Study of Different Painting Process Improvement in Automotive Industry

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Abstract—Painting process is a critical procedure in automotive industry. The reasons for the process are to give more appealing appearance to the vehicles and to give a layer of security against consumption and weathering. The composition procedure are incorporate a hardly any different procedure, which are Pre-Treatment and Electro-deposition (ED) Process, ED sanding, process, sealant and PVC process, groundwork process, and best coat process. The target of the task are to recognize the issues happen in ED sanding process and lessen the issues to enhance the ED sanding. The study was done at India Yamaha Motor Surajpuri, Greater Noida. The techniques used to distinguish the issues depend on the four M technique, which are Manpower, Machine, Method, and Materials. The examination actualize add up to quality administration apparatuses to examination the issues. From the examination that have done, the real issues are the outside material and the scratch. The outside material can be diminished by making the dissolvable with the goal that the layer of anticorrosion can be take out. In the interrim, the scratch is cause by labor. The less the laborer contact the vehicle body, the less scratch framed on the vehicle surface body.

The car business requests the most noteworthy quality alongside changeless unit cost diminishments. Keeping in mind the end goal to accomplish both, every one of the procedures must be viewed as, dissected and streamlined. Real cost-cutting measures are found in the base and most ideal utilization of vitality and material, that is, in asset sparing procedures, items and finish frameworks.

Keywords- Painting process, car industry, Pre-Treatment, Electrodeposition (ED) Process, four M technique

I. INTRODUCTION

Paint application is a standout amongst the most requesting parts of vehicle producing. Not exclusively does the paint covering secure the body surface, it likewise upgrades visual interest by including shading and shine – imperative offering focuses. The innovation utilized must meet elevated standards of value and cost effectiveness while remaining earth capable Leading edge advancements in every single key field joined with our involvement in coordination empower us to give turnkey frameworks of the most elevated quality and cost proficiency. In the part of General Contractor we acknowledge obligation regarding time booking, venture costs, plant execution and the building and its administrations.

Car paint will be paint utilized on cars for both security and embellishment purposes.[1][2] Water-based acrylic polyurethane lacquer paint is at present the most broadly utilized paint for reasons including diminishing paint's ecological effect.

The car business engaged with the fabricate of engine vehicles, counting most parts, for example, motors and bodies, yet barring tires, batteries, and fuel. The business' main items are traveler cars and light trucks, including pickups, vans, and game utility vehicles. This industry associated with configuration, make, and showcasing of the vehicle. There are a few forms in car industry in assembling a vehicle. The procedures in producing a vehicle are stamping process, body gathering process, painting process, and trims and last procedures.

Auto painting is a perplexing mix of various layers of base coat, shading and defensive completing coat. The setup for the canvas procedure requires the ideal change of a wide range of parameters, for example, moistness, temperature and the consistence of the veneer itself. The basic process for automotive paint is shown in figure 1.

![Automotive Paint Process](image)

**Figure 1:** Automotive paint basics

II. LITERATURE REVIEW

As far back as the primary autos were made in the late 1800's, there have been numerous adjustments in paint advances to ensure and embellish these synthetic transportation gadgets, from normal items to cutting edge polymers. In the initial segment of the twentieth century car paint innovation
depended on a similar air-dry varnish frameworks that were utilized for wooden furniture and pony drawn carriages. The real downside was that the main decision of shading offered was dark. What's more, they required dull brush use of various coats and long periods of drying time, which made a generation bottleneck.

The principal thing a great many people see about vehicles are their paint occupations. At the point when an auto has a dreary, blurred complete, it will look old and dated regardless of how great of shape it is generally in. Autos with splendid hues and polished clear coats draw the eye, making the vehicles all the more engaging. Chrome additionally lights up a vehicle, helping its guard, edges, trim and different parts look new and giving the auto a top of the line look. Car paint did not generally offer the same wonderful look that individuals have generally expected today. Rather, its history gives an intriguing knowledge into the innovation behind the improvement of present day car painting forms.

**PRE-1900 TO EARLY 1900S**

At the point when vehicles were first developed, current auto paints were basically not accessible. Rather, individuals handpainted their autos utilizing brushes and paint that they could buy at their neighborhood stores. Since the paint blurred and chipped away rapidly, numerous individuals would repaint their autos consistently. Around 1900, automakers utilized similar varnishes that were utilized for carriages. Applying paint could take as long as 40 days for every vehicle, and after it dried, it must be sanded and cleaned.

Amid the mid 1900s, a man by the name of Dr. George Sargent led an investigation, finding that electroplating chrome would require a proportion of one a player in sulfuric corrosive to 100 sections of chromium. He displayed his exploration in a paper in 1920.

**THE 1930S AND SPRAY-ON CHROME**

In the 1930s, automakers began utilizing paints called stoving veneers. These paints gave glossier sparkles and substantially speedier drying times. In the realm of chrome, Dr. William Peacock built up a silvering shower keeping in mind the end goal to silver mirrors. At the time, mirrors were exceptionally costly on the grounds that they must be separately made by ace experts. With the silvering splash in 1932, Dr. Peacock's disclosure enabled a great many mirrors to be fabricated each day, incredibly diminishing the cost of mirrors and making them broadly accessible.

**THE 1950S AND 1960S: ACRYLICS**

In 1955, General Motors began painting its autos with another acrylic that required the autos to be heated after the acrylic was connected. This procedure gave the autos a predictable complete, however the complete wasn't as reflexive as that gave by stoving polishes. In 1960, Ford Motor Co. started utilizing acrylic stoving lacquers, which gave the intense complete more sparkle.

**THE 1980S: URETHANE AND POLYURETHANE**

In the late 1980s, auto producers started utilizing urethane and polyurethane paints on their vehicles. After the application, clear coats were then connected. This brought about tough and exceptionally shiny completions.

**TODAY**

The innovation of car painting keeps on developing. Some auto producers presently utilize a procedure called electrocoating, which includes submerging vehicles in a preliminary shower and utilizing electric streams to tie the covering to the metal. Splash chrome has additionally progressed essentially. Individuals are currently ready to utilize PChrome chrome shower to accomplish a similar vibe and look that is given by chrome plating yet at a small amount of the cost. To take in more about PChrome chrome splash and its utilization for vehicle rebuilding or customization, call us today.

**III. PAINTING PROCESS**

The sketch forms begin after the collection of vehicle is amasses. The reason for this procedures are to give more appealing appearance to the vehicles and to give the layer of assurance against erosion and weathering. The paints and coatings industry is comprised of a wide range of kinds of tasks, going from expansive volume unique gear makers (OEMs) that run exceedingly mechanized, nearly observed tasks, going from expansive volume unique gear makers (OEMs) that run exceedingly mechanized, nearly observed frameworks to custom shops playing out a scope of agreement work with physically worked hardware [4]. There are five noteworthy procedures in painting forms; pre-treatment and electrodeposition (ED), ED sanding, sealant and PVC line, preliminary, and best coat.

Notwithstanding being in charge of the hues and engaging quality of a vehicle, car paints give insurance against consumption and weathering. Traditional paint films are just as thick as a human hair, yet comprise of four layers. In a customary procedure, a car body is readied, dunked in an electrocoat and afterward has a preliminary connected to it to give consumption security. For attachment, these layers are heated onto the case in a stove. At that point the basecoat, which gives the real shading, and clearcoat for appearance and scratch opposition are connected. The suspension is again prepared in a stove to finish the composition procedure.
A. Pre-treatment and ED

The vehicle bodies, which are by and large made of lightweight steel, experience surface planning and pre-treatment. This arrangement includes through washing and wipe-cleaning. The pre-treatment process makes a compound crystalization happen on the vehicle surface that gives enhanced paint attachment and anticorrosion assurance.

B. ED Sanding

Cathode Electro Deposition is most advanced and environment friendly Water based coating to be done on metal components. A combination of dip and spray ensures reach of paint at every corner of component having intrinsic shape as well. CED is chemically resistant, mechanically durable, and pleasant in appearance having very Good Salt Spray life and is sought for by all automobile users [3].

C. Sealant and PVC line

Pipe string sealant - otherwise called "pipe dope," is utilized as a part of the pipes business to grease up and seal strung associations amongst thermoplastics and metals. Without string sealant, PVC fittings may not fix totally and can leave spaces for media to spill through. Our pipe string sealants are first class and are appropriate for proficient utilize [5].

D. Primer

The preliminary is the primary coat to be connected. The primary elements of the groundwork are to go about as a leveler and defender, and to make the base coat simpler to apply to the segment to which it is connected. The groundwork fills a few needs. It fills in as a leveler, which is vital since the taxi regularly has marks and different types of surface imperfection in the wake of being produced in the body shop. A smoother surface is made by leveling out these deformities and accordingly a superior last item. It fills in as a defender, the preliminary will shield from consumption, warm contrasts, knocks, stone-chips, UV-light, and so on. It additionally enhances simplicity of utilization by making it simpler for paints to adhere to the surface, a more differed scope of paints can be utilized [6].

E. Top coat

Generally showered over a shaded basecoat, clearcoat is a reflective and straightforward covering that structures the last interface with the earth. Hence, clearcoat must be sufficiently sturdy to oppose scraped spot and synthetically sufficiently stable to withstand UV light. Clearcoat can be either dissolvable or water-borne [7].

One section and two section details are regularly alluded to as 1k and 2k respectively. OEM (unique gear make) clear coats connected to the metal assortments of autos are ordinarily 1K frameworks since they can be warmed to around 140 deg C to impact cure. The unmistakable coats connected to the plastic segments like the guards and wing mirrors anyway are 2K frameworks since they can typically just acknowledge temperatures up to around 90 deg C. These 2 K frameworks are ordinarily connected "disconnected" with the covered plastic parts settled to the painted metallic body. Inferable from the distinction in definition of the 1K and 2K frameworks and the reality they are covered in various areas they differently affect the "redissolving" of the metallic base coat. This is most effortlessly found in the light metallic paints like the silver and light blue or green shades where the "slump" contrast is generally checked.

IV. ADVANTAGE OF PAINTING

Coatings can be applied in a variety of ways, from e-coating to a brush.

Except if you are an extensive producer, a large number of the powder or vapor testimony techniques for covering might
be out of your compass for cost reasons. Painting your item not just offers numerous cost favorable circumstances as far as capital speculation, yet can likewise bring down the per-piece cost. For this article, we will consider "painting" to be the wet use of coatings by means of splash strategies.

Splashing paint offers numerous favorable circumstances over alternate types of mechanical covering. Low beginning cost, quick application, high exchange productivity and others we will talk about in this article. Remember that there are dependably exemptions to the principles, and this exchange isn't thorough.

Showering a covering on an item can be as straightforward and minimal effort as a gravity or siphon feed splash weapon in a basic cross draft splash corner. For the little employment shop that doesn't shower each day, this offers the least starting expense and the most adaptability in the coatings that can be connected. High form ground works, consumption safe coatings, CARC, DTM and different coatings would all be able to be connected with a straightforward difference in needle/spout sizes.

At the point when metal substrates are being painted, electrostatic wet splash might be a choice. Despite the fact that the underlying expense is higher than the previously mentioned forms, the per piece money saving advantages can be huge. Electrostatic painting envelops an assortment of covering techniques. For reasons for this talk we will stay with wet e-static shower techniques. Your decision of waterborne or techniques. For reasons of this talk we will stay with wet e-

VI. CONCLUSION

There are difficult to accomplish zero deformities in the entire painting forms. The issues originate from the 4M, which are men, machines, strategies and materials. Along these lines, to enhance the procedure is by diminishing the deformities or issues as lower as could be expected under the circumstances. The assignments are to consider the technique that utilization all the while and propose another strategy that can beat the imperfections or issues. We have studied different painting methods and painting process for improving the automotive industry.

REFERENCES

[2] Kimio Toda; Abraham Salazar; Ko