PROCEEDINGS OF SPIE

Polymer Optics and Molded Glass Optics: Design, Fabrication, and Materials 2022

Alan Symmons Nelson E. Claytor Editors

22 August 2022 San Diego, California, United States

Sponsored and Published by SPIE

Volume 12219

Proceedings of SPIE 0277-786X, V. 12219 SPIE is an international society advancing an interdisciplinary approach to the science and application of light. The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings: Author(s), "Title of Paper," in Polymer Optics and Molded Glass Optics: Design, Fabrication, and Materials 2022, edited by Alan Symmons, Nelson E. Claytor, Proc. of SPIE 12219, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X ISSN: 1996-756X (electronic)

ISBN: 9781510654228 ISBN: 9781510654235 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org Copyright © 2022 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.



Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

• The first five digits correspond to the SPIE volume number.

• The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

v Conference Committee

SESSION 1 GLASS MOLDED OPTICS

12219 02	The design of blend radii for precision glass molded lenses [12219-1]
----------	---

- 12219 03 Mold protective coatings for precision glass molding [12219-2]
- 12219 04 **Reduction of cycle time during press molding of glass lenses** [12219-3]
- 12219 05 Bio-inspired manufacturing of molded optics and optical systems [12219-5]
- 12219 06 Laser assisted diamond turning of tungsten carbide and the material properties required to obtain optical surface finish suitable for lens molds [12219-6]

SESSION 2 INJECTION MOLDED PLASTIC OPTICS

- 12210 07 Injection molding of subwavelength structures over a large surface area [12219-7]
- 12219 08 Antireflection nanostructures for injection molded polymers and polymer resins [12219-8]

SESSION 3 APPLICATIONS OF MOLDED OPTICS

- 12219 0A Generation and propagation of Airy beams and one inch diameter focusing optics using 3D printed polymer optics [12219-23]
- 12219 0B Optical fiber-based Fabry-Perot sensor for acetone sensing [12219-11]

SESSION 4 GRIN

12219 0D Progress in the maturation of polymer-Layered GRadient INdex (LGRIN) optics for high performance optical systems [12219-14]

SESSION 5 METROLOGY OF MOLDED OPTICS

12219 OE	Precision measurement of molded optics including relational datum parameters by use of a scanning point multi-wavelength interferometer [12219-15]
12219 OF	Evaluation of decenter evaluation method between free-form lens surfaces [12219-16]
SESSION 6	AUTOMOTIVE MOLDING
12219 0G	SUPRAX glass optics for automotive application [12219-17]
12219 OH	Controlled viscosity molding of polymer optics [12219-19]
SESSION 7	
3E33ION /	
12219 01	Potential polymer viewing screens for low-energy thermal images [12219-21]