Air ionizer application for electrostatic discharge (ESD) dust removal in automotive painting industry

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Abstract

Dust and fiber have been identified among the highest contributor for the defect in automotive painting line with range from 40% to 50% of total defect breakdown. Eventually, those defects will effect on both visual appearance and also the performance of the parts. In addition, the significance of controlling dust in an assembly line is crucial in order to maintain the quality of the product, part performance yield and effect on workers' health [1]. By considering the principle and technology applied in electronic clean room technology, the ionizer have been introduce to control dust contamination in automotive painting line. The first auto maker industry whom found the effectiveness of the clean room application to reduce the defect and production line downtime was Chrysler [2]. By doing so, it's allowed the transmission plant to offer 50 000 mile guarantee on the transmission systems. The main objective of this research is to verify the effectiveness of ionizer device in order to reduce the rejection contribute by dust and fiber particle in the automotive painting line. Towards the main objective, a few sub areas will be explored, as a supporting factor to ensure the result gain from this study is solid and constructive. The experiment start by verifying the electrostatic value of the raw material (substrate) before and after the ionizer treatment. From here the correlation of the electrostatic value generated by the raw material that effect to production pass rate can be explored. At the meantime, the performance of the production pass rate after the ionizer treatment which related to the painted surface area can be determined.

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Cited References: 10

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1. Title: [not available] **Times Cited: 1**
   By: Arnold, S.
   EOS ESD S Pages: 95-245 Published: 1995

2. **Application of ESP for gas cleaning in cement industry - with reference to India** **Times Cited: 20**
   By: Bapat, JD
   JOURNAL OF HAZARDOUS MATERIALS Volume: 81 Issue: 3 Pages: 285-308 Published: FEB 16 2001

3. Title: [not available] **Times Cited: 1**
   Group Author(s): Combat Coating (M) Sdn Bhd
   Outgoing Quality Inspection Passrate Report Published: 2015

4. Title: [not available] **Times Cited: 1**
   By: Hewitt, G. W. P. G. W.
   AIEE Transactions Published: 1949

5. **Utilization of controlled cement dust as a concrete material in the United Arab Emirates** **Times Cited: 1**
   By: Hindy, K. T.
   Environmental Management and Health Published: 1997

6. **ELECTROSTATIC CHARGING AND DISSIPATION OF DUST CLOUDS IN ENCLOSED ROOMS** **Times Cited: 6**
   By: INCULET, II; TOPPING, DR
   IEEE TRANSACTIONS ON INDUSTRY AND GENERAL APPLICATIONS Volume: IGA7 Issue: 2 Pages: 314-& Published: 1971

7. Title: [not available] **Times Cited: 1**
   By: Khan, Zahid A.; Mokthar, Mohzani; Rosmaini Ahmad, S. K; et al.
   Management of Environmental Quality, an International Journal Volume: 7 Pages: 390-408 Published: 2006
   [Show additional data]

8. **Study on contamination control in a minienvironment inside clean room for yield enhancement based on particle concentration measurement and airflow CFD simulation** **Times Cited: 18**
   By: Noh, Kwang-Chul; Kim, Hyuk-Soon; Oh, Myung-Do
   BUILDING AND ENVIRONMENT Volume: 45 Issue: 4 Pages: 825-831 Published: APR 2010

9. Title: [not available] **Times Cited: 1**
   By: Steinman, Arnold.
   Compliance Engineering, Annual Reference Guide Published: 2006
   Copyright 2006
   Publisher: Canon Communications LLC

10. **Optimum Airflow to Reduce Particle Contamination Inside Welding Automation Machine of Hard Disk Drive Production Line** **Times Cited: 11**
    By: Thongsri, Jatuporn; Pimsarn, Monsak
    INTERNATIONAL JOURNAL OF PRECISION ENGINEERING AND MANUFACTURING Volume: 16 Issue: 3 Pages: 509-515 Published: MAR 2015

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