

USDA BioPreferred Complex Assemblies – An Automotive Perspective



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Agenda

- GM Material Approval Process Background & Examples
- Automotive Material Challenges
- GM's Current Status
- “Green” Analysis
- BioPreferred Status Options
- Recommendations
- Summary

GM Material Approval Process Background & Bio Examples

- Current Approval process for bio based materials
 - Validate material with extensive test sampling plan and physical property testing.
 - Once testing completed, the material would be approved to a specific GM Material Specification and targeted for an application.
 - After application and specific vehicle program have been identified, parts are made and validated at a component level.
- Internally, bio-materials would be given a “Preferred Status” based on application, material, and cost (the same factors as current materials).
- Examples of Current Bio Applications:
 - Balsa wood in Corvette flooring
 - Mass reduction
 - Equinox headliners with natural fibers
 - Acoustic benefits
 - Cadillac XLR has real wood interior trim
 - Aesthetic benefits



Automotive Material Challenges

- Cost
 - Recovery of capital investment and research
 - Low volume (economies of scale)
 - Need cost effective material, priced at or lower than petro-based
- Actual & Perceived Quality
 - Physical property requirements
 - Biodegradability issues
 - Appearance /comfort issues
 - Safety issues
- Mass Reduction
 - Goal is to minimize mass to minimize fuel consumption
- Reduction of Environmental Impacts
 - Selection of natural materials to minimize environmental impacts of cradle-to-gate material manufacturing
- Global and Regional Availability
 - Climate variation
 - Arable land mass variation
 - Regional legislature
- Available Infrastructure
 - Infrastructure to reclaim/recycle biobased materials needs to be developed
 - Quantity of material vs. robust crops and/or plants



GM's Current Status

- GM is interested and following developments in biobased materials.
- Our goals are to:
 - Encourage further development in biobased materials
 - Increase overall bio content in all vehicles wherever technically and economically feasible
- GM Specific Roadblocks
 - Dealing with technical issues on a case-by-case basis
 - Significant cost hurdle
 - Economies of Scale
 - Customers desire to be green \neq Willingness to pay more

“Green” Analysis

- How to determine actual bio content?
 - Carbon dating is true way to prove old vs. new carbon
 - Accurate method
 - Suppliers cost huge (\$800 per test/per part/per lot = \$Millions)
 - Timing unreasonable for complex assemblies (thousands of parts per vehicle)
 - *Perhaps options could be levied such as 1 test per initial material approval, after which, the material supplier is held accountable for maintaining agreed upon level of bio content.*
- How much bio content is needed to qualify part for consideration?
- How to determine actual benefits/detriments to the environment?
 - LCA is necessary
 - Green can be a detriment to the environment
 - Extremely costly and difficult to perform on a vehicle/complex assembly basis
 - *Perhaps USDA could assist with analysis on specific plant level (i.e. corn vs. kenaf vs. sugar beat) to provide auto industry(and others) a guideline on where to focus our efforts.*



Two Approaches for “Rating” Bio Content

- **Path A = Weight percentage of bio content per part/component**
 - Determine the actual lbs of bio per vehicle (tangible number)
 - Easily communicable, however, overall vehicle % would be minimal (i.e. 0.2% of the polymers on this vehicle have bio content)
 - General public may not understand/value the efforts required to achieve high content in one or two parts/components
- **Path B = Percentage of polymer parts that contain bio content**
 - Determine the number of parts with bio content per vehicle
 - Easily communicable, however, would allow for components to have minimal bio content, and still receive credit
 - General public may relate better to the higher number
 - It would require OEMs to do more development work and investigation, because meeting initial requirements is the technically challenge.
 - Once bio content has been introduced on a variety of applications, increasing the content would be more achievable.



Recommendations for Granting BioPreferred Status

- Certification on vehicle/assembly level
- Decide on a minimum weight percentage for the qualifying bio content
- Rate bio content via **Path B**: Percentage of polymer parts that contain bio content
- Once bio content is established, preferred status could be awarded on a variety of published metrics

- Labeling
 - We caution the USDA concerning labeling due to the numerous international, federal, and state current vehicle labeling requirements.
 - Other options that should be investigated may be marketing based notifications/publications, inclusion in the owner's manual, web based information, etc.



Summary

- Auto Industry Perspective
 - GM is very interested in the BioPreferred Status
 - Need a technically and economically feasible manner to have material suppliers verify renewable content
 - Need to utilize LCA on material level to determine environmental benefits of bio content
- Recommendations
 - Certification to published metrics on vehicle/assembly level
 - Rate percentage of parts/components with (\geq minimum) bio content, then go into details
 - Cautious approach to labeling (investigate other options)
- Thank you for your time!!

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