

HOW GOOD IS MY WASHED CATALYST?

Finally, there is a way to know. Catalytic Combustion Corp. (CCC) has developed the Activity Value Test System (AVTS™) that provides the ability to:

- Determine if a washed catalyst has any catalytic activity remaining
- Know how much improvement was gained by the washing process
- Decide if a washed catalyst is worth the time to re-install in your engine.
- Save time and money before re-installation instead of scrambling to replace a washed element that does not perform as needed



Chemical washing of catalysts is a proven method of extending the lifespan of a catalyst. However, there are circumstances where washing cannot restore sufficient activity to bring an engine into compliance. Up until now, the only way to know if a washed catalyst would work was to put it back into the housing and run a test. The risky trial-and-error process was costly in time, labor and lost production.

The AVTS is a non-destructive test that isolates a portion of the catalyst and creates stable, repeatable conditions where the coating should respond to a standardized reference compound being passed through the cells. Several sections of a catalyst element are evaluated to determine a picture of the overall condition of the catalyst. The data gathered during the process is used to calculate the Activity Value Index (AVI™) which is a simple, numerical score of the catalyst element's health.



The overall process involves evaluating the catalyst in the condition it is received from the field, then washing it using CCC's exclusive 5-Step chemical cleaning system, and re-evaluating afterwards to see what improvement in the element's catalytic activity has been gained.

The AVTS and the AVI scoring system were developed to be "color blind" to the origin of the catalyst element being evaluated, meaning the system will work for any catalyst being produced for industrial engines provided the element has a flow depth commonly seen in the field.

AVTS is not a re-creation of the conditions the catalyst will experience in the field, and the AVI is not a prediction of field performance. However, the AVTS/AVI combination used in conjunction with your field testing allows informed decisions as to whether a catalyst is worth putting back into service or needs to be replaced.

What is the “AVI”?

Reporting and interpreting AVTS data is obviously a critical part of this innovative testing process.

Early on, it was determined that reporting a percent conversion was not ideal because it could easily lead to misunderstandings should the field results from a re-installed washed element not match up with the expectations based on the report from the AVTS.

Another consideration was how to represent the data in a meaningful way so that the information allows the ability to distinguish variations in performance. It became obvious that a system that yielded sufficient resolution in the results was needed.

In the end, a mathematical algorithm was developed that takes the raw data from the AVTS and produces the AVI score. The algorithm weighs the results in such a way that the performance of a catalyst that has partial to excellent activity is enhanced so that subtle changes in performance are clearly visible. This information allows the ability to correlate the AVI score with your field results and set the minimum acceptable AVI score needed to re-install a washed element.

The maximum possible score that the AVI algorithm generates is twenty-one (21). It is important to remember that AVI score only relates to the performance of the catalyst undergoing testing by the AVTS and is not a measure of how well the catalyst will perform in the field.

The AVI scores on a catalyst element are reported via a bar-graph format. Graphs for both the pre and post washing condition are shown. There are individual bars for the minimum and maximum test spots as well as the average AVI score for all of the test spots for the element.



Activity Value Index (AVI) Report™

Submitted By For	ABC Energy 2001 Acme Drive Boomtown, TX 87955	Our Reference: <u>40047</u> Your Reference: <u>CO07545</u>
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Catalyst Description and Identifiers

Catalyst Shape	Round	Element #	115
Diameter or Length (in.)	30.25	Manufacturer	Unknown
Width (in.)		Model #	KL3025
Depth (in.)	3.5	Serial #	189754

Incoming Physical Inspection

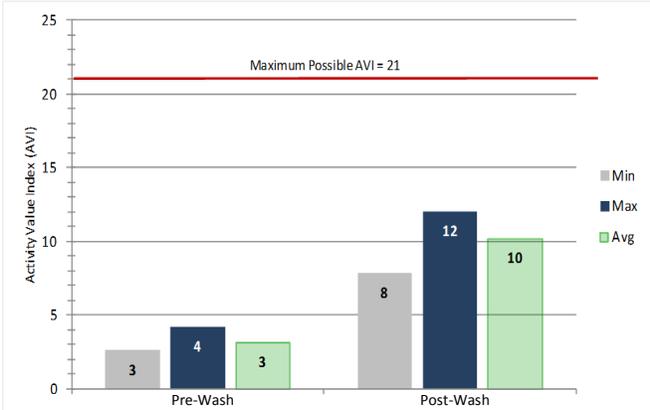
<input type="checkbox"/> Good <input checked="" type="checkbox"/> Dirty, Coated, or Ashed <input type="checkbox"/> Plugged	<input type="checkbox"/> Loose Foil Layers <input type="checkbox"/> Structural Damage
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Services Performed

<input type="checkbox"/> Inspection and Testing Only <input type="checkbox"/> Water Rinse and Drying	<input type="checkbox"/> Vacuum Removal of Ash <input checked="" type="checkbox"/> Complete Chemical Wash
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AVI™ Scores

The Activity Value Index (AVI) is a repeatable, non-destructive evaluation of a catalyst's ability to convert a reference compound under controlled conditions of flow and temperature. The AVI scores shown in the graph below are the results for this catalyst element.



Condition	Min	Max	Avg
Pre-Wash	3	4	3
Post-Wash	8	12	10

Note: Activity evaluation is valid only for comparing Pre-wash to Post-wash condition and is not a guarantee of actual on-engine performance. Results for this catalyst are based on a set of data points taken over the whole element. The actual number of data points is dependent upon the element's face area.