

# COLORiT®

## Instructions for use



# 1. The system

Colorit® is an integrated system for high quality colour designs of solid surfaces. Colorit® is based on the principle of the light-curing material technology of ceramic composites. Thereby micro-fine ceramic particles are connected with a liquid polymer which lets the compound harden by exposure to light. With this basic technology individual colour designs of convincing purity and high surface quality can be realised which is mostly utilised in the jewellery industry for beautifying jewellery pieces and in the medical industry for application of colour markings to surgical instruments.

## **Colorit® can be processed easily and efficiently**

After cleaning and pre-treatment of the surface to be coated thin layers of ca. 0.2 mm each are applied with an application instrument or dosing system to the surface and cured by blue light afterwards. Thicker layers are applied and cured layer by layer.

## **Colorit® can be polished**

Cured Colorit® has a certain hardness which allows further mechanical processing in order to make the surface shiny by grinding and polishing.

## **Colorit® is non-toxic and 100 % biocompatible**

Due to its composition and relationship to medical polymer ceramics Colorit® is a 100 % biocompatible material which is consistently tested for toxicity and biocompatibility. It does not cause any allergies and is skin-friendly.

## **Colorit® is available in all colours and with various effects**

The range of standard colours alone is wide. If beyond that certain colour shades should be attained such special colours can either be ordered in larger quantities with Heimerle + Meule according to the desired Pantone colour chart or can be self-made by mixing standard colours. By admixing or implementation as extra layer glittering, transparent, precious metal, pearl or black light effects can be achieved.

## **Colorit® is very durable**

Due to its material characteristics Colorit® colours preserved durably. They do not fade and resist everyday wear.

## **Colorit® resists galvanic baths**

Colorit® coated goods can be cleaned ultrasonically, degreased electrolytically and electroplated.

## 2. Application

### 2.1 Condition of the Good to be Coated

As Colorit® colours are liquid, coating of plane surfaces can create problems because Colorit® can flow away uncontrollably during application and thereby precise coating can fail. Therefore it has proven in practice to fill Colorit® into deepenings of desired shapes. Hereby the material can be applied controllably.

Depending on the desired results depths of deepenings can vary. It must be considered that Colorit® colours are always a little bit transparent because blue light must be able to reach through to the bottom of the whole colour in order to cure it. From layer thicknesses of 0.4 - 0.5 mm opaque colours are achieved.

A deepening should be preferably even and not deeper on one side than on the other one. Otherwise it can happen that the same colour on the deeper side appears darker than the one on the flatter side as light is refracted differently.

The following depths are appropriate:

#### 2.1.1 Deepenings

##### Depth: 0.2 mm - Engravings

As one Colorit® layer usually has a thickness of up to 0.2 mm the absolute minimum depth of a deepening is approximately 0.2 mm. This depth is only suitable for fine engravings because the colour does not look optimal with broader colour inlays as it does not have any depth and the basic material gleams through the colour. Furthermore no mechanical post-treatment is possible due to the very thin layer.

##### Depth: 0.4 - 0.5 mm - Single-coloured inlays

From a layer thickness of 0.4 - 0.5 mm which are ca. 2 thin layers of Colorit® the colours are not transparent any more but get their full colour saturations. Thus 0.4 - 0.5 mm layer thickness offers the best ratio between quality and consumption of material and time and is common with normal single-coloured Colorit® inlays. Mechanical finishing with full colour results might not be possible with a depth of 0.4 mm because approximately 0.1 mm are removed by polishing of the surface and hereby the thickness of the workpiece and the depth of the Colorit® inlay are reduced accordingly. Thereby the layer thickness of such a Colorit® inlay can be reduced to a level which prevents a deep colour result. If the depth of a deepening is designed to 0.5 mm an additional buffer is given for ensuring good polishing with deep colour results. Therefore a depth of 0.5 mm is ideal for single-coloured inlays in case of serial production.

##### Depth: From 0.8 mm - Optimum quality and colour effects

From a depth of 0.8 mm sufficient space for multi-coloured layers as well as effect layers is available and finishing with a transparent Colorit® layer is possible. Especially finishing an arrangement of Colorit® layers with a transparent layer provides the advantage to repair a damaged Colorit® surface easily by renewing the transparent layer without changing or re-applying the whole colour inlay. This procedure is especially suitable with individual, hard

reproducible colour inlays. Apart from that a final transparent Colorit® layer provides a very nice additional shine which is very welcome with goods of premium quality.

## 2.2 Pretreatment of the surface

### 2.2.1 Sandblasting, undercuts, grooves & drillings

For optimum adhesion it is useful to sandblast the surface to be coated, if possible. Metal surfaces should be sandblasted with a corundum of ca. 150 - 250 µ and a pressure of 4 - 6 bar. Larger surfaces of more than 1 cm width and very smooth ones, for instance electroplated surfaces, should be sandblasted and undercuts should be applied to them.

Undercuts are widenings at the lower edges and corners of a deepening to be coated with Colorit®. They can be implemented already in the design stage or at a later stage by using a suitable tool. Thereby Colorit® can flow into these grooves and gets anchored there during curing. This results in an effective mechanical protection against delamination of the colour which works vertically.

In addition to that it is advisable, especially with larger surfaces, to apply grooves and drillings into the bottom of deepenings which provides Colorit® inlays with additional horizontal hold. In case of heavy temperature fluctuations Colorit® inlays often expand or shrink in different amounts than the material they are applied to. Especially at the edge of an inlay grooves and drillings develop their optimum effect. In order to minimise colour differences at spots with grooves and drillings they should be filled with transparent Colorit®.

### 2.2.2 Cleaning of the surface

Especially dust and moisture have a negative effect on processing of Colorit®. Take care of dry, clean and fat-free surfaces and tools. This can be achieved galvanically by electrolytic degreasing or by cleaning with alcohol.

### 2.2.3. Heating of the workpiece

Parts to be coated with Colorit® should be heated a little bit. Thereby bonding materials as well as as Colorit® colours can flow best and distribute quickly which additionally helps to avoid air bubbles inside the colours and to generally save time. For this purpose parts can be put onto the COLORIT Hotplate prior to coating.

### 2.2.4 Bonding

Colorit® does not naturally stick to solid surfaces. A bonding material which connects Colorit® to the desired surface and which provides a tight hold must be applied to the surface to be coated prior to application of Colorit®.

As Colorit® is a quite hard material after curing and is applied to also hard materials the colour or the basic material can be damaged by hard hits or other mechanical impacts. Apart from it's function as glue the bonding material additionally acts as a buffer which absorbs and distributes appearing forces to the Colorit® inlay and the basic material.

There are different types of bonding materials which are suitable for Colorit®. These are the following ones:

#### 2.2.4.1 COLORIT Primer

The COLORIT Primer is suitable for activation of non-metallic, amorphous surfaces such as glass or ceramic.

It is usually delivered in a small bottle of 4 ml content and is applied like other Colorit® activators with a COLORIT Microbrush Regular or COLORIT Microbrush Superfine. Afterwards the COLORIT Primer should dry, respectively react with the surface for 60 seconds before further coating with COLORIT Bond or Colorit® colours can follow.

With small Colorit® inlays with widths of up to 5 mm each coating with Colorit® colours can begin right after the treatment with COLORIT Primer. With wider surfaces COLORIT Bond should be used additionally as described in chapter 2.2.4.4 before applying Colorit®.

**Attention!** As with other bonding materials that must dry COLORIT Primer should be used at room temperature and not heated additionally in order to ensure a suitable reaction time without accelerated evaporation.

#### 2.2.4.2 COLORIT Premium Bond

The COLORIT Premium Bond is suitable for activation of metallic surfaces and generation of a compound between metal and Colorit® layers.

The COLORIT Premium Bond is usually delivered in a small bottle of 4 ml content and is applied like other Colorit® activators with a COLORIT Microbrush Regular or COLORIT Microbrush Superfine. Afterwards the COLORIT Premium Bond should dry, respectively react with the surface for 60 seconds before further coating with COLORIT Bond or Colorit® colours can follow.

With small Colorit® inlays with widths of up to 1 cm each coating with Colorit® colours can begin right after the treatment with COLORIT Premium Bond. With wider surfaces or in case of heavy material stress caused by later galvanic coatings or sterilisation processes COLORIT Bond should be used additionally as described in chapter 2.2.4.4 before applying Colorit®.

**Attention!** As COLORIT Premium Bond is based on actone it evaporates easily. Therefore COLORIT Premium Bond bottles should always be closed when no solution is taken out.

**Attention!** As with other bonding materials that must dry COLORIT Premium Bond should be used at room temperature and not heated additionally in order to ensure a suitable reaction time without accelerated evaporation.

**Attention!** Further processing should be done within the following 30 minutes after application of COLORIT Premium Bond because the chemical activation of surfaces declines and otherwise adhesion problems might occur.

#### 2.2.4.3 COLORIT Premium Bond Pen

A separate pen is available as a tool for efficient wetting of larger surfaces - the COLORIT Premium Bond Pen. This empty pen is delivered without content and can be filled with the COLORIT Premium Bond liquid in order to distribute it quickly and efficiently across larger surfaces.

For this purpose one fills up to 4 ml of COLORIT Premium Bond liquid into the empty pen body with the imprint “COLORIT Premium Bond Pen“ on it. Then the transparent valve part which contains a spring is pressed with the thinner end ahead into the pen body as far as it goes. Now the white sealing part which gets thinner to the top is screwed on the pen body and a felt tip which is included in the delivery content is put into it as far as it goes. In order to achieve the optimum effect with the COLORIT Premium Bond liquid the felt tip should be kept clean and it would be ideal to insert it into the white sealing part with a clean pair of tweezers. If one presses the felt tip with a little bit more force after insertion the valve in the inside releases the COLORIT Premium Bond liquid which is absorbed by the felt tip. Opening the valve by additional pressure on the felt tip should always be done with care because the COLORIT Premium Bond liquid escapes quite easily as it contains lots of inviscid acetone.

**Attention!** Especially in a warm condition additional pressure due to vaporisation is generated in the inside of the pen body which can press the Colorit® activator unexpectedly suddenly out if the felt tip is pressed too far into the inside of the pen. Therefore the felt tip should be pressed down with the pen in an upright position if the pen has not been used for a while so that vaporised acetone from the inside can be released upwards without jerkily pushing the liquid out along with the vaporised acetone as it can be the case if the pen is held horizontally or pointing down during this procedure.

#### 2.2.4.4 COLORIT Bond

The COLORIT Bond is a very strong compound glue which can reliably bond Colorit® colours with clean organic surfaces, COLORIT Primer layers or COLORIT Premium Bond layers. It does not adhere directly to metallic surfaces.

Mostly it is used as an adhesion reinforcer after application of COLORIT Premium Bond.

The COLORIT Bond is usually delivered in a syringe of 5 ml content and can be applied either with the plunger included in the delivery content of a COLORIT Bond syringe or by connecting the syringe to a dosing system. 2 dosing needles with different diameters are included as well which are suitable for fine to very fine applications.

When mounting the plunger one should take care that it is tightly locked in the yellow shove part in the inside of the syringe before the black fastener at the top of the syringe is removed and replaced by a dosing needle. A silent “Click“ sound should be heard when locking the plunger in the yellow shove part.

After application the COLORIT Bond must be cured with blue light. As with Colorit® colours a wet film (= dispersion/ inhibited layer) remains on the surface after curing. This film should not be removed but the following Colorit® colour should be applied right on top of it. Hereby a clean compound between COLORIT Bond and Colorit® is created.

Whether the COLORIT Bond is cured enough can be tested for example with a toothpick. A possibly existing subsurface structure under the COLORIT Bond layer is leveled by it whereby the toothpick can be pulled across the treated surface without hindrance if it is suitably cured. Moreover a slight colour change of the COLORIT Bond layer can be observed during curing which indicates that curing is finished. Meanwhile the bonding material glows fluorescently red.

## 2.3 Preparation of the Colorit® colour

### 2.3.1 General colour preparation

Prior to application of Colorit® the colour should be heated to approximately 60°C, for example on a COLORIT Hotplate, because it can be that air bubbles are inside and the material is not homogenous. Air bubbles in the lower part of a cured opaque layer are not necessarily troubling because they are not visible. If they are in the upper part right beneath the surface they can be torn open later and become visible as black spots on the surface. Depending on the layer thickness air bubbles in lower parts of a thoroughly transparent layer can be seen.

Therefore air bubbles entrapped in Colorit® colours should generally be avoided by consistent heating and thorough mixing of the colours prior to processing. For this purpose the colour can be taken out of the original Colorit® bottle, heated on a COLORIT Glass mixing plate placed on a COLORIT Hotplate, mixed and appearing bubbles be carefully dissolved by additional flaming of the colour, for example with a lighter, before applying it to the desired surface and curing it.

In case of processing of Colorit® right from the original bottles they can be put onto a COLORIT Hotplate and heated. Due to the generated heat air bubbles entrapped in the colour rise to the surface and can be pushed aside whereby they open and the air can escape.

**IMPORTANT:** Colorit® colours consist of a liquid acrylate and solid materials such as colour pigments and ceramic particles. Gravity makes the heavier solid components inside automatically sink to the bottom. If one takes out the colour, even after horizontal stirring, only from the surface level the colour taken out is more transparent and more inviscid than it should be. If one repeats this procedure the colour remaining in the can gets thicker and thicker and more and more opaque. The thicker the colour gets the worse the colour flows during processing. The more opaque the colour gets the worse curing with blue light succeeds because the light can reach less and less deep into the colour. Furthermore the colour intensity changes. In order to avoid these problems Colorit® colours should be rolled over thoroughly, for example with the COLORIT Application instrument, in circular movements not only horizontally but also vertically prior to any taking out from the original Colorit® can. The actual taking out should always be done from the bottom of the can to the top.

**Hint:** The acrylate can be mixed with the solid particles of the colour quite fast by turning the can with one hand while the other hand holds tight the COLORIT Application instrument with the spatula end of it immersed into the colour down to the bottom of the bottle and pulling material from the bottom to the top from time to time.

### 2.3.2 Colorit® special colours & effects

Apart from the available Colorit® standard colours many special colours in almost all colour shades and certain effects can be produced manually.

#### 2.3.2.1 Special colour shades

For production of special colours with individual colour shades which are not available as standard colours the required basic standard colours can be heated and mixed in warmed condition with each others on the COLORIT Glass mixing plate placed on an operating COLORIT Hotplate by using the COLORIT Application instrument.

Alternatively it is possible to let a desired colour shade be adjusted professionally through Heimerle + Meule in case of repeatedly higher demands. As exact colour adjustments are executed only against absorption of its costs of materials and working time and as professionally adjusted special Colorit® colours are only available in lots of 400 grams each this procedure is only economic in cases of accordingly higher demands. Once a special Colorit® colour has been adjusted it can be supplied repeatedly without covering the costs for the colour adjustment again.

### 2.3.2.2 Transparency effects

In order to produce a special effect colour a Colorit® standard colour can for example be mixed with the transparent Colorit® colours COLORIT Basic Clear and COLORIT Hi Clear. Thereby a very nice looking Colorit® special colour is created which offers a useful additional property:

Light can reach deeper into such a special Colorit® colour due to its increased transparency. Thereby relevant time savings are provided because fewer opaque layers have to be applied and cured one by one.

If the colour should finally be opaque and if the complete layer thickness leaves room for a final opaque coating with the original colour which has not been diluted with transparent Colorit® colours additional time can be saved as well because fewer single, thinner opaque layers do not have to be applied and cured one by one but only one or some thicker transparent layers and the 1-2 final opaque layers.

At a concentration of 25 % of transparent Colorit® colours, COLORIT Basic Clear or COLORIT Hi Clear, layers of up to 0.4 mm thickness can be cured with blue light in one step. From a concentration of 50 % layers of up to 0.6 mm thickness can be cured in one step. From a concentration of 75 % the maximum layer thickness which can be cured in one step at an appealing colour result is reached and up to 0.8 mm thick layers of such a colour can be cured in one step.

**Attention!** COLORIT Basic Clear is an opaline-translucent Colorit® acrylate without colour pigments and ca. 20 % ceramic content while COLORIT Hi Clear contains no ceramic but only the pure light-active Colorit® acrylate. Due to the missing ceramic the compression and shrinking tendency rises with COLORIT Hi Clear up to 2 %. Yet the colour is highly transparent and pure. Due to its ceramic content of ca. 20 % COLORIT Basic Clear shrinks much less during curing but from a layer thickness of ca. 0.4 mm the included ceramic particles cause a milky look.

### 2.3.2.3 Particle effects

With transparent colour compositions in the field of decorative applications particle effects have been quite popular with Colorit® colours for years. There Colorit® EyeFect colours are used which are mixtures of the purely light-active acrylate COLORIT Hi Clear and small colour pigments which reflect light in different colours depending on the the respective COLORIT EyeFect colour. Colorit® EyeFect colours can easily be used for optical upgrading of transparency effects with Colorit®. Hereto a Colorit® EyeFect layer can be integrated under a final transparent COLORIT Hi Clear layer so that the colour gains depth as EyeFect particles are visible in the depth of the colour.



Aside from that various individual particles can be blended into Colorit® colours in order to achieve individual effects. For adding individual particles the transparent special colour should be prepared like all Colorit® colours in the common manner - see chapter 2.3.1.

**Attention!** As the particles of Colorit® EyeFect colours as well as most else particles and materials are usually heavier than the colour itself they can sink to the bottom of the colour relatively quickly. Due to that the desired depth effect can be heavily limited. In order to avoid this such special mixtures should be applied and cured quickly.

### 2.3.2.4 COLORIT Silver powder

For especially noble colour compositions COLORIT Silver powder is available. The material is a highly pure, fine precious metal powder which can be blended into a transparent Colorit® colours like other suitable particles. COLORIT Silver powder should be mixed with COLORIT Hi Clear only because this Colorit® colour contains no colour pigments and no ceramic and thereby precious metal effects are not distorted.

In order to receive an attractive special colour only a small quantity of precious metal powder is necessary. 1 g COLORIT Silver powder can be mixed with 5-10 g COLORIT Hi Clear for this purpose. Here less is often more. With the correct dosage a sparkeling of the single particles appears when turning the cured colour in the light. For adding the precious metal powder the transparent special colour should be prepared like all Colorit® colours in the common manner - see chapter 2.3.1.

**Attention!** As the precious metal particles of COLORIT Silver powder are especially heavy particles they sink to the bottom of the colour quite quickly so that the sparkling in the light can be heavily limited. In order to avoid this such special mixtures should be applied and cured quickly.

## 2.4 Colorit® Coating

After coating of the surface has been prepared with application of the bonding material and by heating the surface and after the colour itself has been best prepared the Colorit® colour can be applied by hand or a dosing device.

### 2.4.1 Application by hand

Here the colour is applied manually to the spots to be coated by using the COLORIT Application instrument.

### 2.4.2 Application with dosing system

For this type of application the heated and mixed colour should be filled into a dosing cartouche. In order to accelerate this process a dosing needle with a wider diameter than the one used for the actual application later can be used. As soon as the colour is inside the cartouche one can adjust the negative pressure with a Colorit® dosing system in order to prevent dripping of the colour out of the cartouche. The negative pressure should be well balanced because otherwise Colorit® is sucked back into the cartouche and hereby air bubbles can enter the Colorit® colour which can create problems at a later process stage.

The Colorit® colour filled into the cartouche can now be applied to the desired surface at a pressure of ca. 1 bar. For a well-balanced flow behaviour the material viscosity is best at room temperature. Depending on the size and shape of the deepening to be coated dosing needles with inner diameters of 0.4 - 0.6 mm have proven well in practice.

### 2.4.3 Coating of deepenings

The colour should be applied by starting with a thin layer of up to 0.2 mm which should be cured with a Colorit® light. A wet grease film (= dispersion layer/ inhibited layer) remains on the surface of the light colour which cannot be cured completely while it is surrounded by air. This is normal and quite helpful for building up thicker Colorit® layers as the next partial layer applied to the wet grease film of the previous partial layer optimally links the two layers and provides a tight hold and seamless junction between both. By repeatedly applying and light-curing a thin Colorit® layer on top of the grease layer of the previous layer the Colorit® inlay is built up layer by layer until the deepening is completely filled.

With the spotlight COLORIT Desk Power DP2 a spot should be irradiated for minimum 1 minute while this can be done with the COLORIT Power Speed in up to 20 seconds. In a COLORIT Light Cube light curing should be conducted for ca. 5 minutes.

**Tip:** In order to test whether the curing process was successful one can for example push the tip of a toothpick or needle into the pre-cured colour. If the colour hereby does not split the pre-curing was successful.

During the light curing process Colorit® colours compress, contract and shrink by up to ca. 1.5 %. In order to achieve a seamless result a partial layer should always be applied to the outer side walls and edges of a deepening first and this layer ring should be cured with blue light thoroughly. Then the gap in the middle of the ring of cured Colorit® should be filled and pre-cured as well and the next partial layer should be applied in the same manner until the desired layer thickness is achieved.

Especially when processing larger inlays the problem of an emerging gap between the side wall of a deepening and the Colorit® colour may appear. In order to counteract this effect it has proven to be helpful to always apply and light-cure a single partial layer from one side to the other one and work the same way back from the other to the one side with the next partial layer.

## 2.5 Post-treatment of the Colorit® colours

### 2.5.1 Mechanical polishing

After the layer has been built up and the desired total layer thickness has been reached and after the last curing a wet grease film (= dispersion layer/ inhibited layer) remains on the surface. This film must be removed by using ethanol before grinding and polishing can be begun with.

For grinding a cured Colorit® surface preferably wet sand paper with corundum of 400, 600, 800, 1200 and with a surface diameter of more than 5 cm sand paper with corundum of 2000 is used. Well grinded is half polished!

Subsequently in case of machine-aided polishing the surface should be pre-polished at high rounds of up to 3,000 r/min and by utilisation of medium, fine to very fine polishing media for metals and plastic. Then polishing to mirror finish follows.

For manual finishing a greasy polishing paste like for example Unipol paste out of the tube can be used as well.

## 2.5.2 Finishing with COLORIT Tighter

A good mechanical polishing gives a very beautiful shine to Colorit®. In order to achieve the maximum shine the unremoved wet grease film on top of the last partial Colorit® layer can alternatively be thoroughly light-cured in warm glycerine oil. Thereby absolutely no micro scratches occur and optimum light reflection and hereby optimum shine can be achieved.

For this purpose COLORIT Tighter, a suitable glycerine oil for Colorit®, is filled into a suitably big, uncoloured glass container which the good or at least the Colorit® layer to be treated can be immersed into completely. Then heat the COLORIT Tighter to approximately 60°C and immerse the part with the Colorit® layer to be treated into it. If the part is dipped into at a too fast speed the wet grease film of the Colorit® layer can slip out of position and the Colorit® surface can get uneven. As an uneven Colorit® surface cannot be leveled later without mechanical polishing that causes micro scratches which are supposed to be avoided with this whole procedure the Colorit® surface including the wet grease layer should be as even as possible prior to immersion and immersed slowly and carefully. Afterwards the wet grease film can be cured with blue light. For this purpose the blue light source should be held as close as possible to the grease film to be cured from the outside of the glass filled with COLORIT Tighter. Depending on the power of the used blue light source the process can take 30-120 seconds. When the grease film is cured completely the process is complete.

The same effect is also achieved by using nitrogen. The grease film is cured completely with blue light under exclusion of oxygen and mechanical polishing is not required. This procedure is only economic with serial application because special workspaces have to be set up.

## 3. Further processing

### 3.1 Galvanic coatings

Uncovered metallic parts of objects coated with Colorit® can usually be treated galvanically.

As there exist various galvanic solutions it is recommended to test the galvanising with a sample piece first.

**Attention!** Utilisation of the COLORIT Bond in addition to the COLORIT Premium Bond as bonding material substantially increases the security that the Colorit® layer does not separate from the basic surface. Furthermore an as seamless as possible finish at the edges of a Colorit® inlay prevents galvanic solutions from subverting the inlay and weakening the compound of the Colorit® inlay and the basic surface coated with it.

### 3.2 Removing

Removing Colorit® is possible at any process stage.

Not cured material or wet grease films can be removed with ethanol.  
Cured material can be milled out or burnt out at 300-380°C.

## 4. System components

### 4.1 Processing accessories

COLORIT Application instrument

For stirring up and application of Colorit® by hand

COLORIT Instrument holder

For comfortable deposition of the COLORIT Application instrument

COLORIT Hotplate

For preparation of the colour (heat generation ca. 60°C)

COLORIT Glass mixing plate

For bubble-free preparation of the colour on the COLORIT Hotplate and stirring up of Colorit® special colours on the COLORIT Hotplate

COLORIT Microbrush

For removal, application and distribution of COLORIT Premium Bond

COLORIT Licht protection box (Colours)

For protection of Colorit® colours against slow curing under day light and artificial light (UV-, neon- and other light sources) during operation

### 4.2 Colorit® lights

#### 4.2.1 Colorit® spotlights

COLORIT Desk Power DP2

Practical LED blue light for pre-curing and curing of Colorit® colours in permanent operation; for goldsmiths, smaller labs, small serial production

**Advice:** The lense of each light head focuses the blue light of the 3 LED bulbs inside each light head to one spot. This focal point is located ca. 6.5 cm below each lense. At this focus point the highest light density is generated and Colorit® colours can be pre-cured or cured at this spot most efficiently. Adjust both light heads so that the focal points of both light heads meet at one mutual focal point. By mounting of the orange light protection screen the light heads are normally adjusted correctly automatically. The groove at the orange light protection screen helps finding the mutual focal point by holding the Colorit® layer to be cured at the same height as the groove, horizontally extended towards the focal point, under the light heads of the DP2 or by adjusting the height at the small lifting platform COLORIT Swiss Boy accordingly.

Usually pre-curing or curing of one colour spot takes approximately 1-2 minutes.

### COLORIT SPEED

High performance iron-quartz blue light for very quick pre-curing and curing of Colorit® in permanent operation, for serial production

**Advice:** Hold the opening where the blue light radiates out as close as possible, ca. 1 cm, to the surface of the Colorit® layer to be pre-cured or cured in order to utilise the maximum light power of the device. Avoid contact between the opening and the colour.

**Advice:** For comfortable operation and protection of the operator's eyes during curing the end of the light hose from the base unit can be plugged into the hole on top of the orange COLORIT SPEED Light protection box and parts to be cured held under the light radiating into the box through the front opening.

The device should be operated at 100 % light power.

Curing one colour spot takes approximately 30 seconds.

**Important!** Protect your eyes during operation by watching the curing process only through the orange COLORIT SPEED Light protection box or by wearing suitable UV protection goggles.

### COLORIT POWER SPEED

High performance iron-quartz blue light for very quick pre-curing and curing of Colorit® in permanent operation with performance reserves, for serial production of larger lots

**Advice:** Hold the opening where the blue light radiates out as close as possible, ca. 1 cm, to the surface of the Colorit® layer to be pre-cured or cured in order to utilise the maximum light power of the device. Avoid contact between the opening and the colour.

**Advice:** For comfortable operation and protection of the operator's eyes during curing the end of the light hose from the base unit can be plugged into the hole on top of the orange COLORIT SPEED Light protection box and parts to be cured held under the light radiating into the box through the front hole.

The device should be operated at 60 % light power.

Curing one colour spot takes approximately 15-20 seconds.

**Important!** Protect your eyes during operation by watching the curing process only through the orange COLORIT SPEED Light protection box or by wearing suitable UV protection goggles.

#### 4.2.2 Colorit® radiation chambers

In suitable radiation chambers Colorit® inlays of many parts can be pre-cured or cured together in one process step. Thereby such radiation chambers relieve Colorit® spotlights and provide higher total production efficiency by reduction of pre-curing or curing times per part.

If the deepening of a part to be coloured or the part itself is not flat so that the liquid, not cured colour can flow away uncontrollably a Colorit® spotlight should be used priorly for fixing the colour to the surface.

**Important:** Do not stack any parts inside a Colorit® radiation chamber because shadows could fall onto parts of Colorit® inlays which could cause improper curing.

#### COLORIT Light Cube 1

Radiation chamber for efficient curing of small parts with small to medium-sized serial production.

#### COLORIT Light Cube 2

Radiation chamber for efficient curing of medium-sized to big parts with serial production.

## 5. Storage

Colorit® colours should be stored light-protected at 15-20°C.

Provided that Colorit® colours are taken out and prepared suitably after storage, see chapter 2.3 Pretreatment of the Colorit® colour, the colours can be processed successfully years after suitable storage.

## 6. Trouble-shooting

Problem	Cause of problem	Solution of problem
<p>After curing Colorit® colours surfaces stay wet</p> <p>Polishing of Colorit® layers does not work well</p>	<p>Characteristic of Colorit®: Surfaces of cured Colorit® colours stay wet, a wet film of Colorit® colour stays on top</p> <p>Colorit® layers cannot be polished after the wet Colorit® film of the top layer has been removed. Layers become grey and stay dull</p>	<p>The wet Colorit® film can be removed by using alcohol. Afterwards Colorit® surfaces are dull. If you want to apply additional Colorit® layers you should not remove this wet film because compound between several Colorit® layers is stronger by applying the next Colorit® layer on top of the wet Colorit® film of the previous layer. Always remove the last wet Colorit® film only.</p> <p>Colorit® surfaces must be grinded before polishing works well. Suitable grinding media (for plastic and lacquer): medium, fine, very fine</p>
<p>Mechanical rework e.g. lathe tooling or milling does not work well</p>	<p>Colorit® layers burst, break, crack when doing mechanical rework</p>	<p>Turn Colorit® surfaces with high rounds per minute, use a sharp tool, cool it with alcohol if required</p>
<p>High polishing does not work well</p>	<p>Colorit® surfaces become grey, dull, cloudy, not steadily shiny</p>	<p>Rounds per minute: 3000. Use greasy polishing paste. Pre-polishing then high polishing</p>
<p>Wet Colorit® films in certain spots of your workpiece cannot be removed and cannot be polished</p>	<p>Colorit® is applied in spots of your workpieces which can hardly be reached and therefore neither the wet Colorit® film can be removed nor these spots can be polished</p>	<p>The wet Colorit® film can be cured in a glass filled with Colorit® Tighter at 60°C. Dip your workpieces thoroughly into the hot Colorit® Tighter and cure it at the same time for 2 minutes with blue light</p>
<p>Colorit® coated workpieces must be electroplated</p>	<p>Due to mechanical rework and polishing electroplated layers have been removed</p>	<p>Colorit® surfaces are resistant against all usual electroplating baths and are heat-resistant up to approximately 100°C so parts coated with Colorit® can usually be electroplated without problems</p>



Problem	Cause of problem	Solution of problem
Polishing in polishing drums does not work well	Surface is not polished steadily	Grind it wet in 1 or 2 steps then grind it dry in 2 steps.
No mechanical compound, delamination of Colorit® although workpiece is degreased	Colorit® compound problem, mechanical problem (e.g. surface to be coated is too smooth due to well bonding)	Sandblast with corundum 150-250 my. Make Under-cuts* and Anchor-drill-holes**
No mechanical compound, delamination of Colorit® although workpiece is degreased  Mixing individual Colorit® colours: Bubbles in Colorit® colours	Colorit® compound problem, chemical problem  When mixing Colorit® colours at room temperature colours are not liquid enough to receive homogenous mixed colours. There are in most cases air bubbles within the mixed colours resulting unsteady colour layers or bubbles when curing colours	Apply Premium Bond. Let it dry for 1 minute. Apply Bond and cure with blue light for 1-2 minutes.  Heat up Colorit® colours to 40-60°C, then carefully mix Colorit® colours on the Colorit® Glass mixing plate or in the original bottle it is delivered in
Colorit® Deep colours can hardly be cured or not at all	Too thick layers of Colorit® Deep colours applied	Apply layer thicknesses amounting maximum 0.2 mm of Colorit® Deep colours or mix them with Colorit® Basic Clear or Colorit® Hi Clear in order to clear up the colours

### General advice:

Before you start applying Colorit® colours you should always make trial coatings with workpieces you have not coated with Colorit® before in order to find out which layer thicknesses are required with these workpieces. Degrees of compound and hardening depths are in most cases differing from part to part.

### **\*Under-cut:**

If you fill Colorit® materials into a WIDE deepening of a workpiece it can be that if your Colorit® coated workpiece is being hit hard by for example falling down from a certain height onto a hard surface the complete Colorit® colour filling is being pulled out of the workpiece and gets loose. If you prepare such a WIDE deepening of a workpiece with an Under-cut the Colorit® filling has a better compound with the deepening and will become even more shock-resistant. For this purpose you must widen the bottom walls of a deepening by cutting a thin channel into the bottom corners of the deepening. When Colorit® materials are then being filled into such a deepening the Colorit® materials which have been distributed in the thin channel tightly hold the complete Colorit® material filling inside the deepening more reliably.

### **\*\*Anchor-drill-holes:**

If you fill Colorit® materials into a WIDE deepening of a workpiece it can be that if your Colorit® coated workpiece is being hit hard by for example falling down from a certain height onto a hard surface the complete Colorit® colour filling is being pulled out of the workpiece and gets loose. If you prepare such a WIDE deepening of a workpiece with anchor-drill-holes the Colorit® filling has a better compound with the deepening and will become even more shock-resistant. For this purpose you should drill 1 or more holes into wide deepenings of workpieces where Colorit® can flow into and make the Colorit® filling even more shock-resistant.

*The details of our product and processes are based on intensive research and technical experience.*

*We impart this information in good faith and reserve the right to make technical changes in the course of product development.*

*Our technical service team of Heimerle + Meule is available at any time to respond to additional queries or to offer expert advice.*

*This in no way excludes the user from reading the instructions provided before using the product at his own risk.*