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# The correct way to work with Orthocryl®

How to get the most out of Orthocryl® and
take your orthodontic appliance to the next level.

DENTAURUM
1886

Insights into **the materials science, tips from the experts** and proven **solution strategies**

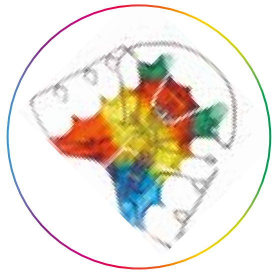


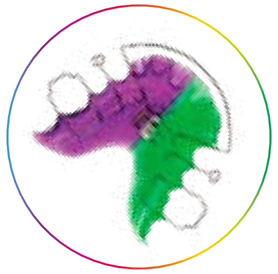
## Dear dental technicians,

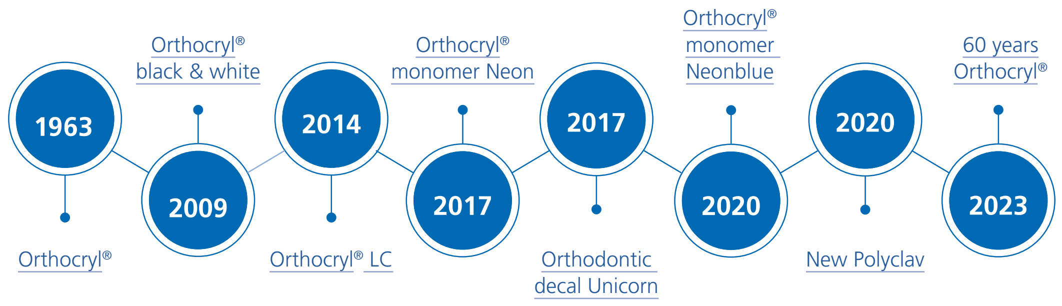
If you're holding this document in your hands, then you must be as enthusiastic about your work as we are. Orthodontic dental technology is not just a manual skill; it is also art. Every appliance that you fabricate is unique and helps improve a patient's health.

In this e-book, we will be looking back on 60 years of Orthocryl® – its history, its development and successes. But we're not only looking at the past, we're fixing our gaze firmly on the present. Together with a team of experts, we have put a guide together to help you in the processing of Orthocryl®.

Consider this an invitation to join us on a journey – starting with the basics and continuing on to techniques that have proven their worth over the years. Together, let's dive into the subject and use the concrete tips and tricks to optimize your orthodontic appliances using Orthocryl® in your laboratory!








## Time travel: 60 years of Orthocryl®

Can you remember products from your childhood or youth that still exist? There probably aren't all that many, are there? And if we focus on the dental market, particularly on products that you still know from your years of training, then the list will be even shorter. And what about if we concentrate on the field of orthodontics? Well, Orthocryl® should definitely be on your list.
This PMMA, cold-curing methyl methacrylate, was introduced in 1963 and it revolutionized the market. For the first time, it was possible, with Orthocryl®, to produce removal orthodontic appliances using the salt-and-pepper technique – a method which is still the predominant process in this area. When Orthocryl® and the salt-and-pepper technique were introduced, a new era began in the production of removable orthodontic appliances. And so the Orthocryl® story of innovation, adaptation and the drive for a good, long-lasting product unfolds.

INSPIRING EXAMPLES OF APPLICATION

Would you like to deepen your knowledge on Orthocryl®? Then pay a visit to our Landing Page for detailed information and inspiring examples using Orthocryl®.

# Convincing advantages

Orthodontic appliances are small, crafted masterpieces and, at the same time, an expression of the dental technician's creativity and precision. It is a craft that requires patience, dexterity and passion, and the choice of material plays a decisive role. This is where Orthocryl® enters the stage – a material with a multitude of advantages.

**Biocompatibility:** It is the high level of biocompatibility of Orthocryl® that makes the appliances pleasant for the patients to wear and the acrylic non-harmful to the patients' health. This evokes positive feelings about the treatment and confidence in the appliance. Orthocryl® is also an approved Class IIa product and is thereby also approved for the fixed appliance technique.

**Durability:** The Orthocryl® appliances are robust, leading to significantly fewer complaints in everyday laboratory practice and a high level of customer satisfaction. Patients benefit from a durable solution that withstands daily challenges such as the mechanical load, the oral environment, etc.

**Individuality:** Orthocryl® puts no limits on your creativity. Thanks to the wide range of colors, glitter and decals, individual design can be made to fulfill the aesthetic wishes of small and big patients.

**Precision:** The carefully coordinated product properties of all Orthocryl® products contribute to the precise final result. Orthocryl® classic is used for the salt-and-pepper technique, Orthocryl® EQ for the doughing technique.

**Efficiency:** Orthocryl® is easy to process so appliances can be produced quickly and efficiently.

**Patient comfort:** The combination of biocompatibility, durability and the possibilities for individualization make Orthocryl® a favorite for removable and fixed orthodontic appliances. A product that not only functions, but also looks and feels good, creates confidence and trust.

Orthocryl® brings a host of advantages into the everyday work in an orthodontic laboratory. And it's not just about producing an appliance. It's about creating a medical device that is convincing in every respect. To operate efficiently, it is important to get the very best out of the workflow for producing an orthodontic appliance. This requires high-quality processing of the material.

# Tips
## for working with Orthocryl®

In a profession characterized by craftmanship such as dental prosthetics, it is often the small details that count. We have therefore collected some proven tips and tricks. Divided into four relevant subject areas, we offer you advice to facilitate your daily work. Be inspired and maybe discover one or the other trick that you didn't already know!

## **Good to go?** Then let's go!

The key to success when producing orthodontic appliances is to prepare well.

### Selection of wax

Use thermo wax rather than other waxes such as modeling wax or sheet wax. Why? Using thermo wax avoids a milky appearance in the appliance; the acrylic retains its brilliance and transparency.

### 3D printed models

It is essential to use a special 3D separating medium when working with 3D printed models. This prevents the 3D printed model from becoming attached to the Orthocryl® and, in a worst case scenario, hindering the removal of the appliance from the model. Please take note of the manufacturer's instructions. A further advantage of special 3D separating mediums is the smooth underside to the appliance, thanks to a good separating medium.

### Dental stone models

Dental stone models must be soaked sufficiently. There is a simple trick to find out what "sufficient" is: submerge the model into a water bath and wait until no more bubbles rise to the surface. A well-soaked model prevents air bubbles from rising during polymerization and avoids problems with the material quality and the fitting process.

- Use thermo wax for clear appliances.
- Always use a special 3D separating medium for 3D models.
- Soak models sufficiently to avoid air bubbles.

# The working process
## in detail

As so often in orthodontics, it is the small details that make a difference. Here we have some tips for you which will help you avoid pitfalls when fitting expansion screws, placing decals or designing opaque appliances.

- Cover the expansion screws with monomer and sprinkle the powder in a controlled manner.
- Cover the decals with clear monomer/polymer.
- Grind black & white appliances carefully and by no means too deeply.


### Placing expansion screws

We recommend wetting the expansion screw from the beginning with some monomer. Then take care to spread the powder in a controlled manner and without excess in the area around the screw. The reason? So no bubbles can form which would have a negative impact on the final result.


### Decals

Cover decals with clear monomer/polymer. This ensures that they remain clearly visible in the finished product and are not hidden by other colors.


### Black & white appliances

When grinding black and white appliances, please take note that this Orthocryl® variant is not transparent. The wire elements and expansions screws cannot be seen. Do not grind too deeply to avoid coming into contact with the retentions on the wire elements.

### Monomer

of methyl methacrylate molecules contains coloring agents and inhibitors

### Orthocryl®

- Two component cold (auto) polymer
- PMMA / polymethyl methacrylate
- Monomer (fluid) and polymer (powder) mix
- Outstanding biocompatibility

### Polymer

of polymethyl methacrylate contains color pigments (black & white) and the chemical activator



# Applying
## polymer and monomer

PMMA (polymethyl methacrylate) is seen as the preferred material for removable orthodontic appliances. Orthocryl® is a two-component system consisting of powder (PMMA) and fluid (MMA). The powder consists mainly of bead polymer, supplemented by coloring agents and regulating substances. The fluid component contains mainly MMA monomer. Here, also, coloring agents and regulating substances are added.

## **An excursion** into the chemistry behind it all!

For those with a thirst for more knowledge and more details: dive with us into the exciting chemistry of polymerization. Join us on an in-depth excursion with explanations from specialists to heighten your understanding of the mechanisms behind the process. A guide for all who find the science and the materials science behind the products interesting.

Observing tried-and-true tips for the polymerization process can make the difference between average and excellent work.

During polymerization, monomer (MMA) is converted into polymer (PMMA). A proportion of monomer molecules that do not react remain in the workpiece as so-called residual monomer. Most of the residual monomer is released in water within the first 24 hours. Further release is a slow process. To reduce the amount of residual monomer to a minimum, we recommend soaking the orthodontic appliance in water for at least one day before fitting in the patient's mouth.

# **Optimum** mixing ratio

The right ratio of powder to liquid is decisive. The liquid must wet the powder and envelop the polymer particles completely to be able to process the acrylic dough.

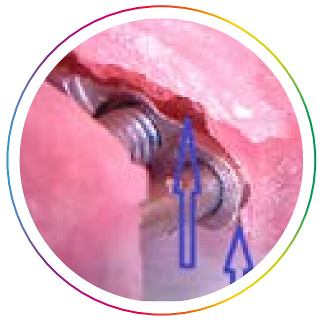
Orthocryl® and other similar products are low-molecular cold-curing polymers.

## Salt-and-pepper technique

We recommend the salt-and-pepper technique. Studies have shown that monomer residues are lower after polymerization using this method.

## The final layer

Take care to always finish with a layer of polymer. This has the advantage that surplus monomer is soaked up (absorbed). If you detect moist patches, apply more polymer. This helps to keep shrinkage during polymerization as low as possible. Too much shrinkage quickly leads to an inaccurate fit.



## Product family

It is necessary to use a monomer and polymer from the same company in order to stay within one product family. The reason is simple: the components are optimally coordinated with one another.

- Always finish with a layer of polymer.
- Use the salt-and-pepper technique.
- Stick to monomers and polymers from the same product family.

# Getting the polymerization right is what counts!

When producing orthodontic appliances, polymerization is the decisive step. Dentaurum has developed the Polyclav pressure vessel especially to get the best results possible with orthodontic appliances. This special pressure vessel enables polymerization in a controlled environment, thereby significantly increasing the quality and stability of orthodontic appliances.

Generally speaking, the appliance will last longer and be of better quality if the process of polymerization is done correctly. Here are some tried-and-trusted tips for daily work in the laboratory.

## Pressure vessel

The pressure vessel may not be opened in the first ten minutes of polymerization. This prevents bubbles from forming which can lead to air pockets in the appliance.

## Parameters for polymerization

It is important to adhere to the specified parameters for polymerization such as temperature, pressure and time. Otherwise, the acrylic cannot fully cure and remains too soft. The mechanical and physical properties deteriorate, and the appliance's hardness, flexural strength and fracture resistance are reduced.

## Length of polymerization

Extending the polymerization time for longer than recommended (20 mins) can reduce the amount of residual monomer, whilst too short a time leads to incomplete polymerization, less strength and an increased amount of residual monomer.

- Do not open the pressure vessel in the first ten minutes.
- Follow the parameters for polymerization closely.
  Pressure vessel: 2.2 bar
  Temperature: 40 – 46 °C / 104 - 114,8 °F
  Time: not less than 15 minutes (Orthocryl® EQ)!
  Not less than 20 minutes (Orthocryl®)!

## Polymerization temperature

A temperature that is too high encourages the formation of bubbles during polymerization. By contrast, a temperature that is too low can lead to insufficient polymerization after the specified time.

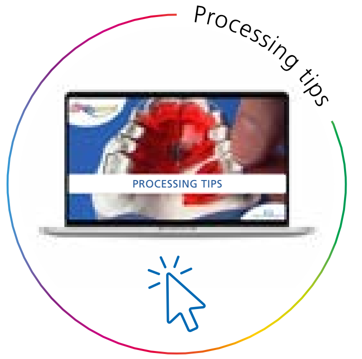
## Pressure

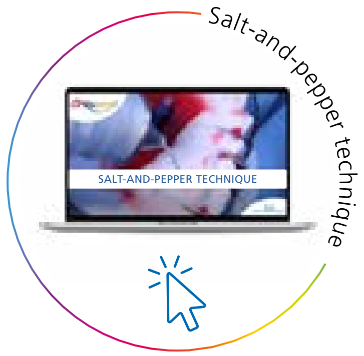
It is rarely a problem if the pressure is set higher than the recommended 2.2 bar; this can even help prevent bubbles from forming. On the other hand, if the pressure is too low, the risk of bubbles forming is increased. Important: The pressure vessel should not be opened during polymerization as this, too, may lead to the formation of bubbles.

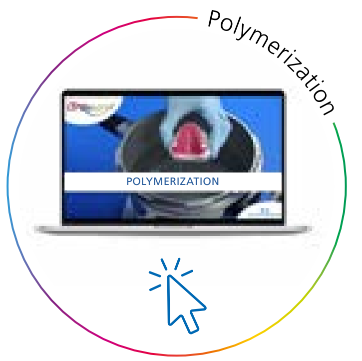
## Avoiding bubbles

Please observe the following tips to avoid the formation of bubbles:

- Always finish with a layer of polymer.
- Do not open the pressure vessel in the first ten minutes.
- Follow the parameters for polymerization.
- Use the salt-and-pepper technique.
- Use monomers and polymers from the same manufacturer.
- Soak the stone models sufficiently until no more bubbles rise to the surface.




**Welcome to the Dentaurum YouTube channel!**

Our YouTube channel has many informative videos with tips and tricks for the production of removal orthodontic appliances using Orthocryl®.

**You can expect:**

- **Instructions:** step-by-step instructions for the correct application of Orthocryl® and other materials for the production of removable orthodontic appliances.
- **Error prevention:** Discover frequent causes for errors and learn how these can be avoided to get the best results.

Immerse yourself in our video library and bring your skills up to the next level!



# Expert tips:

## This is now a thing of the past!

How to get the best out of Orthocryl® and raise your appliance to the next level.

| Difficulty | Cause | Remedy |
|---|---|---|
| Air bubbles in the appliance | Bubbles | Optimum pressure and temperature in the pressure vessel, no opening of vessel during polymerization |
| Air bubbles in the appliance | Insufficiently soaked model | Soak in water until no bubbles surface.<br>Use a vacuum mixing unit<br>➔ vacuum speeds up removal of air |
| Pores / snowflakes / white spots | Cool room temperatures / strong air suction / processing too slow | Store and process the monomer at room temperature as the acrylic starts to build crystals if stored too cooly, the room temperature is too low or the air suction is too strong during processing. Work swiftly, place the plate quickly into the pressure vessel. |
| Discolorations on wire elements and expansion screws | Gap corrosion | Make sure you process Orthocryl® correctly!<br>Store in water |
| Curing of monomer | Direct sun / polymer has entered the fluid | Avoid direct sunlight! |
| Poor fit | Too little monomer / too moist | Ensure the mixture ration of powder and fluid is correct for Orthocryl® EQ. Cover with powder as a final layer for the salt-and-pepper technique. |

Are you missing products to immediately implement the tips and tricks?
Dive into the large variety of our Online Shop! Here you will find all your heart desires.


## **The o-atlas II**: The book for the removable orthodontic technique

The o-atlas II has established itself as a must-have reference guide for orthodontics. It offers a deep insight into the diverse nature of orthodontic elements, equipment and appliances. When you buy the o-atlas II, you gain exclusive access to 360° product views of 50 interesting orthodontic appliances at www.o-atlas.com.


# Dentaurum

## Who we are and what we stand for

Since its foundation in 1886, the company Dentaurum has established itself as a reliable pioneer in the dental field. The company combines tradition and progress with an impressive history of 138 years. The ability to adapt and an open mind for change and innovation are manifested in the long success of Dentaurum - the oldest dental company in the world.

With its headquarters in Ispringen in the southwest of Germany and production facilities in France, Dentaurum focuses on quality "Made in Europe". Its portfolio of more than 8500 products is a demonstration of the company's competence and commitment. The company is one of the top 5 largest manufacturers of dental products in Germany. Dentaurum has not only set standards in orthodontics, but also in the fields of implantology, dental prosthetics and ceramics.

It has international presence with a global network stretching from Benelux to the USA and to Australia. The company is represented in more than 130 countries. Dentaurum is characterized not only by its product quality, but also its social commitment and sustainable management. In an ever-changing world, Dentaurum is a symbol for stability, quality and responsibility.

It was one of the first companies within the dental industry that incorporated sustainability firmly into its corporate philosophy by its own conviction in 1989. Since 1994 the company has continually been DIN EN ISO 14001 and EMAS-certified.

"Active environment protection is incorporated into each and every area of the company and has a high priority in our family company. This is true for now and for the future since economic success is not sustainable if it does not show consideration for the environment", says Mark Stephen Pace, CEO at Dentaurum.

CONTACT
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CHAT

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