



## Criterion Catalyst and Technology's World of Fixed Bed Residue Hydrotreating

Upgrading the bottom of the barrel is one of the toughest challenges in refining. Criterion provides catalysts and technology solutions to help refiners meet both current and future requirements, while also maximising the refinery's profitability. To further enhance this capability Criterion is pleased to announce the addition of three new products to the existing portfolio.

RM-5030 High Metals Deposition Capacity Front End HDM

RN-5210 High Activity Transition HDS

RN-5650 High Stability Tail End HDS

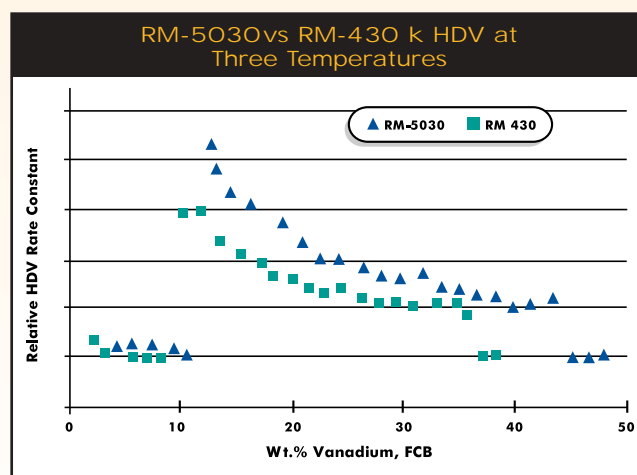
The portfolio is shown on the right. The catalysts have specific functions and are normally referred to as Demetalisation (HDM), Transition (HDM and HDS) and Desulphurisation (HDS) catalysts; however, they also perform other hydrogenation and conversion reactions.

Criterion Residue Catalysts			
New	RM-5030	RN-5210	RN-5650
Recent		RN-412	RN-650 RN-5610
Base	RM-430	RN-410	RN-450 RN-440
	HDM	TRANSITION	HDS CRACKING

### RM-5030 High Metals Deposition HDM Catalyst

HDM catalysts are designed with very wide pores and macropores for storage of the removed metals.

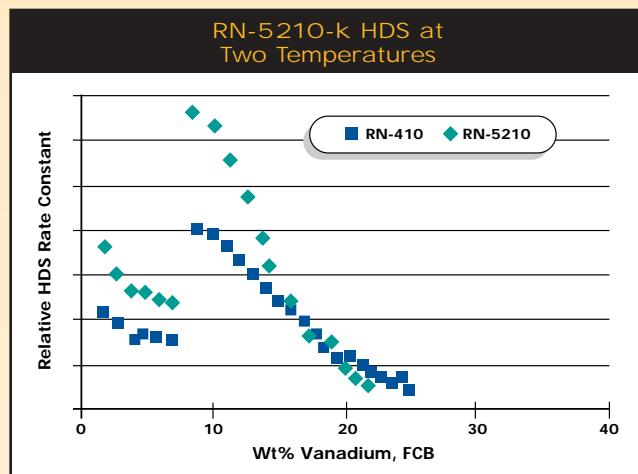
RM-5030 is a catalyst with a very high pore volume (1.04 cc/g) and has very high capacity for metals deposition, while retaining high activity and stability for vanadium removal. This catalyst could hold more than its own weight in metals.



## RN-5210: High Activity Transition HDS Catalyst

Transition catalysts are designed for additional metals removal and hydrogenation for HDN and HDS.

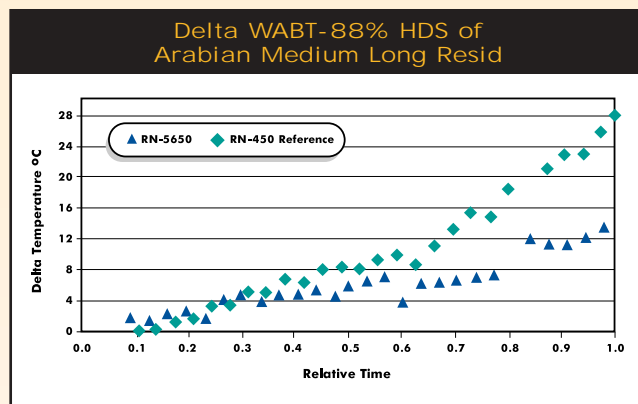
RN-5210's HDS shows step out HDS activity for Vanadium on cat levels as high as 15 wt.%, making it very attractive for middle and back end reactors.



## RN-5650: High Stability Tail End HDS Catalyst

Tail End catalysts have high hydrogenation activity and are designed for high temperature and low  $H_2PP$ .

RN-5650 has significantly higher stability than its predecessors, which is essential for cycle length at severe operations.



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