

A Comparison of American and Japan Car Dye

Eng. Ghazi Aldhafiri

Public Authority for Applied Education and Training

ABSTRACT

In this research the comprehensive comparison of American and Japan car dye has been done. It has been observed that American and Japanese car dealer employ their own plan of dye to fulfil the client demand and requirements. They are also many difficulties associated with widespread customization. The car dye is becoming highly important for the car dealers to establish a good differentiator or even to be distinctive characteristics in comparison with the other countries as well. Therefore, the aim of the research is to obtain a better understanding of different type of car dye. It has been observed that the Japanese car dealer activities have become more like American car dealers. Furthermore, American, and Japanese car dealers sell same number of cars however, Japanese maker still have an advantage over American manufactures in term of electric vehicles, car dye, etc. cars dye, and the procedures used to paint the car's surface represents the cutting-edge of technology that can be employed to produce lasting surfaces, exceed customers' appearance standards, increase efficiencies, and meet environmental legislation. The comprehensive comparison of car dye and technologies has shared. In general, the main performance parameter guiding the development and use of advance car dye. The dye technologies are (i) appealing characteristics; (ii)rust protection; (iii) mass production; (iv) budget and eco-friendly requirements and (v) exterior and toughness. These factors have equal importance. The car dye is extended with a view of technological progress needed for more and more cost-effective and more ecological dye industry. The objective is to show that the true Japanese and American distinctive strategy is to understand the electronic parts and car dye process of complicated system technology innovation.

Keywords - Automotive dye; Finish layer; Automotive; Car; American; Japanese car

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I. INTRODUCTION

About 100 years ago, at the dawn of the automobile industry, automotive were layered with a paint-like substance the vehicle surface was polished. This dye was smoothed and flattened, and then the paint was reapplied and refinished to determine quite a few layers of the dye.

Following the application of many layers of varnish, cars were shiny to generate glossy coats. Some makers, particularly Ford in the Model T series, used a mixture of brushing, dipping, and pouring to completely coat and preserve the many components of an automobile.[1].

Coating procedures were employed by hand, and it did not unusual for the interval among the commencement of the varnish procedure and the finish, when the paint had dried and the vehicle was ready to sale and may take as long to 40.0 days. Between the 1920s and the 1940s, alkyd resin-based "stoving enamels" and spray apparatus were introduced in automotive coating technologies,

which cut application and drying times limited to one week or fewer. The surface finishes were more uniform because of the recently developed spray coating technologies, which also reduced the requirement for sanding. The thickness of each of the cured paint films was around 0.002 inches (51 m), and the chemicals and solvents offered high resistance. Enamel paints also had quicker application times, requiring only 2-3 stages as opposed to 3-4 steps for lacquers.

Additionally, a wide variety of colors were offered in organic pigments, which thrilled customers. Alkyd enamel paints, on the other hand, were deteriorated by oxidation in sunshine, which led to colors fading gradually or becoming dull.

The necessity to provide enough coating with a uniform thickness regardless of whether the surfaces were comparatively flat or significantly curved required considerable artistry when spray painting by hand. With the advent of system-controlled spray guns, the demand for skilled spray coating has significantly decreased. Additionally,

these robotic procedures have undertaken enhancements that guarantee wage earner security and raise the proportion of painted surfaces to painted surfaces sprayed [2].

Today, powder coatings are employed in all primer surfacer procedures in America at GM's truck factories, Chrysler's actual operating facilities, and all new paint shops. The clearcoat method also makes use of coatings / car dye in various BMW plants in Europe [3].

A concise description of locomotive body coverings and dye techniques was covered in the previous section. It hinted to current improvements in locomotive dye techniques and provided a preview of possible future changes. The subsequent provides a thorough outline of contemporary automobile dye techniques, a discussion of coating assessment tools, and a presentation of alternative and potentially appealing coating procedures.

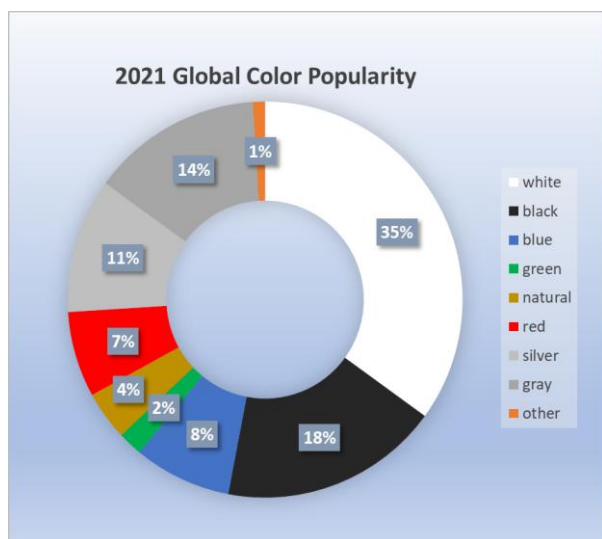


Fig1: 2021 global color popularity

I. COMPARISON ON FOLLOWING POINT

- Pretreatment:** Excess metal is removed and cleaned, and a proper surface structure is formed, allowing the bonding of a corrosion protective layer.
- Electrodeposition (ED)** is called anti-corrosion or rust avoidance coating.
- A sealer such as Poly Vinyl Chloride (PVC)** is used to prevent erosion, eliminate water seep out, and reduce damaging and vibrating noise.

•**Primer:** for the improvement of surface connection between basecoat and layer; primer provides a flatter surface for following coats and has anti-notching capabilities.

•**Finally, Topcoats** it has two coating basecoat and a clearcoat: It provide a desired surface attributes such as color, look, gloss, smoothness, and weather resistance.

These five coating stages, as well as extra coatings, are used [4]. Examining this figure reveals that, in addition to the stages outlined above, a substantial number of coatings and materials are required to create a salable automobile. The American and Japanese car model are distinction based on these five stages.

II. AUTOMOTIVE COATING PERFORMANCE

The effectiveness of an locomotive dye can be evaluated on or after a variety of perspectives, such as the longevity of interior and exterior paint finishes or the appearance of the product. However, there are constraints in terms of paint qualities, operational processes, and, most crucially, the amount of money that is available to optimize the finish.

2.1 Coating Quality

Coating qualities are evaluated using three key criteria: resistance to hostile conditions, durability, and appearance quality. A car with corrosion proofing for more than 20.0 years and a gloss presence for more than a decade span is considered durable. Color, paint smoothness, and gloss are the three factors used to determine visual quality.

2.2 Color

Color must be uniform and constant to provide avoid giving idea of a high-quality finish consumer objections. This is an issue that must be addressed not only at the moment of buying, but also during the life of the car. Pigment direction and concentration are two factors that determine color tone. Adsorption process, the thickness of the coat after contacting a body, dust intervention, and spray affect pace all influence dye orientation [5].

2.3 Corrosion Protection

During their service life, automobile coatings are exposed to a variety of conditions and scenarios. The coating's degradation is determined by three major factors: the varnish formula, the atmosphere intensity or scenario, and its span. UV rays generated by the sun, heat, and humidity have a lasting negative impact with varying degrees of severity varying on the environment and weather circumstances.

III. TRENDS IN AUTOMOTIVE COATING PROCESSES

Recent trends in the locomotive dying process, as stated above, are influenced by decreasing production costs, providing consumer satisfaction through visual appeal and corrosion resistant, and mitigating environmental problems [6].

Automotive vehicles coating systems have received a great deal of thought, and they are sophisticated enough to satisfy most customers worldwide.

When contrasted to 30 years ago, the corrosion problem has almost been eliminated, and the durability and visual appeal of topcoats were becoming acceptable for the lifetime of a car.

Indeed, with the widespread adoption of two-layer topcoats, the color, gloss, and chip resistance of automobile coatings remain relatively good during the first 7-10 years of use. Visual elements are also popular in automobile fashion.

As a result, the following section provides a closer look at current trends in automotive coatings.

IV. POWDER COATING

One method of reducing VOC emissions has been to replace fluid coatings with coatings composed of dry, particle solids, also known as "powder," dying. Their formulations have extremely low levels of organic thinners, on the range of 2.0%, which is significantly lower than any other coating system. The powder is a combination of fine pigment and resin particles that is electrostatic interactions sprayed onto the wall to be coated. The charged particle adhere to the electrostatically grounded surfaces until the substance is heated in the curing oven and merged into a smooth coating. The result is a consistent, long-lasting, high-quality, and

appealing finish. Powder coating is North America's fastest growing finishing technology, accounting for more than 10percent of all manufacturing finishing applications.

3-Wet Paint:

Because of the considerable material and energy savings, the automotive sector seeks to eliminate or reduce the size of spray application methods, space, and baking ovens.

One method has already been proven successful: a wet-on-wet-on-wet (3-wet) system that erases the primer furnace from the coating process.

An additional step was taken to remove the primer surfacer application, which was retained by the implementation of the initial basecoat layer.

Comparison of Both Method:

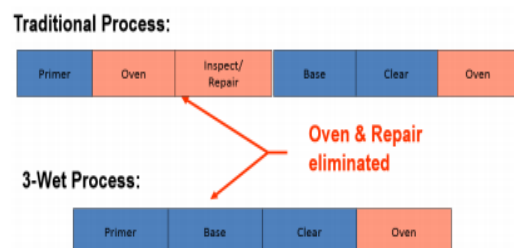


Fig2: Comparison of Both Method

In the tradition process the primer is used in first step then place the part in oven to dry and after that inspect that part if any repair required after that base is applied on it and clear that part and again place it in oven for dry. Where as in 3-Wet paint when we apply primer wait to dry it without oven and repair/inspection base is applied and then after clean it place it oven for dry further. 3 wet processes save time as well as eliminate 2 processes with is followed in traditional process.

V. CONCLUSION

At the end the comparison is concluded as American and Japanese car design, dye are depend on the above discussed points on basis of these point the following conclusion has been drawn.

The United States and Japan have built reputations in the automobile industry over time. Toyota, Subaru, and Honda, for example, are well-known for producing dependable and fuel-efficient automobiles. These traits have evolved into renown shared (though not necessarily deserved) by all Japanese automakers. On the other hand, American

automakers such as Ford and GM have built a reputation for producing powerful, inexpensive, and safe vehicles. However, these companies do not always live up to their great image, even though they have given Japanese manufacturers a run for their money in terms of efficiency and dependability.

This is the primary and most crucial factor that prospective clients consider. A vehicle's design and appearance are distinct elements that should be considered before making a purchase decision. Japanese automakers do not update their vehicle styling as frequently as American manufacturers. They frequently use the same layout for years. However, American automakers build automobiles that are both attractive and inexpensive, such as the Mustang and many others.

Japanese automakers produce elegant vehicles, but not as many as American automakers. Because American designs have larger automobiles than Japanese designs, you should consider this before deciding which car best meets your needs.

Both cars are deemed trustworthy, although Japanese-made vehicles are thought to be more dependable than their American equivalents. They have the best record for dependability. However, when it comes to reliability, the car itself is not considered, but rather its total characteristics and returns. This includes automakers' profit margins. Because Japanese manufacturers are more profitable, they promote higher-quality vehicles.

REFERENCES

- [1]. A comparison of American and Asian automakers' vehicles in quality ... (no date). Available at: https://scholarsmine.mst.edu/cgi/viewcontent.cgi?httpsredir=1&article=3100&context=doctoral_dissertations (Accessed: December 13, 2022).
- [2]. Chang, S., Choi, B. and Song, K. (2020) "Difference of CSR practice for Chinese automakers – comparison with Japanese & Korean automakers," *management revue*, 31(3), pp. 372–394. Available at: <https://doi.org/10.5771/0935-9915-2020-3-372>.
- [3]. "Paints & Coatings 2022: Understanding the chemical industry and current challenges" (2022) *Focus on Powder Coatings*, 2022(5), pp. 5–6. Available at: <https://doi.org/10.1016/j.fopow.2022.04.029>.
- [4]. Akafuah, N. et al. (2016) "Evolution of the automotive body coating process—a review," *Coatings*, 6(2), p. 24. Available at: <https://doi.org/10.3390/coatings6020024>.
- [5]. Schoske, L. (no date) "Comparison of American, German and Japanese car dealership approaches for sales and service." Available at: <https://doi.org/10.23860/thesis-schoske-lukas-2018>.
- [6]. "China's automotive industry in the global era, Japanese Auto Makers, and their China strategies" (2010) *Japan and the Global Automotive Industry*, pp. 260–293. Available at: <https://doi.org/10.1017/cbo9780511730283.011>.