DOWNLOAD PDF METALLIC AND CERAMIC COATINGS

Chapter 1 : Metallic Ceramic Coatings

ceramic coating is often referred to as an exhaust coating, header coating or high heat coating. High temperature coatings are designed to prevent corrosion of exhaust systems and engine components. Corrosion is the breaking down of essential properties due to exposure to moisture in the air.

Ceramic Coatings for Metal Parts There are a wide range of ceramic coatings that can be applied to metal components in order to enhance their functional properties. Most ceramic coatings are electrically nonconductive making them excellent insulators , have a significantly higher level of abrasion resistance than most metals, and are capable of maintaining their integrity under severely elevated temperatures, sometimes up to 4, degrees Fahrenheit. Wear-resistant ceramics, such as titanium nitride and chromium carbide, can be applied to work steels and air-hardening tool steels via chemical vapor deposition CVD , which is one of the more common application methods currently in use. Before applying a coating, it is important to ensure compatibility between the ceramic material and the metal surface. Much of this compatibility depends on thermal expansion properties, as having expansion rates that differ too greatly can cause a coating to crack when it is being cooled after application. In addition, a diffusion layer typically forms on the metal surface, and this can lead to a coating that is too soft or too brittle for the design specifications. Complementary thermal properties will help to prevent heat checking and improve resistance to wear and fracture. Manufacturing Applications Ceramic coatings are often used as barrier materials to enhance the interaction between moving metal parts, such as in the automotive industry. However, they are also increasingly being employed to augment certain manufacturing processes, and exhibit potential for improving the efficiency of some fabricating methods. Ceramic coatings are sturdy and have a high level of lubricity, but due to oxidation concerns, they are typically used in temperatures under 1, degrees F. However, this allows them to be applied to hot forging dies, which operate at lower temperatures. Ceramic coating increases the operational lifespan for these dies, allowing them to produce a greater number of parts before wearing down. Ceramic materials, such as magnesium zirconate and zirconia, exhibiting a high level of hardness, thermal resistance, and elevated melting points are being used as heat barrier coatings for industrial parts. Ceramic Coating Processes Applying a ceramic coating to a substrate is multi-stage process. The preparatory phases of cleaning, roughening, and undercoating or priming greatly influence the success of the project. The actual coating effectiveness depends largely on the mechanical, chemical, and physical bonds that determine the coating adherence and ultimate strength of the ceramic layer. Aside from chemical vapor deposition, the most common ceramic coating methods include: In plasma spraying, ceramic powder is passed through an ionized gas at extremely high temperatures, sometimes approaching 30, degrees F. The pressurized gas speeds molten ceramic particles toward the substrate where they bond onto its surface. The result is a strongly-adhering and high-density coating, but the process can be very expensive. The detonation gun process is most effective for particular ceramic materials, such a tungsten carbide, that are required for producing highly dense coatings on a metal surface. It creates an explosion of oxygen and acetylene gas at around 6, degrees F , melting the ceramic and firing it at high speed toward the target substrate. This method involves heating ceramic powder under a degree F flame, and using compressed gas to spray the coating onto the substrate. It creates porous coating layers with relatively low adhesion strength. In this method, a fused ceramic rod is passed under an oxyacetylene torch burning at degrees F. Pressurized gas is then used to spray molten ceramic material onto a surface, producing a coating with a high level of cohesive bonding. In addition to these standard processing methods, continuing research in ceramic coating technology has introduced newer techniques that may have a major influence on future ceramics work. For example, a procedure for coating metalworking dies with refractory materials, such as molybdenum and tungsten, employs a plasma spray gun and low-shearing compaction to achieve a highly effective and wear-resistant coating.

Chapter 2 : The Truth About Ceramic Coatings: What You Need to Know

The Truth About Ceramic Coatings for Cars: What They Are, What They Do, and What They Don't Do You want your vehicle to look as good as it did the day you bought it. So you carefully wash it on a regular basis and you apply a new coat of wax every few months.

In addition, it has very good chemical and corrosion resistance and possesses excellent thermal barrier characteristics, providing a dramatic reduction in radiated heat. This means reduced under-hood temperatures, accelerated exhaust gas velocity, and a longer life expectancy for the entire exhaust system. Unlike header wraps, ceramic coatings do not hold potentially damaging heat and moisture around the part. Rather, the surface temperatures are actually reduced, extending the life of the part. When cured, a very effective corrosion inhibiting film is formed that protects the part against oxidation and imparts excellent chemical resistance that further extends part life and enhances appearance. Ceramics stand above all other thermal barrier coatings currently being used in combustion chambers. Ceramics have characteristics shared by no other product, providing an unrivaled layer of thermal protection to piston tops, aluminum heads, stainless, Inconel, and titanium valves. Ceramics "move" heat, reducing detonation and increasing the effective oxidation of the fuel. When polished, it provides a highly reflective surface that further aids in improved flame travel. Unlike previous ceramic coatings, ours is not subject to cracking and flaking, which can lead to extensive engine damage. In fact, ceramic coatings actually strengthen the coated part. The cured "Cermet" provides a cap of material that can withstand far more heat. During testing, when sufficient heat was applied to a piston to melt the aluminum, the ceramic did not melt; rather it held the softer aluminum together. Thermal Dispersants Our Thermal Dispersant Coating TDC creates a chemical and corrosion resistant film that increases the ability of a coated part to radiate heat. TDC provides for more even distribution of heat over the coated surface and moves it rapidly away. TDC is blended with lubricating agents which aid in keeping a coated part clean. Dirt and debris cannot get a good grip and become easier to clean off. The appearance of coated parts depends on the surface texture; the coating will show a semi-gloss appearance on machined surfaces and a satin appearance on rough textures. Both finishes are very eye appealing. This type of coating metallic ceramic is used by more companies and manufacturers than any other material. It is extremely popular on exhaust systems, where the high luster finish provides a very attractive, durable surface. It polishes to a high luster, stainless or chrome appearance that will not rust, and is especially effective as a hard protective coating for aluminum parts. Satin Ceramic Exhaust Coatings are the most advanced exhaust system coatings available. They are a very durable ceramic-reinforced coating available in various shades. Dry-Film Lubricants Our Dry-Film Lubricant is a moly-based lubricant capable of providing lubrication at levels as high as , psi. The lubrication aids in preventing scuffing and galling, increasing part life. It also reduces friction, freeing more useable power. This lubricant provides extra protection by preventing damage from oil film failure. Dry-Film Coating is actually impregnated into the metal surface so no dimensional changes are realized. In addition to lubrication, Dry-Film Lubricants also help distribute heat so less metal fatigue is caused reducing the chance of part failure. Call us at for more information on our ceramic coating. We have over 22 years of experience in offering coating services.

Chapter 3 : Ceramic Coating | Beloit, Wisconsin | Contact Metallic Bonds, Ltd.

Metallic Ceramic Coatings, Inc., doing business as JET-HOT, develops and manufactures various coatings. It offers coatings to exhaust systems, including stacks and manifolds; automotive coatings.

Structure[edit] TBC and associated layers. Cooling air is often flowed through the metal substrate to enhance cooling. An effective TBC needs to meet certain requirements to perform well in aggressive thermo-mechanical environments. Phase stability is required to prevent significant volume changes which occur during phase changes , which would cause the coating to crack or spall. Therefore, general requirements for an effective TBC can be summarize as needing: These requirements severely limit the number of materials that can be used, with ceramic materials usually being able to satisfy the required properties. The ceramic topcoat is typically composed of yttria-stabilized zirconia YSZ which is desirable for having very low conductivity while remaining stable at nominal operating temperatures typically seen in applications. This ceramic layer creates the largest thermal gradient of the TBC and keeps the lower layers at a lower temperature than the surface. Such phase transformations lead to crack formation within the top coating. In addition, such zirconates may have a high concentration of oxygen ion vacancies, which may facilitate oxygen transport and exacerbate the formation of the TGO. The use of such coatings would require addition coatings that are more oxidation resistant, such as alumina or mullite. The primary purpose of the bond-coat is to protect the metal substrate from oxidation and corrosion, particularly from oxygen and corrosive elements that pass through the porous ceramic top-coat. Formation of the TGO layer is inevitable for many high-temperature applications, so thermal barrier coatings are often designed so that the TGO layer grows slowly and uniformly. Such a TGO will have a structure that has a low diffusivity for oxygen, so that further growth is controlled by diffusion of metal from the bond-coat rather than the diffusion of oxygen from the top-coat. There are also issues with oxidation areas of the TBC getting stripped off of the TBC, which reduces the life of the metal drastically, which leads to thermal fatigue. A key feature of all TBC components is well matched thermal expansion coefficients between all layers. Thermal barrier coatings expand and contract at different rates upon heating and cooling of the environment, so materials when the different layers have poorly matched thermal expansion coefficients, a strain is introduced which can lead to cracking and ultimately failure of the coating. Cracking at the thermally-grown oxide TGO layer between the top-coat and bond-coat is the most common failure mode for gas turbine blade coatings. TGO growth produces a stress associated with the volume expansion which persists at all temperatures. When the system is cooled, even more mismatch is introduced from the mismatch in thermal expansion coefficients. The result is very high GPa stresses which occur at low temperature and can produce cracking and ultimately fracture of the barrier coating. TGO formation also results in depletion of Al in the bond-coat. This can lead to the formation of undesirable phases which contribute to the mismatch stress. These processes are all accelerated by the thermal cycling which occurs in many thermal barrier coating applications. Additionally, it was one of the few refractory oxides that could be deposited as thick films using the then-known technology of plasma spraying. However, it has a fairly low operating limit of C due to phase instability, and can corrode due to its oxygen transparency. It has a low density, along with good mechanical properties, high thermal stability, low thermal conductivity, and is corrosion and oxidation resistant. However, it suffers from crystallization and volume contraction above C, which leads to cracking and delamination. Therefore, this material is suitable as a zirconia alternative for applications such as diesel engines , where surface temperatures are relatively low and temperature variations across the coating may be large. With a high hardness and chemical inertness, but high thermal conductivity and low thermal expansion coefficient, alumina is often used as an addition to an existing TBC coating. By incorporating alumina in YSZ TBC, oxidation and corrosion resistance can be improved, as well as hardness and bond strength without significant change in the elastic modulus or toughness. Adding ceria into a YSZ coating can significantly improve the TBC performance, especially in thermal shock resistance. This is most likely due to less bond coat stress due to better insulation and a better net thermal expansion coefficient. Some negative effects of the addition of ceria include the decrease of hardness and accelerated rate of sintering of the coating less porous. This material is phase stable up to its melting point and can largely tolerate vacancies on any of its sublattices. Along with the ability for site-substitution with other elements, this means that thermal properties could potentially be tailored. Although it also has very low thermal conductivity compared to YSZ, it also has a low thermal expansion coefficient and low toughness. Rare earth oxides[edit] The mixture of rare earth oxides is readily available, cheap, and may have promise as effective TBCs. The coatings of rare earth oxides ex: The main challenge to overcome is the polymorphic nature of most rare earth oxides at elevated temperatures, as phase instability tends to negatively impact thermal shock resistance. Metal-Glass Composites[edit] A powder mixture of metal and normal glass can be plasma-sprayed in vacuum, with a suitable composition resulting in a TBC comparable to YSZ. Additionally, metal-glass composites have superior bond-coat adherence, higher thermal expansion coefficients, and no open porosity, which prevents oxidation of the bond-coat. Thermal barrier coating applied onto automotive exhaust system Thermal barrier coating applied onto carbon composite Automotive[edit] Thermal barrier ceramic coatings are becoming more common in automotive applications. They are specifically designed to reduce heat loss from engine exhaust system components including exhaust manifolds , turbocharger casings, exhaust headers, downpipes and tailpipes. This process is also known as " exhaust heat management ". When used under-bonnet, these have the positive effect of reducing engine bay temperatures, therefore reducing the intake air temperature. Although most ceramic coatings are applied to metallic parts directly related to the engine exhaust system, technological advances now allow thermal barrier coatings to be applied via plasma spray onto composite materials. It is now commonplace to find ceramic-coated components in modern engines and on high-performance components in race series such as Formula 1. As well as providing thermal protection, these coatings are also used to prevent physical degradation of the composite material due to friction. Although thermal barrier coatings have been applied to the insides of exhaust system components, problems have been encountered because of the difficulty in preparing the internal surface prior to coating. Aviation[edit] Interest in increasing the efficiency of gas turbine engines for aviation applications has prompted research into higher combustion temperatures. Turbine efficiency is strongly correlated with combustion temperature. Higher temperature combustion improves the thermodynamic efficiency of the machine, giving a more favourable ratio of work generated in relation to waste heat. Combined with cool air flow, TBCs increase the allowable gas temperature above that of the superalloy melting point. Generally, these are made from fiber-reinforced SiC. Rotating parts are especially good candidates for the material change due to the enormous fatigue that they endure. Not only do CMCs have better thermal properties, but they are also lighter meaning that less fuel would be needed to produce the same thrust for the lighter aircraft. At high temperatures, these CMCs are reactive with water and form gaseous silicon hydroxide compounds that corrode the CMC. For instance, as the gas temperatures increase towards K K, sand particles begin to melt and react with coatings. The melted sand is generally a mixture of calcium oxide, magnesium oxide, aluminum oxide, and silicon oxide commonly referred to as CMAS. Many research groups are investigating the harmful effects of CMAS on turbine coatings and how to prevent damage. CMAS is a large barrier to increasing the combustion temperature of gas turbine engines and will need to be solved before turbines see a large increase in efficiency from temperature increase. Electron beam physical vapor deposition: HVOF Electrostatic spray-assisted vapour deposition: ESAVD Direct vapor deposition Additionally, the development of advanced coatings and processing methods is a field of active research. One such example is the Solution precursor plasma spray process which has been used to create TBCs with some of the lowest reported thermal conductivities while not sacrificing thermal cyclic durability. Wikimedia Commons has media related to Thermal barrier coating. Journal of the European Ceramic Society.

Chapter 4 : Thermal Ceramics | Ceramic Coatings | Ceramic Coating - PVD Coating | Dynamic Ceramic

Producing solid ceramic components is not always the best approach to solving wear or corrosion problems. In some cases, taking the original metallic part and applying a ceramic coating can be the best solution.

So you carefully wash it on a regular basis and you apply a new coat of wax every few months. Not only that, water spots, dirt, and grime start clinging to your car the day after you give it a thorough wash. What if there was a product that could change this narrative; a product that would provide protection from environmental hazards and make your car easier to wash, while not requiring repeated application. If you have read anything online about Ceramic Coatings, you may have come across some competing claims. On the one hand, manufacturers and detailers have made outstanding promises about the performance of their Ceramic Coatings. What are their benefits? What are their limitations? What will be best for your vehicle? Subscribe to our YouTube channel for more walkaraounds and educational videos. What is a Ceramic Coating? Quartz, and Ceramic Pro is a liquid polymer that is applied by hand to the exterior of a vehicle. A Ceramic Coating is not a substitute for Paint Protection Film , which provides a more comprehensive for of defensive. Rather, it is a premium wax alternative. Who is Exclusive Detail? What Does a Ceramic Coating Do? The coating achieves this result by making your vehicle more resilient and easier to clean. Here are the main benefits: Protection from Chemical Stains and Etching Another danger for your car is chemical staining from naturally acidic contaminants. The result is that your vehicle will be more resistant to staining and etching, provided the contaminant is removed in a timely manner. Ease of Cleaning One of the most significant features of a Ceramic Coating is that it is hydrophobic, which is a fancy way of saying it repels water. When a vehicle has a hydrophobic Ceramic Coating, water will bead on the surface and slide off more easily. Enhanced Gloss If you want your paint to pop with gloss, you will want to add a Ceramic Coating. As we said at the outset, a Ceramic Coating will add value to your vehicle. If you would like to learn more or schedule an appointment, follow the links below. But be sure to keep reading to learn about the limitations of Ceramic Coatings. Therefore, if you choose to have a Ceramic Coating applied, you will be adding value to your vehicle. However, despite the claims of some manufacturers and detailers, a Ceramic Coating is not a miracle, super-cure product that will solve any and every problem for your car. Thus, it is important for you to know what a Ceramic Coating does not do. Though some small scratches can be repelled by a Ceramic Coating as we described above , a coated vehicle will not be completely resistant to the risk of rock chips or parking lot scratches. It is important to know that a Ceramic Coating is not a substitute for more serious scratch or chip protection such as Paint Protection Film , also known as Clear Bra , nor does it eliminate the need to wash your car in a proper manner in order to avoid swirl marks. Eliminate the Risk of Water Spotting A normal drop of water contains a certain amount of dirt or minerals. Detailers and consumers may assume that the hydrophobic quality of a Ceramic Coating will eliminate water spotting, since water slides of the coated surface. While it is true that some water will be repelled from the hydrophobic surface, other water droplets will bead and remain on the vehicle, creating the opportunity for water-spotting. Eliminate the Need to Wash Notice above we said a Ceramic Coating keeps your car looking like-new with comparatively minimal maintenance, not no maintenance. The benefit of a Ceramic Coating is that the cleaning process will be easier. Thus, a Ceramic Coating does not make your vehicle maintenance-free, but it does mean that with less work you will be able to maintain better results. Simply put, it is important to be educated about a product before making a decision about whether it is right for your vehicle. Will Ceramic Coatings benefit your vehicle and add value? It is also important to realize that Ceramic Coatings are not a substitute for the more comprehensive protection you find in a quality Clear Bra Paint Protection Film. For ultimate protection, add a layer of Paint Protection Film to the most vulnerable parts of your vehicle, then place a Ceramic Coating over every painted surface. We are not in the business of making outlandish promises and pushing a product on you. Ready to Get Protected?

Chapter 5 : Brooks Performance Coatings

List of all of the Metallic-and-ceramic-coatings dictionary terms on Corrosionpedia.

Links CermaKrome Coatings CermaKrome is a metallic ceramic coating that polishes to a chrome like finish. This coating will withstand over f base metal temperatures. This coating can be applied to any metallic part except magnesium that can withstand the curing temperature of f. CermaKrome not only enhances the appearance of your headers and engine parts it dramatically increases performance. No other coating can stand up to the elements like CermaKrome. Eagle One - the original "never-dull" wadding polish. How long will the coating last? Depending on the coating, part life increases from two 2 to ten 10 times normal! What is your guarantee? This does not include freight, strip charges, costs incurred during down time, removal or any replacement costs. Failure to properly install and maintain product will void all warranties. All warranty claims must be returned to Classic Chrome Co. Is this Powder Coating? This process is Ceramic based and is designed for thermal management and friction management. Although it can be decorative in nature, it is primarily a functional coating designed to increase performance and durability of the part. What parts should be treated? Any part subject to heat damage, corrosion or abrasion. In addition, enhanced appearance is possible for parts such as headers, brackets, engine accessories and suspension pieces. Will I see a change in temperature? Parts will run cooler. Engine oil and water temperatures will show a temperature reduction. On headers, the radiated heat will be substantially reduced, leading to lower under-hood temperatures and less heat absorption by nearby parts and surfaces. Are the headers coated inside and outside? Yes, Because exhaust gases are so corrosive, we coat all headers and pipes inside and out for a complete barrier against corrosion. For this very reason it is important to follow all instructions enclosed with your coated parts to ensure against damaging the coating. We can coat any surface that can be sandblasted and baked. By coating everything you can effectively insulate from your headers all the way to the tailpipe and ensure the best durability of your exhaust system. Catalytic converters will function even better because they rely on internal heat to do their job. By coating, you can reduce radiated heat and decrease emissions at the same time. What other parts can you coat? Any part that is metal, can be sandblasted and will resist degrees can be coated. Just a few items that we commonly do are:

Chapter 6 : Ceramic Coatings Paintings - SERVICES

CermaKrome is a metallic ceramic coating that polishes to a near chrome like finish. This coating will withstand over f base metal temperatures. This coating can be applied to any metallic part (except magnesium) that can withstand the curing temperature of f.

Design Guide Coatings Producing solid ceramic components is not always the best approach to solving wear or corrosion problems. In some cases, taking the original metallic part and applying a ceramic coating can be the best solution. Ceramic coatings can vary from a few to several hundred microns and be deposited by different means. The ceramic coating, its thickness and means of deposition will depend on the final use of the components and the environment it has to resist. There are a wide variety of surface ceramic coatings available. Brief details of the most commonly used coatings are given below. If you have a specific coating requirement please contact Dynamic-Ceramic for expert assistance. This limit may vary from the appearance of minor pitting or scoring marks in bearing surfaces to the removal of several millimetres of material from the bucket of an excavating tool. However, the useful life of many components, which are unsuitable to be made from advanced ceramics, may be extended by coating with a material tailored to resist the particular environment in which the component is working. Some of these techniques are also capable of building-up worn components to their original tolerances, thus reducing both waste and replacement costs. Figure 1 shows a schematic of the PVD coating process. Titanium Nitride TiN , for example, is deposited in partial vacuum by feeding ionised titanium into a plasma of ionised argon and nitrogen. Figure 2 shows a section through a PVD coating, from which it can be seen that the coating is thin, it is well bonded to the substance and that it contours accurately the original surface. Because the process is carried out in a vacuum chamber there are issues of size limitation of the work piece. In addition the process is effectively line of sight so deep holes and bores can not easily be coated. It is carried out in vacuum chamber where the disassociation of gases which then react at the work piece surface to form a solid coating. This is the process by which Diamond and diamond like carbon DLC coatings are produced. The greatest problem with the technique is the high temperatures that are required. This process is repeated several times until the required thickening is achieved. Advantages of this process include that it is not a line of sight process and large components several metres long can be coated. The coatings are chemically bonded to the substrate and are fully dense i. Ceramic blades have been manufactured, but are brittle and liable to failure by mechanical and thermal shock arising out of the extreme operating conditions. The economic inducement to find a successful coating is therefore high. Schematic of the structure of a two layer thermal barrier coating on a turbine blade surface together with a temperature profile At present, coatings are applied as a duplex structure, shown schematically in the diagram, figure 3. The thermal barrier is made up of plasma spayed ceramic layer, up to 0. Desirable properties of the ceramic barrier coating include a high thermal expansion coefficient, low thermal conductivity, chemical stability in the gas turbine environment and thermal shock resistance. The most durable coatings were found to be formed from a partially stabilised zirconia composition. Investigation of the structure of the plasma sprayed coating has been undertaken. As would be expected from the rapid cooling rates, the structure is non-equilibrium and extremely fine. Furthermore the structure varies considerably over short distances, indicating considerable fine scale inhomogeneity within the thermal barrier coating. Figure 4 is a schematic of the thermal spraying technique for producing thermal ceramics, which consists of a heat source, a means of introducing powder particles into the heat source and a way of accelerating the now semi solid particles toward the target. Other particles follow and a layer is built up. Considerable heat is imparted to the substrate and after deposition the coating can crack as the component cools. This is related to the different coefficients of thermal expansion between the metallic substrate high and the surfacing ceramic low. Figure 4 â€” Schematic of Thermal Spraying To avoid this cracking a bond coat is sometimes used. Figure 5 is a cross section through a ceramic coating showing this bond layer together with other features and defects. As the process is often performed in air, impurities or oxidation products can be introduced into the layer; it is also possible to see the deformations caused as the semi solid particles impact upon the previously deposited material. One can think of the process as throwing cow pats against a wall. Advantages of such a system are that it is cheap, moderate deposition rates can be achieved 0. Disadvantages are that the process requires more expensive equipment and that it is not suitable for manual operation, i. Coating with very high densities and bond strengths can be achieved. In addition deposition rates are moderate â€" on a par with air plasma spraying. If you would like more information about our thermal ceramic coatings, please feel free to call our friendly team on

DOWNLOAD PDF METALLIC AND CERAMIC COATINGS

Chapter 7 : The Classic Chrome Company

Metallic-ceramic coatings. HICoat A08 and A21 are metallic-ceramic coatings useful in most situations where compressors must resist corrosion or light erosion, and can benefit from a fine surface finish.

When cured, this technology will transform itself on the surface to a permanent, durable yet flexible glass shield. Ceramic Pro can be described as an additional clear coat, with 3 times the hardness and self cleaning properties. An additional layer of protection is added to exposed areas including windshield and wheels. An additional protective layer is added to other areas including windshield and wheels. This coating protects against light scratching and provides a beautiful glossy finish with a 2 year warranty. Ceramic Pro once cured, is measured to have hardness above 9H. Normal clear coat has hardness between 2H and 4H. The increase in the hardness of the coated surface is vast. This makes it the hardest paint coating on the market today. This new glass shield prevents minor scratches to your clearcoat and acts as a sacrificial layer. This preserves the original factory paint. Any surface scratches that happen in the coating are easily removed with light polishing which will not weaken the integrity of the original clear coat. Think of Ceramic Pro as an additional clear coat layer, only a lot harder. All of this allows for more peace of mind and a fuller enjoyment of your vehicle, even in harsh environments. Glossy, slick and self-cleaning This nano technology allows the Ceramic nanoparticles to fill the smallest pores in the paint which makes the Ceramic Pro glass shield shiny, smooth and extremely slick or hydrophobic. Ceramic Pro dramatically lowers the surface tension preventing environmental contaminants such as: Water easily removes dirt from the surface by encapsulating it while rolling off the surface. This is called the self-cleaning effect. Permanent protection Ceramic Pro 9H is a one-time application if maintained correctly. Once the Ceramic Pro glass shield has cured it can only be removed through abrasion like wet sanding. This puts Ceramic Pro in a category by itself, compared to sealants or waxes that degrade quickly. The resale market value will therefore be substantially higher! Ceramic Pro pays for itself in the end. This makes washing your vehicle less labor intensive and less frequent. Waxing is now obsolete.

Chapter 8 : Metallic and Ceramic Coatings Dictionary Terms - Corrosionpedia

Report Documentation Page. Form Approved OMB No. Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and.

Chapter 9 : Ceramic Coating â€“ Bonehead Performance

Thermal spraying - A group of coating processes in which finely divided metallic coating materials are deposited in a molten or semi-molten condition to form a coating. The coating material may be in the form of powder, ceramic rod, wire or molten materials.