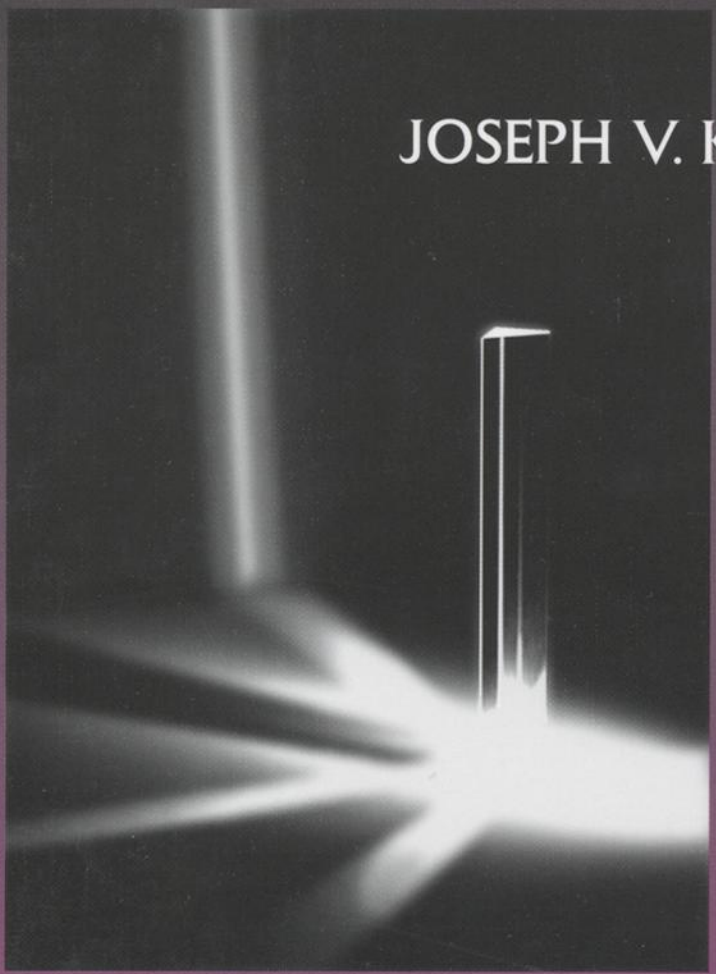
RADIATION CURING OF COATINGS



JOSEPH V. KOLESKE

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Joseph V. Koleske

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ASTM International
100 Barr Harbor Drive
PO Box C700
West Conshohocken, PA 19428-2959

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Foreword

THIS PUBLICATION, *Radiation Curing of Coatings*, was sponsored by Committee D01 on Paint and Related Coatings, Materials, and Applications. This is Manual 45 in ASTM International's manual series.

Contents

Preface

IMAGINE PLACING a layer of a low viscosity liquid mixture made up of monomeric and oligomeric compounds on a substrate, shining a beam of ultraviolet radiation on the liquid, and then in less time than it takes to snap your fingers—effectively, instantaneously—having the entire liquid mass turn into a solid, cross-linked, hard, tough coating with both functional and decorative properties. Sound impossible? Sound magical—like Mary Poppins (to the older generation) or the X-Files (to the younger or younger thinking generation)? Certainly it does! It sounds too good to be true, or as if it were magical in nature. However, it is merely a brief, popularized description of the coating technology known as "radiation curing" or the more limiting term, "photocuring." This technology that deals with using the substrate as your polymerization vessel will be described in detail, but in an understandable manner, in this book. Reading it will give one a good understanding of this topic and enough knowledge to begin formulating radiation-curable inks, coatings, and sealants.

ABOUT THE AUTHOR

DR. JOSEPH V. KOLESKE is a Senior Consultant for Consolidated Research, Inc., and free-lance technical writer in Charleston, West Virginia. He has served in this capacity for 14 years. Prior to this position, he was a Corporate Research Fellow at Union Carbide Corporation in South Charleston, West Virginia for 25 years. In his career, he has worked in the areas of radiation-curable, powder, and high-solids coatings; material science; and solution properties of polymers, fibers, and polyurethanes.

He lectures about radiation-cured coatings during the annual summer coatings short course at North Dakota State University.

He serves on the Editorial Review Board of the *Journal of Coatings Technology* and is a Contributing Editor for *Paint & Coatings Industry Magazine.*

Dr. Koleske is the editor of ASTM International's *Paint and Coating Testing Manual: Fourteenth Edition of the Gardner-Sward Handbook.*

He holds 89 U.S. patents in the above fields, with 30 of them related to radiation-cured coatings. He is the author or coauthor of 107 journal articles and book chapters, with 30 of them related to radiation-cured coatings. Authored monographs include *Free Radical Radiation Curing,* 1997, and *Cationic Radiation Curing,* 1991, *Federation of Societies for Coatings Technology,* Blue Bell, PA. Coauthored books include *Alkylene Oxides and Their Polymers,* Marcel Dekker Inc., New York, 1990; *Poly(ethylene oxide),* Academic Press, New York, 1976; and *Poly(vinyl chloride),* Gordon & Breach, New York, 1969.

Dr. Koleske received his B.S. degree in chemical engineering from the University of Wisconsin-Madison and M.S. and Ph.D. degrees from the Institute of Paper Chemistry, Lawrence College, Appleton, Wisconsin.

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