



Mehr Afzoun Saman Co.

Mehr Afzoun Saman Co. (MAS Co.) has been established since 2003 and has grown through a series of its people hard work and talent. Owning a plentiful mine of Natural Asphalt (Gilsonite) in south part of Iran and as one of the leaders of exploration, mining and processing of this mineral in the country, we have a strong presence in many global markets such as India, China and south east Asia. Our sales are supported by our manufacturing and packaging plants in two regions of Iran and also trustful partners worldwide.

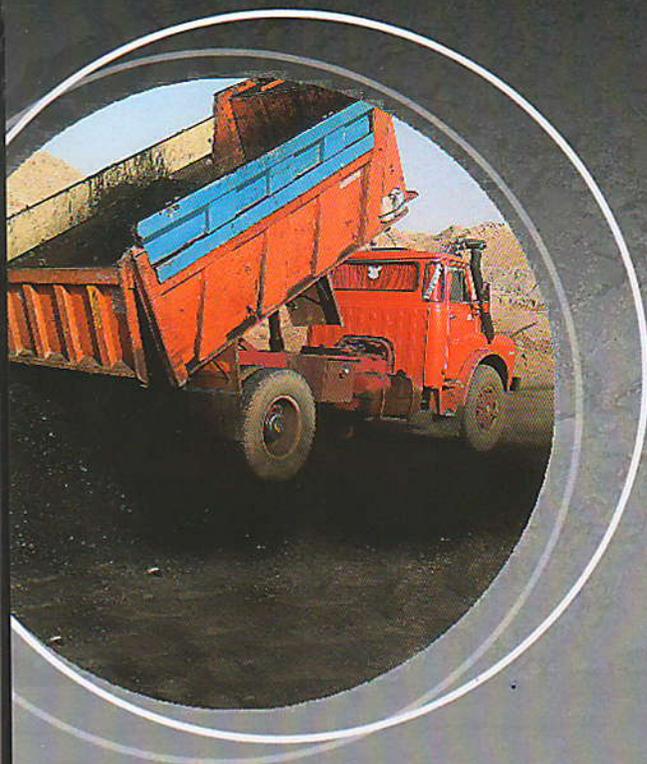
Our natural asphalt has a good level of physical and chemical properties naturally like solubility and softening point and variety of ash grades suited for different industries. In our processing and packaging plant in Isfahan, we can make natural asphalt lumps and even its rough powders into powders with mesh sizes varying from 30 to 110 and ash contents varying from 5% to 20% and even more.

The products will be finally under strict quality control by our engineering team and will be packed in customer's desired packaging such as 500 Kg, 750 Kg or 1 MT jumbo bags for lumps and 25 or 50 Kg bags for powders. The production capacity is about 2,000 metric tons per month at least.

Benefitting from our plants and premises inside the country that comes the below, we own a reliable and efficient network of facilities which enables us to meet our customer's technical and commercial requirements:

- Our mine in Behbahan city, Khuzestan province
 - Our production and processing plant in Alavicheh Industrial town, Isfahan province
 - Our headquarter office in Tehran for managing, planning and coordination of all operations
 - Our Trading office in Bandar Abbas port to perform and ease the procedure of land and ocean transportations and customs clearance formalities
 - Our general trading company in Erbil, the capital of the Kurdistan Region of Iraq
- Enjoying our team's refreshing knowledge and expertise, we are committed to deliver our customers best products and quality of services, always.





ABOUT GILSONITE (MD)

Gilsonite, or MD or Natural Asphalt is a natural, resinous hydrocarbon. This natural asphalt is similar to a hard petroleum asphalt and is often called a natural asphalt, asphaltite, uintaite, or asphaltum. Gilsonite is soluble in aromatic and aliphatic solvents, as well as petroleum asphalt. Due to its unique compatibility, gilsonite is frequently used to harden softer petroleum products. Gilsonite in mass is a shiny, black substance similar in appearance to the mineral obsidian. It is brittle and can be easily crushed into a dark brown powder. MD is found below the earth's surface in vertical veins or seams that are generally between two and six feet in width, but can be as wide as 28 feet. Due to the narrow mining face, Gilsonite is mined today, much like it was 50 or 100 years ago. The primary difference is that modern miners use pneumatic chipping hammers and mechanical hoists.

GILSONITE CONSUMPTION USAGE

Gilsonite is used in the manufacture of wire insulation, paints and varnishes, construction materials, asphalt, printing ink, oil well drilling, drilling fluid and in foundry casting. Gilsonite is a geologically interesting and economically significant resource, and its wide range of uses has changed over time with new technology and industrial needs.

DRILLING FLUID

For many years, Gilsonite has been used in the oilfield as an additive in drilling fluids. Gilsonite's unique properties make it important for many oil field drilling fluid products and the recent boom in oil and gas development has increased demand. When gilsonite is added to oil- and water-based drilling fluids, it partially melts or deforms, plugging off micro-fractures in the rock and smearing the inside of the well bore to make a tight, tough filter cake that prevents fluid loss.

The dissolved gilsonite also increases drilling fluid viscosity, providing lubrication, and together with the sealing off and stabilization of problem rock around the well bore, helps prevent the drill pipe from getting stuck in the well. Gilsonite is also used in cementing fluids as a lost-circulation material due to its plugging and binding properties, and as a slurry density reducer in some specialty cementing fluid.

CONSTRUCTION & ROAD PAVING

Asphalt producers use Gilsonite resin, road paving engineers and paving contractors who are concerned with PG specifications, high performance and cost effectiveness. Gilsonite, long known as a bitumen reinforce and hardening agent, also offers a unique combination of high performance and economical for high stress paving, as well as preservation applications. A significant benefit of Gilsonite is in producing road pavement mixes of higher stability than conventional ones.

Various properties of asphalt are manipulated to produce a product that has the appropriate wear properties, rut resistance, fatigue and low temperature cracking resistance, adhesion strength, viscosity and pour point. Rut resistance is resistance to longitudinal surface depressions in the wheel paths. Adhesion strength is the maximum adhesion strength of the joint sealant and the joint reservoir, including but not limited to, between the aggregate and the binder. Shove resistance is resistance to permanent, longitudinal displacement of a localized area of the pavement surface caused by traffic pushing against the pavement. Heavy hydrocarbon that can be derived from, without limitation, natural asphalt (Gilsonite), shale asphalt, bottoms from a solvent DE Asphalting process, hard asphalt, blown asphalt, stiff refined asphalt and flux. It is generally regarded that Gilsonite reduces pavements' low temperature properties making them susceptible to thermal cracking.



Gilsonite melted into hot asphalt will reduce penetration and increase viscosity of the asphalt binder. Gilsonite may also be mixed with aggregate prior to combining with the asphalt binder. Gilsonite-modified asphalt pavements have been particularly successfully in highly stressed traffic areas. Transportation has been increased dramatically nowadays. High stress traffic situations frequently take place around the country.

Advantages:

- Improved resistance to deformation
- Improved the economic performance of the road
- Improved resistance to stripping
- Improved resistance to fatigue
- Improved durability
- Compensation for poor mixes design
- Compensation for poor aggregates

GILSONITE IN FOUNDRY

Gilsonite is combined with coal and other ingredients as an additive in foundry sands to insure the quality of the molded part. The lower gas evolution should reduce ventilation load on the pouring floor. The physical property relationships developed in new sand mixes were confirmed by sand using Gilsonite as an additive. Casting finish of a Gilsonite mix has been equal to sea coal.

Gilsonite is also used as a carbonated additive in casting sands that creates smoother plates on gray iron castings. In a lower temperature than coal, it makes the material volatile so that it improves the process of separating the metal from the mold. Moreover, the surface of the mold is smoother and cleaner. Gilsonite can be used as an additive to or a replacement to sea coal or other common carbonated additives in foundry.

One of the great advantages of using Gilsonite on sand mold is increasing the hot resistance, increasing the pure (dry) resistance, decreasing the penetration and increasing the hardness of the mold. Physical Sand properties with Gilsonite resin are equal or superior to sea coal at significantly lower additive levels. Gilsonite improves sand density, water requirements and strength (green, dry, baked, and hot). Gas evolution curves show that Gilsonite volatilizes more rapidly than sea coal. Gilsonite has the same total volatiles as sea coal at one-third the additive level.

During pouring, the gases given off from the carbonaceous additives form a gaseous film which prevents the molten metal from making direct contact with the clay-coated sand grains, reducing sand-metal contact and consequently burn-on. When heated, the carbonaceous materials provide volatile, hydrocarbon gases which then pyrolyse to posit a lustrous carbon graphitic layer in the metal-mold interface region. This deposition acts as a physical barrier to iron silicate formation as well as not being readily wetted by molten iron. The combination effect is to inhibit burn-on and penetration.

Gilsonite will

- Reduce imperfections due to the rapid reactions
- Improve sand peel from casting at shakeout
- Produce smoother, cleaner casting surface
- Minimize imperfections, casting losses, scrap

Gilsonite has

- Three times as much gas generated as sea coal for better mold release
- High lustrous carbon for better finish
- Reductive atmosphere for less reaction between mold & casting for fewer imperfections



INKS AND PAINTS



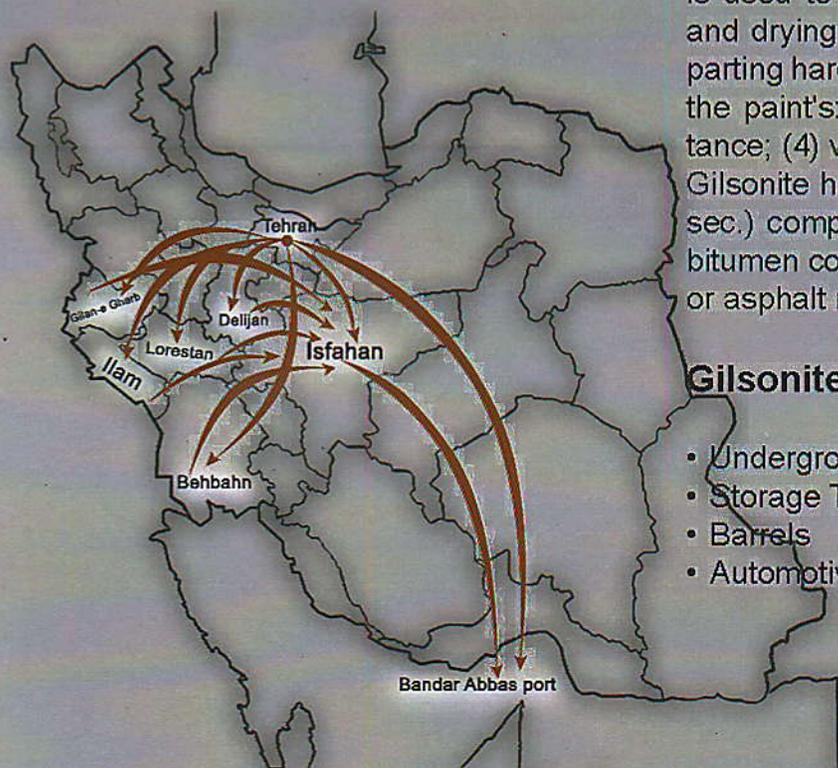
Gilsonite has been used for in the paint industry for a decent amount of time. This material is used in paints with a bitumen base. The high nitrogen content of Gilsonite increases the adhesiveness and the stability of the Gilsonite against ultraviolet (UV) light. This product is mainly used in coating the exterior surface as also creating resistance against acids, it is used as the coating for car chassis and coating of metal structures. Gilsonite has been used as the first wet carbon agent in black inks for newspapers and magazines. High concentrations of Gilsonite have been used in newspaper printing inks. The main usage of this material is for dispersing black carbon particles that comprise the black color of the printing inks. This material is used in black ink as a cost-effective replacement for other resins. Moreover, in wood paintings it is used as dark brown paint. Due to the unique chemical and physical qualities of Gilsonite, it can lend useful characteristics to paints and polishing finishes.



Gilsonite powder is readily soluble without heating in aromatic solvents (Benzene, Toluene, Xylene) and in most chlorinated solvents. It is also soluble without heating in aliphatic and low aromatic solvents (VM&P and other Naphtha, Ink Oils and Mineral Spirits), but mixing time is longer. Without heating, the pulverized grade is recommended. In paint applications, Gilsonite is usually used in combination with bitumen (asphalt). In most cases, if Gilsonite is used alone, the final paint will be very hard and brittle after drying. If normal straight-run bitumen is used alone, the finished paint is too soft and tacky. Therefore, a combination of Gilsonite and bitumen is used to achieve the desired hardness (penetration) and drying time of the finished paint. In addition to imparting hardness to the paint, Gilsonite is also increasing the paint's: (1) adhesion; (2) gloss; (3) chemical resistance; (4) water resistance; and (5) body. For hardness, Gilsonite has a zero (0) penetration (at 25°C; 100 gm. 5 sec.) compared to the 60-70 pen, 80-100 pen or softer bitumen commonly available from petroleum companies or asphalt manufacturers.

Gilsonite is recommended to be used in

- Underground Pipelines & Undercarriage
- Storage Tanks
- Barrels
- Automotive





Mehr Afzoun Saman Co.

Miner, Industry leader and Exporter



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