MetSoP

METALLURGICAL SOLUTIONS & PRODUCTS

Flotation Reagents:

Performance, Precision and Partnership with MetSoP

In mineral processing, flotation reagents are not just chemicals. They are performance drivers. Recovery, concentrate grade, circuit stability and even smelter penalties are all directly influenced by flotation chemistry. Yet many operations still treat flotation reagents as routine consumables instead of strategic optimisation tools.

At MetSoP, we see flotation reagents differently. We see them as part of an integrated metallurgical solution — backed by mineralogy, analytical precision and structured plant optimisation.

What Are Flotation Reagents?

Flotation reagents are chemical compounds used in froth flotation to selectively separate valuable minerals from gangue. They modify mineral surfaces so that valuable particles attach to air bubbles and float to form a concentrate.

The correct flotation reagent strategy directly impacts:

- Recovery performance
- Concentrate grade
- Selectivity
- Reagent consumption
- Cr:Pt ratios in PGM circuits
- Overall plant profitability

If flotation chemistry is not aligned with the ore, value is lost.

The Main Types of Flotation Reagents:

Every flotation circuit relies on a carefully balanced combination of reagents.

Collectors

Collectors are responsible for making target minerals hydrophobic. In sulphide circuits, these may include xanthates, dithiophosphates and thionocarbamates. Collector selection largely determines recovery performance.

Frothers

Frothers control bubble size and froth stability. Proper froth management improves selectivity and reduces entrainment.

Depressants

Depressants suppress unwanted gangue minerals. In PGM flotation, effective chromite depression is critical to maintaining acceptable Cr:Pt ratios and reducing smelter penalties.

Activators and pH Modifiers

These reagents enhance mineral response and maintain optimal flotation conditions. Each plays a role. But real performance comes from how well they are integrated and optimised.

Why Generic Flotation Reagent Programmes Fall Short:

Ore bodies across Southern Africa are becoming more complex. Many operations face:

- Fine mineral intergrowth
- Variable feed grades
- High gangue content
- Challenging water chemistry
- Clay-rich ores

Using the same flotation reagent programme across changing ore zones often leads to unstable recovery and rising costs.
Optimisation without mineralogical insight is reactive. True improvement requires understanding the ore first.

MetSoP's Integrated Approach to Flotation Reagents:

What differentiates MetSoP is not just the supply of flotation reagents — it is the integration of chemistry, mineralogy and analytical science.

1. Ore Intelligence Through Mineralogy

Our Mineralogy Division provides detailed insight into mineral associations, liberation characteristics and gangue behaviour. This ensures flotation reagents are selected based on evidence, not assumption.

2. Laboratory-Based Validation

Our ISO-aligned laboratory conducts controlled flotation test work to evaluate collector blends, depressant strategies and frother optimisation before plant implementation.

3. Laboratory-Based Validation

Through our Analytical Services Division, we provide accurate and reliable data that supports real-time optimisation decisions.

4. Structured Plant Trials

We implement and monitor plant trials using a disciplined, data-driven approach, ensuring measurable performance improvement.
This integrated model allows MetSoP to develop customised flotation reagent strategies tailored to each ore body.

Delivering Measurable Plant Improvement

Flotation improvements do not always require capital investment.

In many cases, targeted reagent optimisation has delivered:

- Recovery improvements of 3 to 7 percent
- Improved concentrate grade
- Reduced chromite entrainment
- Lower reagent consumption
- Greater circuit stability

These gains translate directly into improved revenue and operational efficiency.
Small chemical adjustments, when properly designed and validated, can deliver significant plant-wide impact.

Flotation Reagents and Sustainability

Modern mining demands responsible operations.
MetSoP focuses on:

- Optimising dosage to reduce waste
- Improving selectivity to minimise environmental impact
- Supporting operations using recycled water
- Developing reagent strategies aligned with sustainable mining practices

Performance and sustainability must work together.

Why MetSoP Is the Right Flotation Reagent Partner

Choosing a flotation reagent supplier is straightforward.
Choosing a technical partner who understands your ore, validates solutions in the lab, supports plant implementation, and measures impact — that is strategic.
MetSoP combines:

- Technical metallurgical expertise
- Dedicated Mineralogy capability
- Advanced Analytical Services
- On-site plant support
- Structured performance reporting

Our focus is not simply on supplying flotation reagents. It is on delivering performance with purpose — measurable, sustainable and aligned with your plant's objectives.

Unlocking the Full Value of Your Ore

As ore complexity increases and margins tighten, flotation reagent optimisation becomes one of the most powerful tools available to metallurgists.

The right chemistry, guided by the right data and implemented with the right technical support, unlocks value that would otherwise be lost.

If your flotation performance is inconsistent, recovery is under pressure, or concentrate grade is declining, it may be time to revisit your flotation reagent strategy.

At MetSoP, we partner with operations across the region to turn chemistry into measurable performance.

Because flotation reagents are not just inputs.