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Foreword

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Introduction

Dermal exposure assessment explores the dynamic interaction between environmental contaminants and the skin. Occupational skin diseases and disorders constitute a significant percentage of workplace illnesses; the number and frequency of work-related adverse health effects involving the skin is considerably greater than health effects involving the respiratory system[1]. Occupational skin diseases affect virtually all industry and business sectors and are estimated to cost the European Union 600 million Euros each year, resulting in around 3 million lost working days[2].

For thousands of chemicals in the workplace, the contribution to total-body exposure by the dermal route has yet to be determined. Historically, the assessment of occupational exposure has focused on inhalation of chemical agents; however, toxicological evidence indicates that dermal contact can serve as the primary route of exposure for many chemical substances and that the contribution to total dose, integrated from all exposure routes, should be considered. As occupational inhalation exposure limits are lowered, the dermal contribution on total dose becomes more critical to assess.

In the decade before publication of this Technical Report, scientific research on dermal exposure continued to be published. An important contribution to this field was the development of a conceptual model for dermal exposure (see Annex A)[3]. The model systematically describes the transport of contaminant mass from exposure sources to the surface of the skin and provides a structure for both qualitatively and quantitatively evaluating dermal exposure.

The purpose of this Technical Report is to provide a framework of methodologies, including guidance on application and consistency regarding the measurement of dermal exposures to agents in the workplace.