
- Large temperature range of approx. 5 °C above ambient temperature to 300 °C
- Short heating up times
- Low heat dissipation due to 60 mm insulation
- Advanced timing functions



› The BMC Racing Team

smoothly like Swiss clockwork precision. Each part of the frame is woven in the „Stargate“ around the so-called positive core as a whole. More than 100 bobbins loaded with wafer-thin threads run through the braiding machine at breathtaking speeds to weave a seamless, flexible tube of carbon fibers in seconds. A certain similarity with a black stocking cannot be denied at this stage of production.

Until now, braiding machine technology has primarily been known in the manufacture of steel cable such as that used for mountain railways or cable cars. In carbon processing, it is an absolute novelty. BMC calls its technology Load Specific Weave (LWS). The high-tech braiding machine is used to weave varying degrees of material thickness and load distributions. The innovative method allows you to manufacture frame tubes made-to-measure for each individual section of the frame. After the weaving process is completed, the carbon fabric is soaked in the molds with epoxy resin and pre-cured in negative forms that give the carbon tubes their final shape.

Uniform drying

After shaping, the carbon tubes must be cured and dried for 15 to 120 minutes depending on the wall thickness and size. Even here nothing is left to chance. BINDER heating chambers of the FED series ensure a uniform drying climate at BMC at constant humidity and a temperature of 80 °C. They provide the best possible conditions for curing the epoxy resin. BINDER heating chambers are even used during final assembly and



> FED and ED drying chambers are used for curing epoxy resin and epoxy adhesives

finishing of the frame sections. When drying and curing lacquers, lettering and assembly adhesives, BINDER heating chambers of the FED series play a supporting role. With a capacity of 53 to 400 l and possible temperatures of up to 300 °C, they are ideally suited for the wide range of requirements. And they do one thing particularly well: save energy. Thanks to their 60 mm insulating layer, BINDER heating chambers exhibit extremely low heat dissipation.

Fleet-footed success

The high quality products from BINDER seamlessly integrate into the world's first automated production process of carbon frames. In just four years, BMC developers have got the pioneering facility up and running. It has been worth it: An impec carbon frame from BMC only weighs about 1 kg on average. How successful the overall concept would be in practice in just a short period of time may have even surprised BMC a little. The Swiss BMC racing team around the world champion Cadel Evans was able to compete at the Tour de France on an impec for the first time ever in 2010.

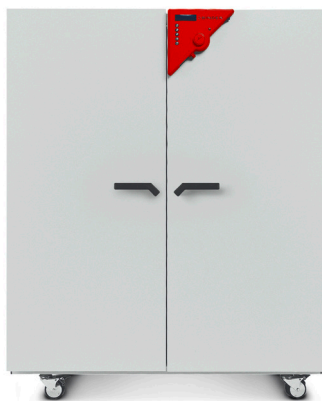
“The "Stargate" is a high-tech radial braider and forms part of a complex automation system. Using it, BMC is the first organization in the world to manufacture complete carbon frames in an automated process.”

Advantages

- Fast, even drying
- Wide temperature range
- Comprehensive standard equipment
- Additional product lines with humidity, light, CO₂ or vacuum
- "Made in Germany" quality

Areas of application

- Electronics / semiconductor industry
- Basic research / research institutes
- Plastics industry



> FED drying chamber

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Simulating thermal aging in the heating chamber



Plastic materials are subjected to rigorous testing in the laboratory.

“Maximum safety through comprehensive quality management” could be the slogan of the Lapp Group, one of the leading providers of integrated solutions and brand products in the field of cable and connection technology. Ensuring a consistently high product quality is clearly the company's top priority. A range of product features such as functionality or service life are highly dependent on the climatic conditions. Ever-increasing requirements are placed on the thermal resistance and the aging behavior of the

plastic parts used – particularly in the field of cable and connection technology – as these must be able to function reliably without problems under extreme climatic ambient conditions. For example, heat can take its toll on the plastic jackets and insulation materials of the cables, making them age prematurely and become brittle. To determine how well a cable is going to last over the next decades, the Lapp Group rigorously tests the material. These tests significantly speed up the aging process.



› Plastic jacket

Tasks and objectives

- Testing the functionality and service life of cables
- Aging behavior of plastic parts
- Ensuring product quality
- Quality testing and certification according to national and international standards
- Constant climatic conditions

BINDER solutions

- ED and FD drying and heating chambers Classic.Line
- Tests with natural and forced convection
- Homogeneous temperature distribution even under full load
- High temperature accuracy
- Defined ventilation
- Easy-to-read program guidance
- Temperature range from 5 °C to 300 °C

Simulating artificial aging

25 different [drying and heating chambers](#) from the BINDER ED and FD series are used for this purpose. The quality tests and certifications are performed according to national and international VDE, UL, EN, ISO, and IEC standards. The thermal aging process of cable jacket materials is simulated in the test laboratory by exposing the materials to age accelerating conditions (temperature increase, high rate of air exchange). The artificial aging of products through controlled climatic conditions identifies their weak points and can predict material fatigue or even material failure. The acceleration effect is induced by varying temperature increases up to 300 °C. The tests are performed with both natural and forced convection. “Thanks to natural convection and the high rate of air exchange, all thermal processes in the ED series drying chambers are highly efficient,” explains Michael Hagenmüller, laboratory manager at Lapp. “The FD series drying chambers with forced convection are mainly used when we require rapid process dynamics.” Thanks to the APT.line™ technology, the chambers ensure a homogeneous temperature distribution across all levels even at full load.

“The BINDER chambers meet all requirements extremely reliably; they impress with a high temperature accuracy and precisely maintain the defined ventilation parameters in line with the time specifications,” says Michael Hagenmüller. “And the fact that they are excellent value for money was obviously another advantage.”

“**The BINDER chambers meet all requirements extremely reliably; they impress with a high temperature accuracy, and precisely maintain the defined ventilation parameters in line with the time specifications**”

Michael Hagenmüller, Lapp GmbH

Global player

The Lapp Group, which is based in Stuttgart, has 17 manufacturing facilities worldwide and maintains its own research and testing centers in Europe, Asia, and North America. It is active in approx. 100 countries with partner companies, and has 39 of its own distribution companies. The Group employs approximately 3,440 employees worldwide. Its core market focuses on machine and plant engineering.

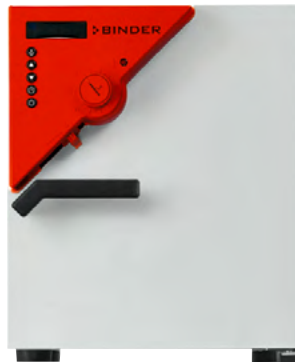


› FD 23 heating chamber with forced convection

Other important sales markets include the food, energy, mobility, and life science industries. The Group's portfolio includes cables and highly flexible cables, industrial connectors and screw technology, customer-specific assembly solutions, automation technology, and robotics solutions for Industry 4.0 and what is known as the smart factory.

Advantages

- Temperature range: up to 300 °C
- Natural and forced convection
- Controller with LCD display
- Electromechanical control of the exhaust air flap
- Class 2 integrated independent adjustable temperature safety device (DIN 12880) with visual alarm
- Excellent temporal and spatial temperature accuracy



› Model ED 23

 **LAPP KABEL**

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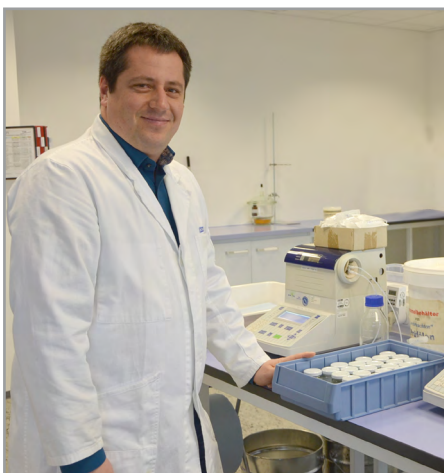
From toothbrushes to tool handles and seals in vehicles



TPE is a versatile product

The company Kraiburg TPE from Waldkraiburg in Germany produces thermoplastic elastomers, an extremely innovative product that we will all have come across at some point in our day-to-day lives.

From soft toothbrush handles to children's toys and haptic elements in tools – thermoplastic elastomers from KRAIBURG TPE provide real added value in all kinds of different products. TPEs from Waldkraiburg are also in high demand in the automotive industry, where they are used in vehicle interiors and exteriors and in engine-related applications for a number of well-known car manufacturers.



› Robert Klier, laboratory team leader at the site in Waldkraiburg, prepares the samples for testing in a BINDER heating chamber.

For example, TPE compounds make the controls comfortable to handle, provide glazing encapsulation with outstanding weather resistance, and can be used as sealing elements with high temperature resistance in the engine compartment. The granulate, which can be easily processed by the end customer, does however need to be checked on a regular basis to assess its resistance levels.

How do the thermoplastic elastomers change when they are exposed to certain media such as greases or water? How does the material react to high temperatures in conjunction with this substance? These are just two of the fascinating questions that TPE specialist Robert Klier deals with on a day-to-day basis. And this is where Tuttingen-based company BINDER comes into play. The company provides the laboratory team leader with the equipment required for extensive testing. “We tried out a few different simulation chambers in the past, but we decided to stick with BINDER. They really are top-quality products – we now have 16 drying and heating chambers, one dynamic climate chamber, and one vacuum drying chamber in our laboratory,” says Klier, who requires

Tasks and objectives

- Precise maintenance of temperature in short-term and long-term tests
- Test results must be logged and transferred directly to the PC
- Units should be stackable
- Heating chambers must be suitable for special testing

BINDER solutions

- Temperature range: plus ten to 300 °C
- Up to 30% lower energy consumption compared to conventional units on the market
- High temperature accuracy
- Forced convection
- Controller with LCD display
- Electromechanical control of the exhaust air flap
- Two chrome-plated racks
- Ergonomic handle design
- USB port for recording data

the highest degree of accuracy in his measurements. At the end of a test run, the key criterion for Klier is that the interference factors have not resulted in any changes. Together with his team, and with the help of the BINDER chambers, the laboratory team leader also simulates the processing of the thermoplastic elastomers at the end customer's site. "In this process, we check what happens when soft TPEs and hard materials come together – for example, in the case of a toothbrush. The adhesion between TPEs and hard thermoplastics comes not from a chemical bond, but from attractive intermolecular forces and a mechanical anchoring of macromolecules of both components," explains the specialist. Furthermore, at KRAIBURG TPE, every raw material undergoes in-depth testing on arrival and can only be used for production following internal approval. The BINDER heating chambers are used in particular for testing compression set, swelling behavior, and aging. "The standard tests in a drying and heating chamber (FD) take between 24 and 72 hours at 70 to 150 °C. This often involves aging the materials at an accelerated rate," reports Klier. Special testing – when a product is to be changed or further developed, for example – is carried out in continuous operation. This type of testing can take up to 1000 hours at 120 °C. Klier: "In the case of special testing, we need to fit the heating chambers with test equipment which we produce on a very individual



› The drying and heating chambers from BINDER are stackable and reliable – which is why laboratory team leader Robert Klier enjoys working with them so much.

We tried out a few different simulation chambers in the past, but we decided to stick with BINDER. They really are top-quality products.

Laboratory team leader Robert Klier at Kraiburg TPE

was also a crucial factor. "KRAIBURG TPE is known on the market as a specialist for thermoplastic elastomers. In order to build up our expertise, we rely entirely on high-quality suppliers and partners. We are happy to have found an expert partner for heating chambers in BINDER," adds the laboratory team leader.

basis. The chambers provide the ideal environment for equipment of this kind. Tests like this are used for the automotive industry in particular." This was not the only advantage that won over KRAIBURG TPE – the accuracy of the BINDER units

Advantages of drying and heating chambers

- Safe and accurate tests
- "Made in Germany" quality
- Two materials can be tested at the same time in one chamber
- Special testing of all kinds possible
- Easy to use: good insertion technology and a very reliable controller
- Easy to look after
- Networking: software can be analyzed quickly



› FD 260 model Avantgarde.Line

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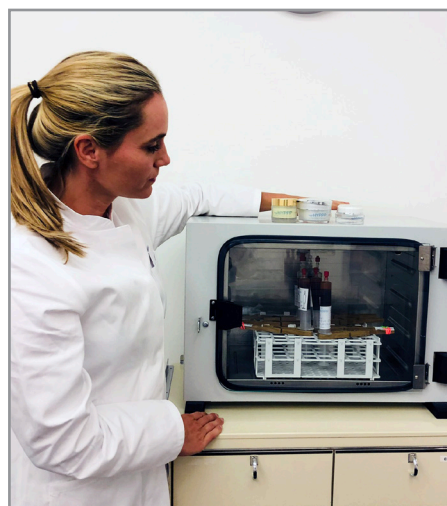
Eternal youth with new anti-wrinkle cream



The aging process starts as early as the age of 30. Our subcutaneous fat decreases and the skin loses protein fibers, causing it to become less elastic. But that's exactly what today's women don't want – they want to look youthful, fresh, and radiant. This loss of substance is to be kept hidden, especially as looking young and beautiful is considered the ideal these days. For men too, the desire for eternal youth is now commonplace. Whether male or female, more and more

people are seeking out the plastic surgery clinic of Dr. Constance Neuhann-Lorenz and Princess Dr. Sarah von Isenburg on Munich's Theatinerstraße. The two doctors – a mother and daughter partnership – talk through appropriate solutions with their patients, while also moderating any unrealistic requests. The end result doesn't have to be an operation – on the contrary, there are non-surgical products such as the “myHYPPP” series, which Princess von Isenburg has developed jointly with other plastic surgeons and scientists from the Technical University of Munich at its rechts der Isar university hospital.

The product contains not only nourishing ingredients but also the right active ingredients. These are obtained from the patient's own blood and – in particular – with the aid of BINDER incubators. The idea is a good one and its application –



› Princess Dr. Sarah von Isenburg monitors the storage of blood samples in a BINDER incubator.

Requirements

- Accurate temperature control
- Easy to open
- Unit must be reliable in continuous operation

BINDER solutions

- Temperature range: ambient temperature plus 5 °C to 100 °C
- APT.line™ preheating chamber technology
- Natural convection
- Adjustable exhaust air flap
- Controller with timer functions
- Inner door made of tempered safety glass (ESG)
- 2 chrome-plated racks
- Stackable
- Class 3.1 independent temperature safety device (DIN 12880) with visual temperature alarm
- Computer interface: RS 422

when you know how it works – is feasible and scientifically replicable.

The process starts with a blood sample. The sample is then placed in a BINDER incubator, which is ready and waiting to receive the cells at an interior temperature of 37 °C, i.e., body temperature. The blood is contained in a hermetically sealed syringe. Due to the lack of oxygen, growth factors similar to those found in wound healing are formed over the four to seven days that the cells are stored. These factors or signals are filtered from the conditioned blood and incorporated into the cream.



› A perfect team both personally and professionally: Dr. Constance Neuhann-Lorenz and her daughter Princess Dr. Sarah von Isenburg (right).

“These signals are able to read the body well, leading to the production of new collagen, elastin, and nourishing blood vessels,” states Princess von Isenburg,



› The anti-wrinkle cream from Princess Dr. Sarah von Isenburg activates cell renewal processes in her patients' faces. Here, the doctor is taking a close look at the healing processes.

This gentle method is helping many women to feel better about themselves and regain their confidence.

The process starts with a blood sample. The sample is then placed in a BINDER incubator, which is ready and waiting to receive the cells at an interior temperature of 37 °C, i.e., body temperature.

“

Princess von Isenburg

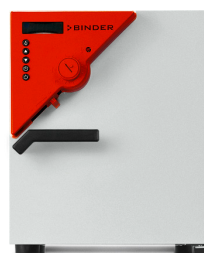
explaining how her cream works. She goes on to say that further cosmetic surgeons are already building on her method in the BINDER incubator. “We are already achieving significant success with the cream, the serum, the eye cream, and the HYPPOP Princess Mask,” states the doctor

who comes from a family of surgeons. She explains that this gentle method is helping many women to feel better about themselves and regain their confidence. Princess von Isenburg adds, “I use the cream myself and have noticed a real difference. Normal anti-wrinkle creams aren't allowed to contain any active ingredients, but ours are.”

Advantages of standard incubators with natural convection (BD 23):

Advantages:

- Safe and reproducible results even under high batch throughputs in long-term operation
- Disinfection routine at 100 °C
- Inner glass door for a stable atmosphere



› Model BD 23

Further models are available here › go2binder.com/en-Standard-Incubators

myHYPPOP

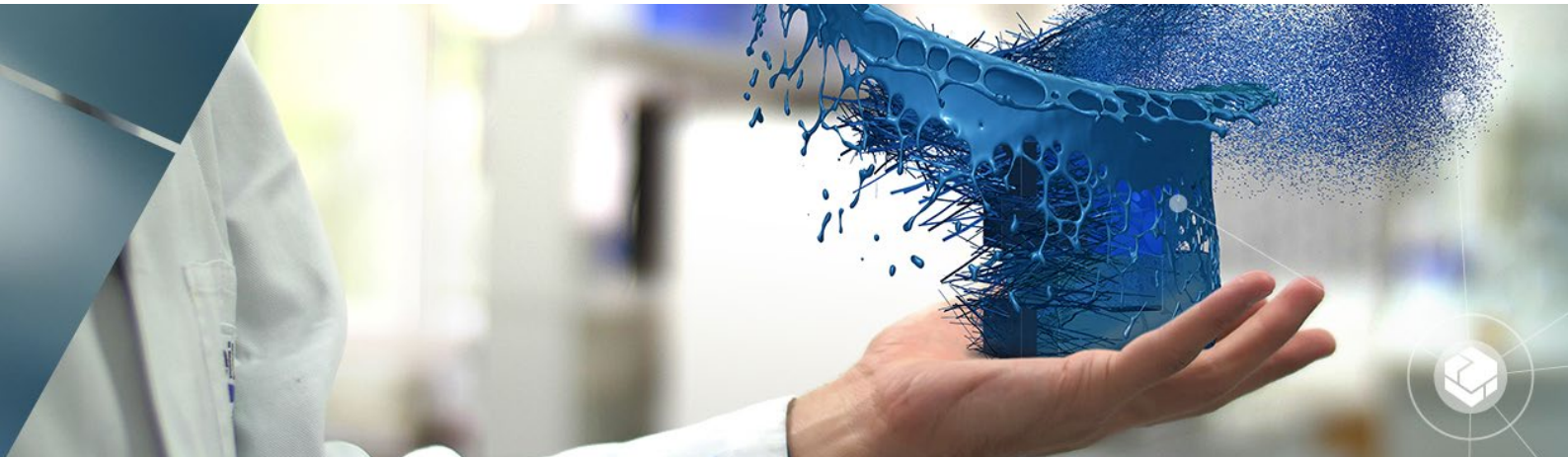
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BINDER chambers provide perfect conditions for tests involving solvent-based coatings



FreiLacke, based in the town of Döggingen in Germany's Black Forest, manufactures over 18,000 different coating formulations. Employing 550 people, it is known as the leading supplier of system coating solutions within the markets on which it focuses. So just what is it that leads so many customers to choose FreiLacke? Service staff member Rüdiger Oswald has the answer: "Our product range contains more coating systems than almost any other company. In some applications, it's really important for

customers to get all their coatings from the same source, so they can be sure the shades will match up perfectly. Wheels in the automotive industry are a good example, as they have a layer of powder coating applied to them, then a liquid coating and another layer of powder coating." To ensure that its coatings are doing their job of making items more durable and visually appealing, as well as adding value to them, FreiLacke puts the quality of its products to the test on a near-daily basis. That's where employees like Reinhold Weißer, Rüdiger Oswald, and Ronny Buck come in. They perform these tests using 30 different BINDER chambers. Ronny Buck, who is responsible for development and application technology in the area of industrial coatings, uses two FDL safety drying chambers for investigating solvent-based coatings and gaining new insights into these materials. As a laboratory technician, he finds BINDER chambers a real pleasure to work with because the



› Ronny Buck prepares test panels in BINDER safety drying chambers almost every day.

Tasks

- Dry coatings in a short time at a high temperature
- Consistent temperature distribution
- Door easy to open
- Chemical resistance tests
- Complete reliability for applications that use solvents

BINDER solutions

- FDL 115 safety drying chambers
- Temperature range: ambient temperature plus 300 degrees
- Controller with time-segment and real-time programming
- Fresh-air monitoring with audible and visual alarm and automatic deactivation of heating
- Replaceable fresh-air filter cartridge, Class M6 spare filter according to DIN EN 779:2012
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- Computer interface: RS 422

DIN A2-sized test panels that he uses fit precisely inside them. His day of testing kicks off as early as six o'clock in the morning, with the safety drying chamber then running uninterrupted for a full twelve hours. A panel that has been coated with a solvent-based material normally takes an hour to dry at 70 degrees. "Anything that separates out of the solvent is extracted during the drying process, and the waste heat is also fed back into the heating system, which helps us save energy," says Buck.

BINDER's safety drying chambers prevent anything from disrupting the process of drying solvent-based coatings. "I'm absolutely delighted with our BINDER chambers. We can take the prepared test panels to our customers and show them what the color of the coating looks like when it's dry, or how the surface feels, for instance," Buck explains.

For Oschwald, chemical resistance tests are also crucial: These test how coatings behave when they come into contact with other materials such as cooling lubricant or grease. Once it has been coated, the test panel is placed in a vessel containing a certain substance and is then exposed to a temperature of some 80 degrees. This is a long-term test that takes more than a month. There are also special tests that the coatings undergo, the latest of which



> In a safety drying chamber, a solvent-based coating on a test panel is able to dry in just one hour at 70 degrees.

I'm absolutely delighted with our BINDER chambers. We can take the prepared test panels to our customers and show them what the color of the coating looks like when it's dry, or how the surface feels, for instance.

says Ronny Buck

involves a segment of an alloy wheel. In this case, the segment has been sitting in a safety drying chamber for 14 days so far and will continue to be exposed to sources of stress for some time to come. Oschwald and his team perform all manner of tests like these every day and can speak from their experience with BINDER chambers: "They're durable, they're reliable, and they deliver accurate temperatures."

FreiLacke also manufactures powder coatings, which are much in demand the world over. These materials do not use any solvents at all and are also applied to panels for testing purposes. FreiLacke uses several BINDER drying and heating chambers (FED 115) for this purpose: The powder coating on the test panels is placed in the oven, where it is melted by the heat and then forms a chemical bond. This is just one more example of how versatile BINDER chambers are – and how there is a BINDER chamber to suit virtually any application.

Advantages of safety drying chambers

- Fulfill the safety requirements of EN 1539:2010-08
- Short drying times due to high temperature accuracy and defined ventilation
- Interior free from silicone and dust
- Easily replaceable fresh-air cartridge ensures constant fresh-air quality



> FDL model

Further models are available here > go2binder.com/en-safety-drying-chambers

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