

# KEY QUESTIONS TO ASK WHEN SELECTING OR AUDITING A RESID CATALYST RECYCLER

Many refineries have asked about AMG's process, meeting The Industry Benchmark, and how to educate their personnel on selecting a Catalyst recycler that will protect the liabilities and reputation of the refinery. Accordingly, we offer this checklist to aid refinery personnel engaged in selecting or auditing a Catalyst recycling vendor. These questions provide a starting point for a robust processor evaluation, with an aim at protecting the oil refiner, human health, and the environment.

Catalyst Processor Evaluation Criteria	
<b>Process Overview</b>	
Does the processor hold a permit to handle Spent Resid Catalyst? What is the maximum quantity of Spent Catalyst that can be stored?	
Is metals reclamation achieved through pyrometallurgical or hydrometallurgical processing?	
Does the processor partially process Catalyst and then transport to another facility <sup>(1)</sup> for metals reclamation, or does processor fully reclaim spent catalyst on-site <sup>(2)</sup> ?	

Catalyst Processor Evaluation Criteria	<sup>(1)</sup> Intermediate Processor			<sup>(1)</sup> Metals Reclaimer			<sup>(2)</sup> One-Stop Full Metals Reclaimer		
	Yes	No	N/A	Yes	No	N/A	Yes	No	N/A
<b>Storage of Raw Spent Catalyst</b>									
Is Catalyst or Intermediate produce stored in containers, tanks, containment buildings, drip pads, waste piles, or surface impoundments to fully contain the material?									
Is oil that expresses from the Catalyst collected from the primary containment?									

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Does Catalyst storage have secondary containment with leak detection?									
Are procedures in place to prevent tracking of Catalyst and oil from storage?									
Are protocols in place to prevent unauthorized entry into the processing area?									
Is the Catalyst stored to ensure proper segregation from incompatible materials to minimize risk of fire?									
<b>Intermediate and End Product Characteristics after Processing</b>									
Does the process remove reactive sulfides to fully mitigate self-heating risk?									
Does the product contain leachable arsenic, antimony, nickel or vanadium?									
Does the process remove Polycyclic Aromatic Hydrocarbons (PAHs)?									
Does treated material meet Land Disposal Requirements?									
<b>Landfilling Waste</b>									
Are any wastes from the process going to landfill?									
Will the landfill properly handle the wastes to minimize potential future liability?									
Is there adequate financial assurance for remediation?									
Will the processor provide a Certificate of Destruction that certifies the final disposition of all material?									
Is the processor properly defining and documenting destruction?									
<b>Pollution Control Equipment, Procedures and Permitting</b>									
In the permit application, has the facility provided a full process flow diagram that identifies all emission units?									
Does the process flow identify and quantify emissions from all emission units and fugitive emissions?									
Do the quantities of products, wastes and emissions identified in the process flow account for all of the Catalyst and other raw materials?									



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<b>Hazardous Waste</b>									
Does the processor employ sufficient practices to prevent the migration of pollutants into stormwater (including from fugitive emission sources, storage piles, etc.)?									
Does the facility have a Spill Prevention, Control and Countermeasures (SPCC) Plan or equivalent to prevent water pollution as a result of oil spills?									
Do the reporting and record-keeping requirements ensure compliance?									
Are regulatory inspections or audit requirements prescribed in the permits or regulations?									
<b>Stormwater Emissions</b>									
Has the facility been issued a permit that establishes emission limits in stormwater for each relevant element of toxicity?									
Do permits include limits for each pollutant and monitoring (e.g monthly sampling of stormwater) protocols?									
Is facility stormwater controlled to enable regular monitoring of pollutants?									
Does the facility have a plan to prevent Storm Water (surface water) Pollution?									
Does the facility Storm Water Pollution Prevention Plan address erosion control, corrective actions, inspections, recordkeeping?									
Do the reporting and record-keeping requirements ensure compliance?									
Are regulatory inspections or audit requirements prescribed in the permits or regulations?									

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<b>Process Wastewater</b>									
Does the process generate wastewater that is other than clean, non-contact wastewater?									
Does the facility have on-site wastewater treatment that eliminates pollutants prior to discharge?									
Is the facility permitted to treat and discharge process wastewater?									
<b>Air Emissions</b>									
Has the facility been issued a permit for air pollutant emissions?									
Does Air permit include limits for each pollutant?									
Are emission estimates based on the "worst case" full potential to emit?									
Does the Air permit prescribe compliance monitoring protocols (continuous monitoring / parametric monitoring / stack testing / observations for visible emissions)?									
Is the proposed Air pollutant emission control technology "Best Available Technology" or "Best Available Technology"?									
Do the reporting and record-keeping requirements ensure compliance?									
Are regulatory inspections or audit requirements prescribed in the permits or regulations?									
<b>Financial Assurance</b>									
Has the processor provided adequate protection from future liability?									
Has potential future financial liability from facility closure or incident been adequately addressed by the refinery for your choice?									
Does the financial assurance posted by the processor adequately cover all costs of closure of the processing facility?									
Does the processor have the financial capacity to remain viable in low market values?									
Is the processor's investment adequate to discourage it from exiting the business, abandoning the facility and material?									

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<b>Identification, Labeling and Packaging</b>									
Is the Catalyst and / or any resultant materials after processing appropriately packaged to protect from risks of self-heating, metal leachability and other concerns?									
Is the Catalyst and / or any resultant materials after processing appropriately classified and labeled to acknowledge risks from self-heating, metal leachability and other concerns?									
Has the material been appropriately (and conservatively, in case of doubt) identified as hazardous or non-hazardous for the purposes of Basel Convention and / or OECD									
Has the Catalyst been appropriately and conservatively identified as Catalyst (not an ore or Metal Concentrate) for the purposes of Customs Tariff Classification									
Has the material been appropriately (and conservatively, in case of doubt) identified as hazardous or non-hazardous for the purposes of Transportation Regulations									
Has the material been appropriately (and conservatively, in case of doubt) identified as hazardous or non-hazardous on the International Maritime Dangerous Goods Declaration									
Can the processor supply an import consent document issued by the EPA, or the importing country identifying the Catalyst as hazardous waste or hazardous recyclables?									
Is the processor exporting thermally processed Catalyst properly labeled as Catalyst?									
Is the processor making the appropriate notices and disclosure regarding The Toxic Substances and Control Act or its equivalent?									

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<b>Safety</b>									
Does the processor fully address the key aspects of employee safety, including policies, practices, training and auditing?									
Does the processor provide adequate Personal Protective Equipment for employees such as eye, foot and hand protection (including for thermal and chemical exposure)?									
Does the processor enforce Life-Saving Rules?									
* Work with a valid work permit when required									
* Conduct gas tests when required									
* Verify isolation before work begins and use the specified life protecting equipment									
* Obtain authorization before entering a confined space									
* Obtain authorization before overriding or disabling safety critical equipment									
* Protect yourself against a fall when working at height									
* Do not walk under a suspended load									
* Do not smoke outside designated smoking area									
* No alcohol or drugs while working or driving									
<b>Auditing and Inspections</b>									
Has an adequate internal auditing program been established by the processor to support environmental excellence and employee safety programs?									
Do the regulatory agencies issuing operating permits to each of the facilities perform inspections frequently enough to ensure compliance with permit requirements?									
Does the processor have HSSE Management Systems, Procedures and record keeping implemented to meet the requirements of the contracts?									
Does the processor hold current registrations for ISO 14001 (environmental) and OHSAS 18001 or ISO 45001 (safety)									