Verification Statement

The subject of this critical review is the **comparative cradle-to-grave life cycle assessment (LCA) of different paint formulations using a newly designed TiO_2 pigment grade**. *DuPont Titanium Technologies (DTT)* wants to understand how the environmental footprint of the product using the new TiO_2 pigment differs from the incumbent product analysing three main scenarios:

- **A drop-in solution** replacing incumbent with new TiO_2 pigment (TS-6300); paint formulation remains the same for all other ingredients;
- **A cost-optimised solution** using TS-6300;
- **A quality-optimised solution** using TS-6300.

The LCA is based on primary data for paint formulations collected by various experts from *DTT* and ensuring that the specified paint formulation scenarios deliver an equal paint performance. Background data is taken from the European Council of the Paint, Printing Ink and Artists' Colour Industry (CEPE) database and dates from 2013.

The purposes for carrying out this study include internal product development, technical customer support as well as marketing and communication of the results for internal and external stakeholders.

The study was commissioned by *DTT* and performed by *DuPont Engineering Research & Technology* according to the International Standards ISO 14040 and ISO 14044.

Key results are (in comparison with the base case using the incumbent TiO_2 pigment)**:**

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- 2The **drop-in solution** using the new TiO_2 pigment (TS-6300) provides significant potential environmental benefits across all environmental impact categories while significantly improving hiding power.
- The **cost-optimised solution** requiring less TiO_2 pigment while delivering a comparable paint performance provides significant environmental savings across all environmental impact categories.
- The **quality-optimised solution** delivers greater hiding power with a higher spread rate and at significantly lower environmental burdens across all environmental impact categories. The environmental performance is superior compared to the cost-optimised solution.

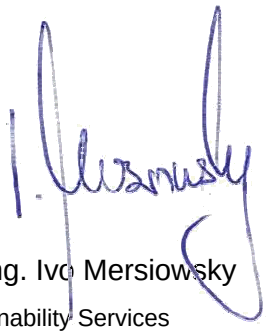
One improvement potential of this LCA study is the fact that no primary LCI data for TS-6300 production is available. Although reasonable and conservative estimates for the environmental profile of TS-6300 production are used in this LCA, the accuracy of the study could be improved if primary production data was collected and evaluated.

It should further be noted that some life cycle stages and associated processes are omitted from this LCA study since they are the same for all investigated scenarios. Consequently, only relative results can be derived and should exclusively be used for communication.

The critical review confirms that best available background data was used for paint raw material production and the paint manufacturing process. The LCA was conducted using a well-developed software model. It can further be noted that underlying data sources, life cycle models, assumptions, and calculations are transparent and appropriate.

The critical review process included detailed data quality checks. A few formal shortcomings were identified during the review process. These could be clarified in the process of the critical review in which *DuPont* acted in an open, competent and very professional manner.

The reviewer found the overall quality of the methodology and its execution to be adequate for the goal and scope of the study. The critical review undertaken for this project can ascertain that the LCA was conducted in accordance with the applicable International Standards on LCA, ISO 14040–44.



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