

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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R.J. Reynolds Vapor Company,

Petitioner

v.

Fontem Holdings 1 B.V.

Patent Owner

U.S. Patent No.: 8,365,742  
Issue Date: Feb. 5, 2013  
Title: Aerosol Electronic Cigarette

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*Inter Partes* Review No. IPR2016-01532

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**DECLARATION OF DR. ROBERT H. STURGES, PH.D.  
IN SUPPORT OF PETITION FOR INTER PARTES REVIEW  
OF U.S. PATENT NO. 8,365,742**

**R.J. Reynolds Vapor**

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## I. INTRODUCTION

### A. Engagement

1. I have been retained by the law firm of Brinks Gilson & Lione on behalf of R.J. Reynolds Vapor Company to provide this Declaration concerning the technical subject matter relevant to the *inter partes* review petition concerning U.S. Patent No. 8,365,742 (“the ‘742 patent”; Exhibit 1001).<sup>1</sup> I have been asked to render an opinion regarding the validity of claims 2 and 3 (the “challenged claims”).

### B. Background and Qualifications

2. I am currently a Professor in the Departments of Mechanical and Industrial Systems Engineering at Virginia Polytechnic Institute (“Virginia Tech”). From 1987 to 1997, I was first an Assistant Professor and then later an Associate Professor in the Mechanical Engineering Department at Carnegie Mellon University. I have a combined Bachelor of Science and Master of Science degree in mechanical engineering from M.I.T. and a Ph.D. in mechanical engineering from Carnegie Mellon University.

3. In my past work, I have extensively studied and designed various fluid power systems, including a robotic arm and robotic end effectors. In the latter, I

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<sup>1</sup>I refer to exhibit numbers that correspond to those I understand will be submitted with the Petition for *Inter Partes* Review.

applied fluid “resistors” that rely on porous media to provide resistance to flow. I have also applied heat transfer fundamentals to design and build variations of commercial steam engines used in my undergraduate labs at Carnegie Mellon University and my graduate course in Sustainability at Virginia Tech. In addition, I have taught undergraduate courses focused on fundamental mechanics and the conservation of energy, including basic principles of fluid flow and heat transfer.

4. Based on my background, experience, education and professional activities, I consider myself an expert in the fields of mechanical design, mechatronics, and manufacturing, including systems that employ heat, mass and fluid transfer.

5. My Curriculum Vitae, including my publications and patents, is submitted herewith in Appendix A.

**C. Compensation and Prior Testimony**

6. I am being compensated at a rate of \$400 per hour for my study and time in this matter. I am also being reimbursed for reasonable and customary expenses associated with my work and time in this investigation. My compensation is not contingent on the outcome of this matter or the substance of my testimony.

7. The list attached at Appendix B identifies my past expert engagements.

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