



TMS² BV VANADIUM SOLUTIONS



TMS² brings together Vanadium & Transition Metal chemistry, R&D, technical support and production process knowledge & competences under one organisation. We offer high quality specialty vanadium chemicals & solutions alongside allied products used in gas processing as corrosion inhibitors and promoters for CO₂ removal systems.

GAS PROCESSING IS OUR BUSINESS

TMS² calculates optimum concentrate blend and agrees mass balance equations with engineers. The solved output would provide options ranging from custom made 'corrective' liquid blend to restore Carbonate/Vanadate/Borate to target values as well as dosing or partial changeout/top-up.

WE OFFER COMPETENCIES

- ✓ *More than 25 years experience*
- ✓ *Global production & logistics capabilities*
- ✓ *Local stocks of products and/or consignment stocks at customers*
- ✓ *Fast response with full analytical, technical and R&D support*
- ✓ *Complete range of high quality Vanadium Chemicals/Solutions*
- ✓ *Competitive pricing through optimized supply chain*
- ✓ *Full REACH compliance in Europe and ISO 9001 Accreditation*

ProAct & ProAct+ **BENEFITS**

- ▶ *Identical performance to other well-known products from competitors in Hot Potassium Carbonate CO₂ removal systems*
- ▶ *ProAct comes with a more competitive pricing structure, typical 20-30% lower cost*
- ▶ *Better availability /service and offers greater operational ease of use and handling characteristics while delivering identical performance to industry alternatives*

POTASSIUM CARBONATE-BASED CO₂ REMOVAL

Products & Applications For Hot Potassium Carbonate based CO₂ removal:-

- Range of Bensol Corrosion inhibitors-based on dry & liquid Vanadium compounds
- Tailored make up solution – custom made to restore Potassium, Vanadium & Promoter to required minimum levels
- Range of CO₂ Promoters including ProAct/ProAct+ generic equivalents to other well-known competing products as replacement for DEA offering superior performance

We offer products for use in the following CO₂ removal technologies:-

- Benfield process (licensed by Universal Oil Products (UOP), US)
- Catacarb process (licensed by Eickmeyer & Associates, US)
- Giammarco Vetrocoke process (licensed by Giammarco Vetrocoke, Italy)

Gas Processing Markets Served include:-

- Ammonia/Urea
- Ethylene Oxide/Ethylene Glycol
- Hydrogen Production
- Natural Gas Sweetening
- Vinyl Acetate Monomer
- Refining

ProAct/ProAct+ TECHNICAL COMPARISON

Specification comparison:-		ProAct	ProAct +	OTHERS
	Units	minimum	Minimum	minimum
'Active' content	weight %	67%	99.7	67%
Water content	weight %	max. 33%	Max 1%	max. 33%
Total Nitrogen	weight %	32% (dry basis)	32% (dry basis)	32% (dry basis)
melting point	deg.C	33-37	106	33-37
boiling point	deg.C	110-118	N/A	110-118
flash point	deg.C	approx. 82	N/A	approx. 82
appearance	-	white/yellow	White Flakes	white/yellow
odour	-	ammonia like odour	ammonia like odour	ammonia like odour
Gas Chromatography-Mass Spectrophotometry (GC-MS)	-	identical analysis **		
Infra-Red analysis	-	identical analysis **		
** see attached report 'Paired Comparison of two Amine Based Materials				

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