



A Subsidiary of PETRONAS Chemicals Group

Antifoams

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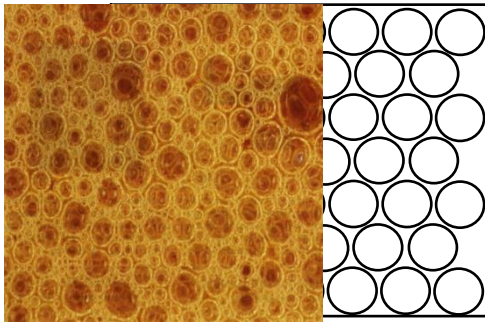
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Antifoams

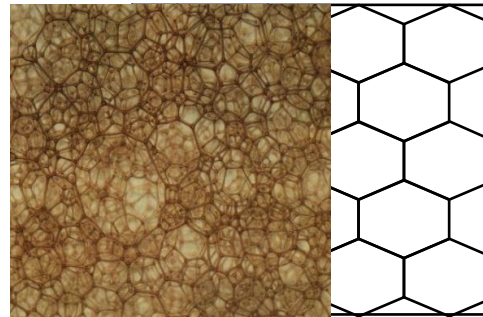


Foam Theory - What is foam?

- Definition : A concentrated dispersion of air or gas bubbles in a liquid medium, stabilized by impurities
- Properties:
 - Low density and large surface area
 - Liquid in bubble-wall thinned to a lamella
- Structures:



Spherical
Wet
Less stable
- *Beer*
- *Detergent*



Polyhedral
Dry
Highly stable
- *Fire fighting*
- *Shaving*

Foam Theory – How it's formed

Chemical

- Reaction (curing, neutralization, redox, effervescence)



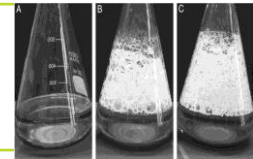
Biological

- Bacteria & yeast (degradation, metabolism, fermentation)



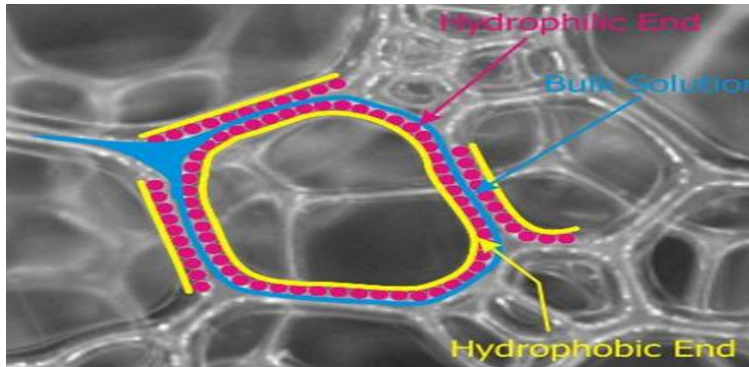
Physical

- Handling (blending, extraction, centrifuging, pouring)



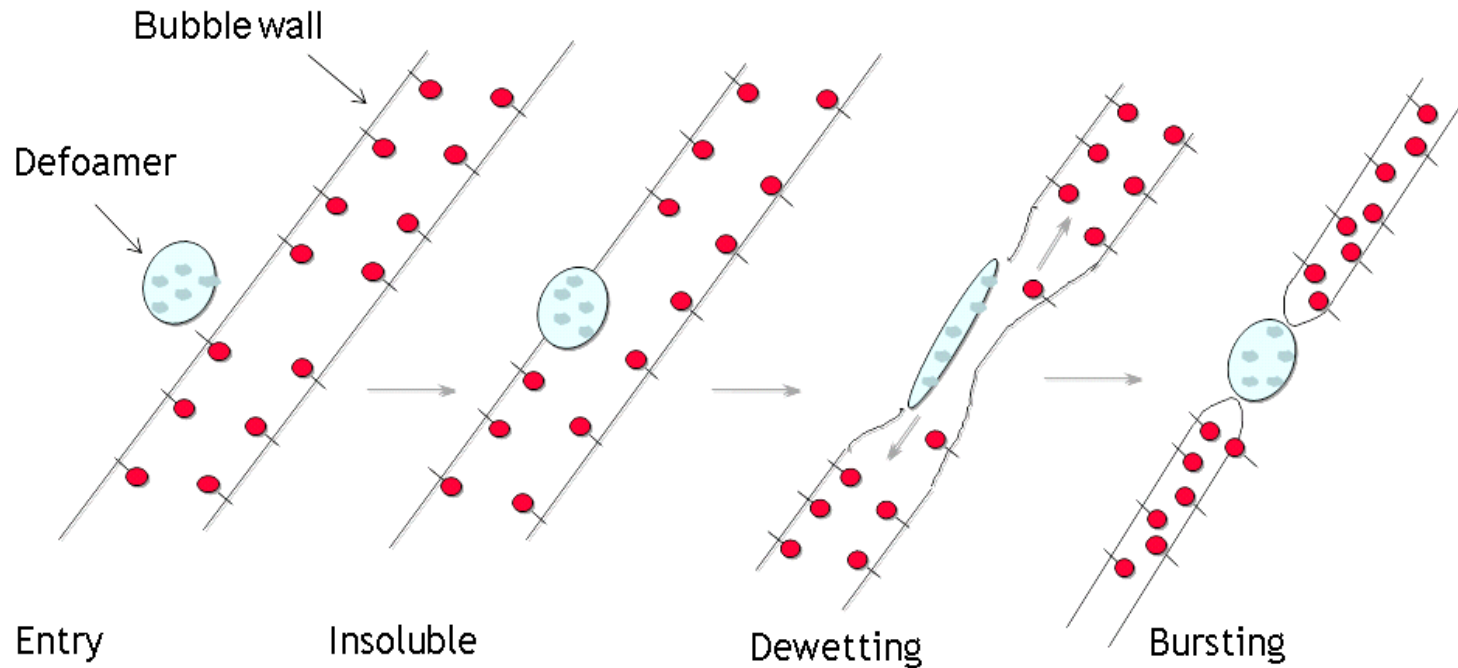
Foam Theory - Stability

High Concentration
Low Temperature
High viscosity
High pH



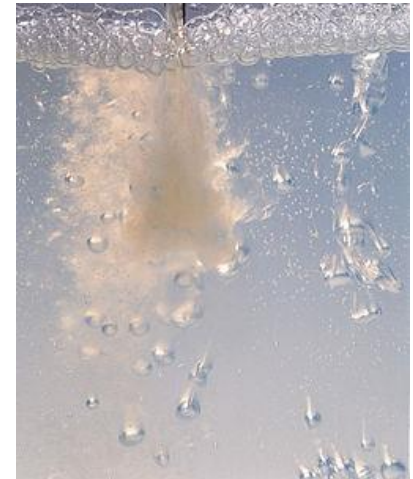
Surface Elasticity – Marangoni ‘self-heal’
Surface Viscosity – Slows bubble drainage
Bulk Viscosity – Maintains trapped air
Electrical Repulsion – Prevents wall thinning
Gas Diffusion – Ostwald Ripening

Foam Control Theory – Mechanism



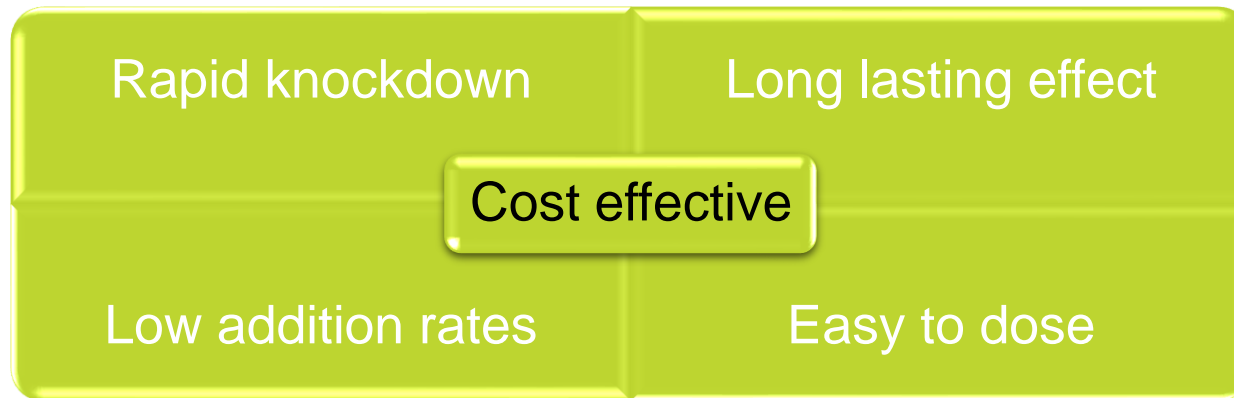
Foam Control Practise – Antifoam Characteristic

- Be neither soluble or insoluble in foaming media
- Disperse to the surface quickly and evenly
- Cause no unwanted secondary effects
 - Oil spotting
 - Reticulation
 - Separation
 - Poisoning
- Meet regulatory protocol



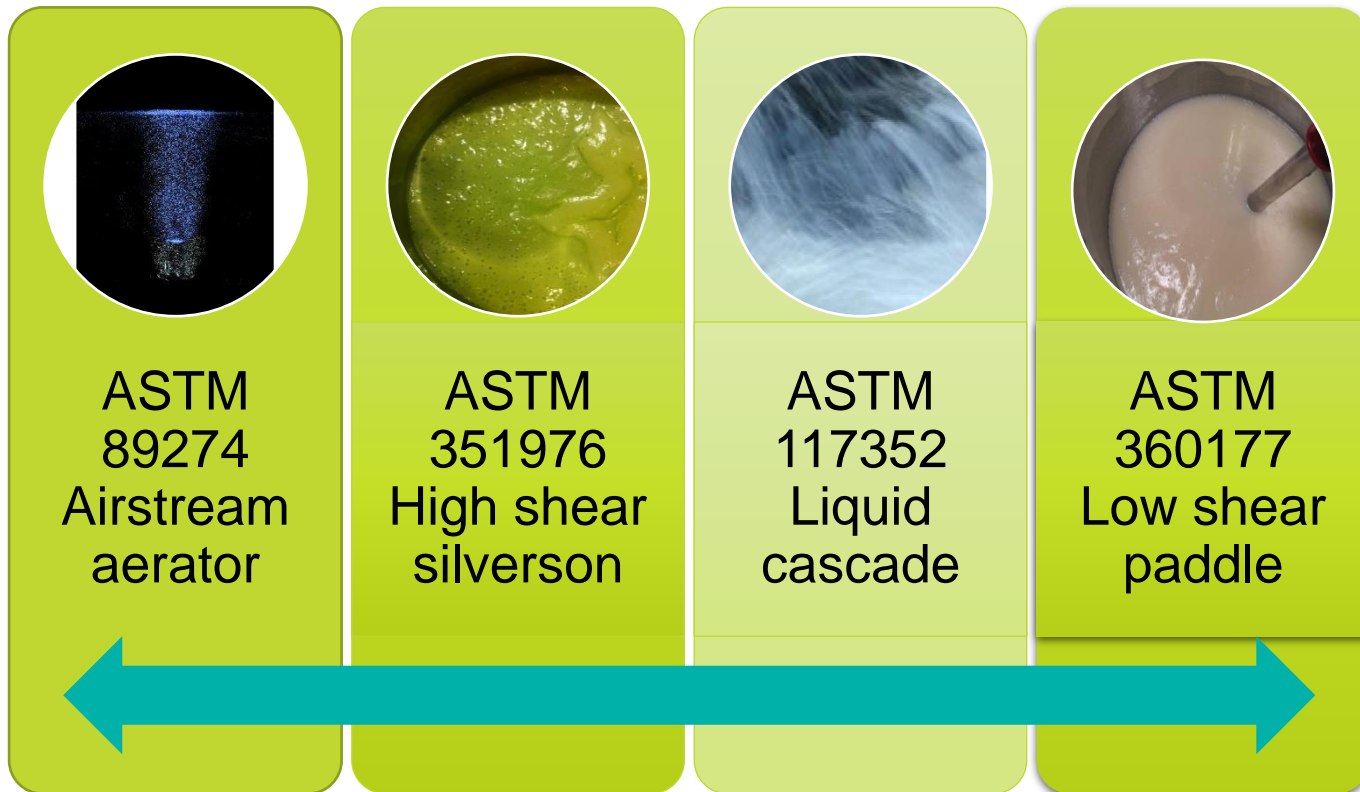
Foam Control Practise

- The ideal antifoam



Foam Control Practise

- Antifoam testing



Foam Control Application

- Application testing

- Basic measuring cylinder shake-test
- Ross Miles test – Diesel fuel
- Rudin test – Fermented beers
- Hamilton Beech test – Latex emulsions
- Wascator test – Detergent antifoams
- Contifoam test – Knockdown & durability



Foam Control

BRB Akasil® Technology

Silicone fluids

Silicone compounds

Silicone emulsion

Foam Control- Akasil® Antifoam Silicone Fluids

Akasil® Antifoam 12,500 – 80,000 cSt Fluids

BRB Silicone Oil 100 – 1000 cSt Food Grade

Akasil® Antifoam 2107 – in solvent

Akasil® Antifoam 3107 – in solvent

Akasil® Antifoam 4107 – in solvent

Akasil® Antifoam 7107 – in solvent

Foam Control- Akasil® Antifoam Compounds

Akasil® ADP 100

Akasil® ADP 300

Akasil® ADP 500

Foam Control- Akasil® Antifoam Silicone Emulsion

Akasil® Antifoam TG/XP – Industrial

Akasil® Antifoam FD – Indirect food contact

Akasil® Antifoam SD/PS – Food compliant

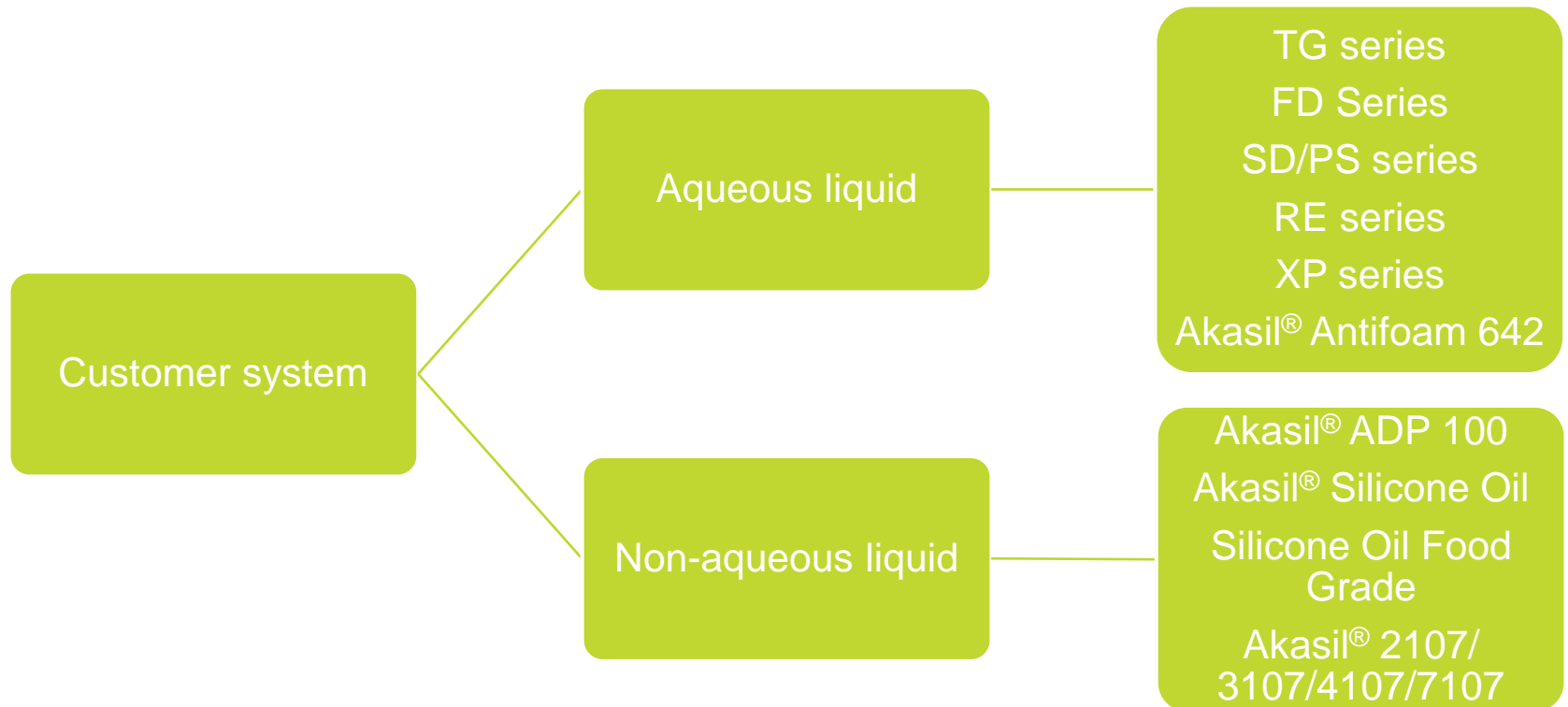
Akasil® Antifoam RE – pH stable

Akasil® Antifoam 642 – Non-silicone

BRB Antifoam range overview

Product	% Silicone content	Technology	Foaming medium	Performance
Akasil® ADP 100, 300, 500	100	Compound	Non aq	Technical & food grade
Akasil® Antifoam TG 10, 20, 30	10, 20, 30	Non-ionic emulsion	Water	General purpose technical
Akasil® Antifoam RE 20	20	Non-ionic emulsion	Water	Alkali resistant
Akasil® Antifoam XP 20	20	Emulsion	Water	High shear stable
Akasil® Antifoam 2107, 3107, 4107, 7107	30, 10, 20	Solvent	Non aq	For hydrocarbons
Akasil® Antifoam 12.5 - 60 K cSt	100	Concentrate	Non aq	For hydrocarbons
BRB Silicone Oil 100 - 1000 cSt Food Grade	100	Concentrate	Non aq	Food grade
Akasil® Antifoam FD 10, 20, 30	10, 20, 30	Non-ionic emulsion	Water	Indirect food contact
Akasil® Antifoam SD 10, 20, 30	10, 20, 30	Non-ionic emulsion	Water	Food grade
Akasil® Antifoam 10, 20, 30 PS (Halal certified)	10, 20, 30	Non-ionic emulsion	Water	Food grade
Akasil® Antifoam 642	100	Concentrate	Water	General purpose technical, non-Silicone based

Foam Control – Choices



Foam Control In Application



Markets

- Adhesives & Sealants
- Agro-chemicals
- Coatings / inks / Varnishes
- Construction Chemicals
- Detergents & cleaning
- Fermentation
- Food and beverages
- Leather & Textile
- Metal working fluids
- Decorative paints
- Pulp & Paper
- Oil & Petrochemicals
- Starch – Sugar / Potato
- Water Treatment

Foam Control Application – Food

Key factor

- Antifoam are process-aids, seldom ingredient
- Each country has unique food sector
- Universal contract food production
- Observe FDA Limits : 10 ppm antifoam actives

Foam Control in Foods – Regulation

Chapter 21 FDA 173.340 Direct Food Contact

- Most relevant paragraph for defoamers

Chapter 21 FDA 175-178 Indirect Food Contact (Silicone)

- Adhesives for board & packaging, process lubricants

Jecfa

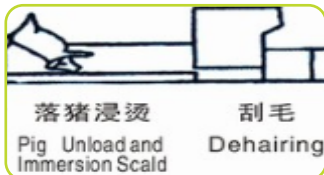
- Joint Expert Committee on Food Additives (PDMS E900)

HACCP

- Hazard Analysis & Critical Control Point



Akasil® Antifoam SD 10 for meat & fish



Meat processing

- Dehairing, scalding
- Meat processing industry



Digest production

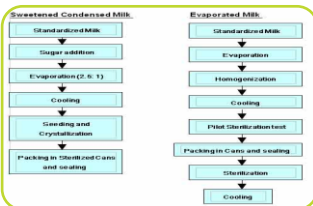
- Boiling, concentrating
- Rendering industry



Brine solutions (shellfish)

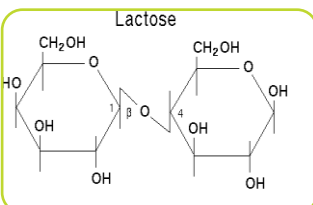
- Washing and canning
- Fish processing industry

Akasil® Antifoam SD 10 in dairy sector



Condensed milk

- Evaporation under vacuum
- Dairy industry



Whey, protein products

- Lactose processing evaporation, spray drying
- Food ingredients industry



Cleaning/Sanitizing In Process

- Rinsing and draining aid
- I & I detergent producers

Akasil[®] Antifoam SD 10 in sugar preparations



Jams, marmalades & sweets

- Soft fruit boiling, jellies
- Jams & preserves industry



Fruit compotes

- Boiling, sieving, dewatering
- Dairy industry



Juices, cordials & syrups

- Diluting, boiling, evaporating, bottling
- Soft drinks industry

Akasil[®] Antifoam SD 10 in vegetable & salad



Salads

- Lettuce Washing & sanitising
- Salad packing industry



Vegetables

- Peas beansprout washing cutting
- Vegetable processing industry



Beans and pulses

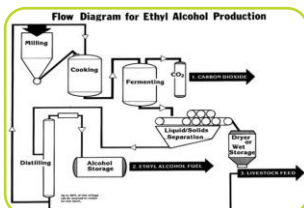
- Washing, rinsing, cooking
- Canned food industry

Akasil® Antifoam SD 20 in food fermentation



Beers and lagers

- Fermenting, boiling, centrifuging, yeast transfer
- Breweries



Alcohol and spirits

- Bio-culture forming, fermentation
- Alcoholic beverages industry



Vinegars

- Fermentation, bottling
- Condiments industry

Foam Control in other food categories



Cooking Oils

- Akasil® ADP 100/Akasil® ADP 2000P (Halal-certified)
- Oils & fats producers



Tofu and Soy Milk Production

- Akasil® Antifoam SD 10/Akasil® Antifoam 30PS (Halal-certified)
- Soybean processing industry



Packaging adhesives

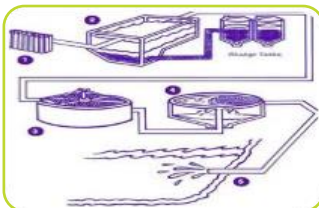
- Akasil® Antifoam FD 10/SD 10/Akasil® Antifoam 30PS (Halal-certified)
- Adhesives industry

Foam Control Application - Water Treatment

Key factor

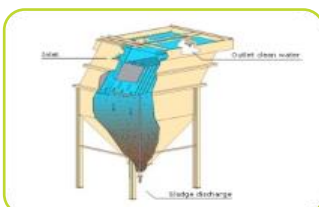
- Hundreds of specialist service providers
- Distributors well placed to offer one-stop shop
- Regulatory limits: generally none
- PDMS attaches to solid waste (non-biodegradable)

Akasil® Antifoam TG 10 for effluents



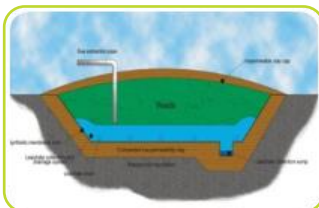
Municipal wastewater

- Aerobic, anaerobic digestion, evaporators
- Domestic water-supply companies



Industrial liquid waste

- Digestion, flotation units, lamella-flow, final effluent
- Chemical plants, food plants, textile/leather producers



Landfill and solid waste

- Leachate treatment, solvent recovery, biogas
- Waste and domestic landfill

Akasil® Antifoam TG 10 for process water



Recycling

- Plastic, cement, metal washing, effluent treatment
- Recycling industry



Sanitizing packaging for food

- Boiling, concentrating
- Industrial & Institutional detergent producers



Mining and mineral processing

- Mineral beneficiation, ore flotation
- Mining industry

Akasil® Antifoam TG 10 for cooling water



Metal working fluids

- Cutting, grinding, flushing
- Lubricant producers



Wire drawing

- Cooling, antifoaming, deaerating
- Metal processing industry



Boiler treatment

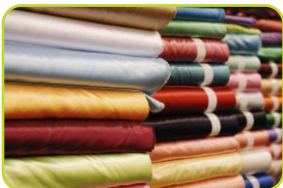
- Antifoaming and dearration
- Water treatment service companies

Foam Control Application – Industry

Key factor

- Many and varied applicational areas
- Many and varied products – often bespoke
- Major pre-requisite is process inertness

Akasil[®] Antifoam TG 10 for processing industry



Textile applications

- Preparation, coloration, finishing
- Textile auxiliary suppliers



Leather processing

- 47 processes in beamhouse, dyehouse
- Leather chemical suppliers



Pulp and paper

- Kraft pulping, brown-stock washing, coating
- Paper chemicals suppliers

Akasil[®] Antifoam TG 20 for formulations



Paints, inks, coatings, adhesives

- Solvent and water-based systems (Fluorosilicone)
- Coatings industry



Wood preservatives

- CCA, Copper triazole, cationics
- Timber chemical industry



Agrochemicals

- Pesticides, herbicides, fertilizers, rinsing
- Agrochemical industry

Akasil® Antifoam TG 30 for chemical industry



Polymers and latex emulsions

- Monomer stripping, styrene-butadiene, acrylonitriles
- Latex producers



Organic resins

- PU, PF, UF, blending, distillation, in process
- Polymers & resins producers



Construction cements and mortars

- Air-entrainment, plasticizers, chemical grouts
- Construction auxiliary suppliers

Akasil® Antifoam RE 20 and XP 20 for detergents



Powder laundry

- Dry-blend, spray-tower, fluidized bed
- Detergent producers



Liquid laundry

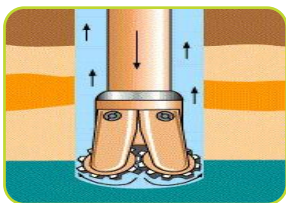
- In-line blending, batchwise process
- Detergent producers



Industrial detergents

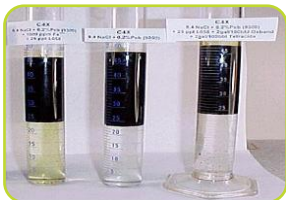
- Professional cleaners & detergents
- Industrial & Institutional detergent producers

Akasil® Antifoam for petrochemical



Exploration and extraction

- Drilling muds, cuttings treatment
- Drilling mud producers



Separation – gas, oil, water

- Demulsifiers (High Visc fluid), S/N scavanging
- Oilfield service companies



Downstream processing

- Refining (Silicone fluid) Diesel (Silicone glycol antifoam)
- Refineries



**Bursts your
bubbles**



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