



INTRODUCTION TO MODESTA COATING CHEMISTRY



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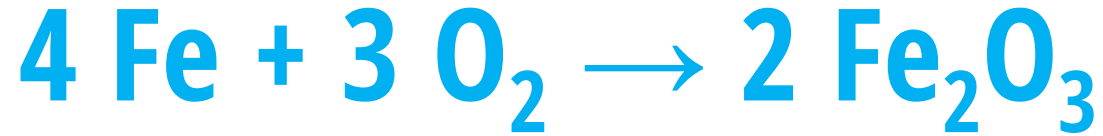
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Oxidation inhibitors if working properly

Modesta coatings prevent air (oxygen) contact with the substrate with their thick layers

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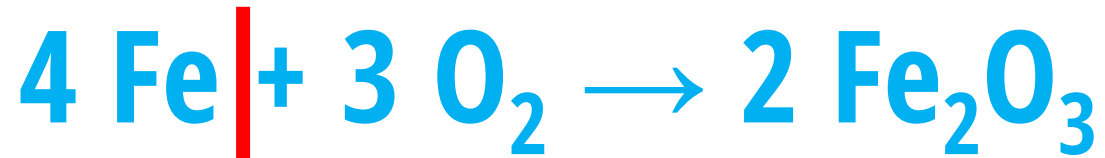
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= corrosion

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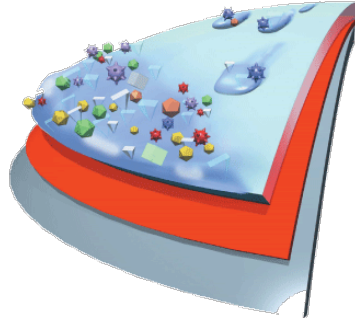
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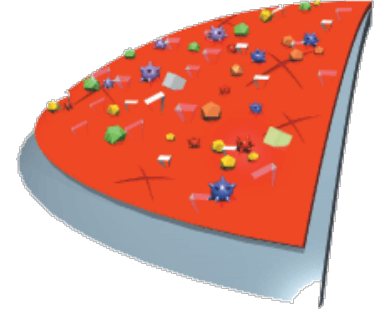
Protected surface

Contaminations can't deposit into the paint and cause damages.



Unprotected surface

Contaminations deposit into the paint and cause damages by friction, oxidation and other means.



What coatings are composed of?

Silicone

The base ingredients of coatings, they have various functions – like polymerizing into layers or depositing on surface

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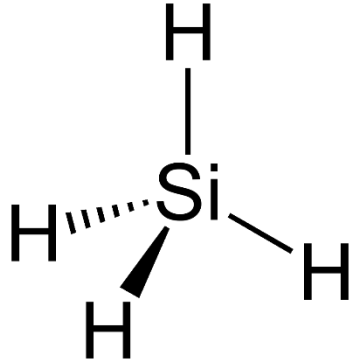
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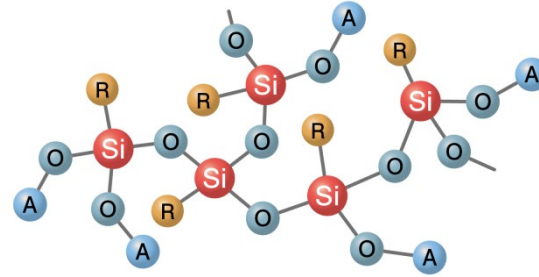
Other ingredients

Depending on manufacturer – for example reaction regulators, additives and similar

Silicone types and differences between them



Silane



○-A アルコキシシリル基 R メチル基、フェニル基、反応性官能基など

Silicone Oligomer

Inorganic vs organic nature of coatings

Organic Compound



DNA



Methane



Benzene

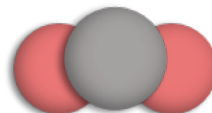
Inorganic Compound



Salt

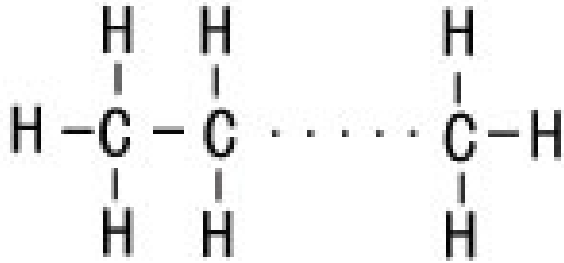


Diamond

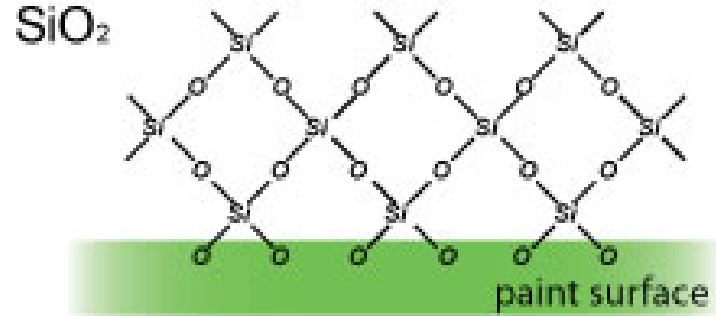


Carbon dioxide

Inorganic vs organic nature of coatings



Organic Compound Eg: Paraffin Wax

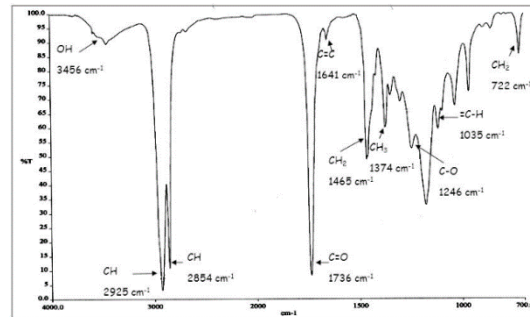
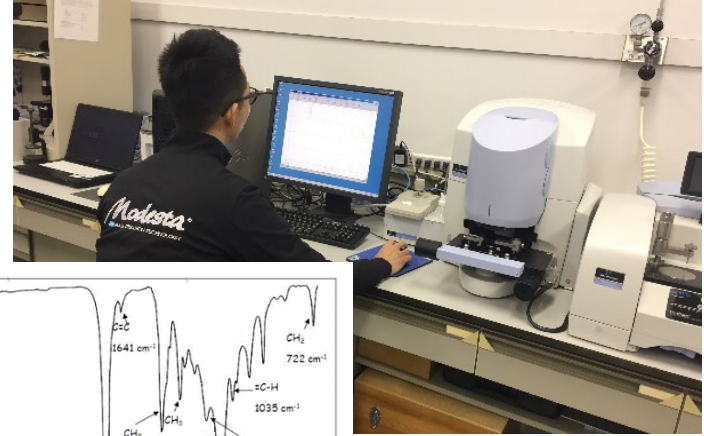


Inorganic Polymer

Inorganic vs organic nature of coatings

Examining the Composition of Deposited Coatings with Fourier-transform Infrared Spectroscopy (FTIR)

- It analyzes a crystal of a crystalized coating
- With using infrared light, the spectrometry shows us the composition of the crystal sample
- That way we are able to determine what compounds the coating contains and if they are organic, inorganic and what the ratios are





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Catalysts

We use metal oxides as catalysts, often that could be various forms of transition metal compounds, like dibutyltin

The advantages of ingredients chosen in our products

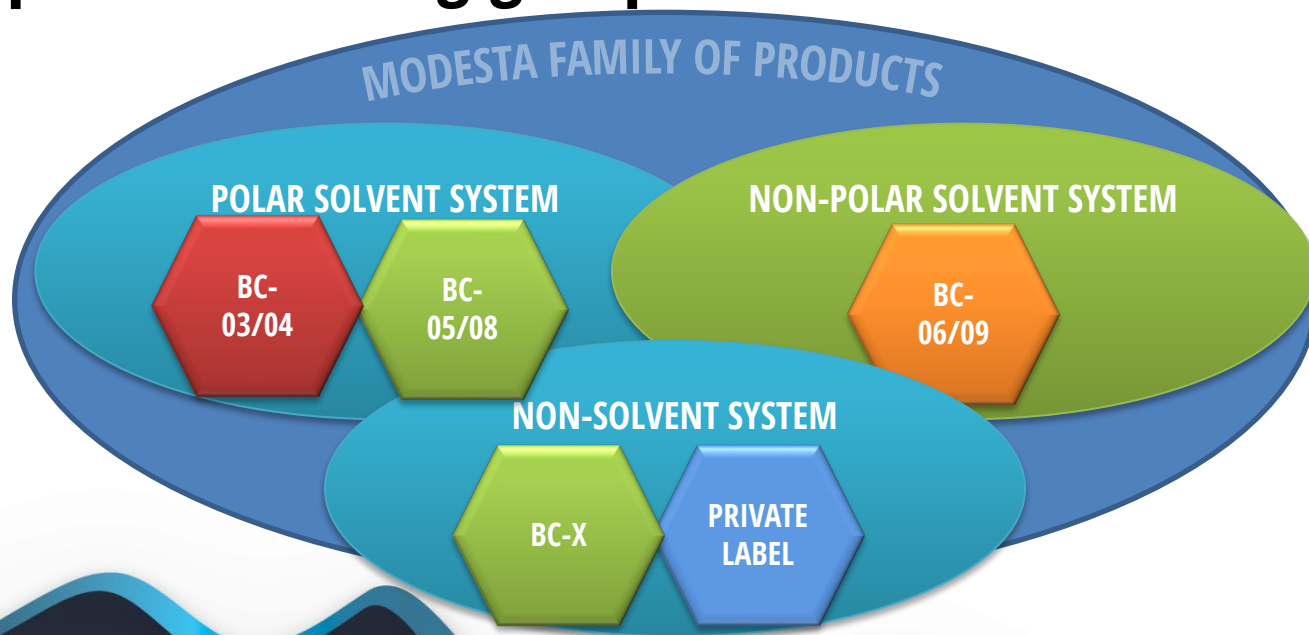
ShinEtsu



One of the government laboratories we use

Modesta® +
+ PLUS CREATION TECHNOLOGY

Description of coating groups in the Modesta line-up



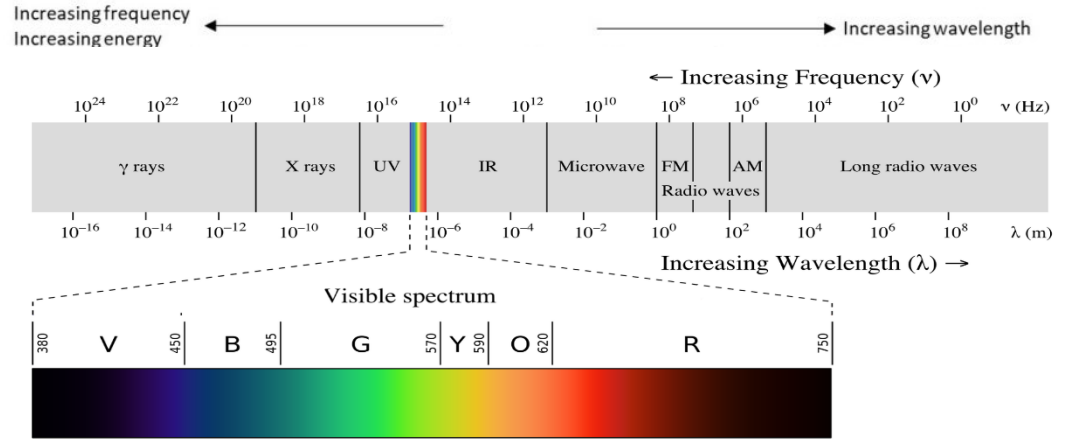


CHEMICAL ASPECTS OF THE INFRARED CURING PROCESS



What infrared light is

- It is a wave – same as are X-Rays, radio waves or visible light
- Not inside the visible spectrum
- It is an energy carrier



Light
380 nm – 750 nm

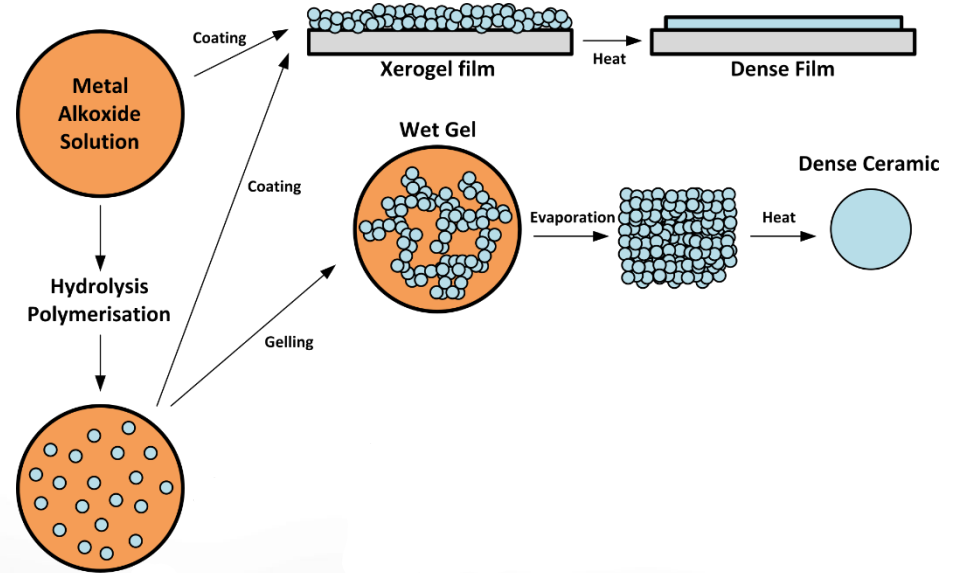


What infrared light is

Division name	Wavelength	Frequency	Photon energy
Short-wavelength infrared	1.4–3 μm	100–214 THz	413–886 meV
Long-wavelength infrared	8–15 μm	20–37 THz	83–155 meV

The effect of IR curing on Modesta coating structure

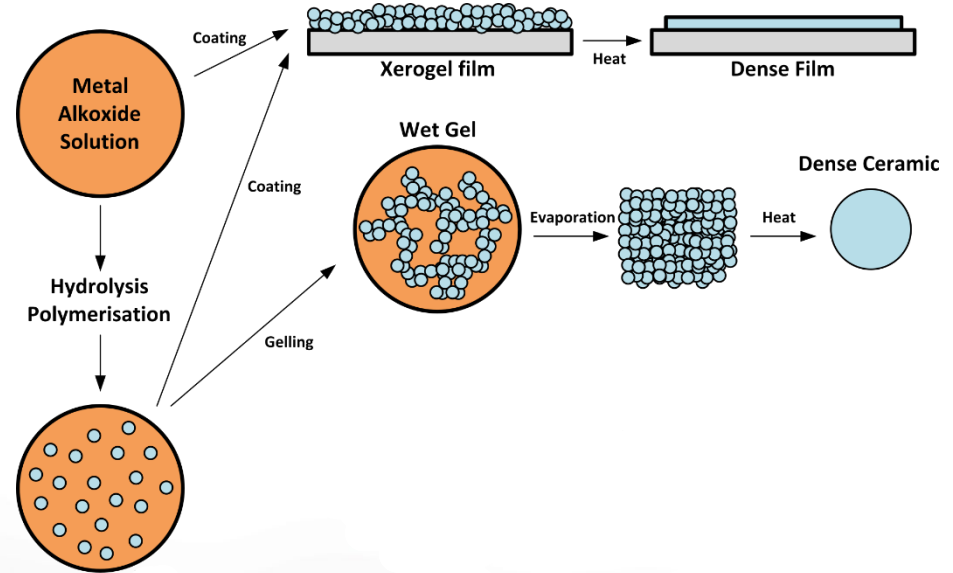
- the sol-gel process is a method for producing solid materials from small molecules
- It is a conversion of monomers into a colloidal solution (sol) that acts as the precursor for an integrated network (or gel) of either discrete particles or network polymers



The effect of IR curing on Modesta coating structure

In Modesta coatings:

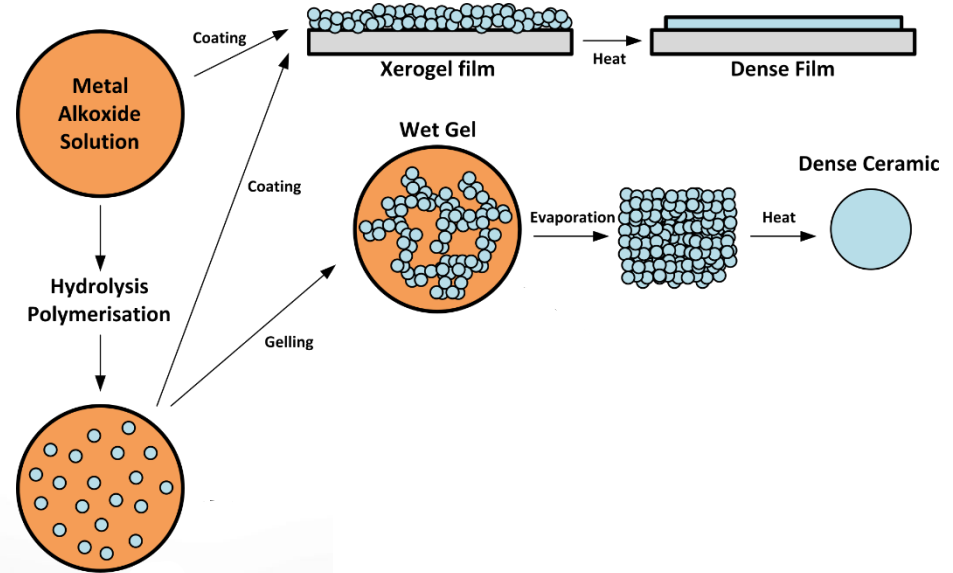
- The “sol” would be the coating itself (metal alkoxide solution)
- The “gel” would be the dense film, the polymer network – as we also call it the “coating layer”



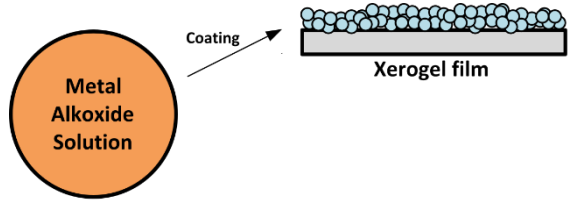
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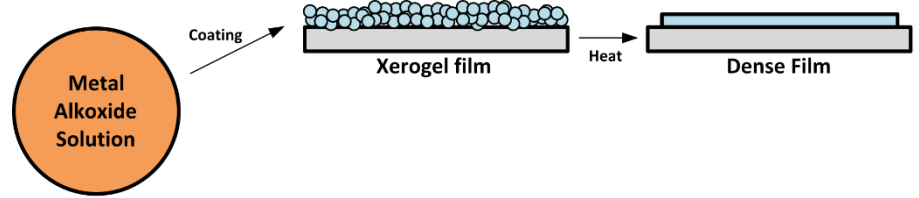
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The effect of IR curing on Modesta coating structure



A Modesta coating without IR curing produces a porous structure that is obtained by evaporative drying of wet gels (so-called "xerogel"). No densification, no polycondensation, no enhancement of mechanical properties or structural stability is imparted to the result.



A Modesta coating with IR curing produces a dense film through the means of densification and polycondensation, which imparts an enhancement of mechanical properties and structural stability to the resulting coating layer.



NEW MODESTA PRODUCTS



MODESTA BC-X



- new Modesta mid-tier coating
- expected durability around 4-5 years
- exceptional hydrophobic properties
- can be applied to both paint and plastic surfaces
- will slightly refresh faded plastics
- easy in maintenance requirements on daily driven cars
- easiest coating of the Modesta range to apply
- offers excellent costs to performance ratio

MODESTA BC-06TC



- hydrophobic top coat for BC-06
- will change the properties of BC-06 wheel coating from hydrophilic to hydrophobic
- wheels and other surfaces protected by BC-06 will bead
- not a stand-alone product – to be used on top of BC-06
- same durability and protection as BC-06 itself

MODESTA MC-01



- Modesta's Marine Coating
- designed to be applied to the body of boats and other watercraft
- both above and below the water line
- will provide ease of maintenance and cleaning to the surface
- will reduce the build up of grime and slime on the immersed parts of the craft
- durability over one year



HANDS-ON CHEMISTRY



HANDS-ON CHEMISTRY

We will live mix a general-purpose coating for motor vehicle paint together now.

There are 30ml bottles ready for you, so all of you will get to mix their own coating step by step. You will take this coating home (if you want to) and you can play around with it to see how successful you actually were in doing my job 😊

First of all, please imagine what you would like to make the coating like. You may like to make it hard enough to minimize car wash scratches, or soft enough to apply on plastic parts. You may prefer to make it repellence than BC-08. You may also prefer to make it slower to flash off than BC-05 for ease of application

HANDS-ON CHEMISTRY

Bottle A – Silicone oligomer for hardness

Bottle B – Silicone oligomer for flexibility

Bottle C – Silane for bonding

Bottle D – Fluorine silicone compound for water repellency

Bottle E – Pre-mixed solvent

Bottle F – Catalyst

4.86ml – 9.73ml

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1.26ml

0.00ml – 0.62ml

fill up to the line of BC-X

0.27ml – 0.53ml



**Max 9.73ml
combined**