

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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**EXPERT DECLARATION OF RICHARD C. JUERGENS**

Exhibit No. 1116

1                                   **Expert Declaration of Richard C. Juergens**

2           I, RICHARD C. JUERGENS, do hereby declare that:

3   **I.    BACKGROUND**

4           **1.**    I am an American citizen residing in Tucson, Arizona.

5           **2.**    A copy of my *curriculum vitae* is submitted as Exhibit No. (“ZEISS”)  
6    1129.

7           **3.**    I am a Senior Engineering Fellow at Raytheon Missile Systems,  
8    Tucson, Arizona, working in the Hardware Design Department. I am also  
9    President of Cimarron Optical Consulting, Inc., in Tucson, Arizona.

10          **4.**    I have held the following positions: Assistant Director of Marketing at  
11    Optical Research Associates (now the Optical Solutions Group of Synopsys, Inc.),  
12    Pasadena CA, 1988-1999; Senior Scientist at Hughes Aircraft Company, El  
13    Segundo CA, 1984-1988; Vice President of Engineering at FLIR Systems, Inc.,  
14    Portland OR, 1982-1984; Section Supervisor, System Analysis and Requirements,  
15    Ford Aerospace, Newport Beach CA, 1970-1982; and Member of the Technical  
16    Staff at Rockwell International, Anaheim CA, 1966-1970.

17          **5.**    I received a B.A. in Physics from California State College at  
18    Fullerton, Fullerton, CA, in 1967. I received an M.A. in Physics from University  
19    of California, Irvine, Irvine, CA, in 1969.

1           **6.**     I have over 40 years of experience as an optical designer and optical  
2 engineer. I have designed many different types of telescopes and optical systems,  
3 including catoptric, dioptric, and catadioptric systems.

4           **7.**     Since the mid-1970s, I have been a member of the Optical Society of  
5 Southern California. In 1980, I was President of the Optical Society of Southern  
6 California. Since the mid-1970s, I have been a member of the Optical Society of  
7 America. Since the mid-1970s, I have been a member of the SPIE, The  
8 International Society for Optical Engineering, and have chaired several of their  
9 conferences during this time.

10          **8.**     From time to time, I teach courses at Raytheon Missile Systems on  
11 fundamentals of optical engineering, and give guest lectures at the College of  
12 Optical Sciences of the University of Arizona on various aspects of optical  
13 engineering and design.

14          **9.**     I have extensive experience using CODE V optical design software,  
15 which is used by many optical designers worldwide. While employed by Optical  
16 Research Associates, the suppliers of CODE V, I gave seminars, lectures, and  
17 technical support on how to use CODE V effectively for design and analysis of all  
18 kinds of optical systems, including lithographic systems. During this time I gave  
19 seminars and technical support at Carl Zeiss in Germany and Nikon in Japan.

1           **10.** I understand that Carl Zeiss SMT GmbH will file a petition  
2 (hereinafter the “Petition”) for *Inter Partes* Review (“IPR”) of claims 55-67 (the  
3 “Challenged Claims”) of the Omura Patent (U.S. Patent No. 7,348,575), to Nikon.  
4 I have been retained by Carl Zeiss SMT GmbH and my specific tasks have been  
5 given to me by their counsel, Fish & Richardson, P.C. I am being compensated for  
6 my work in this matter at my customary consulting rate of \$125 per hour.

7           **II. MATERIALS CONSIDERED FOR THIS DECLARATION**

8           **11.** My opinions in this declaration are based on my academic training,  
9 experience, research, and review of the documents cited in this declaration,  
10 including U.S. Patent No. 7,348,575 (“the Omura Patent”) (ZEISS 1101); A  
11 Certified English Translation of Japanese Unexamined Patent Publication No. JP  
12 2003-128154 (ZEISS 1107); U.S. Patent Application Publication No.  
13 2005/0036213 (“Mann”) (ZEISS 1110); Certified English translation (“Omura  
14 ‘387”) (ZEISS 1112) of JP Patent Application Publication No. JP 2003-114387  
15 (ZEISS 1111); European Patent Application EP 1336 887 A1 (“Takahashi”)  
16 (ZEISS 1114), which is an English republication of PCT Patent Publication  
17 WO 02/035273 (“Takahashi PCT”) (ZEISS 1113); S. Asai et al., “Resolution Limit  
18 for Optical Lithography Using Polarized Light Illumination,” *Jpn. J. Appl., Phys.*  
19 Vol., 32, pp. 5863-5866 (1993) (“Asai”) (ZEISS 1114); U.S. Patent No. 5,825,043

1 (“Suwa”) (ZEISS 1123); W. Ulrich et al., “The Development of Dioptric  
2 Projection Lenses for DUV Lithography,” Proc. SPIE Vol. 4832, pp. 158-169  
3 (2002) (“Ulrich”) (ZEISS 1118); and U.S. Patent No., 4,346,164 (“Tabarelli”)  
4 (ZEISS 1125). In arriving at my conclusions, I have also run calculations on some  
5 of the optical designs disclosed in Mann, Takahashi, and Omura ‘387 using the  
6 optical design software CODE V. CODE V sequence data and sub-routines used  
7 for these calculations are provided in Exhibits ZEISS 1130 and ZEISS 1131  
8 accompany this declaration.

9 **12.** I note that cites to specific portions in the documents are only  
10 exemplary.

11 **13.** I also refer herein to the Claim Charts set forth as sections V(C),  
12 V(E), and V(G) in the Petition, which also summarize at least some of my  
13 conclusions below.

### 14 **III. APPLICABLE LEGAL STANDARDS**

15 **14.** Although I am not an attorney, and will not offer opinions on the law,  
16 I have been informed of several principles concerning the patentability of claims in  
17 a patent or application, which I have employed in arriving at my conclusions in this  
18 declaration.

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