IPR2015-01368 U.S. Patent No. 8,525,138

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ASML NETHERLANDS B.V., EXCELITAS TECHNOLOGIES CORP., AND QIOPTIQ PHOTONICS GMBH & CO. KG, Petitioners

v.

ENERGETIQ TECHNOLOGY, INC., Patent Owner

> Case IPR2015-01368 U.S. Patent No. 8,525,138

PATENT OWNER'S RESPONSE UNDER 37 C.F.R. § 42.120

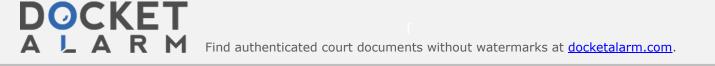


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		1. At the time of the invention, it was believed that a short wavelength laser would have led to energy being absorbed less efficiently, resulting in lower brightness light14	
		2. At the time of the invention, it was believed that a short wavelength laser would have led to larger plasma, resulting in lower brightness light	
		3. Energetiq's recognition of an unexpected physical result led to the claimed invention	

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	titioners Fail To Demonstrate <i>Why</i> An Ordinary Artisan ould Have Combined Gärtner With Beterov25	
1.	Petitioners do not demonstrate why no one combined Gartner with a short wavelength laser, despite the wide availability of such lasers at least as early as Gärtner	
	a. Suitable short wavelength lasers existed long before the '138 priority date	
	b. The years-long commercial availability of suitable short wavelength lasers before the invention, coupled with the teachings away from the use of such, shows that the invention was not obvious when made27	
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I. INTRODUCTION

This case is about a light source so much brighter than anything that preceded it that it has essentially replaced its predecessors in the semiconductor manufacturing field. Previously, state of the art light sources for semiconductor wafer inspection, lithography, and metrology tools were arc lamps – e.g., Xenon or Mercury arc lamps. Energetiq patented a fundamentally new approach that uses a *laser* to provide energy to a gas in a chamber—at a wavelength within 10 nanometers of a strong absorption line of the gas—to produce a light that was brighter than any previous technology could achieve.

Critically, Petitioners concede that the invention was novel. They advance *no anticipation arguments* in this proceeding, instead relying on factually incorrect and legally insufficient obviousness arguments that are guided by hindsight reconstruction and undermined by the very references upon which they rely. For the reasons set forth below, the '138 claims are not obvious over Gärtner in view of Beterov, at least because there would have been no motivation to combine Gärtner and Beterov, and because contemporaneous references taught away from such a combination.¹

¹ Energetiq does not discuss Petitioners' other proposed rejection—obviousness over Gartner in view of Wolfram—because the Board denied institution on this basis. Because Petitioners have not met their burden of proof, the '138 patent claims must be confirmed.²

II. STATE OF THE ART

A. Arc Lamp Technology

For at least a decade prior to the invention, the semiconductor industry used xenon or mercury arc lamps to produce a light for use in wafer inspection and metrology systems. (See Smith Declaration at ¶ 8 (Ex. 2016); '138 patent (Ex. 1001), 1:33-35 ("The state of the art in, for example, wafer inspection systems involves the use of xenon or mercury arc lamps to produce light.").) Arc lamps use an anode and cathode to provide an electrical discharge to a gas within the lamp that excites the gas, causing it to emit light. (See '138 patent (Ex. 1101), 1:33-49.) However, they suffer from a number of shortcomings that constrain the accuracy and efficiency of the equipment that uses them, including instability of the arc, undesirable time to failure, and limits on how bright such sources can get (the spectral brightness of arc lamps is limited by the maximum current density-if too high, it would melt the arc lamps' electrodes). (See, e.g., Smith Decl. at ¶ 8 (Ex. 2016).)

² This response is supported by the Declaration of Dr. Donald K. Smith. Patent Owner did not submit a preliminary response in this proceeding.

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