



**MAGIC OF
PIGMENTOLOGY**
BY VICTORIA BUDNYK

HD **BEAUTY**
ACADEMY



COLOUR THEORY

Colour theory is essential in the field of permanent makeup, also known as cosmetic tattooing.

When applying permanent makeup, it is crucial to understand how pigments interact with different skin tones, skin types and how they will change over time.

We will dive into the world of colours, hold on tight, make sure you have your pen and paper ready!

Just like many PMU Artists, I was struggling with pigments for a long time and had my share of mistakes. In this course, I will be sharing everything that made my life a LOT easier in permanent makeup and allowed to create flawless results!

| COLOUR VS. LIGHT

Colour and light are related concepts but not the same thing.

Colour refers to the visual perception of different wavelengths of light. When light hits an object, some wavelengths are absorbed by the object, and others are reflected. The wavelengths that are reflected determine the colour of the object that we see.

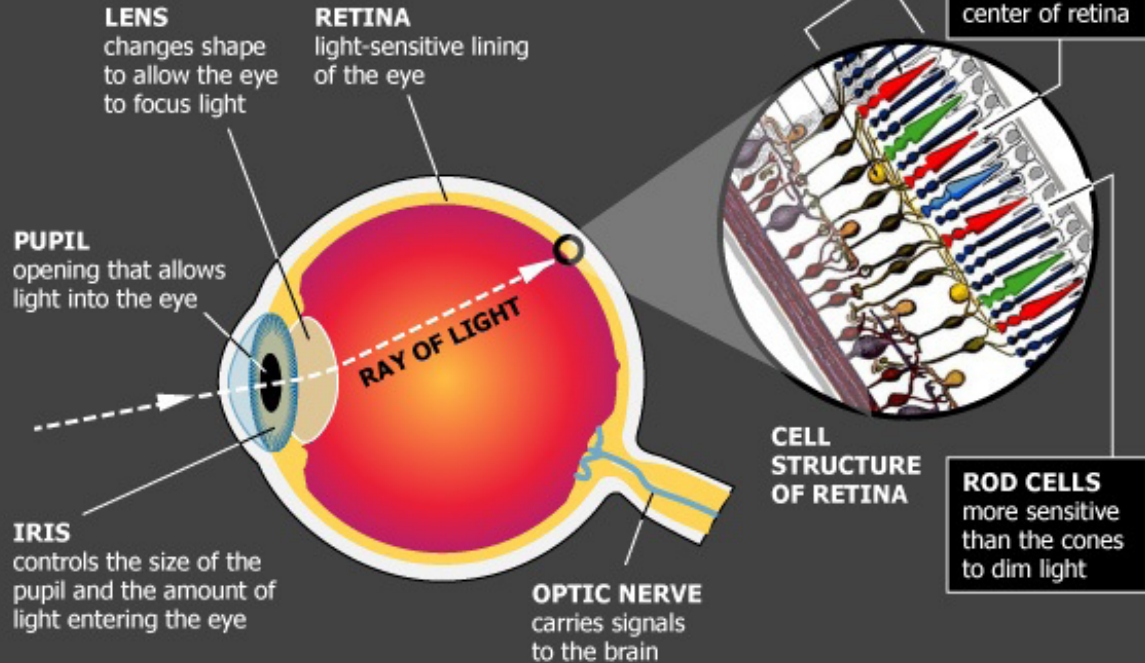
In the darkness, you do not see an actual color, everything is perceived in black and white. As soon as the light hits the object, we see the colour.

Every human sees colors differently in terms of their saturation and sometimes even hue. This factor is very important to consider in Permanent Makeup. Your client might have a completely different perception from yours; therefore it must be a mutual decision.

Take a look at the diagram and let's analyze why we see colours in certain way.

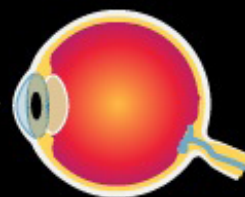
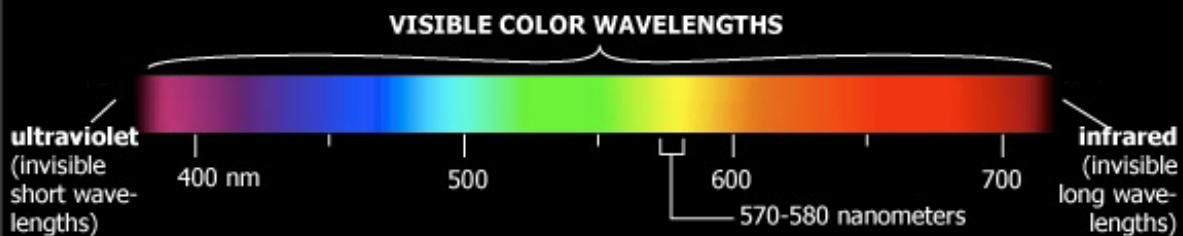
How the Eye Sees in Color

The retina contains cells called rods and cones that are sensitive to different colors of light.



Why Bananas Appear Yellow

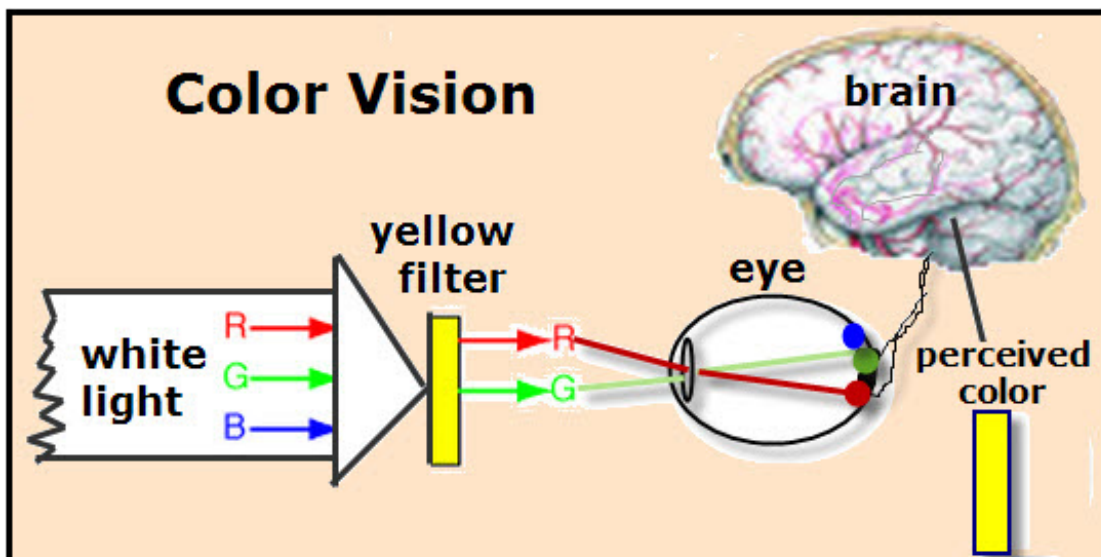
The full spectrum of light falls on the bananas, but only light with wavelengths of 570 to 580 nanometers, in other words "yellow" light, is bounced off. (A nanometer is one billionth of a meter.)



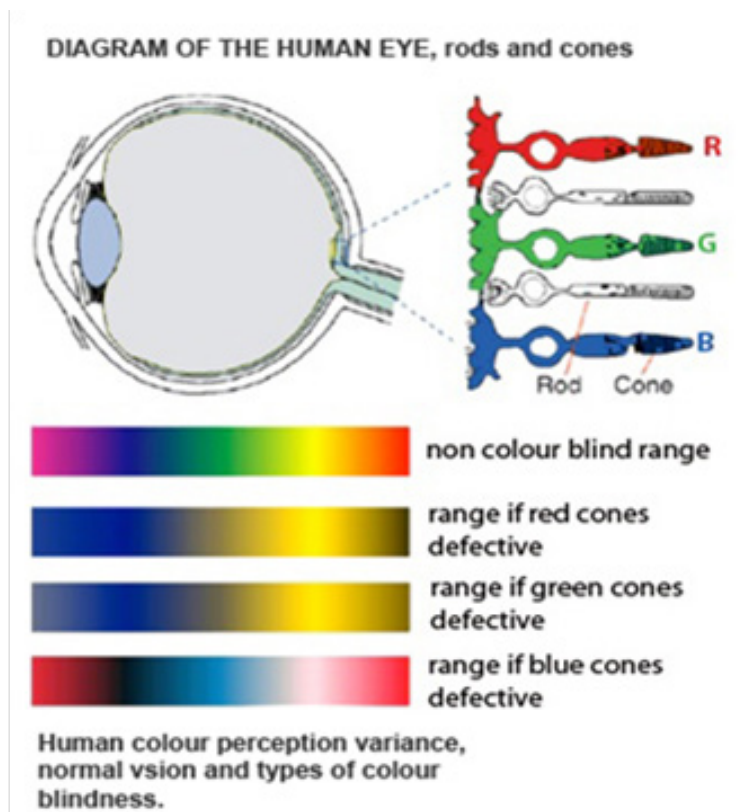
Yellow light reflected from the bananas stimulates the eye's cone cells to varying degrees. Nerve signals from the cones travel to the optical cortex of the brain for decoding.

SOURCE: NATIONAL LIBRARY OF MEDICINE, PHOTOS8.COM

Graphic by Karl Tate *Life's Little Mysteries*



Our eye retina has only 3 types of receptors: Red, Green, and Blue. If one of those receptors is lacking the strength, you will perceive colours different from another person. Sometimes one of the receptors can be missing completely, and we call it Colour Blindness. (Take a look at the diagram below)





Colour blindness can present a challenge in permanent makeup, as it can make it difficult for the artist to accurately perceive colors. Colour blindness, also known as color vision deficiency, is a condition in which an individual has difficulty distinguishing between certain colours or perceiving them at all.

In permanent makeup, colour blindness can affect the artist's ability to choose the right pigment for their client's skin tone and natural features. It can also make it challenging to accurately assess the color of the pigment during the procedure, which can lead to a

less-than-optimal outcome.

To address this challenge, some permanent makeup artists use colour-correcting glasses or tools that can help them perceive colors more accurately. These tools can help artists distinguish between different colours and ensure that the pigment they are using is the correct shade.

Another strategy is to rely on a trusted colleague or assistant who does not have colour blindness to assist with colour selection and verification during the procedure.

| COLOUR VS. LIGHT

In conclusion, Light and colour are critical factors in permanent makeup, as they can affect how the makeup looks and how it complements the client's natural features.

Lighting conditions can have a significant impact on how the makeup appears. Different types of light have different color temperatures, which can affect how the pigment appears. For example, a pigment that looks natural in natural daylight might appear too warm or too cool under fluorescent lighting. To ensure that the makeup looks natural under different lighting conditions, it is essential for the artist to consider the lighting conditions in which the makeup will be viewed and choose pigments accordingly.

Colour theory is also important in permanent makeup, as the colour of the pigment will interact with the client's skin tone, natural hair and eye colour. Permanent makeup artists need to have a good understanding of colour theory to choose pigments that will look natural and complement the client's features.

For clients with certain skin tones or colorations, such as darker skin or scarring, it may be necessary to use colour correction techniques to create a natural-looking result. Colour correction involves using complementary colors to neutralize undesired hues and achieve the desired effect.

COLOUR WHEEL

I know many of you will roll your eyes now saying that colour wheel is not important in Permanent Makeup (I did that in the past).

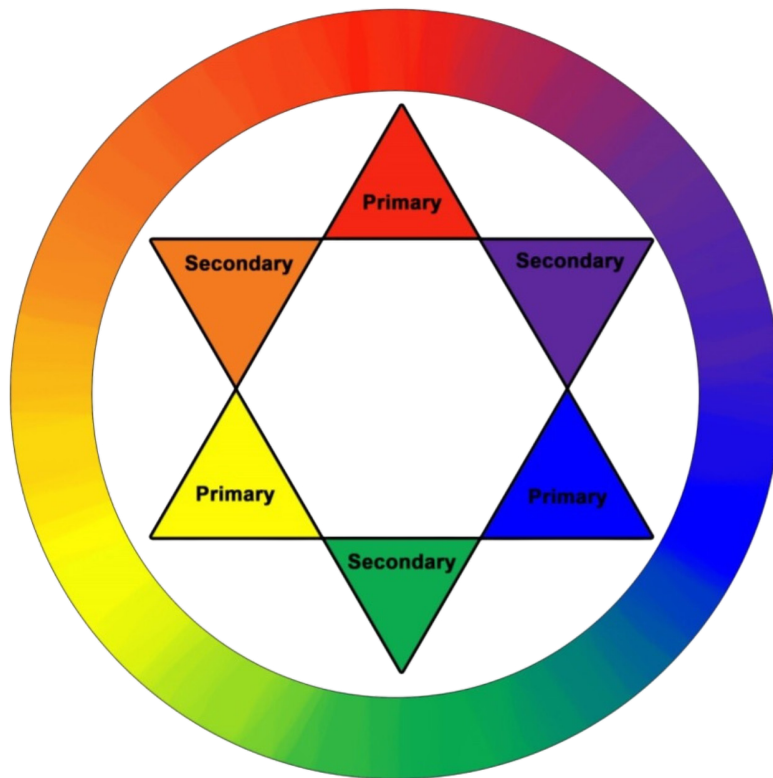
However, as a PMU artist we will be dealing with pigments of various tones and undertones. Understanding of colours and how they are made is a crucial aspect.

For example, by combining Primary Colours which are Red, Yellow, Blue we will achieve secondary colours: Green, Orange, Purple. What if we put a little bit more of Blue and only few

drop of yellow?

Am I getting the same green as before? Absolutely not, now my green will be cooler in shade. And the same theory applies to mixing secondary and primary colour together.

In permanent makeup, you will find in next chapter, we can have various shades of yellow. Yellow in the pigment can warm it up if mixed in good proportion with orange or red; and at the same time yellow mixed with green will significantly cool down the colour!



COLOUR TEMPERATURE

In Permanent Makeup, when colours are warm we place it densely in the skin.

If colour is cool, we work transparently.

Combining: 1 piece of **RED** + 1 piece of **BLUE** + 1 piece of **YELLOW** = gives us Neutral Brown (if all were used in equal proportion)

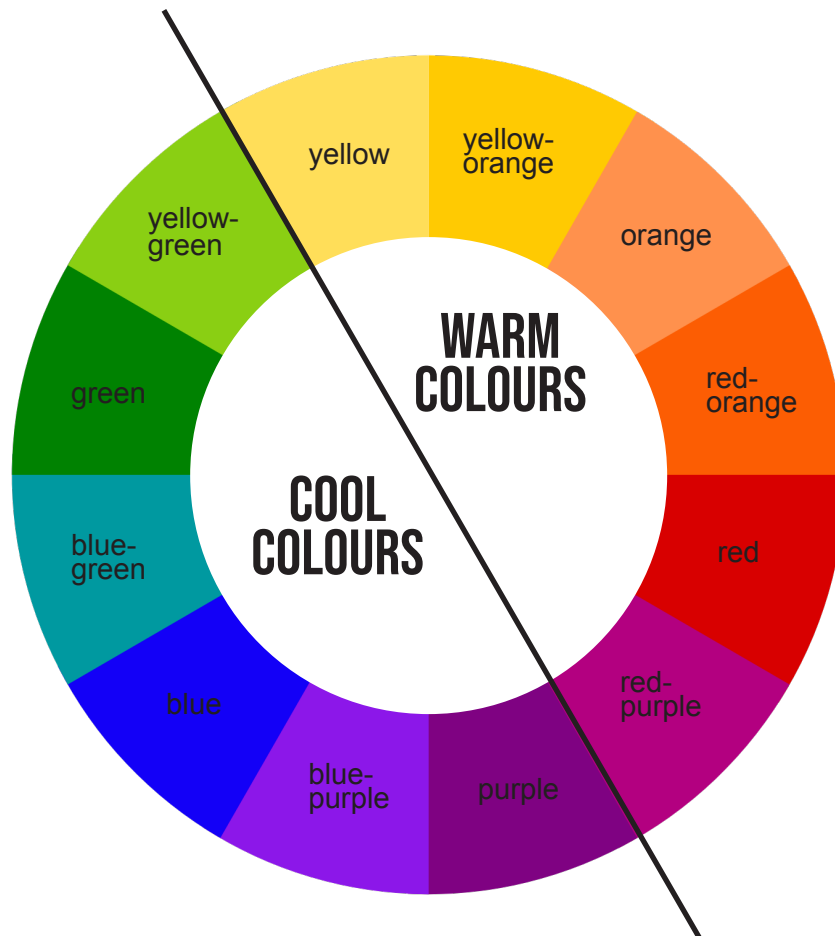
Also understanding colour wheel will help you choose the most appropriate tone of pigment during the correction.

Example:

Client comes in with old brows that have Red/Purple tone to them. Now look at the colour wheel, right across the Red/Purple tone we have Yellow/Green.

Therefore, when doing a cover-up on her eyebrows I will be choosing a colour that has more of Yellow Green tone to it.

And NOW, let's learn how to determine which tones are in our pigments and how we can predict the outcome!





| PIGMENTS

HOW TO READ A PIGMENT LABEL

Let's be honest now, have you ever even thought that reading a pigment label can change your whole PMU technique and improve the quality of your work? I haven't, and that is exactly why I want to make sure that from now on every single artist understands all pigment brands and makes a choice based on science and not because product had incredible marketing.

THINGS WE NEED TO SEE ON THE LABEL:

CI – Colour Index: is an international system used to identify and categorize colours. It is a standardized method of naming and identifying colours

The Colour Index allows for easy identification and communication of color, which is essential in industries where consistent colour reproduction is important. By using the standardized identification numbers, manufacturers can ensure that their products are made with the same colorants, regardless of the location of production or the manufacturer.

CIGN – Colour Index Generic Name

CIGN is a system used to name colours based on their chemical composition, rather than their commercial or proprietary name. The CIGN is a part of the Colour Index, which is a standardized system for identifying and categorizing colors. Each CIGN is a unique, internationally recognized name that describes the chemical structure of the colourant, using a specific nomenclature.

The CIGN is typically composed of three parts:

1. "C.I." (which stands for "Colour Index")
2. A two-letter prefix that identifies the chemical class of the colourant (such as "PR" for pigments, "PB" for pigments with blue shade, "RE" for reactive dyes, etc.)
3. A five-digit number that identifies the specific colourant within its chemical class.

For example, the CIGN for Pigment Red 122 is C.I. PR122. This name indicates that the colorant is a pigment (PR), and is the 122nd pigment listed in the Color Index. Other examples of CIGNs include C.I. PB15:3 (Phthalocyanine Blue) and C.I. REACTIVE YELLOW 17 (Reactive Yellow Dye).

| PIGMENTS

CAS (CHEMICAL ABSTRACTS SERVICE) REGISTRY NUMBER

The CAS number is a numerical identifier consisting of up to nine digits, which is used to identify specific substances regardless of their commercial or trade names.

Although the **Colour Index Generic Name (CIGN)** is commonly used to identify pigments based on their chemical composition, some pigments may also have a CAS number assigned to them. The CAS registry number is used to identify the chemical structure of a pigment and is important for regulatory purposes, as it helps to ensure the safety and proper handling of the substance.

To find the CAS registration number for a specific pigment, you can search for the pigment's CIGN in the Color Index, which may include the CAS number if available. Alternatively, you can search for the pigment's CAS number directly | on the CAS Registry website or in other chemical databases such as PubChem or ChemSpider.

It's important to note that not all pigments have been assigned a CAS number, and some pigments may have multiple CAS numbers assigned to them, depending on their manufacturing process and other factors.

LABEL INFORMATION

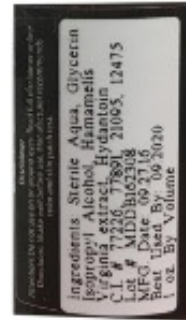
1. Brand Name responsible for the Pigment Manufacturing
2. Expiry date and open cap shelf life.
3. Usage protocol and warnings
4. LOT number
5. Ingredients including CIs or CAS numbers
6. Identification of Sterility of the product

WHY DO YOU NEED ALL THIS INFORMATION?!

First of all, it shows the quality of production and manufacturer's acceptance of full responsibility. You can rest assured, if all guidelines are present- pigment has gone through the quality control and is safe.



Doreme Liquid Jet black



Two made in USA tattoo ink brands

EXAMPLE OF IDEAL PIGMENT LABEL:



Now that we know how ideal label should look like, let's dig deeper on what Ingredients can really do to help us improve our Permanent Makeup results.

COLOURANT FOR PERMANENT MAKEUP

BASE

- Liquid (water H₂O or D₂O, alcohol, hamamelis)
- Thick (water, glycerin, alcohol)

PIGMENT

- Organic
- Inorganic
- Hybrid

ADDITIVES

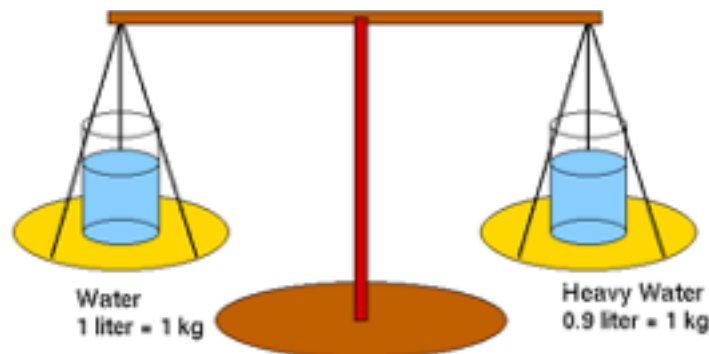
- Oils
- Bio Add-Ons
- Light Active Ingredients

Water can be either H₂O CAS 7732-18-5 or D₂O Deuterium Oxide CAS 7789-20-2

In permanent makeup (PMU), water (H₂O) is commonly used as a solvent for pigments, which are suspended in the water-based solution. The use of water-based pigments allows for easy application and removal of the pigment, and also allows for the creation of a wider range of colours.

D₂O (deuterium oxide), on the other hand, is not typically used in PMU pigments. This is because the heavier isotopic composition of D₂O can affect the physical properties of the pigment, such as its consistency, stability, and colour. Additionally, D₂O is more expensive and less readily available than H₂O, making it less practical for use in PMU pigments.

While there may be some research investigating the use of D₂O in PMU pigments or related areas, it is not a commonly used or recommended practice. In general, water-based pigments that use H₂O as a solvent are considered safe and effective for PMU procedures, when used by a trained and experienced technician following proper safety and hygiene protocols.





ORGANIC VS. INORGANIC VS. HYBRID



Colourants are the primary ingredient in tattoo pigments, and are responsible for providing the pigment's colour. Colorants can be made from a variety of sources, including inorganic minerals, organic compounds, and synthetic chemicals. Some examples of inorganic colorants used in tattoo pigments include iron oxide, titanium dioxide, and carbon black, while organic colorants can be derived from plants, animals, or synthetic sources.

CLEAN AND HIGH QUALITY DRY COLORANT = BETTER PIGMENT QUALITY

1. ORGANIC PRODUCTS

- are products of organic synthesis, carbon compounds. Common CIs in PMU pigments : 11000-11999, 20000-299999
- Non-water soluble
- Bright in colour, vivid
- Easily implanted into the skin because of the small particle size
- Last longer in the skin, because of a stronger molecular structure
- Sheer, Transparent
- Looses max 30% of colour after healing

And now let me open up a secret... Pure ORGANIC Pigments DO NOT exist in Permanent Makeup!

For a long period of time regulations for Pigment Manufacturer's did not require them to list an ingredient which is less than 1% in that pigment. However, almost all Lip pigments on the market today contain less than 1% of Titanium Dioxide (CI 77891) which adds opacity to the color and is INORGANIC.

Therefore, even if less than 1% of Inorganic compound is present in Ingredients, it makes our Pigment Hybrid. We will get back to Hybrids in details soon, but what you should understand now that Pure Organic Colours would be harder to work with in Permanent Makeup and they can get very unpredictable..

Organic colours have a very wide spectrum of shades, and it's very important to be able to identify them in your pigments. Obviously you will never be able to remember all the numbers, for that reason I'm providing you with a colour Bible! (Chart of organic colours down below)

PIGMENT C.I. NO	CAS NUMBER	COLOUR	HUE	DENSITY	MOLECULE SIZE	COLOUR REFRACTIVE INDEX
12085	2814-77-9	PIGMENT RED 4	RED BLUE	1.60 G/CM ³	327.72 G/MOL	1.647
12085	2425-85-6	PIGMENT RED 3	RED YELLOW	1.19 G/CM ³	307.3 G/MOL	1.650
12150	1229-55-6	PIGMENT RED 1	RED YELLOW ORANGE	1.12 G/CM ³	278.31 G/MOL	1.550
12310	6041-94-7	PIGMENT RED 2	RED BLUE WITH PINK	1.38 G/CM ³	436.29 G/MOL	1.673
12315	6448-96-9	PIGMENT RED 22	RED NEUTRAL	1.50 G/CM ³	426.42 G/MOL	1.674
12355	6471-49-4	PIGMENT RED 23	RED BLUE	1.46 G/CM ³	487.42 G/MOL	1.693
12370	6535-46-2	PIGMENT RED 112	RED YELLOW	1.42 G/CM ³	484.76 G/MOL	1.672
12380	6471-50-7	PIGMENT RED 14	RED BLUE	1.38 G/CM ³	460.87 G/MOL	1.665
12385	6410-32-8	PIGMENT RED 12	DARK RED BLUE	1.32 G/CM ³	440.45 G/MOL	1.665
12390	6655-84-1	PIGMENT RED 17	LIGHT RED PINK	1.32 G/CM ³	440.45 G/MOL	1.665
12420	6471-51-8	PIGMENT RED 7	RED PINK BLUE	1.34 G/CM ³	464.34 G/MOL	1.778
12460	6410-38-4	PIGMENT RED 9	RED YELLOW	1.38 G/CM ³	466.32 G/MOL	1.657
12465	6410-39-5	PIGMENT RED 15	BLUE RED	1.34 G/CM ³	476.87 G/MOL	1.619

IMPORTANT!

MOLECULE SIZE

Organic pigments with larger molecular nets are more resilient to colour migration and stay exactly where they have been implanted to, without travelling to deeper skin layers.

PIGMENT DENSITY

Smaller pigment density disperses the pigment and therefore it will create fuzzy reflection on the surface. And larger Color Reflective Index means pigment will be more reflective under the light.

PIGMENT C.I. NO	CAS NUMBER	COLOUR	HUE	DENSITY	MOLECULE SIZE	COLOUR REFRACTIVE INDEX
12466	67990-05-0	PIGMENT RED 269	DARK BLUE WITH RED	1.32 G/CM ³	581.02 G/MOL	1.651
12474	2786-76-7	PIGMENT RED 266/120	RED BLUE	1.38 G/CM ³	440.45 G/MOL	1.657
12475	2786-76-7	PIGMENT RED 170	BLUE WITH RED	1.60 G/CM ³	454.48 G/MOL	1.658
12477	61932-63-6	PIGMENT RED 210	RED WITH BLUE	1.60 G/CM ³	381.21 G/MOL	1.657
12485	5280-68-2	PIGMENT RED 146	RED WITH BLUE	1.33 G/CM ³	611.04 G/MOL	1.641
12490	6410-41-9	PIGMENT RED 5	PINK RED	1.34 G/CM ³	627.11 G/MOL	1.619
12513	6985-95-1	PIGMENT RED 175	BURGUNDY RED	1.32 G/CM ³	498.44 G/MOL	1.750
12514	31778-10-6	PIGMENT RED 208	RED BLUE	1.30 G/CM ³	537.57 G/MOL	1.691
20067	52238-92-3	PIGMENT RED 242	LIGHT PINK RED	1.60 G/CM ³	930.46 G/MOL	1.664
45160	989-38-8	BASIC RED 1	DARK RED	1.26 G/CM ³	479.01 G/MOL	1.593
56110	84632-65-5	PIGMENT RED 254	RED NEUTRAL	1.60 G/CM ³	357.19 G/MOL	1.732
562700	117989-29-4	PIGMENT RED 257	RED BLUE	1.60 G/CM ³	298.94 G/MOL	1.699
65300	4051-63-2	PIGMENT RED 177	RED BLUE	1.49 G/CM ³	444.45 G/MOL	1.771

PIGMENT C.I. NO	CAS NUMBER	COLOUR	HUE	DENSITY	MOLECULE SIZE	COLOUR REFRACTIVE INDEX
71130	5521-31-3	PIGMENT RED 179	DARK RED MAGENTA	1.60 G/CM ³	418.4 G/MOL	1.904
73360	2786-76-7	PIGMENT RED 181	RED YELLOW WITH GREEN	1.58 G/CM ³	393.31 G/MOL	1.751
73907	2786-76-7	PIGMENT RED 202	BLUE WITH RED	1.60 G/CM ³	381.21 G/MOL	1.707
73915	61932-63-6	PIGMENT RED 122	RED MAGENTA	1.31 G/CM ³	340.375 G/MOL	1.676
11680	5280-68-2	PIGMENT YELLOW 1	YELLOW GREEN	1.30 G/CM ³	340.33 G/MOL	1.621
11710	6410-41-9	PIGMENT YELLOW 3	YELLOW GREEN	1.60 G/CM ³	395.2 G/MOL	1.650
11740	6985-95-1	PIGMENT YELLOW 65	YELLOW RED	1.60 G/CM ³	386.36 G/MOL	1.600
11741	31778-10-6	PIGMENT YELLOW 74	YELLOW GREEN	1.44 G/CM ³	386.26 G/MOL	1.600
11767	52238-92-3	PIGMENT YELLOW 97	YELLOW RED	1.26 G/CM ³	591.03 G/MOL	1.603
13980	989-38-8	PIGMENT YELLOW 151	YELLOW GREEN	1.60 G/CM ³	381.34 G/MOL	1.721
11781	84632-65-5	PIGMENT YELLOW 154	YELLOW GREEN	1.60 G/CM ³	405.33 G/MOL	1.640
11785	117989-29-4	PIGMENT YELLOW 194	YELLOW GREEN	1.43 G/CM ³	367.36 G/MOL	1.699
20710	4051-63-2	PIGMENT YELLOW 93	YELLOW GREEN	1.60 G/CM ³	937.05 G/MOL	1.677

PIGMENT C.I. NO	CAS NUMBER	COLOUR	HUE	DENSITY	MOLECULE SIZE	COLOUR REFRACTIVE INDEX
21108	5567-15-7	PIGMENT YELLOW 83	YELLOW RED	1.50 G/CM ³	818.48 G/MOL	1.628
21090	6358-85-6	PIGMENT YELLOW 13	YELLOW GREEN	1.47 G/CM ³	629.49 G/MOL	1.735
21095	5468-75-7	PIGMENT YELLOW 14	YELLOW RED	1.42 G/CM ³	657.55 G/MOL	1.735
21096	6358-37-8	PIGMENT YELLOW 55	YELLOW RED	1.32 G/CM ³	657.55 G/MOL	1.735
200310	68516-73-4	PIGMENT YELLOW 155	YELLOW GREEN	1.37 G/CM ³	716.65 G/MOL	1.613
21290	7704-81-0	PIGMENT YELLOW 180	YELLOW GREEN	1.52 G/CM ³	732.7 G/MOL	1.725
21107:1/ 21108:1	15110-84-6	PIGMENT YELLOW 87	YELLOW RED	1.49 G/CM ³	749.6 G/MOL	1.617
56280	5590-18-1	PIGMENT YELLOW 110	YELLOW RED	1.93 G/CM ³	641.93 G/MOL	1.801
56300	5590-18-1	PIGMENT YELLOW 138	YELLOW GREEN	1.85 G/CM ³	693.96 G/MOL	1.801
56298	36888-99-0	PIGMENT YELLOW 139	YELLOW ORANGE	1.70 G/CM ³	367.27 G/MOL	1.698
12075	3468-63-1	PIGMENT ORANGE 5	ORANGE RED	1.52 G/CM ³	338.27 G/MOL	1.630
21110	3520-72-7	PIGMENT ORANGE 13	ORANGE RED	1.42 G/CM ³	623.49 G/MOL	1.610
21160	6505-28-8	PIGMENT ORANGE 16	ORANGE RED	1.26 G/CM ³	620.65 G/MOL	1.620

PIGMENT C.I. NO	CAS NUMBER	COLOUR	HUE	DENSITY	MOLECULE SIZE	COLOUR REFRACTIVE INDEX
12470	6358-48-1	PIGMENT ORANGE 22	ORANGE RED	1.45 G/CM ³	480.34 G/MOL	1.735
21115	15793-73-4	PIGMENT ORANGE 34	ORANGE RED	1.39 G/CM ³	651.55 G/MOL	1.699
11780	12236-62-3	PIGMENT ORANGE 36	ORANGE	1.66 G/CM ³	416.78 G/MOL	1.744
71105	4424-06-0	PIGMENT ORANGE 43	ORANGE RED	1.76 G/CM ³	412.20 G/MOL	1.924
561170	84632-59-7	PIGMENT ORANGE 73	ORANGE RED	1.50 G/CM ³	400.51 G/MOL	1.732
12915	74336-59-7	PIGMENT ORANGE 67	ORANGE YELLOW	1.75 G/CM ³	382.76 G/MOL	1.781
12510	6992-11-6	PIGMENT BROWN 25	BROWN RED	1.58 G/CM ³	492.31 G/MOL	1.759
12517	12225-08-0	BASIC VIOLET 32	PURPLE RED	1.53 G/CM ³	576.58 G/MOL	1.660
73900/ 46500	1047-16-1	PIGMENT VIOLET 19	BLUE RED	1.37 G/CM ³	312.322 G/MOL	2.040
51319	6358-30-1	PIGMENT VIOLET 23	PURPLE	1.53 G/CM ³	589.47 G/MOL	1.788
51345	57971-98-5 17741-63-8	PIGMENT VIOLET 37	DARK PURPLE	1.60 G/CM ³	726.73 G/MOL	1.684
73385	5462-29-3	PIGMENT VIOLET 2/36	RED PURPLE	1.58 G/CM ³	393.31 G/MOL	1.800

WHAT WOULD YOU DO WITH ALL THESE COLOURS?

Let's read this pigment together:
First is always listed the main Base of mix, which in this case is Water. Water and alcohol based pigments are easier implanted into the skin than glycerin. Then we see on the second place Inorganic Titanium Dioxide #77891 – which tells us that majority of the pigment is made up of it.

On the third place, Organic CI 12477 (that's when we refer to our chart to identify what kind of red is it?)

CI 12477- Red with blue

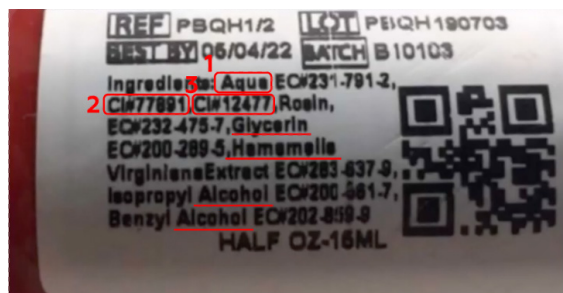
Therefore, without even looking at the pigment we can tell- This color of red has cold undertone and cannot be used on someone with cold lips tones

(Example: darker lips which have blue or purple hue to them)

Also, this pigment has both Organic and Inorganic colours in it which makes it what?

Correct...

Hybrid!



2. INORGANIC PIGMENTS

- Are products of synthetic minerals such as Iron Oxide, Titanium Dioxide.
- **You will hear, Inorganic pigments = Minerals...RUN!** If pigment contains pure minerals instead of synthetic ones, those are the most dangerous to work with. Your client will have an allergic reaction in 99% of cases and will also be stuck with this color for a very long time.
- Synthetic minerals are cleaned of any allergens, and last maximum of 2 years and fade away
- After the procedure, colour appears translucent on the surface and very soft.
- Due to a larger particle size, pigment takes longer to implant into the skin
- If you are a beginner artist and afraid of dark healing results - this type of pigment is your best choice!
- Not very effective for lips on it's own, colour retention will be very low.

Common CIs in PMU pigments: 77000-77999

Without any tests, how to tell whether your pigment is Organic or Inorganic:

Inorganic pigment will have a very milky soft consistency when rubbed on the skin, while organic ones dry up very quickly and flake off.





Today on the market, 90% of Inorganic Pigments are Synthetic minerals, which make it safer for clients and easier for us as Artists.

SYNTHETIC INORGANIC PIGMENTS															
Oxides	<table border="0"> <tr> <td>Titanium Dioxide</td> <td>Chrome Oxide</td> <td>Yellow</td> <td>Reds</td> <td>Iron Oxides</td> <td>Brown</td> <td>Black</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Titanium Dioxide	Chrome Oxide	Yellow	Reds	Iron Oxides	Brown	Black							
	Titanium Dioxide	Chrome Oxide	Yellow	Reds	Iron Oxides	Brown	Black								
Mixed Oxides	<table border="0"> <tr> <td>Cobalts</td> <td>Titanates</td> <td>Zinc Ferrite</td> <td>Bismuth Vanadate</td> <td>Ultramarines</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Cobalts	Titanates	Zinc Ferrite	Bismuth Vanadate	Ultramarines									
Cobalts	Titanates	Zinc Ferrite	Bismuth Vanadate	Ultramarines											
Metal Salts	<table border="0"> <tr> <td>(Cd,Zn)S</td> <td>Cadmiums CdS</td> <td>CdS,Se or (Cd,Hg)S</td> <td>Zinc Sulphide</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>	(Cd,Zn)S	Cadmiums CdS	CdS,Se or (Cd,Hg)S	Zinc Sulphide										
	(Cd,Zn)S	Cadmiums CdS	CdS,Se or (Cd,Hg)S	Zinc Sulphide											
Metal Chromates	<table border="0"> <tr> <td>Lead Chromates</td> <td>Lead Molybdates</td> <td>Zn, Ba & Sr Chromates</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	Lead Chromates	Lead Molybdates	Zn, Ba & Sr Chromates											
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Others	<table border="0"> <tr> <td>Aluminium</td> <td>Bronze</td> <td>Pearlescent</td> <td>Phosphorescent</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Aluminium	Bronze	Pearlescent	Phosphorescent										
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Inorganic synthetic pigments are a type of pigment commonly used in permanent makeup (PMU). These pigments are made from minerals or other inorganic materials, and they are often synthesized in a laboratory rather than being sourced directly from nature. Here are some characteristics of inorganic synthetic pigments used in PMU:

1. **Stability:** Inorganic synthetic pigments are known for their stability and resistance to fading, which means that they can retain their color in the skin for a long time, without going into weird shades. Fading happens gradually.
2. **Consistent color:** Inorganic synthetic pigments can be manufactured to provide consistent, predictable colour results, which can be important for achieving the desired results in PMU.
3. **Safe and hypoallergenic:** Inorganic synthetic pigments are often formulated to be safe, non-toxic, and hypoallergenic, which means they are less likely to cause adverse reactions in the skin.
4. **Biocompatible:** Inorganic synthetic pigments are often marketed as being biocompatible, meaning they are less likely to be rejected by the body or cause inflammation or irritation.

There are not that many CIs to remember, and technically you don't have to memorize them all. Just print out charts and have them in your office.

 <p>77891; 77941; 77120; 77004;</p>	<p>Titanium Dioxide</p>	<p>White colour, very stable. Might turn into beige over time. In PMU, titanium dioxide is often used as a white pigment to lighten other colours or as a base for certain shades. It can also be used as an opacifying agent to create more opaque or solid colours. Titanium dioxide is known for its high opacity and reflective properties, which make it's a popular choice for cosmetic and PMU applications.</p>
 <p>77288; 77289;</p>	<p>Chrome Oxide Green</p>	<p>Green, very stable color will gradually fade over time.</p> <ul style="list-style-type: none"> • CI 77288 is a dark green pigment in PMU, it may be used as a base colour for green or brown eyebrows, or as a modifier to adjust the tone of other colours. • CI 77289 is a lighter, more yellowish green pigment, in PMU It may be used to create subtle green or yellowish undertones in lip pigments.
 <p>77742</p>	<p>Manganese Violet</p>	<p>Blue, very stable colour will gradually lighten</p> <ul style="list-style-type: none"> • In PMU, CI 77742 is often used as a modifier to adjust the tone of other colours, particularly for eyebrow pigments. It can be used to create cool or ashy tones in brown or black pigments, or to add depth to gray pigments.
 <p>77491;</p>	<p>Red Iron Oxide</p>	<p>Red-brown, very stable colour, will lighten over time</p> <ul style="list-style-type: none"> • In PMU, CI 77491 is often used to create warm, reddish-brown tones in eyebrow pigments. It can be mixed with other brown or black pigments to adjust the tone and create a more natural-looking result. It is also sometimes used as a modifier to adjust the tone of other pigments, particularly in lip pigments.

	<p>Iron Oxide Black</p>	<p>Black colour, less stable and can go into blue over time</p> <ul style="list-style-type: none"> In PMU, CI 77499 is often used to create dark black or dark gray pigments for eyeliner, as well as for filling in eyebrows. It can be mixed with other pigments to create custom shades and adjust the tone of the final colour.
	<p>Iron Oxide Brown</p>	<p>Brown shades, less stable in the skin</p> <ul style="list-style-type: none"> In PMU, these pigments are often used to create natural-looking shades of brown, as well as other warm tones
	<p>Iron Oxide Yellow</p>	<p>Yellow, not stable and will be the first one to leave the skin.</p> <ul style="list-style-type: none"> Used in PMU to warm up the colour
	<p>Carbon Black</p>	<p>CI 77266 is a black pigment made from carbon. It is commonly used as an eyeliner pigment in permanent makeup. This pigment is often referred to as “carbon black” or “lamp black.”</p> <p>CI 77266 is a popular choice for permanent eyeliner because of its strong black colour and its ability to create crisp, defined lines.</p> <ul style="list-style-type: none"> PMU Artists must be experienced to work with this pigment since it can cause a blowout in the skin

LET'S TAKE A LOOK AT THE LABEL OF SYNTHETIC INORGANIC PIGMENT



First 3 CI's are 77499, 77491, 77492 which are in the mix create a Brown Iron Oxide (refer to the chart). These colours make up the majority of the pigment, and then we have CI 77891 which is Titanium Dioxide in small percentage and CI 77288 very last – Chrome Oxide.

NOTE: CI 19140:1 is a Hybrid colour, warm yellow which we will discuss in next section.

This mix tells us that colour has warm tones in it, and to avoid too much redness manufacturer has added Green in a very small amount.

REMEMBER: *In the ingredients everything that has a bigger presence percentage in the pigment is always listed first, and everything that has small percentage of inclusion is listed last.*

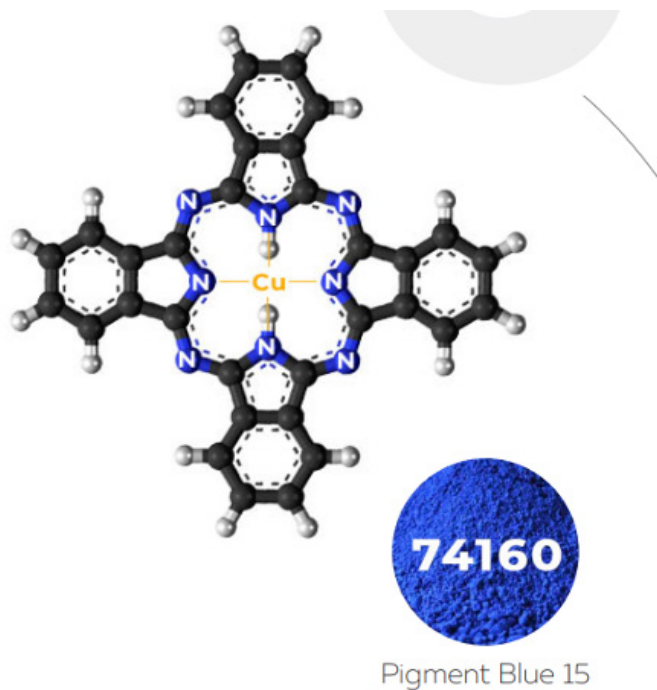
3. HYBRID PIGMENTS & ORGANIC COLOURS

Got confused already?

HYBRID ORGANIC COLOURS: Into organic molecule built-in inorganic atom.

Got confused already?





HYBRID ORGANIC COLOURS: Into organic molecule built-in inorganic atom.



This is a separate group of colors, and they have their separate CI numbers (chart, pg. 26)

- Very stable in the skin, do not migrate and do not travel to deeper skin layers
- Not affected by UV lights
- High Colour Reflection Index
- Used always in combination with either Organic CIs or Inorganic CIs to create a pigment.

CI	DESCRIPTION
 <p>13015</p>	<p>Acid Red-2G with Yellow combination</p> <ul style="list-style-type: none"> Used to add red colour to products, however not very common in PMU
 <p>15630:2</p>	<p>Dark red with blue undertone</p>
 <p>19140 19140:1</p>	<p>Warm yellow</p>
 <p>74160</p>	<p>Blue</p>
 <p>74180/ 74200</p>	<p>Blue with green undertone</p>
 <p>75510</p>	<p>Blue</p>

 <p>74260</p>	<p>Green shade pigment that is known for its high chroma and excellent light fastness, meaning it resists fading when exposed to light.</p>
 <p>74265</p>	<p>Green pigment, not common in PMU</p>
 <p>16035:1</p>	<p>Red with yellow undertone</p>
 <p>15850 15850:1 15850:2</p>	<p>Red with purple undertone</p>

REMEMBER: Hybrid Organic Colors are always used in combination with either Organic or Inorganic groups to create a quality PMU Pigment.

HYBRID PIGMENTS

These ones we all hear about in the Permanent Makeup Industry! These pigments are combination of Organic and Inorganic colours.

Biggest brands on the market today are mostly Hybrid Pigments. If you take a look at their labels you will find CIs in ingredients of both Organic numbers and Inorganic.

BENEFITS OF SUCH PIGMENTS IN PMU

For example, let's take a brown color that is pure Synthetic Inorganic: The **lighter the brown** (the more yellow it has), **the redder** the result of artist's work will become over time because as we know, Inorganic Yellow will be the first to leave the skin. To solve this problem, big brands of PMU pigments have come up with a perfect solution.

As we said above, organic pigments are stable as opposed to Inorganic ones. Why not to add an organic yellow (e.g. CI 21095) instead of an inorganic yellow (e.g. CI 77492)? Now the pigment becomes Hybrid, just by switching one ingredient from the groups of CIs.

Therefore, Hybrid Pigments are the most common ones you will now see on the market. ALSO, they are more expensive to manufacture comparing to the Synthetic Inorganic ones!

Tina Davies x Perma Blend DARK BROWN	
CI CODE	COLOR NAME
CI 21095	 Yellow 14 (organic)
CI 56110	 Red 254 (organic)
CI 77891	 Titanium Dioxide (inorganic)
CI 12466	 Red 269 (organic)
CI 77266	 Carbon Black (inorganic)

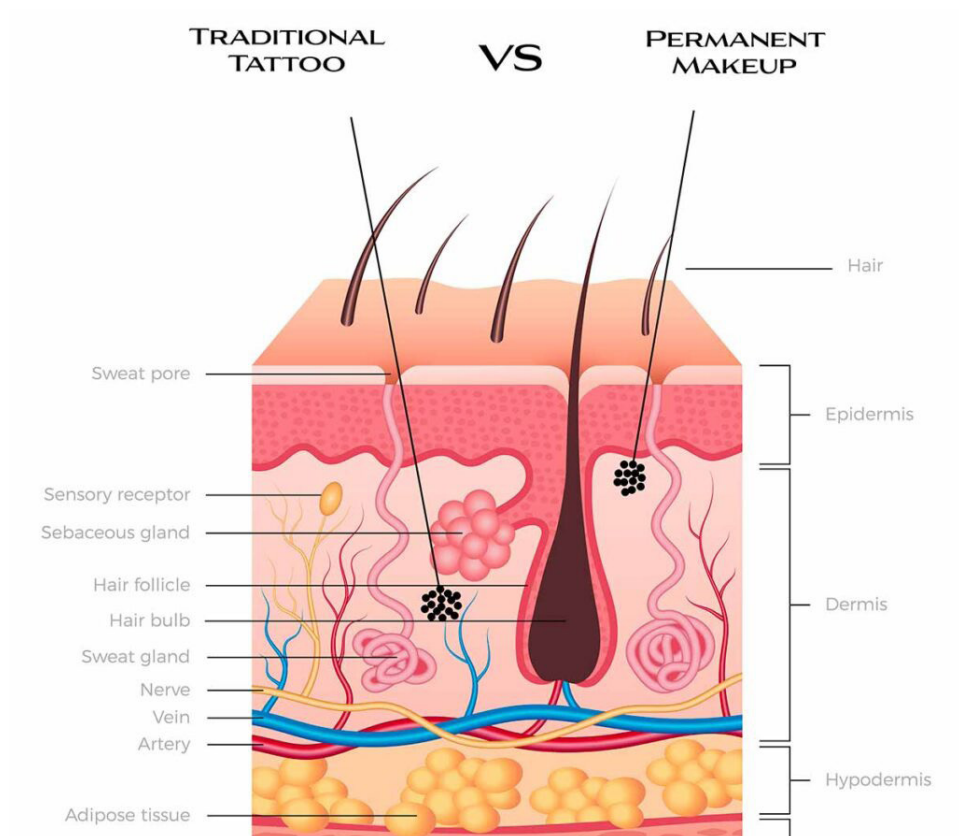


We see combination of Organic and Inorganic CIs in all PermaBlend Pigments

| SKIN & PIGMENTS

FACTORS AFFECTING THE CHOICE OF PIGMENTS AS WELL AS WHOLE PMU PROCEDURE OVERALL:

- How deep the pigment will be injected under the skin
- Skin colour
- Skin tone
- Previous pigment presence in the skin
- Colour saturation
- Skin condition (scars, eczema etc.)
- Pigment choice (organic, inorganic, hybrid)





PICKING THE RIGHT TONE OF PIGMENT

When we are deciding what pigment we should pick for the procedure (Lips, Brows) , we always should take into consideration the following factors:

- Skin Tone (warm, cool, neutral)
- Skin Type (normal, oily, dry)
- Skin Colour (Fitzpatrick scale)

SKIN COLOUR AND TONE

The **Fitzpatrick scale** is a numerical classification system that is widely used in dermatology and aesthetics to describe how different skin types react to ultraviolet (UV) radiation from the sun or other sources. The scale was developed by Thomas B. Fitzpatrick in 1975 and is based on how easily the skin burns, tans, or becomes pigmented in response to UV exposure.

The Fitzpatrick scale ranges from Type I (very fair skin that always burns and never tans) to Type VI (very dark skin that never burns and always tans). Other factors that are taken into account when assessing skin type include the presence of freckles, the tendency to develop moles, and the color of the hair and eyes.

The Fitzpatrick scale is also used in permanent makeup to help determine the most appropriate pigments to use for different skin types.

	SKIN REACTION EXAMPLES	SKIN TYPE
1.	Tans little or not at all; burns easily and severely, then peels.	People most often with fair skin, blue eyes, freckles, white unexposed skin
2.	Usually burns easily and severely (painful burn); tans minimally and lightly; also peels.	People with fair skin, blue or hazel eyes, blonde or red hair, white unexposed skin.
3.	Burns moderately; gains average tan.	Average Caucasian, white unexposed skin.
4.	Burns minimally; tans easily and above average with each exposure.	People with light brown skin, dark brown hair, dark eyes, white or light brown unexposed skin (Asians, Hispanics, and Mediterraneans).
5.	Rarely burns; tans easily and substantially.	People with brown skin, including brown unexposed skin. (East Indians, Hispanics, etc.).
6.	Tans profusely and never burns.	People with black skin (Africans and African Americans, Australian and South Indian Aborigines).

1. Fitzpatrick Type I: This skin type is very fair and burns easily. It requires extra care and gentle treatment during permanent makeup procedures. Pigments that are too dark can look harsh on this skin type, so lighter and more natural-looking colours are typically used.
2. Fitzpatrick Type II: This skin type is fair and also burns easily. It may have a slightly more yellow or peach undertone compared to Fitzpatrick Type I. Pigments that are too warm can look orange on this skin type, so cooler and more neutral colors are typically used.
3. Fitzpatrick Type III: This skin type has a more olive or beige undertone and tans easily. It is the most common skin type in many ethnic groups. Pigments that match the skin's natural undertones are typically used, and neutral colors can also work well.
4. Fitzpatrick Type IV: This skin type has a warm undertone and tans easily. It may have a slightly more reddish or coppery tone compared to Fitzpatrick Type III. Pigments that are slightly cooler and more saturated can work well on this skin type.
5. Fitzpatrick Type V: This skin type has a warm or reddish undertone and rarely burns. It may have a slightly darker complexion compared to Fitzpatrick Type IV. Deeper and more saturated pigments can be used on this skin type.
6. Fitzpatrick Type VI: This skin type has a very dark complexion and rarely burns. It may have a cool or warm undertone depending on the individual. Deeper and more saturated pigments can be used on this skin type, and warm or cool pigments can be used depending on the individual's undertones.

Skin colour and skin tone are often used interchangeably, but they have slightly different meanings.

Skin colour refers to the natural colour of a person's skin, which is primarily determined by the amount and type of melanin in the skin. Melanin is a pigment that gives skin its color and protects it from the sun's harmful ultraviolet (UV) rays. Skin tones refer to the undertones that are present in the skin, such as pink, yellow, or olive.

RULE for Brows PMU:

Warm Skin Tone + Cool or Neutral Pigment = Beautiful Brown Shades of Brows

Cool Skin Tone + Warm and/or Neutral Pigment = Beautiful Brown Shades of Brows

Neutral Skin Tone + Neutral Pigment = Beautiful Results

If you put into a cool skin tone, cool pigment - your result will be blue or purple eyebrows! It's like taking a red colour and putting blue on top of it.



COOL

blue or purple veins
skin has pink, red, or blue tinge

Those with cool undertones will notice their skin has a pink, red, or blue tinge to it.

You have a "cool" undertone if:

- If the veins on your wrist are blue or purple
- If silver jewelry flatters your skin more than gold
- When you look at your skin in the sun, it appears blue-ish



NEUTRAL

blue-green veins
skin has neither pink/red/blue nor yellow/gold/peach

If you have neutral undertones, your skin is neither pink/red/blue nor yellow/gold/peach, but somewhere in between.

You have a "neutral" undertone if:

- The veins on your wrist are blue-green
- Both gold and silver jewelry flatter your skin
- When you look at your skin in the sun, it appears greenish



WARM

green or olive veins
skin has yellow, gold, or peach tinge

Those with warm undertones will notice their skin has a yellow, gold, or peach tinge to it.

You have a "warm" undertone if:

- The veins on your wrist are slightly green or olive
- Gold jewelry flatters your skin more than silver
- When you look at your skin in the sun, it appears yellowish

NATURAL SKIN FILTERS

MELANIN

- Brown shades

CAROTENE

- Yellow/orange shades

HEMOGLOBIN

- Blood vessels (red shade)

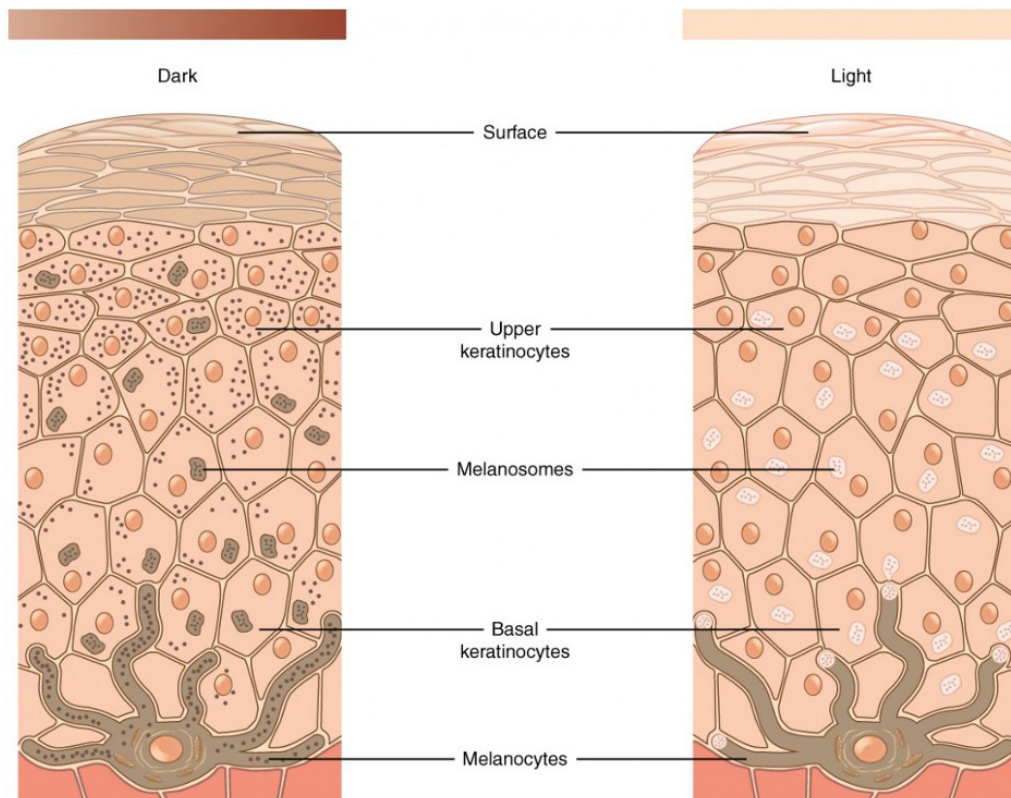
MELANIN



Melanin is a pigment that is naturally produced in the skin by specialized cells called melanocytes. It is responsible for the colour of the skin, hair, and eyes. The amount and type of melanin produced in the skin determines a person's skin colour and can vary widely among individuals.

Melanin also plays a crucial role in protecting the skin from the harmful effects of the sun's ultraviolet (UV) rays. When the skin is exposed to UV radiation, melanocytes produce more melanin, which darkens the skin and provides some protection against UV damage.

In individuals with darker skin tones, the increased presence of melanin can cause colours to appear darker or more muted, and can also make it more difficult for pigments to fully penetrate the skin. In contrast, individuals with less melanin in their skin may experience brighter and more vibrant results.



TYPES OF MELANIN

1. EUMELANIN

- Is a type of melanin that is responsible for the brown and black pigmentation in human skin, hair, and eyes.
- Increases under the UV lights
- In PMU eumelanin directly affects the colour outcome. For brows, a dark brown pigment may appear darker and cooler on someone with more eumelanin in their skin compared to someone with less eumelanin. In these cases, the technician may need to adjust the pigment colour or use a different technique to achieve the desired result.
- And if we are talking about lips, to counteract the effects of eumelanin, a skilled PMU artist may choose to use warmer pigments with orange, warm red, and warm yellow undertones to help neutralize the gray or blue hue that may result. It's important to take into consideration the client's skin tone, eumelanin concentration, and personal preferences when selecting pigments for lip PMU.



2. PHEOMELANIN

- Is a type of melanin pigment found in the skin, hair, and eyes of humans and animals. It is responsible for producing red and yellow hues and is synthesized from the amino acid tyrosine. Unlike eumelanin, which provides protection against UV radiation, pheomelanin is not effective in protecting the skin from sun damage.
- Responsible for pink areas of human body such as lips, nipples.
- When performing PMU on a person with a high concentration of pheomelanin in their skin, the artist may need to take special care to ensure that the pigment used does not result in an overly warm or orange-toned result. This is because pheomelanin can have a “masking effect” on the PMU pigment, causing it to appear warmer or lighter than intended.
- Additionally, pheomelanin can be more sensitive to sun exposure and may fade more quickly than eumelanin-based PMU pigments. As a result, it is important for clients with pheomelanin-rich skin to take extra precautions to protect their PMU from UV radiation, such as wearing a hat or using a sunscreen specifically formulated for use on the lips or eyebrows.

There are two types of melanin:

- **eumelanin** – black-brown form
- **pheomelanin** – red-yellow form



The more eumelanin in your epidermis, the darker your skin.

Light skin contains little eumelanin.

Fair skin, freckling, and carrot-red hair is associated with large amounts of pheomelanin and small amounts of eumelanin.

CAROTENE

Carotene is a type of pigment that is naturally present in the skin and is responsible for giving it a yellow or orange hue. In permanent makeup, carotene can affect the final color result, particularly in procedures involving the eyebrows or lips.

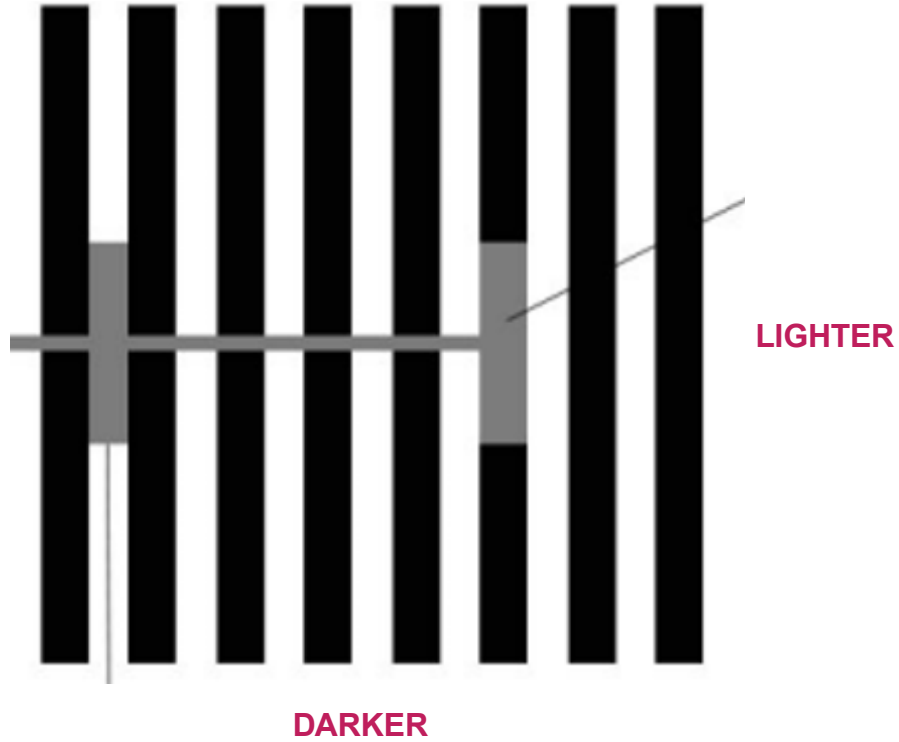
If the client has a lot of carotene in their skin, it may be necessary to select a PMU pigment that has a cooler or neutral undertone to counteract the warmth of the carotene. For example, if a warm brown pigment is used on eyebrows, it may appear too red or orange on a client with high levels of carotene in their skin.

It is important for the PMU artist to take into account the client's natural skin pigmentation and any underlying tones, such as carotene, when selecting a pigment and determining the appropriate color for the procedure.



CONTRAST IN PERMANENT MAKEUP

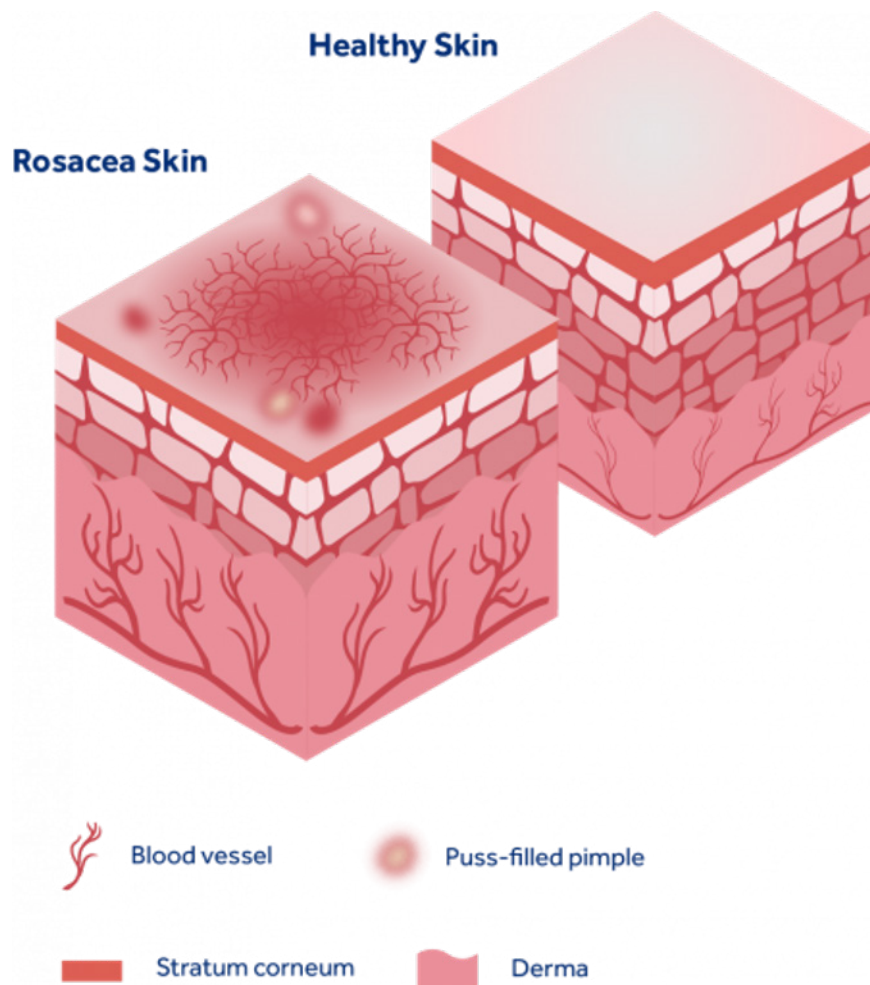
Dark pigment appears lighter on the dark skin than it does on a lighter skin.



HEMOGLOBIN

Hemoglobin is a protein in the blood that contains iron and gives blood its red colour.

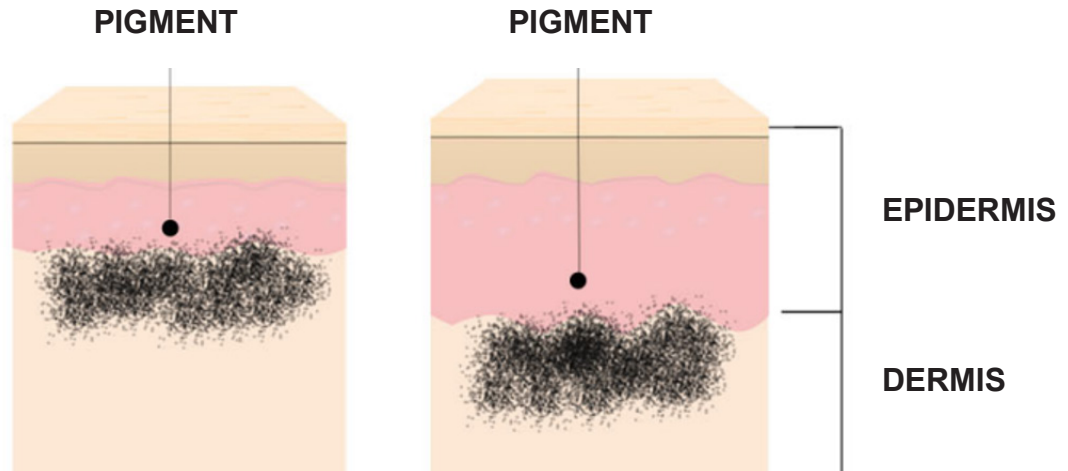
- Clients with excessive redness (blood vessels are located very close to the surface of the skin causing Rosacea and skin sensitivity) will require a warmer or neutral color selection to avoid grey or blue healed results
- During the procedure, it is important to be gentle with the skin and avoid causing further irritation



DIAGNOSIS OF SKIN PIGMENT RETENTION

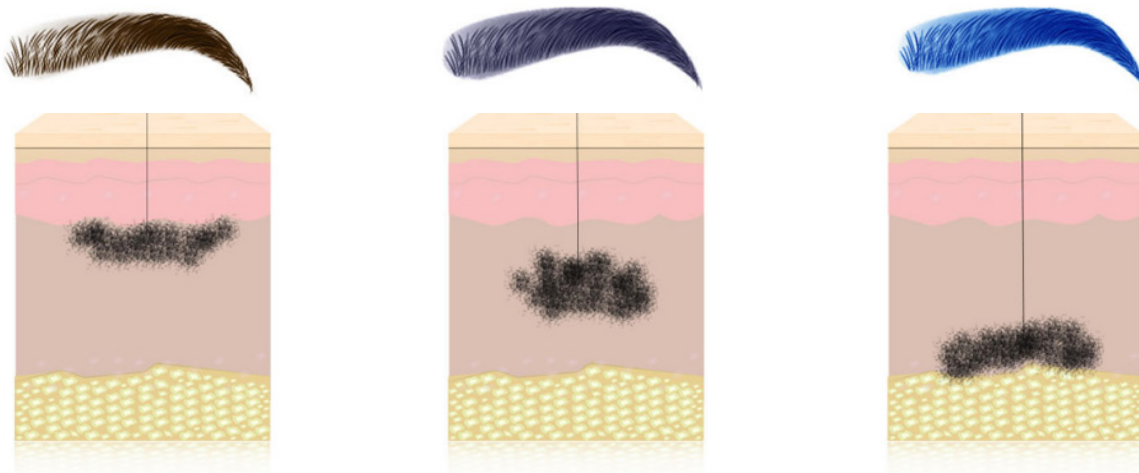
SKIN THICKNESS

- Thicker skin will always have pigment heal cooler
- Oily skin has a thicker epidermal layer
- It is recommended to always use warmer toned pigments on an oily skin to avoid blue or grey healed results in eyebrows



DEPTH OF YOUR WORK

- It's extremely important to work very soft and stay in the upper dermal layer for natural healed results
- Deeper color penetration will cause colder healed results, plus more permanent results which will be very hard to remove





**MAGIC OF
PIGMENTOLOGY**
BY VICTORIA BUDNYK

HD BEAUTY
ACADEMY