Form Cure

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Formlabs has made every e ort to ensure these instructions are as clear, complete, and correct
as possible. The information provided in this documentation contains general descriptions
and/or technical characteristics of the performance of the products contained herein. This
documentation is not intended as a substitute for, and is not to be used for, determining
suitability or reliability of these products for specific user applications. It is the duty of any
such user or integrator to perform the appropriate and complete risk analysis, evaluation, and
testing of the products with respect to the relevant specific application or use thereof. Neither
Formlabs nor any of its a   liates or subsidiaries shall be responsible or liable for misuse of
the information that is contained herein. If you have any suggestions for improvements or
amendments or have found errors in this publication, please notify us.

Welcome

Congratulations on purchasing the Form Cure. On behalf of the employees who create and support Formlabs technology, we thank you for your purchase.

The instructions in this manual provide information for skilled persons to understand safety, setup and installation, operation, and maintenance of the Form Cure. These instructions are intended for anyone who is installing, operating, maintaining, or otherwise interacting with the Form Cure. Supervise young or inexperienced users to ensure an enjoyable and safe operation.

Read This Manual

Read and understand this manual and its safety instructions before using the Form Cure. Failure to do so can result in serious injury or death. Keep all safety information and instructions for future reference and provide them to subsequent users of the product.

Follow all the instructions. This will avoid fire, explosions, electric shocks, or other hazards that may result in damage to property and/or severe or fatal injuries.

The Form Cure shall only be used by persons who have fully read and understood the contents of this usage manual. Ensure that each person who uses the Form Cure has read these warnings and instructions and follows them. Formlabs is not liable for cases of material damage or personal injury caused by incorrect handling or non-compliance with the safety instructions. In such cases, the warranty will be voided.

Product Support and Documentation

Visit support.formlabs.com to:

- Access the latest version of all Formlabs product documentation.
- Contact Formlabs to request documentation, usage instructions, and technical information.
- Submit any comments or feedback regarding what is good and what can be improved.
- Request additional training.

1.2.1 Product Service and Support

Retain a record of the original purchase to request warranty services. Service options depend on the status of the specific product's warranty. Include the serial name of the product when contacting Formlabs for product support.

Instead of a serial number, all Formlabs machines have a serial name, which is a unique identifier to track the history of manufacturing, sales, and repair, and to distinguish usage when connected to a network. The serial name is on the back panel of the machine in this format: "AdjectiveAnimal."

Service providers of Formlabs products also provide support and service. To the extent that Formlabs or a certified service provider o ers other or extended warranties, the terms of the separate o er may apply. For products purchased from certified service providers, contact the original service provider for assistance before contacting Formlabs.

For any support or service requests, including product information, technical assistance, or assistance with instructions, contact Formlabs Services or a certified service provider:

| **support.formlabs.com**	**USA**	**Germany**
	Formlabs, Inc.	Formlabs GmbH
	35 Medford St.	Nalepastrasse 18-50
	Somerville, MA, USA, 02143	12459 Berlin, Germany

1.2.2

Formlabs accepts returns for unopened, unused, undamaged products within 30 days of the shipment date. Returns must be authorized by Formlabs. Visit Formlabs.com for more detailed information about returning your purchase.

1.2.3

This product is protected under warranty. Formlabs o ers a warranty for all Formlabs-branded hardware. Unless otherwise expressly stated, the Terms of Service, including the Warranty, constitute the entire agreement between you and Formlabs with respect to the Service and any product you purchase from Formlabs and supersedes all prior or contemporaneous communications, proposals and agreements, whether electronic, oral or written, between you and Formlabs. Read the warranty for more details on the Formlabs warranty for your region:

(EN)

(DE)

(FR)
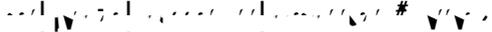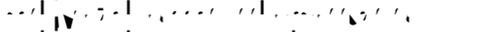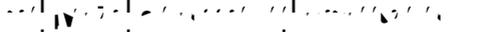
The Form Cure provides the light and heat necessary to post-cure 3D printed parts to their optimal properties. The final performance characteristics of cured photopolymer resin may vary according to your compliance with the instructions for use, application, operating conditions, material combined with, end use, or other factors.

In some cases, the additive manufacturing process ma   inherentl   result in variable performance characteristics between manufacturing runs or within a speci c part. Such variances ma   not be apparent and ma   result in unexpected defects in

	7.3 kg (16.1 lb)
	5.6 kg (12.4 lb)
	35.4 × 35.4 × 45.6 cm (14 × 14 × 18 in)
	26.2 × 26.2 × 34.0 cm (10.3 × 10.3 × 13.4 in)
	26.2 × 26.2 × 64.0 cm (10.3 × 10.3 × 25.4 in)
	100–240 V ~ 6.0 A 50/60 Hz 144 W
	60950-1:2005+A1:2009+A2:2013 (and applicable national deviations)
	Does not exceed 70 dB(A).
	19.3 cm (7.6 in)
	18.5 cm (7.28 in)
	Suggested 18—28 °C (64—82 °F)
	80 °C (176 °F)
	13 multi-directional LEDs
	39 W
	9.1 W
	405 nm

Double walls insulate the cure chamber and internal surfaces reflect light.

**100 W heating module** can heat the chamber up to 80 °C / 176 °F.

An array of thirteen (13) 405 nm LEDs help to post-cure parts. Secondary lights illuminate the turntable when the cover is open and during heating.

Rotating plate ensures balanced post-curing across all exposed surfaces.

Shows status, time, temperature, and options for configuring the Form Cure.

Turn or press to adjust time and
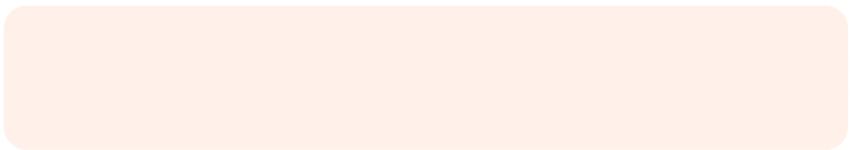
Like any heating appliance, a fire may occur if the Form Cure maintains extended contact with flammable materials, such as walls or curtains. Keep the Form Cure away from walls and curtains. Keep the area surrounding the turntable clean, and only post-cure parts that have been completely dried. Accumulation of cured material creates the possibility of malfunction.

3.1.3

The Form Cure uses heat and 405 nm light to post-cure 3D printed parts. The cover includes an interlock system that is designed to automatically pause heating and extinguish the cure lights when the cover is open.

> For best results, avoid opening the cover while the Form Cure is operating.

3.1.4

Respect Formlabs resin like any household chemical. Follow standard chemical safety procedures and Formlabs resin handling instructions.

In general, Formlabs resin is not approved for use with food, drink, or medical applications on the human body. However, biocompatible resins, such as Dental SG, are biologically safe for specific types and lengths of exposure to the human body. Refer to information about each specific resin for more detail.

> Wear gloves whenever handling liquid resin or isoprop l alcohol.

> Never ingest resin in liquid or solid form. If swallowed, immediatel call a poison center or medical professional.

> Alwa s consult the SDS (Safet Data Sheet) as the primar source of information to understand safet and handling of Formlabs materials. Combinations of resin and solvents should be handled according to the restrictions of both. For questions, consult the appropriate SDS(s).

3.1.5
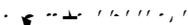
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to CFR Title 47, Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

Changes or modifications to this product not authorized by Formlabs could void the electromagnetic compatibility (EMC) and negate your authority to operate the product.

> Use of controls or adjustments or performance of procedures other than those speci ed herein ma result in ha ardous radiation exposure.

⚠ Safety Warnings

> Resin may cause skin irritation or an allergic skin reaction. Wear gloves when handling liquid resin or resin-coated surfaces. Wash skin with plenty of soap and water.

> Some methods of support removal may cause small pieces of supports to break away. Beware of flying debris. Wear eye protection and gloves to protect the skin and eyes.

⚠ Supplies and Accessories

The Form Cure shall only be used with supplied accessories and additional tools recommended by Formlabs. Third-party accessories and materials may cause damage.

Purchase additional supplies:

- Powder-free, chemical-resistant, disposable gloves (nitrile or neoprene)
- Sandpaper
- Mineral oil
- Primer and paints

> Consider the weight and dimension of the product for installation.

Arrange the Workspace

For best results:

1. Choose a stable, level workspace to install and operate the Form Cure.
2. Reserve the following minimum dimensions for the most convenient access:
   - Width: 36 cm (14 in)
   - Depth: 36 cm (14 in)
   - Height: 64 cm (25.2 in)
   - The cover opens upward from the front to allow inserting and removing printed parts from the turntable. To fully open, the Form Cure requires an additional clearance of 30 cm (12 in) above the unit for a total clearance height of 64 cm (25.2 in). The Form Cure unit weighs 5.6 kg (12.4 lb).
3. Allow additional space for accessories, such as the Formlabs SLA printer, Finish Kit, and Form Wash.
4. Ensure either the wall outlet or power supply for the Form Cure is easily accessible. To disconnect the equipment from mains electricity and power o the unit, unplug the power cable from the wall outlet, or the power supply.

Unbox the Form Cure

The Form Cure ships in a cardboard carton, protected by foam inserts above and below the machine. The upper foam insert also contains the accessories. During unboxing, inspect the Form Cure for any damage or missing items. In the case of damage or missing items, contact Formlabs or the certified service provider.

To unbox the Form Cure:

1. Open the box from the top.
2. Lift and remove the foam insert containing the power supply.
3. Lift the Form Cure out of the box.
4. Remove the turntable, located at the bottom of the box.

> Remove all packaging material before connecting power. Retain all packaging and inserts for warrant service.

5.

5.1
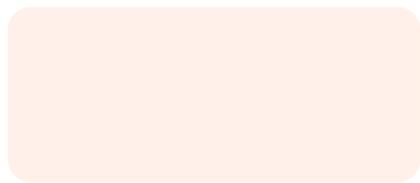
Operate the Form Cure in a well-ventilated room with a temperature of 18–28 °C (64–82 °F). For optimal performance, do not exceed this range.

5.2
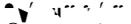
5.2.1

Fully dry all solvent o   of printed parts after washing. Check all surfaces, because curing non-dried parts may trap solvent inside the part, prevent parts from strengthening, and

5.2.3

When the cure cycle completes, the LEDs and heater will turn o . Lift the cover and remove parts. Use caution; the metal turntable may be hot.

5.2.4

Once parts are post-cured, use the flush cutters that come in your Finish Kit or Form Wash to carefully cut the supports attached to the part(s). Supports can also be removed before post-curing, but parts may warp under exposure to light and heat without structural support.

> ⚠️ **Wear safet glasses to protect e es from dislodged fragments of supports.**

In addition to removing supports, use sanding, polishing, priming, or painting to improve presentation, or use other equipment to create molds from printed parts.

Consider the specific geometry of each part when starting the post-cure cycle. Modify the post-cure process for parts that are large or long, have dense support structures, or have thick or thin features.

5.3.1

Some parts require more dense or thicker support structures. These can inadvertently block light from reaching some part surfaces during post-curing. The Form Cure helps ensure even post-curing by rotating the part during the cure cycle and exposing the part to light from all directions, including underneath the turntable. Remove some supports, only as needed, to ensure that light can easily reach all part surfaces. Leave some supports in place whenever possible to prevent features from warping during post-curing.

5.3.2
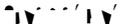
The Form Cure turntable has a diameter of 19.3 cm (7.6 in), and the maximum part height that can be post-cured in the Form Cure is 18.5 cm (7.3 in). Most parts should be post-cured before removing support structures to preserve their shape and prevent warping. While some parts may fit on the turntable more easily without supports, long or tall prints may require special arrangements to stand on the turntable without support. Consider the part dimensions when designing the support structures or planning the post-cure steps.

5.3.3
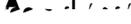
Large or thick parts may require a longer post-curing time or higher temperatures because the part takes longer to heat. Light alone cannot post-cure beyond the surface of the part, which is one advantage of the Form Cure heating functionality. When post-curing thick geometries, warm the part before post-curing and allow extra time for the Form Cure to preheat to the target temperature before starting the post-cure lights and timer.

5.3.4

Warping during post-curing may occur if a part is especially thin, inadequately supported, or unevenly exposed to light. The Form Cure helps prevent warping by rotating the part during the cure cycle and by exposing the part to light from all directions, including underneath the turntable. Use support settings or manual editing to design su cient supports so that thin features do not warp during post-curing. In the case of a thin, flat, sheet-like object, placing the part directly on the turntable may o er the best support during post-curing.

For the best results, use the recommended time and temperature settings tested specifically for use with the Form Cure.

Each material's print settings are designed and refined to print parts successfully at optimal speeds. Additional post-curing further improves the functional properties of the materials.

Post-curing exposes parts to light and heat and strengthens crosslinks in the polymer structure, improving the parts' strength, sti ness, and temperature resistance. Due to the increased number of bonds the material becomes more tightly packed and will shrink slightly. Each material's print settings are designed to account for the expected shrinkage during printing and post-curing.

Although using a higher temperature for post-curing results in a faster post-cure, a higher temperature setting may also cause some materials to warp, depending on the part geometry and features. When choosing to modify the recommended post-cure settings, the material must be able to withstand the temperature and maintain a stable material structure.

Formlabs resins are designed for printing and post-curing with 405 nm light.

RESIN TYPE	CURE	TIME (MIN)	TEMPERATURE (°C)
STANDARD RESINS			
Clear Resin	Recommended [1]	15	60
	Full Cure	30	60
Black Resin White Resin Grey Resin	Recommended [1]	30	60
	Full Cure	60	60
Color Resin	Recommended [1]	30	60
	Full Cure	60	60
Draft Resin	Better elongation	5	No heat
	Better UTS	5	60
ENGINEERING RESINS			
Tough Resin	Recommended [1]	60	60
	Full Cure	120	60
Durable Resin	Full Cure [2]	60	60
Flexible Resin	Recommended [1]	15	60
	Full Cure	60	60
High Temp Resin v1	Recommended [1]	30	60
	Full Cure	60	60
High Temp Resin v2	Recommended [3]	120	80
Rigid Resin	Full Cure [4]	15	80
Grey Pro Resin	Full Cure [4]	15	80
Elastic Resin	Full Cure	20	60
Ceramic Resin	N/A [5]	N/A	N/A

5.5.2 [illegible heading]

The Form Cure includes a USB port for the possibility of future firmware updates. See *5.1*

5.5.3 [illegible heading]

The serial name is on the back panel of the machine in the format "AdjectiveAnimal." The serial name is also available on the display. To access the serial name or firmware version on the display:

1. Disconnect the power cable.
2. Reconnect the power cable.
3. When the display shows [illegible], press and hold the knob immediately. The display shows the serial name (preceded by [illegible]) and firmware version.

[illegible heading]

Formlabs has made every effort to provide updated safety data sheets (SDS) for every resin product, in accordance with the latest government guidelines. Always consult the SDS as the primary source of information to understand safety and handling of Formlabs materials.

> In an emergenc involving resin, alwa s refer to the safet data sheet and/or seek help from a medical professional.

When handling solvents, always consult the safety data sheet (SDS) from the solvent supplier as the primary source of information. Handle solvents with gloves in a well-ventilated area. Keep flammable solvents away from heat, sparks, and open flame. Some solvents, such as isopropyl alcohol (IPA) evaporate rapidly, so keep bottles closed whenever possible. Promptly clean and inspect the Form Cure if any liquid resin spills on or in it to minimize any

6.2.2

Completely wash and dry all parts before post-curing in the Form Cure. Do not operate the Form Cure with uncured resin, partially cured resin, or other liquids on the turntable.

6.3

6.3.1

The internal surfaces of the Form Cure are covered in a reflective coating that reflects the light from the 405 nm LEDs and ensures that parts post-cure evenly. If the reflective coating is damaged or covered, parts may not post-cure properly.

Visually inspect the internal surfaces of the Form Cure for traces of resin, cracks, or other damage. Resin will harden during the cure cycle. Cured resin blocks light and must be removed.

If parts are washed but not fully dry before post-curing, certain washing solvents, such as tripropylene monomethyl ether (TPM), may evaporate and form deposits on the interior surfaces of the Form Cure. These deposits will cloud the reflective coating and prevent parts from post-curing properly. Clean the reflective coating as needed. Use IPA to clean the reflective coating and allow IPA to fully evaporate before starting a post-cure cycle.

6.3.2

The 405 nm and white secondary LEDs in the Form Cure are covered by frosted light diffusing panels. These light diffusers spread the light from the LEDs and ensure that parts post-cure evenly. If the light diffusers are damaged or covered, parts may not post-cure properly.

Visually inspect the light diffusers for traces of resin, cracks, or other damage. Resin will harden during the cure cycle. Cured resin blocks light and must be removed. If parts are

6.5.1

Formlabs regularly releases updated firmware to fix bugs and improve functionality. Review the PreForm and firmware release notes to learn more about the improvements that come with each version's release.

To update the firmware:

1. Connect the Form Cure with a USB cable to a computer running the latest version of PreForm.
2. Locate and run the Form Wash/Cure Updater tool in the PreForm installation folder to check for firmware updates and to update the firmware.
3. When the updater tool detects the unit, select
4. The tool uploads the new firmware and restarts the unit to complete the update. The update should take approximately 20 seconds. The turntable may rotate during firmware updates.

(!) Do not disconnect the USB or power cables during the update.

5. appears next to the connected unit in the main updater window. Select once the update is complete.
6. Repeat steps 1–5 to update firmware on additional Form Cure units.
7. Select to close the updater.

Troubleshooting

For detailed guidance and visual assistance, search on support.formlabs.com.

Display Freezes During Firmware Update

If the display freezes during or after the firmware update, power cycle the Form Cure unit:

1. Unplug the unit.
2. Wait at least 10 seconds to ensure a complete power cycle.
3. Reconnect the power cable to restart the unit.

Troubleshooting

In the case of an error or abnormal activity with the Form Cure, reference the following errors, causes, and proposed solutions. Complete the initial troubleshooting steps and carefully document all results. Contact Formlabs or an authorized reseller for additional assistance.
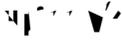
ERROR	CAUSE	SOLUTION
The display does not turn on.	Power failure or a faulty electrical connection	Check that the

7 -

TERM	MEANING
Circular wheel mount	The turntable sits on the circular wheel mount, which is driven by the motor assembly.
Cover	The hinged cover allows access to the Form Cure turntable. Double walls insulate the cure chamber and internal surfaces reflect light.
Display	The display shows status, time, temperature, and options for configuring the Form Cure.
Display ribbon cable	A flat, flexible cable connects the display assembly to the motherboard.
Heater	A 100 W heating module that can heat the chamber up to 80 °C / 176 °F .
Interlock magnets	The interlock sensor detects these magnets to determine when the cover is closed. This safety mechanism disables the heater, 405 nm LEDs, and turntable when the cover is open.
Knob	The knob is the primary interface device for the Form Cure. Turn the knob to navigate the display menu. Press the knob to select a feature or setting.
LEDs	An array of thirteen (13) 405 nm LEDs help to post-cure parts. Secondary lights illuminate the turntable when the cover is open and during heating.
Motherboard	The motherboard is the main circuitry through which all systems in the Form Cure communicate.
Motor assembly	The motor assembly rotates the turntable during the post-cure cycle.
Power supply	Provides power to the Form Cure. Specifications: 24 V, 6 A
Turntable	A rotating plate ensures balanced post-curing across all exposed part surfaces. The turntable is perforated to allow light to reach all surfaces of printed parts in the Form Cure.
USB port	The Form Cure can connect to a computer via USB. The port is connected to the motherboard and can be accessed from the back of the machine.