

Flotation



Extracting Value with Efficient Flotation

Separation of minerals through an efficient flotation process is important in recovering the most value from extract ore operations. Dow provides a wide range of integrated solutions to help our customers optimize their flotation processes. Dow offers flotation solutions for sulfide and non-sulfide minerals as well as non-metallic ore processing, including coal.

The Power of ORE

From increasing cost pressures, to more stringent environmental and safety regulations, to declining ore grades, the mining industry faces numerous challenges impacting profitability. Dow is helping to address these challenges with the Power of ORE – a wide range of products and expertise to address a broad spectrum of mining, mineral processing and remediation challenges.

The Power of ORE gives companies striving to extract more value from mining operations a real choice in the marketplace. Dow can help enable **Operational efficiency**, boost **Recovery enhancement** and facilitate **Environmental protection**.

Flotation Offerings and Solutions

Function	Dow Product	Description
Depressants	ANTISOL™	Carboxymethylcellulose additives
	CELLOSIZE™	Hydroxyethylcellulose additives
	Ethyleneamines	EDA, DETA, TETA, TEPA & AEP
Dispersants & Rheology Modifiers	ACUMER™ Series	Acrylic polymer dispersants and rheology modifiers for industrial minerals and metallic ores. Works well in dispersing clays and reducing viscosity in high-concentration flotation systems.
Frothers	DOWFROTH™	Industry-leading line of polyglycol ethers
	Alcohols	Diisobutyl carbinol (DIBC), Methyl isobutyl carbinol (MIBC) and 2-ethylhexanol
	Ketones	Methyl isobutyl ketone (MIBK) and Industrial grade ketone solvents
Defoamers & Surfactants	DOWFAX™	Anionic surfactants
	ECOSURF™	Biodegradable* non-ionic surfactants
	TERGITOL™	Non-ionic surfactants
	TRITON™	Anionic and non-ionic surfactants
	Polypropylene Glycols (PPGs)	Molecular weights from 250 to 4000
Separation Aids & Flocculants	UCARFLOC™	High molecular weight polyethylene oxides (PEOs) that exhibit unique attraction toward colloidal silicates

*Readily biodegradable as defined in OECD Guidelines for the Testing of Chemicals, Section 3 (Rev. 23, March 2006)

Dow's portfolio of flotation solutions includes modifiers, frothers, and separation aids and flocculants. Some of the benefits are listed below.

Modifiers

- Wide range of specialty and performance depressants, dispersants and rheology modifiers
- Enhanced flotation selectivity
- Increased recovery with higher solids and lower water content in flotation cells
- Selective dispersion of undesired clays and other gangue material

Surfactants

- Wide range of anionic and non-ionic surfactants
- Enhanced water surface tension reduction
- Foam control and froth stability
- Selective particle wetting for enhanced hydrophobicity in flotation separation
- Biodegradable¹ offerings

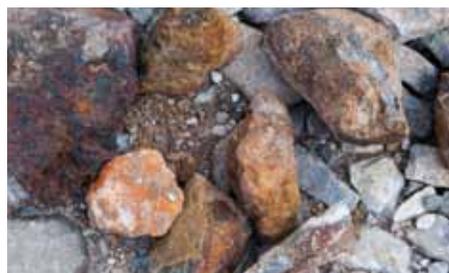
Flocculants

- Accelerated particle settling
- Improved filtration
- Selective mineral enrichment

¹Readily biodegradable as defined in OECD Guidelines for the Testing of Chemicals, Section 3 (Rev. 23, March 2006)



Copper ore



Gold ore



Nickel ore

Dow's complete line of frothers is designed to help meet any and all of your froth flotation needs. Included in Dow's family of frothers is DOWFROTH™, a premium blend of polypropylene glycols and glycol ethers that has been recognized as an industry leader for over six decades. In addition, Dow offers a wide range of specialty and performance alcohols and ketones. Some of the benefits offered by Dow frothers include:

- Reduced water surface tension
- Improved froth stability
- Accelerated flotation

Product	Application
DOWFROTH™ 200	Platinum and selective fine particle flotation
DOWFROTH™ 250	Copper, molybdenum, lead, zinc, iron, gold and silver
DOWFROTH™ 300	Coal
DOWFROTH™ 400	Coarse particle flotation

Dow's History in the Mining Industry

Since our earliest roots isolating compounds from prehistoric brine in the 1890s, to pioneering chemistries for froth flotation processes, to developing innovative technologies for water treatment and reuse today, Dow has continued to innovate to help customers extract more value in the mining industry.

Dow is a world leader in membrane (RO/NF/UF) and ion exchange technologies, and provides a powerful portfolio of chemistries and solutions to address:

- Mine water management, including tailings and waste treatment
- Slurry management
- Dust control
- Grinding and milling
- Flotation and hydrometallurgy, focused on maximizing metal recovery utilizing select chemistries, polymer additives and ion exchange technologies

Commitment to Sustainability

Dow's commitment to sustainability is infused into the very DNA of our Company. In 2006, we launched our current set of 2015 Sustainability Goals, which focus not only on the Company's footprint in our own operations but also our handprint through the positive impact of Dow products and their role in global sustainable development. Focused on addressing global challenges like water, food, climate change and energy, Dow has made significant progress against these goals. For more information on how sustainability is integrated into all aspects of our business and operations, please visit www.dow.com/sustainability.

**Product Stewardship and Safety**

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products – from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

The Dow Chemical Company**U.S., Canada and Mexico****dow.com/mining**

Toll Free 800 447 4369*

Latin America +55 11 5188 9222**Europe**

Toll Free +800 3 694 6367*

+32 3 450 2240

Asia Pacific

Toll Free +800 7776-7776*

+60 3 7958 3392

Middle East (Dubai) +971 4 453 7000**North Africa (Cairo)** +202 2 480 1466**Sub-Saharan Africa
(Johannesburg)** +27 11 575 1547*Toll-free service not available in all countries

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