



Ganga Rasayan

(A HOUSE OF SOLVENTS & COAL TAR BY-PRODUCTS)

GarotAR: COAL TAR IN HIGH PERFORMANCE ANTI CORROSIVE AND CHEMICAL RESISTANT COATINGS

GarotAR 62 B are refined coal tar having excellent compatibility with Epoxy and Poly-urethane resins.

Benefits

High solid content over 90%

Excellent water and chemical resistance

Excellent compatibility with epoxy & PU resins and can be blended even upto 75%

Specifications:

Product	Dehydrated Coat Tar
Product Code	GarotAR B
Specific Gravity at 30 °C ±0.01	GR 62 B
Viscosity in RWII / 50 ml at 50 °C ±15`	1.190
Viscosity in Tar Viscometer 50 ml at 50 °C	4`
Viscosity in Centipoises ±2000	45` - 50``
Viscosity in 10% Toluene by FC4 at 30 °C ±10``	8000
Toluene Insoluble ±2	80``
Ash content	8
Moisture Content	< 0.2%
Phenol Content	<0.1%
Volatile Matter at 120 °C for 1 hour	<0.1%
Solid Content	<10
Distillate Residue – Softening Point (R & B) ±5 °C	>80%
	50 °C

A reference Epoxy / Coal Tar formulation (Two Pack):

A. Pigmented Base	
Epoxy Resins (Epon 834 / 1001)	10 % – 15 %
Dehydrated Coal Tar	20 % – 25 %
Cellosolve / MIBK	15 % – 20 %
Micronised Soap Stone Powder (Talc)	25 % – 30 %
Micronised Red Oxide	05 % – 10 %



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Method

Dissolve Epoxy Resin in solvents, add Dehydrated Coal Tar, mix thoroughly and then add micronised pigments/ extenders and thoroughly disperse in a high speed Cowles Dissolver or a Ball Mill / Attritor.

A. Curing Agent

Di Ethylene Triamine	50 %
Butanol	50%

For proper curing of the pigmented base the amount of curing agent (B) should be so adjusted that 100 parts of Epon 1001 is reacted with 6 parts of D.T.A. In case a lower molecular weight Epon 834 is used then proportion of D.T.A will have to be adjusted by the formulator. It may be mentioned that other catalysts i.e Ethylene Diamine, Tri Ethylene Tetramine are also used for curing but the preferred one is D.T.A.

It has been estimated by many reputed institutes in the globe that the loss due to corrosion is in the range of 150\$ Billion – 200\$ Billion per year. It is a enormous burden and one of the most economical ways of fighting this menace of cancerous corrosion is application of high performance coatings based on epoxy and polyurethane where high temperature Refined dehydrated coal tar can play a very important role. Such Epoxy / Coal tar coating when applied after surface preparation and at a recommended film thickness can give a long life to steel on which it is applied. It is believed that this can reduce corrosion loss roughly to the extent of 30%.

The main cause of corrosion of steel is ingress of moisture and oxygen and in chemical industry the various types of reactive chemical fumes. While corrosion is an electro-chemical process it can be contained by physical barrier mechanism by application of tough protective coatings with excellent adhesion and having high degree of water and chemical resistance. Such coatings can be pigmented with inert pigments and extenders, which can impart great strength to the film. The other possibility is usage of inhibiting pigments for giving chemical protection to the underlying surface.

Epoxy and polyurethane's are well known resins and when properly cured by polyamines and polyisocyanates respectively give very tough films with excellent adhesion, flexibility, abrasion resistance, high impermeability, very high chemical and solvent resistance. These resins have a good compatibility with high temperature refined dehydrated coal tar. Combination of coal tar which could be anything between 50% to 75% of the total binding medium, not only makes the over all coatings much more economical but also develops a high degree of thixotrophy which helps in building much thicker films which are essential for stopping ingress of moisture and oxygen and chemical fumes. It is well established that incorporation of refined dehydrated coal tar of high temperature carbonization origin in these protective paints does not in any way effect the solvent resistance of these materials (indeed in certain cases it may improve it), but helps in considerable improvement in water, oil, alkali, and general chemical resistance. Adhesion and flexibility of such high performing coatings can be easily managed by suitable adjustment of proportions of epoxy resins to coal tar. It is worth mentioning that coal tar should not be regarded as a diluents when combined with these sophisticated resins and it is believed that it partakes in cross linking though the exact nature of this reaction is not understood.

The above mentioned coatings are two pack systems whose pot life is about 4 – 6 hours depending on the climatic conditions and therefore, minimum quantity should be mixed just prior to the application. While spraying is a preferred method of application, these can be easily brushed giving higher film build. In special cases two coat application should be able to give approximately 20 mm dry film thickness for better protection against aggressive atmospheric conditions.

It must be remembered, however, that the main purpose of these coatings is protection of the surface and therefore the aesthetic value is of an average order because of its black colour.

Dehydrated Coal Tar has also good compatibility with chlorinated rubber. The chlorinated paints are cheaper and yet have very good chemical and water resistance but they are thermoplastic in nature. This may have some bearing on their poor heat and solvent resistance. The chlorinated rubber / coal tar paint has an advantage that it is one pack material and therefore handling becomes much easier and one is not constrained by the pot life of a Two – Pack – System.

All of the above mentioned coatings can be usefully applied on :

Bridges, Electric Poles, Outside Sewage Pipes, Outside of Pipelines in chemical and other industries, Underbody of car coatings, chassis of trucks, barges, Wooden Poles, Under water ships bottoms, pontoons and jetties. Etc.