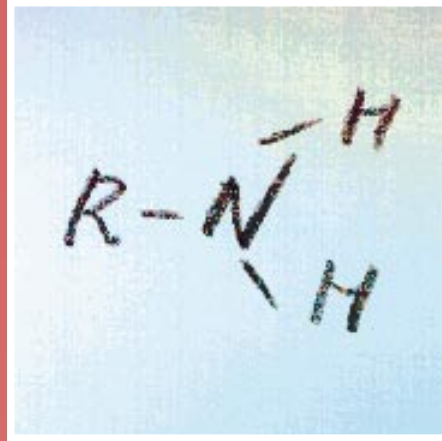


FATTY AMINES



Rofamin®



State-of-the Art Technology Designed for High Standard Products.

Fatty Amines

By 1931, Deutsche Hydrierwerke (DHW) in Rodleben/Germany patented and initiated the world's first production of fatty alcohols based on the evolving technology of catalytic, high pressure hydrogenation. The experiences acquired by the DHW since this time in field of hydrogenation technology resulted in a key innovation for the company in 1960: the production of fatty amines from natural raw materials. The initial use for primary amines was in the flotation of potash ore and then followed the establishment of a wide range of fatty amine compounds. Decades of experience in fatty amine manufacture then led to the construction of a new state-of-the-art production facility which was built in 1997.

DHW fatty amines are made and distributed under their trade name, ROFAMIN. Through extensive research and development, continuous quality assurance and customer information, the ROFAMIN range has expanded to include products for a large variety of applications in industrial and chemical processing.

In 1991, DHW was incorporated in the worldwide network of research and production facilities of our oleochemicals group. With the creation of Ecogreen Oleochemicals in 2001, DHW reinforced its position as a global producer and supplier of primary fatty amines, unsaturated fatty alcohols, sorbitols and other sugar alcohols as well as of a new range of speciality fatty esters and ethers.

Longtime R&D experience combined with additional synergies from global oleochemistry allows DHW to present itself as a strong and reliable partner for industrial cooperation. DHW in Rodleben offers starting from vegetable based raw materials tailor-made oleochemical derivatives to be used in the production of nutritional products, cosmetic and pharmaceutical goods as well as additives for industrial purposes.

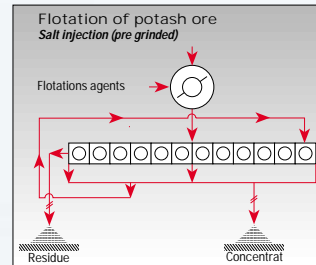
Progress from Nature

Over the years, as worldwide awareness for environmental issues have grown, gentle processing technologies and the use of renewable resources have become increasingly important. Our technological expertise making use of natural ingredients for the production of chemical substances qualifies DHW at Rodleben to fulfill its obligations in meeting the requirements for a sustainable, ecologically-sound world. The concept of a chemical production site based on human needs and environmental awareness is already reality within our company today.

Flotation agents

Flotation is designed to separate the separation of one material from a mix of several substances. To achieve this, the target product needs to be made selectively oleophilic and this – as in the potash flotation of potassium chloride – can be brought about by treatment with long-chain amines i.e. compounds of type ROFAMIN T/TD, T40/TD40 or R.

For maximum yield, we take care to supply amines with chain length compositions adjusted to specific conditions. Equally good results are obtained with ROFAMINS in the flotation of quartz, sands, feldspar and other acidic siliceous minerals and rocks.



Anticaking agents

The term anticaking agent refers to substances such as ROFAMINS that can prevent inorganic salts from caking. Their anticaking effect is based on a hydrophobic action displayed by fatty amines and their substantivity for the various salts, which enables salts and fertilizers to be made smooth and free-flowing. The effect thus produced is a lasting one and persists during the time of storing, shipping and up to the time of further processing of the material. The fatty amine treatment is made using either the molten form or aqueous dispersions or aqueous fatty amine salt solutions.



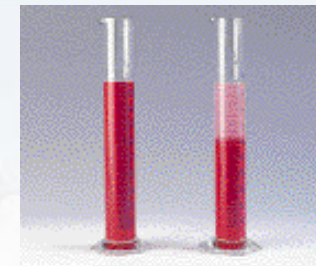
Substantivity – dominant principle of versatility

The cationic compounds i.e. fatty amines and fatty amine derivatives, differ from anionic and nonionic surfactants in that they have a marked degree of substantivity for nearly all solid surfaces. Their substantivity is a characteristic property which allows them to be absorbed onto solids and form a firm cationic film on them so that properties can be varied to fit in with any desired application. Thus materials such as wool, hair, leather, cotton, synthetic fibres, plastics, dye pigments, rocks, metals etc. can be treated with fatty-amine-based cationic formulations to acquire useful properties for quite specific applications. Substantivity imparts versatility in product application and this reflects in fields including

- anticorrosion agents for oil, aqueous media, and lubricants,
- fabric softeners, antistatic agents,
- bonding and wetting agents for varnishes, paints, adhesives, dispersions and bitumen/asphalt,
- textile, leather, rubber, dyeing and washing auxiliaries,
- hair conditioners and disinfectants,
- flotation agents and anticaking products etc.

Corrosion inhibitors

ROFAMINS and their salts are suitable for use as anticorrosion agents as they can be substantively absorbed onto metal surfaces from either aqueous or oily systems. The resulting coating firmly adheres to and protects metal surfaces from aggressive liquids or gases. Very good results have been obtained with type ROFAMINS T applied as internal anticorrosion treatment to steam and condensate piping. Similarly, in the petroleum industry, fatty amines and their salts give outstanding results in corrosion prevention. ROFAMIN salts added to fuel or mineral oil or other hydrocarbons prevent corrosion caused by condensation moisture in storage tanks.



Dispersants

Addition of ROFAMINS including their ethoxylated forms or salts, in the preparation of paints and printing inks, provides an effect that induces optimum wetting and dispersion of dye pigments. Even small percentages of ROFAMINS added to formulations in the plastics and rubber industry can act as release agents and as dispersants for fillers and pigments.

Emulsifiers and Additives

Salts of the ROFAMINS, i.e. their acetates, hydrochlorides, lactates and citrates have manifold uses as substantive emulsifiers. Together with ethoxylated ROFAMINS, they enter the preparation of cationic oil-in-water type emulsions. These formulations have two distinct features – excellent oil perfusion and oil adherence, a quality that anionic or nonionic formulations could never achieve. Asphaltic bond emulsions prepared with fatty amines and their derivatives have gained great importance in roadbuilding. With them, roadbuilding may be carried on even in wet and cold weather.



Fungicides, Bactericides, Algicides

Fatty amines and their salts have a broad spectrum of activity against bacteria and fungi, which explains why formulations and preparations made with ROFAMINS fail to show putrefaction or mould. Against many organisms, activity is optimal in a chain length range of 12 to 16 carbon atoms. ROFAMIN K and KD or preparations based on these are therefore most appropriate for disinfection uses in the medical, technical and household areas. In order to achieve a satisfactory fungicidal effect, fatty amines are neutralized with acids and phenols having fungal activity. Combinations of fatty amine and quaternary ammonium salts derived from it are known as algicides and prevent algae growth in swimming pools, cooling towers etc.

ROFAMIN formulations deny no wishes

Manufactured to meet high standards of quality

Long standing production know-how and a production technology specifically engineered to meet fatty amine quality standards are a guarantee of products of the highest grade. Being concerned with regard to both technology and ecology, we have committed ourselves to a strategy for quality that accords with the tradition and weight of an established brand of products known as ROFAMINs. As a result, there is a dedicated high level of quality that assures processing security and product safety as well as marketable end products with a competitive edge.

Uncompromising qualities – optimum benefit

ROFAMINs and their salts are invaluable in terms of substantivity and indispensable in a wide range of uses of cationic surfactants. They have entered numerous products and industrial processes and many of these would now be inconceivable without them. In addition to this, ROFAMINs are appealing and desirable for use as raw materials in chemical processing.

As primary fatty amines, they are a key element in the synthesis of secondary and tertiary amines and of quaternary ammonium compounds. Reacting ROFAMINs with ethylene oxide gives water-soluble products which, unlike the water-insoluble free fatty amines, can exert distinct substantive properties as early as at the basic stage – a crucial advantage in some specific textile auxiliaries.

Primary fatty amines are also basic materials for propylene diamines, with a prime use as cationic emulsifiers in asphaltic road construction. Apart from these, there are many other syntheses that can use saturated or unsaturated type fatty amines and this, of course, highlights the role of ROFAMINs in synthesis.

Physical characteristics

ROFAMINs at room temperature, can be either liquid, pastes or solids depending on their chain length, and have a characteristic smell. While fatty amines are virtually insoluble in water, their hydrochlorides, acetates, formates etc. as well as ethoxylated compounds at more than 5 moles EO can readily be dissolved in water. Most of the fatty amines and their derivatives dissolve in organic solvents such as alcohols, hydrocarbons, oils etc.

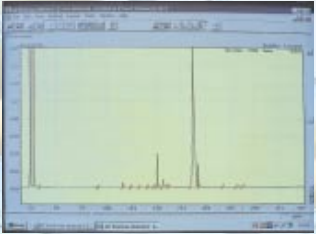
Available Range

Product	Chemical description
Saturated Primary Fatty Amines	
ROFAMIN K	coconut amine, technical grade
ROFAMIN KD	coconut amine, distilled
ROFAMIN ST	stearyl amine
ROFAMIN STD	stearyl amine, distilled
ROFAMIN T	tallow amine, hydrogenated
ROFAMIN TD	tallow amine, hydrogenated & distilled
ROFAMIN R	rape oil amine, hydrogenated
ROFAMIN RD	rape oil amine, hydrogenated & distilled
Unsaturated Primary Fatty Amines	
ROFAMIN T 40	tallow amine, partially unsaturated
ROFAMIN TD 40	tallow amine, partially unsaturated, distilled
ROFAMIN O 75	oleyl amine, unsaturated
ROFAMIN OD 75	oleyl amine, unsaturated, distilled
ROFAMIN O 85	oleyl amine, unsaturated
ROFAMIN OD 85	oleyl amine, unsaturated, distilled

The above is a list of our standard products of which we always have stock to supply your needs. Our flexible production will also allow us to quickly tailor – make any product you may require – including those made from different vegetable oils.

For precise product data and details, please refer to the specification sheets.





Customer orientation is our principal mission, where we strive to offer tailored solutions for products and services. In technical marketing our research department's expertise exists in numerous applications, and the input of our customer's requests is our primary concern.

Carefull control assures consistent product quality. Using up-to-date modern equipment, the analytical methods follow the latest international standard procedures. Whenever specific requirements exist, the procedures and the documentations of results are detailed according to the customer's needs.

Our standards provide for the responsible care. The raw materials are based on renewable sources and manufactured with 'state of the art technology'. Sewage treatment facilities at our production sites assure that the scenic Elbe river valley in Germany and the Pacific bays in Indonesia remain the way nature intended it to be. Beavers, storks, and sea habitants can thrive, live, and breed for their next generations' offspring.

*Give us
a call*



A Strong Global Partner in Oleochemicals

Our strength is experience in the manufacture of products based on renewable raw materials together with our direct access to natural resources. Our core business is based on the

production of saturated and unsaturated natural fatty alcohols from palm-kernel or coconut oil.

Polyols, fatty amines and speciality chemicals broaden our current product portfolio and by day we add new products to our range.

Throughout the world our people develop products, technological

solutions, performance optimizations and new application formulas.

With our initiatives, we want you to benefit from the global strength of our dynamic group.

We look forward to working with you!

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