



## zp® 150 High Performance Composite

### FREQUENTLY ASKED QUESTIONS

#### 1. What is zp150?

zp150 is the best powder system available on Z Corporation 3D printers. It provides significant improvements over previous materials in both appearance and strength and offers the versatility to be the new standard in 3D Printing materials.

##### Best Color and Whiteness

- Brightest whites - 90% whiter than zp131<sup>1</sup>
- Largest color gamut ever – 125% larger than zp131
- New HD color printing mode for the ZPrinter® 650



Great color

##### Highest strength

- Better green strength than zp130 and zp131 for easier processing
- 40% stronger with Z-Bond™ 101<sup>2</sup> over zp130.
- 100% stronger with Water Cure over zp140.

##### New finishing option - Water Cure with Epsom Salt

- Easy and user-friendly post-processing option – only water and salt are required to seal and strengthen your printed parts
- Works with color models for draft color.

##### Great Versatility – One powder for all applications

- Compatible with Water Cure, Wax, Z-Bond and Z-Max™ – something for every application
- No more choosing between powders – one powder does it all!



Water Cure finish

<sup>1</sup> Compared to zp131 with Z-Bond 101. zp150 is 300% whiter compared to zp130. Per CIE Whiteness Index.

<sup>2</sup> Compared to zp130 with Z-Bond 101. Final strength is comparable to that of zp131 with Z-Bond 101.



## 2. When will zp150 be available?

zp150 will be available for pre-orders on June 9, 2009.

zp150 is planned to start shipping on June 22, 2009.

## 3. With which 3D printers is zp150 compatible?

As of June 2009, zp150 is exclusively compatible with the ZPrinter® 450 and the ZPrinter 650, currently available from Z Corporation.

## 4. How will higher “green strength” change my 3D printing experience?

Green strength characterizes the strength “out of the printer”, that is before any infiltrant is applied to your model. Higher “green strength” means that you’ll be able to successfully print, extract, depowder and finish 3D models with smaller features.

## 5. What do you mean by Water Cure?

Water cure with Epsom salt is the best way to finish early concept models quickly and easily. No hazardous or restricted chemicals are involved: simply dissolve the Epsom salt into tap water, spray a fine mist over the surface of your parts and dry them to get a hard surface and a bright white appearance.

The Water Cure with Epsom salt method applies to all parts printed using zp150 powder.

Color 3D models can be finished with Water Cure. However, colors will not be as vibrant as compared to a Z-Bond finish.



zp150 with Z-Bond



zp150 with Salt Water Cure

For top color accuracy and vibrancy, zp150 models should be infiltrated with Z-Bond instant infiltrant.



### 6. What is Epsom salt?

Epsom salt is magnesium sulfate, a mineral compound that has many uses, from health and beauty to household cleaning and organic gardening.

Epsom salt can be purchased directly on ZShop™ or through your local Z Corporation authorized reseller. Epsom salt can also be purchased from your local or online drug store.



### 7. Water Cure sounds great, why would I ever do anything else?

Models finished using Water Cure with Epsom salt are not as tough as models finished with infiltrants such as Z-Bond 101 or Z-Max and are generally not appropriate for functional testing.

Models treated with Water Cure have a hard surface, similar to a ceramic or a plaster cast. The strength is comparable to that of a model infiltrated with wax.

### 8. Can I finish architectural models with Water Cure?

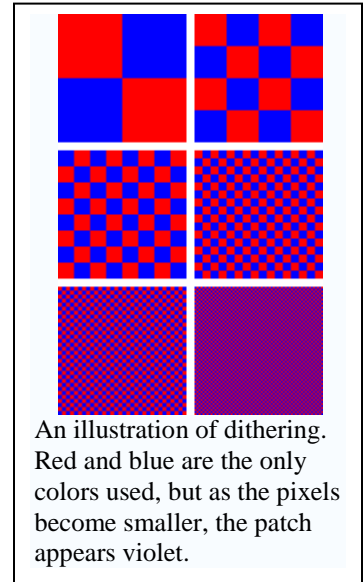
Water cure is a great way to finish a range of architectural models from massing models to site models. Water cure is quick, easy and non-hazardous and produces the brightest white models.

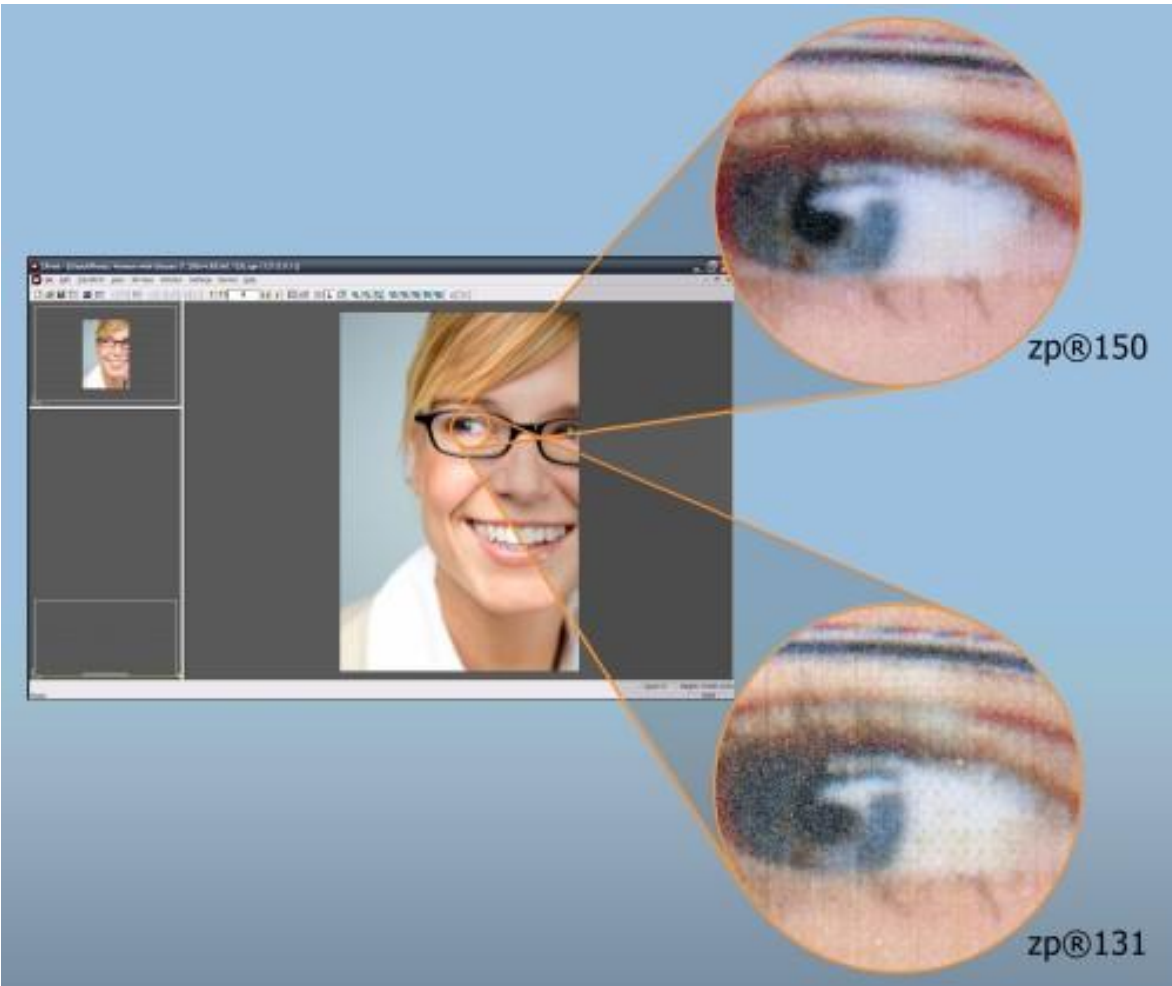
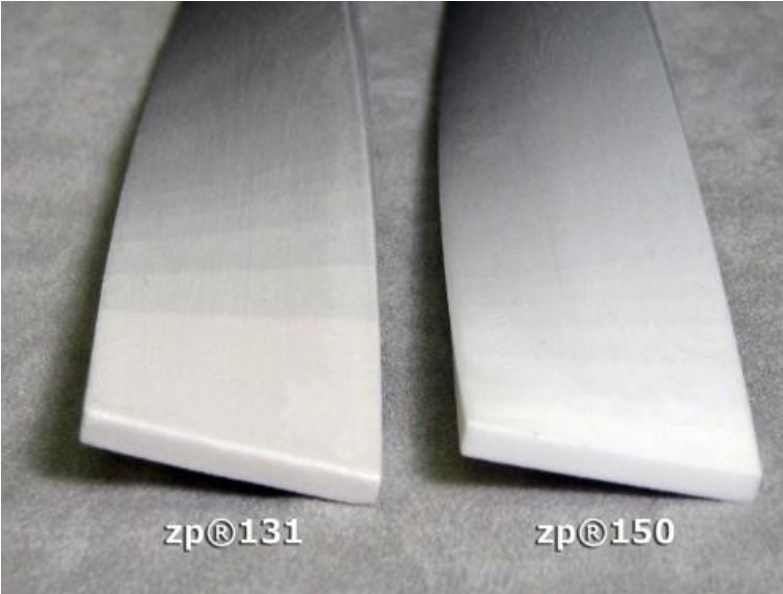
For best color accuracy, zp150 models should be infiltrated with Z-Bond instant infiltrant. Water cure with Epsom salt is compatible with color models but colors will remain somewhat muted.

### 9. How will I benefit from the NEW HD Color mode on Z650?

The new HD Color printing mode on the ZPrinter 650 dramatically reduces visible ‘dithering’. In the printing world, dithering is the process of mixing Cyan, Magenta, Yellow and Black to create a wide range of colors. Better dithering makes smoother, crisper and more vibrant colors.

The first photograph below shows the improved dithering of zp150 resulting in a smoother gradient from black to white on that printed part. In the second photograph, the part printed in zp150 has crisper details and does not have a visible ‘dot pattern’ on the white portion of the eye.







**10. What binder do I use with zp150?**

ZPrinter 450: zb®63 clear binder.

ZPrinter 650: zb61 binder set (clear and colors).

Both zb63 and zb61 have been optimized to provide precise printing and improved stability. They also provide additional brightness to your printed 3D models.

**11. What infiltrants can I use to finish my models?**

Z-Bond 101, Z-Bond 90, Z-Max and Paraplast X-TRA™ wax are fully compatible with zp150.

If you're not sure which finishing option to use, here is how they compare:

	NEW Water Cure	Z-Bond	Z-Max
Whiteness	★★★★	★★	★
Color	★★	★★★★	★★
Strength	★★	★★★	★★★★
Office friendly	★★★★	★★★	★

**12. How much is zp150 going to cost?**

International customers should consult their local authorized Z Corp. representative to get pricing information. Customers in the Americas can log on to the ZShop website to get detailed pricing information. The ZShop e-commerce site can be accessed through ZCentral.

(ZPrinter 450) The price of zb63 is the same as zb59.

(ZPrinter 650) The price of the zb61 binders will stay the same.

**13. What packaging sizes will zp150 be available in?**

zp150 will be available in 8 kg cartridges, for easy automated loading into your 3D printer and in 14 kg 'Eco-Drums'

Eco-Drums are paperboard containers, made from renewable resources and 100% recyclable. They contain enough powder to print approximately 700 in<sup>3</sup> (11,470 cm<sup>3</sup>) of parts.





The price per cubic inch of zp150 in Eco-Drums is slightly lower than in cartridges.

#### 14. What version of ZPrint™ do I need to run zp150?

zp150 requires ZPrint 7.9 or higher.

#### 15. What version of firmware do I need to run zp150?

ZPrinter 450: 4.154

ZPrinter 650: 5.233

#### 16. What do I need to do to change over from my current material to zp150?

To start using zp150, look for the zp150 upgrade kit on ZShop or contact your local reseller.

The zp150 upgrade kit includes all the tools, software & firmware files and hardware modifications that you will need to use the new material, along with a supply of materials and detailed instructions.

**THE PURCHASE OF A ZP150 UPGRADE KIT IS REQUIRED to change over a printer that is currently running zp130 or zp131. Full instructions must be followed. There are discounts available on the upgrade kits to encourage adoption of this new material.**

Please note that the zp150 Upgrade kit for the ZPrinter 650 includes enough powder to provide roughly 4-5 inches of vertical (Z axis) printing capacity. Additional powder may be purchased separately.

Some powder will be lost during the changeover. To compensate for it, the zp150 upgrade kits include 400 to 500 in<sup>3</sup> worth of free powder.

#### 17. Is there an upgrade kit?

Yes. Please visit ZShop or contact your local authorized Z Corp representative for further details. See the previous question for more details on the upgrade kit.

#### 18. Can I mix zp150 with zp130 or zp131?

No, mixing two different powders will compromise their specific features. If powders get mixed together, a service visit may be required to clean out the printer's powder circuits.

#### 19. Can I use another binder with the new zp150?

On the ZPrinter 650, the binder does not change: it remains zb61. No other binder should be used.



On the ZPrinter 450, zb59 Clear binder and zb63 Clear binder will coexist in the printer's internal reservoir during a transition period. Once you have used up your supply of zb59, you should use zb63 exclusively.

## 20. Can I use table salt or other salts instead of Epsom salt?

It is not recommended to use other salts than Epsom salt. Table salt (sodium chloride) does not give good results.

## 21. Can a Water Cured part be sanded or painted?

Yes, models printed with zp150 powder and finished with Water Cure can be sanded and painted with most common paints.

## 22. I have been using zp140 Water Cure. Should I use Epsom salt?

While Epsom salt is necessary for finishing zp150 models with Water Cure, it is not required for zp140. The main benefit of using Epsom salt with zp140 is the ability to finish parts with color (textures, labels, block color, etc.).

## 23. How is zp150 different from zp140?

Both powders feature great whiteness and Water Cure finishing option. zp150 features these key improvements:

- Green strength: zp150 models are 100% stronger out of the printer compared to zp140
- Water Cure: models printed with zp150 and treated with Water Cure are 100% stronger than zp140 models treated with Water Cure.
- Water Cure: the use of Epsom salt allows for color models to be treated and minimizes erosion.

## 24. What's the procedure for upgrading to zp150? Is a service visit required?

No service visit is required: changing over to zp150 can be performed by the customer.

A firmware and software upgrade will be required for both the ZPrinter® 450 and the ZPrinter 650.

### ZPrinter 650:

REQUIRED: Order the ZPrinter 650 zp150 upgrade kit.



The upgrade kit includes detailed instructions and everything that is needed to perform the changeover. Its price is discounted to encourage adoption.

Changing over will take a total of 3 to 6 hours but only about 30 minutes of hands-on time. There is one part that needs to be replaced: the roller scraper blade. The powder needs to be removed from the feeder (done by a semi-automated routine). There is no binder change needed. For more details, see the ZPrinter 650 Materials Changeover Procedure, available on ZCentral.

**ZPrinter 450:**

REQUIRED: Order the ZPrinter 450 specific upgrade kit.

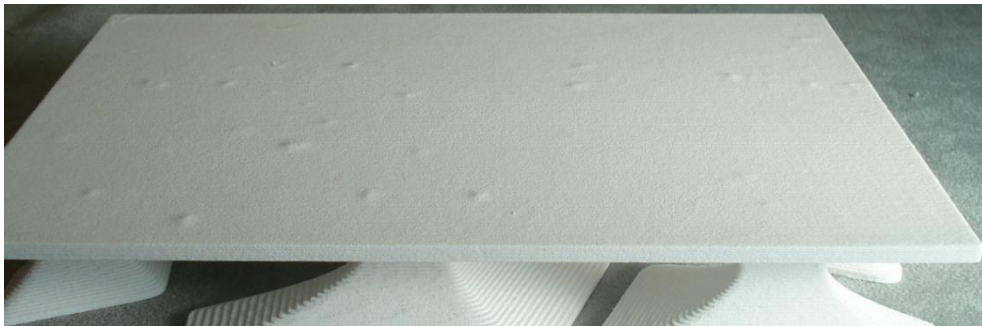
The upgrade kit includes detailed instructions and everything that is needed to perform the changeover. Its price is discounted to encourage adoption.

Changing over will take a total of 3 to 6 hours but only about 30 minutes of hands-on time. There are two parts that needs to be replaced: the roller scraper blade and the clamp that holds it in place. The powder needs to be removed from the feeder (done by a semi-automated routine). The binder change is simply removing the zb®59 cartridge and replacing it with zb63. For more details, see the ZPrinter 450 Materials Changeover Procedure, available on ZCentral.

**25. Why is it necessary to replace the scraper blade (ZPrinter 650) or the scraper blade & scraper blade clamp (ZPrinter 450)?**

Scraper Blade: Failure to replace the scraper blade can lead to geometrical inaccuracy that resembles squash or even cracks in extreme cases.

Scraper Blade Clamp: The new scraper blade clamp doesn't have any lip on the front-facing end. Failure to replace the scraper blade clamp can lead to large packets of powder falling onto the build area. This will show on finished models as bumps on flat surfaces or other unwanted artifacts.



**Bumps caused by failure to replace the scraper blade clamp on a ZPrinter 450**



**26. Why is it important to clean the fast axis when changing a printer over to zp150?**

Failure to clean the fast axis can result in a 'Fast Axis out of tolerance' error after the firmware upgrade. The reason is that powder may have accumulated at the end of the rail, blocking carriage travel as it tries to re-zero when it reboots.