



XIPER INNOVATIONS INC.

a polymers & coatings consulting company

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Rustom Kanga is the President and Founder of Xiper Innovations, Inc., a consulting firm offering Research and Product Development services to corporations. Dr. Kanga is a Research Scientist and Product Development professional with extensive knowledge in the Graphic Arts (Printing), Photopolymers, and UV Cure, Polymer Chemistry, and Specialty Coatings industries. He also has extensive experience in international business practices. He has a proven track record in innovation with over 36 US patents/applications and 60+ European and PCT patents and is conversant with all aspects of product development from concept to market. He brings a well-rounded background of corporate experience and educational credentials (Ph.D. in Polymer Chemistry and an Executive MBA) to Xiper Innovations. At Xiper Innovations, Dr. Kanga has continued his commitment to innovation by working on projects as diverse as use of microreplication for radiation cure systems, Elastomers for Direct Laser Engraving for relief printing applications, and development of a portfolio of solvent-based, water-borne and UV curable coatings, which has resulted in several patents.

Prior to Xiper Innovations, Dr. Kanga was Research Project Manager in the Plates Division for Macdermid Printing Solutions. During his tenure there (1995-2005), he headed a number of critical research initiatives in Digital and In-the-Round (ITR) Flexography, identifying several key technologies for continued growth of the flexographic market and Macdermid's market share. This effort resulted in more than 10 US patents and several (5+) commercial products. He led a team of technicians, associates, and engineers, developing his staff and guiding them in both company and independent research projects. Dr. Kanga also served as liaison for the corporation's patent attorneys for intellectual property protection and development.

From 1990-1995, Dr. Kanga was affiliated with W. R. Grace & Company as Research Chemist, Designed Polymers Research, in its Washington Research Center. During this stint, he designed and developed several novel water-dispersible elastomeric photopolymers using anionic polymerization, which resulted in several patents. Earlier career experiences included a yearlong assignment at AT&T Bell Laboratories as a post-doctoral Member of the Technical Staff. There he trained in microlithography, which laid the foundation for his subsequent work in photopolymer chemistry. His initial work helped pave commercialization of AT&T Bell Laboratories' CAMP-6 Photoresist circa 1992.

His international experience includes work in Europe, Asia Pacific, and South America. In addition to completing his undergraduate work in India, Dr. Kanga served as a Visiting Scientist at Johannes Gutenberg University in Mainz, Germany under a NATO grant. He has also collaborated with scientists in France, Switzerland, China and Japan on ongoing research projects. Dr. Kanga is the author of numerous scientific and business publications and white papers published in journals such as Macromolecules, Chemistry of Materials and SPE Conference etc.

Dr. Kanga's educational credentials include a Ph.D. in Polymer Chemistry from the University of Florida, an MBA (Executive Program) from Georgia State University, and a B.Sc. (Technology) in Chemical Technology from Bombay University's Department of Chemical Technology (UDCT).

More detailed lists of his Consulting Services and Patents follow.

Consulting Profile

Expert Witness / Expert Consultant

- Expert Consultant in all Aspects of Polymer Chemistry dealing in Utility Patent Application Projects with US PTO
- Expert Consultant / Expert Witness in Patent Litigation matters in Flexographic Printing
- Working knowledge of *Inter Partes Review* (IPR) and *Post Grant Review* (PGR) as it pertains to challenging the validity of issued patents

Flexographic Printing

- All aspects of Digital (DTP) Technologies for Flexography both solvent developable and thermally developable Digital photopolymer printing plates
- Digital Flat Top Dot (FTD) technology based on UV-A activated Oxygen Scavenging Coating
- ITR (In-the-Round) Technologies for Flexography
- Development of Sheet Photopolymers for Flexographic Printing- both Conventional and Digital
- Development of Photopolymer Cap for capped Sheet Photopolymers for Flexographic Printing- both Conventional and Digital having excellent image fidelity and ink transfer characteristics
- Development of Liquid Photopolymers for Corrugated Flexographic Printing
- Elastomer Technologies for Direct Laser Engraving for Flexography using IR Lasers at high resolutions (2540-5080 DPI) rivaling Digital Flexo imaging

Laser Ablative Digital Coatings for Graphic Arts and Other Applications

- Carbon Black based Laser Ablative Mask Solvent Solutions (LAMS) for ITR Flexographic Printing Sleeves
- Carbon Black based Laser Imageable Mask Coating on Polyester Substrates for Digital Flexographic Printing Plates

Microreplication Applications in Graphic Arts

- Microreplicated Surfaces for Light Manipulation in Graphic Arts Applications
- Light Collimating Articles for use in Graphic Arts Imaging for Improved Image Fidelity

3D Additive Manufacturing (3D AM)

- Xiper Innovations has 3D AM project collaborations with other corporations
- Our concept is the use of Thermoplastic elastomers such as Styrenic Block Copolymers for 3-D Printing Additive Manufacturing Applications
- Provisional patent application filed. Several formulatory options chosen for use in SLA, DLP, CLIP and HARP

UV/EB Radiation Cure Technologies

- 100% Solids UV/EB Curable Inks for Various Printing Applications (Screen, Flexography etc.)
- UV Cure Coatings/Inks for Low Energy Difficult-to-Adhere Substrates (e.g. Polyolefins and Metals)
- 100% Solids, UV Curable Anti-Microbial Coatings for Various Substrates and Fabrics

Adhesives

- Solvent-based non-blocking, UV curable adhesives/primer coatings on polyester substrates for liquid photopolymer flexographic printing plates
- Solvent-based non-blocking, UV curable adhesives/primer coatings on polyester substrates for other UV curable systems such as membrane switches, printed electronics etc.
- Water-borne UV curable coatings used as adhesives/primers for sheet photopolymer printing plates and other radiation cure systems (craft stamps, UV Digital imaging, Optics applications etc.)
- Water-borne Polyurethane and Acrylic Dispersion Adhesives for Wood, Film Lamination, Fabric-Film Composites etc.
- UV Cure Coatings/Adhesives for Low Energy Difficult-to-Adhere Substrates (e.g. Polyolefins and Metals)
- Emulsion Polymer/Clay Nanocomposites for Pressure-Sensitive Adhesives
- Solvent-borne PSA based on Thermoplastic Elastomers for Specialty Applications
- UV Curable Permanent Bond PSA
- Heat activated Adhesives for Specialty Applications

Smart Coatings

- Regenerable Antimicrobial Water-borne Coatings using Hydrogen Peroxide based cleaning solvents to reactivate antimicrobial activity
- 100% Solids, UV Curable Anti-Microbial Coatings for Various Substrates and Fabrics
- Water-borne, UV curable hard-coat coatings showing superior abrasion resistance, chemical resistance, and other beneficial attributes
- 100% Solids UV coating as hard-coat having superior abrasion resistance, chemical resistance, and other beneficial attributes

Construction Material Projects

- Improved composite polymeric structures for panels used in RTA furniture market offering significant benefits over current Kraft paper systems
- Design of a polymer reinforced composite plywood having superior debris and impact resistance

Expert Witness/Consultant Projects

- **Arkansas Labeling Inc. v. Tim Proctor, Gary Parr et al:** United States Eastern District Court. Case# 4:19-cv-00773-KGB. Expert Consultant and Expert Witness for the Defendant (Tim Proctor, Gary Parr et al). February 2022 (Active), Zoom Videotape Deposition: April 2022
- **Aquasyn LLC v. Joseph Peter Marcilese et al:** Superior Court of the State of California for the County of Los Angeles. Case No. 21STCV19760. Expert Consultant and Expert Witness for the Defendant (Marcilese et al). November 2021 (Active)
- **E. I. du Pont de Nemours & Company v. Agfa NV and Agfa-Gevaert NV:** USDC, Norfolk, VA. Civil Action No.: 2:18cv326. Non-deposition, informal Expert Consultant for the Defendant (Agfa). Litigation, August 2018. Concluded 2019
- **MacDermid Printing Solutions, L.L.C v. E. I. du Pont de Nemours & Company:** USDC, District of New Jersey. Civil Action No.: 07-4325. Expert Consultant and Expert Witness for the Plaintiff (MacDermid). Litigation, September 2007. Concluded 2017. Videotape Depositions: August 2010 and June 2012
- **E. I. du Pont de Nemours & Company v. MacDermid Printing Solutions, L.L.C.:** USDC, District of New Jersey. Civil Action No.: 06-3383. Inventor's Report in favor of the Defendant (MacDermid). November 2006
- **Nupro Technologies, Inc. v. E. I. du Pont de Nemours & Company:** USDC, Middle District of NC, No. 1:06 CV 1061. Expert Consultant and Expert Witness for the Plaintiff (Nupro). October 2007. Concluded 2008. Videotape Deposition: April 2008
- **Birch Stewart Kolasch Birch:** Hired as an Expert Consultant for patent prosecution in the area of Polymer Chemistry. Rendered expert opinion for specific questions related to US5798202, especially as it pertained to defining an "elastomeric material" for client's patent examination with US PTO. April-May 2009
- **Birch Stewart Kolasch Birch:** Hired as an Expert Consultant for Photoresists. Rendered expert opinion for specific questions related to US5529880 and JP-A-6-67418, on the esterification of pendant hydroxyl groups of positive photoresists for client's patent examination with US PTO. November-December 2010
- **Quick Med Technologies Inc.:** Expert Consultant for the patentability of U.S. patent application 09/965,740, "Adsorbent Materials with Covalently Bonded, Non-leachable Polymeric Antimicrobial Surfaces, and Methods for Preparation", Batich et al. April 2008

Dr. Kanga's Patent Portfolio (US)

- Polymer Reinforced Composite Plywood and Laminates, US 10259199 B2 (Issued: 04/16/2019), US 9688056 B2 (06/27/2017)
- Water-borne antimicrobial formulations with hydrogen peroxide, US 9999226 B2 (06/19/2018)
- Durable antimicrobial treatments for textiles and other substrates, US 9986742 B2 (06/05/2018)
- Regeneration of antimicrobial coatings containing metal derivatives upon exposure to vapor-phase hydrogen peroxide, US 9808548 B2 (11/07/2017)
- Regeneration of Antimicrobial Coatings Containing Metal Derivatives Upon Exposure to Aqueous Hydrogen Peroxide, US 9549547 B2 (01/24/2017)
- Non-Attenuating Light Collimating Articles for Graphic Arts, US 8867135 B2 (10-21-2014), US 8,441,730 B2 (05-14-2013)
- Laser Engravable Flexographic Printing Articles Based On Millable Polyurethanes, And Method, US 8748082 B2 (06/10/2014), US 8501390 B2 (08-06-2013)
- Disinfectant with Durable Activity Based on Alcohol-Soluble Quaternary Ammonium Polymers and Copolymers, US 8,343,523 (01-01-2013)
- Method of Forming Photosensitive Printing Sleeves, EP1709488 (11-02-2011)
- Processless Digitally Imaged Photopolymer Elements using Microspheres, US 6,989,220 (1-24-2006), US 6,806,018 (10-19-2004)
- Printing Sleeve with an Integrated Printing Surface, US 6,966,259 (11-22-2005)
- Laser Imaged Printing Plates, US 6,916,596 (7-12-2005), US 6,756,181 (6-29-2004)
- UV-absorbing Support Layers and Flexographic Printing Elements Comprising the Same, US 6,413,699 (7-2-2002), US RE 39835 E (9-11-2007)
- Laser Imaged Printing Plate Comprising a Multi-layer Slip Film, US 6,367,381 (4-9-2002)
- Method Of Making Laser Imaged Printing Plates Utilizing Ultraviolet Absorbing Layer, US 5,925,500 (7-20-1999)
- Multiblock Copolymers for Flexographic Printing Plates, US 5,304,458 (4-19-1994)
- Photosensitive Elastomer Polymer Compositions for Flexographic Printing Plates US 5,550,005 (8-27-1996), US 5,344,743 (9-6-1994), US 5,290,662 (3-1-1994)