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PAINT JOURNAL

A QUARTERLY JOURNAL DEVOTED TO PAINT MATERIALS & PAINTING METHODS

Editor : P. GOPAL RAO, M.Sc.

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SODHAN
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ECONOMICS OF SWADESHI

"I do not know much about tariff but I do know this much :

When we buy goods abroad we get the goods and the foreigners get the money ; when we buy goods made at home we get both the goods and the money"

—*Abraham Lincoln*

COMMENT

IT is over seven months since the declaration of war. Paint industry in this country has recovered from its first shock and is adjusting itself to changed conditions. At a time when economic planning in industrial reconstruction is being seriously attempted and people in general have become industry conscious, this war has put a break in our progress. In the paint trade we have to depend on imports for most raw materials. But strangely enough we have most of the basic materials in plenty in the natural state. We export the crude material and get back the refined material. We have large deposits of Barytes but we import Blanc-fixe and even Barytes powder. We export chromite ore and import the chromates and pay twenty times more even in peace time. We have large deposits of bright iron oxide but most paint works buy imported iron oxide. We have to import Synthetic gums, zinc oxides, lithophones, carbon blacks, ultramarine blues and almost all heavy chemicals. We have few key industries and practically no pigment works. In peace time with normal prices and regular sailings it may be difficult for our budding industries to withstand outside competition. This is a very favourable time for us to take to new basic industries and achieve economic self-sufficiency. War is a bad thing. If, however, we will be able to turn this to our benefit by becoming industrially self-sufficient we can once more say "God does everything for our good."—*Amen.*

Wartime Possibilities

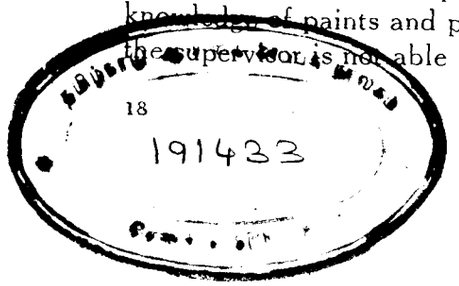
Commenting on the report in a United States journal devoted to decorating trade that the waste oil from the sumps of motor cars is suggested as a medium for paints, one of our distinguished English contemporaries visualises the horror with which a reputable manufacturer of high class products would view the suggestion that his best branded materials were made from oil, drained from sumps of lorries and adds that during war lots of things will be used which find no use in peace time and many low grade products will incorporate all sorts of curious

How odd it Sounds ?

materials that one would hardly connect, even remotely, with paint. In India, war or no war, all sorts of odd materials enter the inferior paints. India produces lots of Linseed and exports it too, but the general purchaser in the market has to be satisfied with linseed oil adulterated with heavy mineral oils. The medium in some stiff paints is a blend of liquid rosin and lubricating oil. At times ordinary Kerosene oil mixed with a little camphor is offered as turpentine. Common rosin melted and thinned with kerosene oil goes as Copal Varnish. We have no quarrel with those who say "That is the stuff they can get at the price." We only say it is bad. The responsibility of educating the public to use and demand the right qualities rests on the manufacturer. The ignorance of the consumer should not be exploited.

Please Note!

Elsewhere we publish a letter from a painting contractor, which, we think, is written after an unhappy reverse. We do not find specifications are so vague. Departmental specifications are drafted with great care and fore-thought. No doubt they cannot be all comprehensive and their meanings may be stretched too far. Conventions and practices may put new meanings on old words. We think most of the existing troubles will vanish if the advice of firms specialising in paints is taken into account by architects and engineers before deciding on the painting procedure. It should be realised that painting, though one of the many items, is a highly specialised line and there are competent firms specialising in the line, to offer advice. The contractors should be sympathetically treated. If an unforeseen trouble comes and the contractor draws the attention of the engineer to it, it will not help matters if he is curtly told "a contractor is supposed to tender for the work after personal inspection. Therefore he should make his own arrangements to get the final finish." When unexpectedly caught in a tight corner through an honest looking clause in the contract, the contractor with the best of intentions is tempted to play foul to escape heavy loss. In that case the results may not be quite desirable. The supervisors on painting works should have a fair knowledge of paints and painting methods We have known cases where the supervisor is not able to mark the difference between a bazaar grade



white paint and a white lead paint. Some do not realise that old paint on wood work is best removed by blow lamp, and caustic cleaning swells the fibre and spoils the wood.

Need No Painting?

'Need no painting. Look well in all surroundings.' That is how a brand of asbestos cement pipes is advertised. What a heart breaking news for painters and paint manufacturers! Both the protective and decorative qualities of paint are set at naught. We think it is just telling that even if unpainted they do not rust like iron and rot like wood—(may break like glass though!) Does the dirty white colour of these asbestos articles look well in all surroundings? Are they not porous? Do they not take in and give out moisture? Does not this breathing under widely varying temperatures affect the strength of the binder? After all it is just an advertisement and they are catch phrases. Painting on asbestos articles is as common as painting on wood and iron. Painting asbestos sheets is a subject by itself.

Indian Paint Industry

This brings us to the position of paint industry in our country. The Indian painter in general is an ignorant and illiterate (not literally though) labourer who is ignord. There are of course the Engineers, Architects and Building contractors in towns and cities. But painting to them is one minor item in many more important ones. The village artisans as carpenter and mason play no mean part in building construction of this country. But they are ignorant about paint and painting methods. Paint marketing is confined to towns. Villagers and village artisans who form the bulk of the consuming public are ignored. The consumer is nowhere in the picture. In other countries paint advertisements are intended for painters. Paint marketing councils tell the consumers to *brighten* their *homes with paint*. In India we have vague advertisements intended for all and none. We make no collective effort to educate the painter and the consumer. It is over 40 years since the first paint factory was established in India. During the last twenty years scores of paint works, big and small, have come into being. But the painter and the consumer are where they were. All

followed the same straight line imitation. The importance of the middleman is overemphasised. We know that in modern society the middle man has a place. But it must be realised it is *just a place* and not *all space.* A consumer requires better attention. Direct approach to him is overdue. This obviously cannot be properly achieved by agents of individual manufacturers who have in their mind the interests of their firm only in the narrowest sense. It is time that Paint manufacturers, big and small, do not stand on formalities and join hands in organising a central paint research laboratory and an educative propaganda branch.

Some time back we read about the remark of a well known English decorator about the paucity (almost bordering on absence) of skilled painters in India. For any first rate job, even when requiring an Indian or oriental touch, we have to requisition a foreign expert, brought up in different traditions. Is it not time for the painters and all who care for the painter and his art in India to wake up, organise themselves and strive to be worthy successors of Ajanta traditions?

The Editor will be glad to receive articles of a practical nature, preferably accompanied with illustrations, on topics covered by this journal.

RED LEAD

RED LEAD is one of the few oldest paint materials that is still unrivalled in its own limited field. To the engineer concerned with the protection of iron and steel structures from corrosion, the excellence of red lead paint as priming is a proved fact. As a result of a number of independent tests on iron and steel conducted by many paint testing institutions, it is definitely established that the protection afforded by red lead paint is also chemical instead of being only mechanical unlike other inert pigments as red oxide etc. It is supposed that red lead acts upon the iron and steel surfaces and forms a type of oxide film which resists corrosion. Paints formulated with inert pigments as red oxide, graphite etc. owe their protective properties to mechanical factors like impermeability. These paints protect the metal surface as long as the paint film is intact and continuous. Any injury to the film leads to the rusting of the exposed surface. With red lead paint it is different. Any slight injury to the paint film does not easily allow rusting in the portions so exposed. There may be a limit to the protection afforded by chemically protective pigments, but a paint which protects chemically also, gives much better service than that affording only mechanical protection.

A Different Type of - Protection

Besides this chemical protection afforded by red lead its other excellent properties have greatly contributed to its universal use as a priming paint for metal surfaces. Metal unlike other building materials as wood, plaster etc., is impervious to paint. Therefore a priming which is next to the metal and is intended to be a reliable foundation for the succeeding paint coats should have good adhesion. A paint not having good adhesion is worthless as a metal priming, however excellent its other properties. Secondly, since metals have much higher expansion co-efficient than wood or plaster, any paint, intended as a hermetical seal shutting out air, moisture, and other corrosive agents, should not only be

The Ideal Primer for Metal Work

very elastic when fresh, but should keep up the elasticity for a sufficient length of time. Any undue fall in elasticity will make the paint film break away during the successive expansions and contractions of metal structures under changing temperatures. The breaks in paint films will expose bare metal and early corrosion results. Thirdly, as with any other paint, capacity to withstand exposure over a prolonged period is essential.

Merits of Red Lead

The above three essential characteristics of a good paint for metal surfaces are found in red lead paint. Red lead paint has excellent adhesion, continued film elasticity, and prolonged weather resistance. These desirable characteristics are attributed to the remarkable affinity exhibited by red lead towards linseed oil. Due probably to the formation of certain types or lead soaps, red lead linseed oil paints give most closely adhering films which are air-tight and impervious, thereby giving maximum protection from corroding agents to the underlying metal surfaces. Red lead paints are found to be very satisfactory on exposed iron and steel surfaces even if immersed intermittently in water, but fail quickly if the painted work is continuously under water. Since the protective value of red lead is mainly due to chemical action between red lead and the metal surface, any small variation in the paint medium composition as the increase of thinner proportion etc., does not greatly alter the protective properties of the paint in general. Red lead is also considered as a desirable addition to priming paints for wood. The pigment of the well known pink primer of standard specification is a mixture of red lead and white lead, with some whiting.

Its - - Shortcomings

In spite of all the excellent qualities of red lead referred to above, there are serious working difficulties with red lead paints, and efforts are being constantly made to overcome them. The red leads produced in the early days were of large particle size and low chemical purity. With paints made with such red leads, settling of pigment was a very serious drawback. Such paints used to set very hard within a very short time.

Therefore the original specifications for painting with red lead insisted the mixing of red lead and linseed oil on the works spot. As a result of further developments in the manufacturing methods of red lead, much purer varieties with finer particle size are produced. These types are called non-setting red leads and are generally used in the red lead paints in our country. These non-setting red leads have no doubt reduced the troubles experienced with ordinary red lead, but cannot yet be said to be satisfactory. Recently, however, a very much purer and finer particle-sized red lead, called high disperse red lead, is coming into vogue. It is claimed that due to its high bulking value and greater oil absorption, paints formulated with high disperse red lead have higher spreading capacity, greater ease of application and almost normal storage facility.

Red lead has low hiding power, weight for weight. When sharp corners or vertical surfaces are painted, the heavy particles of red lead tend to settle downwards in the paint film leaving pigment free oil patches at places. Such patches will be more vulnerable to corrosive agents. The pigment content of a straight red lead paint should be very high to have the necessary film formation usually about 75%. Consequently straight red lead paints are difficult to stir and more difficult to apply. The painter using a pure red lead paint weighing about 28lbs. per gallon gets tired much quicker than when using a red oxide paint weighing only about 20lbs. per gallon. A tired workman cannot maintain a uniform standard in work, and a patchy film with gaps vulnerable to corrosion results.

Some Improvements

To overcome these and such other painting difficulties many investigations are carried out. It is now proved that red lead modified with small percentages of certain inert materials as red oxide, graphite, and zinc dust, will give easily brushable paints without impairing the protective qualities. Though very little is known about the use of zinc dust in our country, red oxide, and graphite are used in combination with red lead in some first rate metal primers, which are free from the defects of

straight red lead paint, without impairing protecting efficiency. With regard to the medium used in red lead paints, the general practice has so far been in favour of using raw or boiled linseed oils or a mixture of both. Processed linseed oils and synthetic resins are now used in some of the superior types of modified red lead primers and are found to give much better results than ordinary linseed oil.

Imitations of Red Lead

Any account of red lead will be incomplete without a reference to its imitations in the market. Red lead is orange in colour, which is a mixture of red and yellow. Any organic pigment dye with a red lead colour or a mixture of yellow and red dyes in proper proportions, when ground with large amounts of barytes, and the dull colour so obtained is brightened with additions of small amounts of mineral oil, will be indistinguishable from genuine red lead to the layman's eye. Such are the imitations that are offered in the market in place of genuine red lead. They look like red lead but have none of the protecting qualities of the genuine variety. The easiest way to distinguish the genuine from the spurious quality is just to take a small sample on a pallette knife and heat it on a flame. The genuine red lead will regain its original colour on cooling, while the imitation quality will lose its red lead colour. If the heat is sufficient to burn away the dye completely, the residue will be white (like barytes), otherwise the residue will be blackish due to unburnt carbon of the organic dye used in its manufacture.

To

THE EDITOR,

"PAINT",

TENALI.

Dear Sir,

THE articles in the first issue of your journal faithfully reflect the trend of the present day painting practices. The para on specifications and schedules in the article "*Painter and his work*" brought vividly to my mind the vague way in which the word "scraping old painted surface" is interpreted by engineer-in-charge. Depending on his whim it may mean anything from dusting and cleaning with a rag or broom-stick to complete removal of all old paint with scrapers.

As a matter of course in tender notices scraping is defined as removal of old paint blisters and scales and sand papering to get a smooth surface. But it is an open secret that in majority of cracked and blistered paint work a smooth surface cannot be got by scraping. Even though surface looks badly cracked and blistered in many cases it will not be possible to economically remove scales and blisters by scraping. If we inspect the job, put in a clause about the desirability of removing the old paint and quote a rate which includes paint removal. In all probability the clause about the removing of old paint is ignored and work is given to a lower bidder whose rate did not include the removal of cracked and blistered paint. In 9 cases out of 10, he may just dust the surface, paint it and pocket his bill money. In case of trouble the supervisor can take his stand on the definition of scraping in the tender notice as 'removal of old paint blisters and scales and sand papering to get a smooth surface'. Without providing for any extra rate for paint removal he can insist on the removal of all old paint if he uses the word 'scrape' instead of 'remove'. The contractor is at his mercy.

I was once obliged to remove by scraping all old paint on an iron work even though it did not crack and was in good condition because the supervisor took 'scraping old paint' to mean 'removing old paint.' In old painted wood work I was more than once obliged to take to blow lamp cleaning in places without any extra rate simply because my rate was supposed to include scraping old paint. The supervisor-in-charge took it to mean removing old paint by scraping and insisted on it even though it was pointed out that blistered and cracked paint cannot be economically removed by scraping.

In such tight corners, to make good the loss we have to dodge over less easily detectable specifications. The whole is a vicious circle. I sincerely wish for the day when the painting contractor and the engineer co-operate to raise the standard of painting work. At present each tries to exploit the other and painting standard is degenerating.

Yours etc.,

A Painting Contractor

Free discussion on subjects of interest to Paint manufacturers and Paint consumers is welcomed, but opinions expressed in such discussions are not necessarily those of the management.

PAINT & PLASTER

WHEN painting walls and such other surfaces as brick, plaster, cement, asbestos sheets etc., it is generally taken for granted that painting them is for mere decoration. It is seldom realised that painting also protects them. These surfaces are generally porous and water is readily absorbed by them through minute pores in them. If such absorbed water freezes in the pores (as it does in the winter months in some parts of our country) its volume increases, because ice is bulkier than water, and the minute pores develop into cracks which get bigger and bigger with time. Again continued taking in and giving out of moisture by structures, under widely varying temperature conditions, tends to lessen the cohesion and binding strength of cements and plasters. Even in modern ferroconcrete constructions, where steel framework is enclosed in cement, there is a likelihood of the metal inside getting rusted. If such concrete structures are not protected by water-proof foundations below, and paint coatings above, moisture is absorbed and this moisture is one of the prime causes for rusting. The general belief that cement wash over steel structures preserves them from rusting may seem contrary to the above statement. But the existing conditions in both cases are fundamentally different and bear no comparison. The thick cement plastered wall never dries as thoroughly as the thin film of cement wash. Again the water used in mixing cements and plasters is seldom free from soluble salts which come out on the surface and absorb moisture from the air even when within. They try to retain as much of moisture as they can in the wall and create all favourable conditions for electrolytic action which makes the iron rust.

Paint for Protection

According to the bulletin on the decoration of new plaster and cement contributed by the Building Research Station and published by the Ted-

Water in New Plaster Work

dington paint Research Station, roughly a ton of water is present in the brick-work and plaster-work of a newly built room, 16' × 15' × 9'. With so much water in the construction and the possible presence of soluble salts to enhance the corrosive action of water, the protection of the enclosed iron and steel work is very necessary. It is best to give it a coat of red lead paint ready mixed or preferably a good quality anticorrosive primer, and allow it to dry hard before enclosing in cement.

Painting Troubles

The painting of plaster and cement presents many difficulties. In painting wood-work we have to reckon with the absorption of paint, the discolouring, and to some extent the solvent action of exudations from knots etc., on the paint film, and the effect of a certain amount of moisture which is invariably present in wood-work. In painting iron and steel work the removal of rust mill-scale grease etc., is of primary importance, and the paint should have good adhesion as metal structures unlike wood and plaster are nonporous and do not afford good key to paint films. In the case of painting plaster surfaces a very different and difficult problem has to be tackled. The ingredients which go to make up the surfaces themselves have harmful effects on the paint films. Most plasters are alkaline by nature. They are mixed with large amounts of water and are applied in rather thick layers to a porous backing which is itself in a wet condition. Most walls have direct connection with the ground and, unless adequately water-proofed, moisture is sucked up, due to capillary action, to great heights and tries to come out from the wall surfaces. This moisture activates the alkali in the plaster and the oil content of the paint is attacked by the so activated alkali. The reaction is called saponification, i.e., the alkali attacks the oil in the paint, reacts with it and forms a soap. At such places the paint does not dry and the oil which is the binder for the pigment particles gets converted into an ever-tacky, non-drying soap. The alkali sensitive pigments in the paint as Prussian Blues and Brunswick Greens are also attacked and bleached by the alkali and very ugly looking patchy paint films result. Again, the water used in

mixing plasters and cements contains dissolved salts. Such salts if any are brought out to the surface during the drying period and crystallise on the surface. If such salts are deposited between the paint film and the plaster surface, the key is broken and the paint blisters and peals off. The crumbling of plaster surfaces, and (in some cases) mud walls which is a common occurrence in the coastal areas is due to these soluble salts, which enter into the structure through the water used in their construction. The prime cause in this case is also absorbed moisture.

Moisture, the Chief Foe

Most of the painting troubles on plaster surfaces can be minimised if painting can be postponed till the walls dry well throughout. But the speed with which modern building construction proceeds does not allow of this leisurely procedure. While the best plan will be to put off the painting of newly plastered walls for at least a year after plastering, it is not unusual to find the owner insisting that the ground floor should be complete with painting and ready for renting out before the first floor is even half finished. Again, usually, the architects and building engineers hurry the final stages of building construction to cover up delays resulting from the leisurely way in which the early stages of building construction proceed. Painting being the final item, enough time is not allowed for the walls to dry well to make the painting work a success. It will be of great help to the painter if he is well posted with the information regarding the reactions of plasters used in the construction towards his materials and the uniformity of their other characteristics as porosity, the rate of absorption and giving out of water, chemical nature etc. For successful work the plasterer should follow the specifications and not make unauthorised additions to plasters. Successful painting is only possible when there is close co-operation between the plasterer and the painter. If, say, the plaster on which paint is applied contains too much of sand and too little of cement binder, as a result of which crazing and cracking occur and the plaster falls off taking off the paint on it along with it, the blame for such failure is thrown on the painter or his paint. If the plasterer smears some grease or oil on the plastered surface to just make it appear uniform in colour to

avoid blame for patchy work during inspection, he is unconsciously putting on an impervious coat which does not allow the breathing of the plastered surfaces and greatly retard their drying speed. With so many difficulties to surmount, the painter is expected by his customers to work wonders, hide the existing defects and decorate the whole. The painter in turn expects the paint manufacturer to produce a wonder-working paint which can stand up against all odds and does not let him down even under abnormal conditions. We have now in the market many varieties of wall paints which can withstand mild alkali action and dampness within limits and provide excellent decoration to plaster surfaces. But each type of material has its merits and limitations. This should be realised and due allowance should be given to these aspects. If the walls are not perfectly dry and an almost impervious paint film with low porosity is applied on them, the escape of (1) moisture which is present in excess in the wall (2) the moisture which has soaked into the wall from wall surfaces exposed to direct rain and (3) the moisture sucked up from the ground through capillary action in the wall, is hindered. The paint blisters. Again the faces of newly plastered walls remain much cooler than the surrounding atmosphere (due to the continuous evaporation of water which draws up heat) and moisture in the surrounding atmosphere condenses on such cool surfaces. If the paint coat put on is porous enough to absorb such moisture to a great extent the tidy appearance of the wall is kept up; otherwise the condensed moisture flows down in unsightly runs. But paints which give porous films and do not hinder the breathing of walls and their consequent drying and are able to absorb condensed moisture on walls to a great extent cannot be very water resisting. Prolonged soaking and continued damp conditions over long periods will make them absorb so much moisture from outside, that they become soft and the binder in them loses its binding power. Thus each product gives good service when its limitations are understood and merits are not overestimated. The painting of old plastered walls in good conditon is a comparitively simple matter. The majority of troubles are experienced in the decoration of new plaster and cement. The chief causes of trouble are: 1. The alkalinity of plasters, 2. The soluble salts entering the plasters through sand and water mixed in them, 3. The defects in

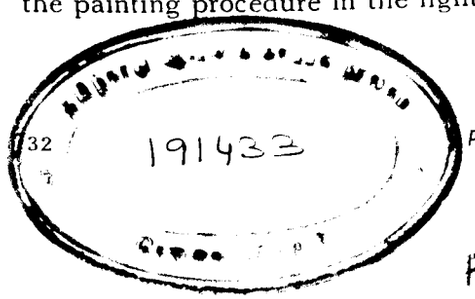
cement composition. 4. Fungoid growth.—1. The troubles arising out of the alkalinity of plasters are more acute under damp and moist conditions. There are no doubt some neutral plasters as keen as cement, plaster of Paris etc., but their use is not general in our country. The widely used Portland cement and lime plasters are alkaline enough to effect even best alkali resisting qualities under damp conditions. Dampness must however be called the agent provocator in all these cases of trouble. Where it is not possible to put off painting till the plaster has completely set and the free alkali (generally lime) is converted into calcium carbonate, there are certain preliminary treatments which are advocated. They are the treatment of such surfaces with (1) dilute Sulphuric acid, (2) Zinc sulphate solution. The aim in both cases is to neutralise the residual alkali on the surface. Sulphuric acid will convert calcium hydroxide into calcium sulphate which is a neutral salt with no action on paint medium or pigments. Zinc sulphate is expected to react with free lime on the surface and by double decomposition give zinc oxide and calcium sulphate which form a hard crust on the surface. That is why a zinc sulphate solution is sometimes marketed as a surface hardening or concrete dressing liquid. It must be admitted, however, that these surface treatments are just doubtful make-shifts which may at best put off the trouble for sometime longer. The so created inert layer is too thin and porous to be really effective and the moisture escaping through this thin layer will bring along alkali to the surface and the trouble will once again begin. The aim in any successful treatment should be to check the ingress of moisture and to ensure thorough drying of the surface. Obviously in the acid and zinc sulphate treatments more water is supplied to the surface which is the reverse of the guiding principle. In some particular cases, however, these treatments are known to yield good results; of the two the acid treatment is better. Any excess of acid can be easily washed out with fresh water and after the wall is dry it can be safely painted. In the case of zinc sulphate treatment we are introducing a soluble salt into the wall which is prone to enhance the trouble through efflorescence.

As regards remedies the most important precaution to be taken is in the building procedure. The foundations should be damp-proofed. The moisture in the walls may be classed as 1. existing 2. absorbed and 3. sucked up; of these the last one is most difficult to control. This is due the capillary attraction in the walls.

What to do?

It must not be imagined that the more porous a wall the greater the sucking of moisture. The continuity of the pores is the more relevant cause. A check in the continuity will arrest this suction. Generally a layer of Cuddapah slabbing above the ground level will go a long way to remedy the defect. From the painters view the best procedure will be to wait till the wall is dry for a year before commencing painting. If decoration is insisted within the limit he should suggest a lime wash, colour wash or a dry distemper which is loosely bound and gives a very porous film which does not retard the breathing of the wall. These form excellent temporary decoration during the intermediate period and can be easily removed when more permanent decoration is undertaken. As far as possible paints containing oil and oil emulsions should not be recommended on fresh plaster surfaces. If, however, oil paints are insisted it is best to sponge the surface with dilute sulphuric acid (1 part acid in 10 parts water), wash it with plenty of fresh water the next day, allow the surface to dry for a couple of days, give at least two coats of an alkali proof medium, then over it to put on the required paint and trust to luck.

It is easy to say all this. In actual practice however the painter has to take things as they are. In the tenders a definite painting sequence is given and he is asked to quote his best rate. Sometimes the very material specified may not be suitable for the job. If the manufacturer is called in to investigate the trouble and advise the remedy, he may just say "A different material is necessary for the job." In such cases the painting contractor is in an awkward position. To avoid all these troubles the best remedy is to call a paint manufacturer, show him the surface, ask him to suggest the procedure throwing full responsibility on him, and then draft the painting procedure in the light of his advice.



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