

ADT

advanced dispersion technology

 **KIMYA**
CHEMICAL TECHNOLOGIES



Steel Industry Chemicals

Kimya Steel Industry Chemicals Division deals with the formulation and production of specialty chemicals and lubricants used in the Steel and Metalworking Industry.

Kimya innovative solutions help Customers to raise productivity and product quality and achieve unrivalled HSE benefits: eliminate operator's exposure to VOC, risk of fire and carcinogenic compounds.



Chemicals

- Dust Suppressants.
- Hot Rolling Oils (Throughput Enhancement).
- Cold Rolling Oils (Bio-based Dispersions Disruptive Technology, **ADT**).
- Pickling Inhibitors (free of Formaldehyde releasers).
- Pickle Line Rinse Aid (prevent discoloration & stop marks, reduce water consumption).
- Wet Temper Fluids (Water-based, Boron and Nitrites-free).
- Metalworking Fluid (Bio-based).
- Rust Preventive Oils.

Kimya Advance Dispersion Technology (**ADT**)



ADT “Advanced Dispersion Technology” has been developed with the purpose of getting marked friction reductions during steel cold rolling as well as an excellent cleanliness of the strip before and after the annealing process.

ADT is based on the aqueous **dispersion of bio-based oils, polymers, and a customised additive package** (depending on the steel grade, plant configuration, downstream treatments, etc.).

It does not contain mineral oils, biocides or other toxic substances.

Oil droplets dispersed in the aqueous phase are **bigger than conventional emulsions and electrostatically charged** to enhance adhesion on steel surface, resulting in uniform spreading on the strip (better plate-out) and improved lubrication.

Unlike traditional technology based on oil-in-water emulsions, the **ADT** spent oil, can be **easily treated and discharged**.

ADT Vs Traditional Emulsions

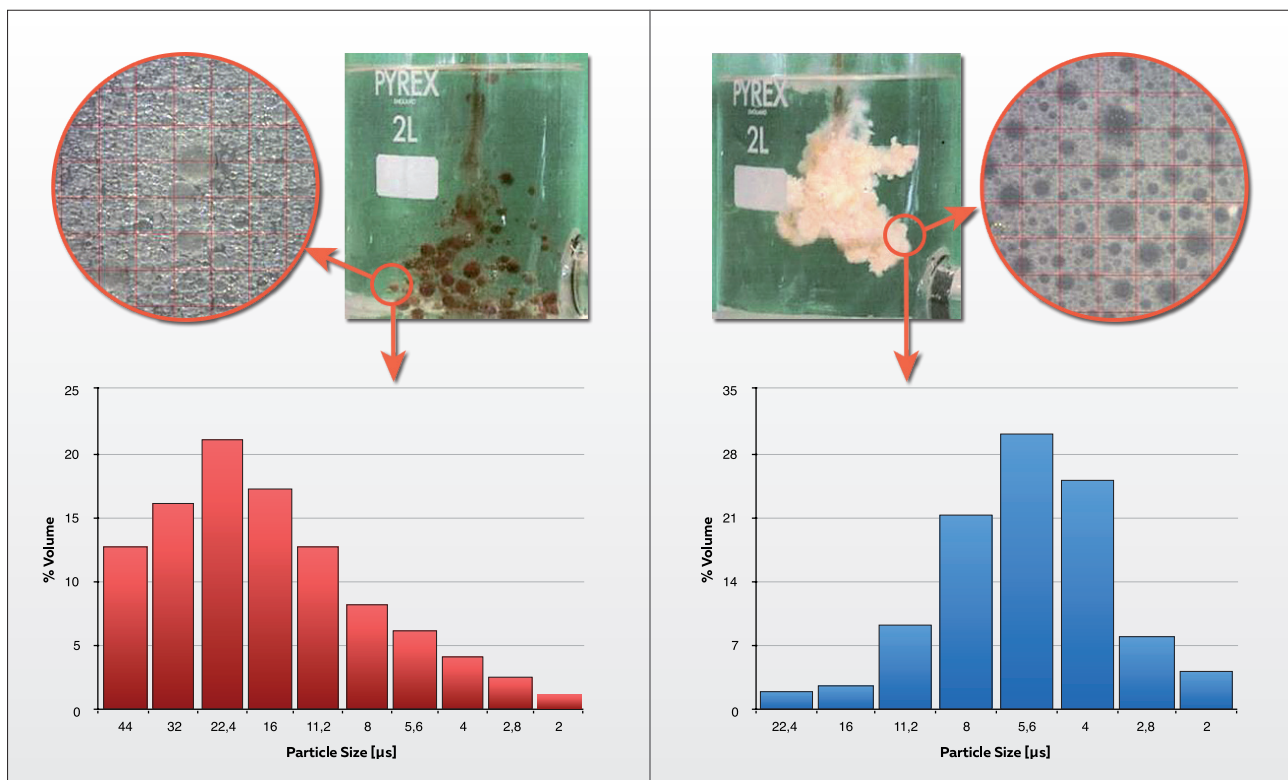
Emulsion

Heterogeneous system consisting of two immiscible liquid phases (water and oil) kept together by surfactants.

Dispersion

Oil droplets dispersed in the water phase. Since the oil droplets are water insoluble, agitation must be in place to create a uniform and homogenous mixture.

PROPERTY	EMULSION	HYBRID	DISPERSION
Particle Size [µm]	2 - 16	8 - 24	4 - 44
Plate-out	Low	Moderate	High
Breakout	Slow	Moderate	Fast
Emulsifier	Non-ionic or Anionic	Non-ionic or Cationic	Cationic
Agitation	Not required	Moderate	Vigorous





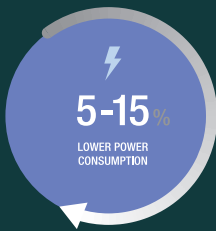
ADT Benefits

Custom made **ADT** formulations ensure lower friction leading to several benefits.



Lower Oil Consumption

Traditional emulsion breakage due to rolling forces and tramp oil results in spent oil being skimmed off and high magnetic filters operating time. **ADT** requires minimum maintenance and lower magnetic filters operating time. As a result ADT oil consumption drops to 0.15-0.30 kg/ton in most applications.



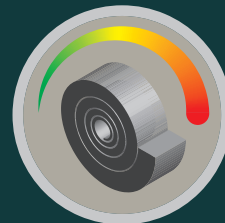
Lower Power Consumption

5-15% reduction in power consumption obtained during trials at current Clients.



Lower Roll Forces

80-250 tons load reduction obtained in most trials at current Clients.



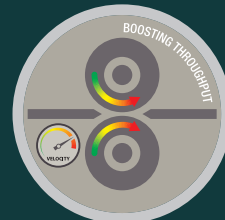
Debottlenecking

Lower forces allow to roll wider strips with lower gauge out and higher gauge in.



Lower Roll Consumption

Up to 50% achieved during trials at current Clients.



Higher productivity

ADT consistently ensures stable rolling parameters and reduced risk of strip breakage allowing to push the mill to the maximum speed.



Further Benefits

ADT lubricants represent the new generation of bio-based cold rolling oils. They deliver excellent performance as well as compliance with the most severe requirements in terms of operators safety and environmental protection. Product customisation and continuous follow-up ensure fine tuning for each mill, based on the specific operating conditions.



Robust formulation

Consistent performance even when subject to high tramp oil, chlorides, iron fines and pH fluctuations.



Superior Strip Cleanliness

Reflectivity >65% after cold rolling and > 90% after annealing.



Reduced environmental footprint

Lower environmental impact (made from bio-based oils) and positive impact on Health and Safety (operators are not exposed to VOC liberated from mineral oils).

Lower costs for spent dispersion downstream treatment and disposal



Traditional emulsions require expensive treatment to separate the spent oil from the water and subsequently treat the water to comply with the wastewater discharge limits.

Spent **ADT** dispersions, separate quickly leaving an upper layer of oil that can be skimmed off. Residual water chemical parameters require minor treatment to comply with the discharge limits.



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