

Consumer's Guide to Ceramic Coating

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Introduction

Ceramic coating is the most recent advancement in paint protection for autos, trucks, RV's, airplanes and marine craft. A lot of companies who sell products to these markets have introduced ceramic coatings into their product offerings. Some of these companies actually make their own ceramic coating, whilst others put their name on a private-label coating. With so many different brands available consumers need to make a choice and, quite naturally, want to know: *"Which is the best ceramic coating for me?"* This Guide will help you in making that choice.

History of paint protection technology

Paint protection is what we call everything from wax to clear bras. Here's a timeline for paint protection that is useful in knowing more about ceramic coating.

- 1800 – wax, developed from animal fat, was developed in Germany for horse carriages. This was the first paint protection technology.
- 1891 – Frank Meguiar, Jr. develops wax for automobiles. The "Meguiar's" brand is a top brand in automotive care.
- 1901 – George Simons develops carnauba wax. Simonize is born.
- 1925 – 3M develops masking tape. This allows automobile manufacturers and automotive paint companies to have two tones.
- 1944 - Plastone invents the first bottled car wash that later became known as "Turtle Wax."

- 1970 – Dupont introduces the first polymer sealant, whilst in Japan and Europe, the first clear coat was brought to market.
- 1980 – Detailing clay bar was developed in Japan.
- 1990's – Microfiber towels arrive on the detailing scene.
- 2000 – PPG Industries invents Ceramiclear to eliminate clear coat degradation from UV rays, acid rain and salt.
- 2007 – Clearpaint sealant, a nanotechnology polymer coating, is invented. Gtechniq invents C1 Crystal Lacquer.
- 2010 – Nano Shine, Ltd. released the Ceramic Pro range in 2010 for automotive, marine and airplane industry.
- 2013 – Ceramic Pro introduces 9h ceramic coating.
- 2017 – Gtechniq introduces 10h ceramic technology

As you see, ceramic coating nanotechnology is a recent advancement in the auto detailing industry, and, as a result, there is reliable and unreliable information about it. So, let's explore what it is, what it does and does not do, and what is the best ceramic coating product for you.

What is ceramic coating nanotechnology?

Let's keep this non-technical, although that may not be 100% possible. Keep reading to understand why.

Definition

The most common definition is: ceramic coating is a semi-permanent, non-metallic, inorganic clear coat. "Huh?" you ask.

Description

Bendable glass is the best way to "describe" ceramic coating, but that doesn't tell you *what* it is. So imagine making a smoothie: you put a lot of ingredients into a blender to suit your taste, and then blend it up and out comes a beverage you like. That's a good metaphor for ceramic coating. But in this case, it's more like: *start with this stuff, then do that to it for a while, then add this other stuff to that stuff and do something else to that, then add that other stuff over there to this stuff and do something else to all of this for a while, and...well, I'm sure you get the picture.*

Basic formulation of ceramic coatings



Image from IGL Coatings.

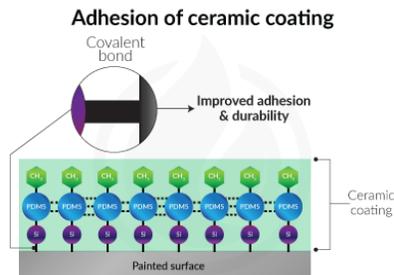
The basic recipe for ceramic coating includes: a resin, solvents and additives.

Resins

Quartz is the foundation of ceramic coatings. Resins typically include silicone-based polymers (SiO_2^1 and TiO_2^2) that are non-toxic, inert, non-flammable, optically clear with excellent thermal and is UV stable. The resin provides hardness, glossiness and high hydrophobic-ness (beads water). Unfortunately these resins have poor adhesion qualities, might not be as hard or hydrophobic as desired, and they may not have the UV protection and gloss level as are necessary in making a usable and effective paint protection coating for the surface it is intended to protect.

Additives

Additives help the resin achieve the shortcomings above. One additive brings strength and durability by forming a covalent bond³ with the clear coat. Others increase its hardness, its gloss, its UV capability and its gloss and shine.



Solvents

We started with quartz. It needs to be applied as a liquid. This requires solvents. The solvents suspend the product until it comes in contact with air. Once that happens, the solvents “die out” leaving behind a very hard surface. Other types of solvents, called “carrier solvents” allow multiple coats of ceramic coating to stack up on one another and bond to each other.

What a ceramic coating does

Short answer: Protects your vehicle’s paint better than any other technology except for paint protection film. Prevents oxidation via advanced UV protection, protects against most scratches, looks glossy for years. Saves money by not going to a car wash anymore. (You should never take a ceramic coated vehicle to a car wash. Your installer will show you how to wash it.)

¹ SiO_2 (Silicon dioxide) helps create a smooth, flat surface needed for hydrophobicity.

² TiO_2 (Titanium dioxide) affects the hardness of the coating.

³ A **covalent bond** is a chemical **bond** that involves the sharing of electron pairs between atoms. These electron pairs are known as shared pairs or **bonding** pairs, and the stable balance of attractive and repulsive forces between atoms, when they share electrons, is known as **covalent bonding**. en.wikipedia.org

Hydrophobic effects of ceramic coating

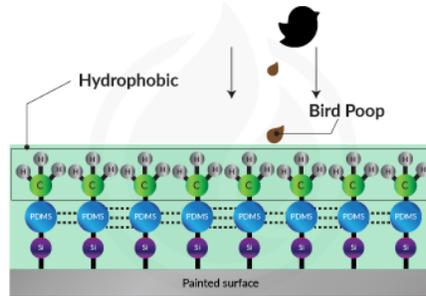


Image from IGL Coatings.

What a ceramic coating does NOT do

Protect against rock chips and other road hazards that can chip your paint. That's what paint protection film does. It does NOT mean you don't have to wash your ceramic coated vehicle. You should wash it every two weeks at a minimum, but not at a car wash, which has harmful chemicals that affect the coating. Use the "no-rinse" method as shown by your installer.

Ceramic coatings for autos

Now that you know what it is, let's focus on two types of ceramic coating for automobiles: The DIY products and professional grade products.

Here's a quick down and dirty comparison:

Feature	DIY	Professional Grade
Price of coating per 50ml (1.7 oz.) bottle	\$40-100	\$100-300
Hardness	5-7h	7-10h
Glossiness	Good	Better than DIY
UV protection	Good	Excellent
Warranty	No	Yes
Available retail	Yes	No
Prep work	Same	Same
Margin of error (experience in installing a ceramic coating)	Higher	Lower
<p>Correcting improper installation problems such as : high spots, streaks, bad reflections and hazing.</p>  <p>Image from civicX.com</p>	<p>Take it to a detailer unless you have sanding and polishing experience to remove the coating.</p>	<p>A certified ceramic coating pro is trained by the manufacturer to install the coating correctly. If there are any mistakes, they will correct them during the flash time of the coating or use products designed to remove a coating before it fully cures.</p> <p>Once ceramic coatings cure, sanding and polishing is required to completely remove it.</p>

Setting	Outside or your garage. Uncontrolled.	Mobile detailers can install a ceramic coating outdoors under a canopy with sides. A detailing shop should have a controlled environment.
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After reading the above table, you might see the value in hiring a professional installer.

One note about prep work: What is meant by “Same” is that a ceramic coating should NEVER be applied until the vehicle is:

1. Thoroughly washed
2. Decontaminated
3. Clay barred
4. Wiped down
5. Taped to protect from 6 & 7
6. Machine paint correction (if necessary)
7. Machine polished (always necessary)
8. Wiped down with a prep solution
9. Coating applied – 1st coat
10. Coating buffed AFTER it flashes
11. Coating applied – 2nd coat
12. Coating buffed AFTER it flashes
13. Topping applied (some coatings recommend a topper)

If you are unwilling or unable to do the above 12-13 things, then you should have a professional ceramic coating installer do the job for you.

Why is it so expensive?

Product cost

The cost to bring a commercial ceramic coating to market is HUGE! There’s R&D, manufacturing, marketing, sales and administrative costs incurred by the manufacturer. It requires millions of dollars before one bottle is sold!

Installation cost

A certified ceramic coating installer is paid roughly the equivalent of an automotive tech at a commercial garage, which ranges from \$100-200 an hour. The installer has years of detailing experience, paint correction and polishing expertise as well as many hours of manufacturer’s product and application training.

Cost of continuing to wax your vehicle

How often would you need to wax your car to get it to look like it does with a ceramic coating, over the lifecycle of the coating. Let’s say you have a 7-year coating installed on your favorite vehicle and it costs \$2,500. That’s a one-time cost that includes a warranty. Now, wax typically lasts 3-4 months, or until you

go through the car wash again. If you pay a detailer to wax your car, you're going to pay about \$250 each time. So if you do that 3 times a year for 7 years, you've spent \$5,280. So which is the better value?

That's too much money!

If money is the primary issue in making your decision, ask about a 1, 3 or 5 year rated ceramic coating. You may find that your initial investment is less while still reaping the benefits of a ceramic coating.

Decision time

Now that you know what ceramic coating is and the difference between DIY and Pro level products, you have a decision to make. Hopefully this Guide has helped you in making the best decision for your specific needs. You can always contact us for questions.

Good luck on your endeavor!

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