

Preface

On December 23, 1988, a major law went into effect in the United States which has changed forever the way that industry views chemical and petroleum piping systems. This law, which was written as a revision to the Resource, Conservation and Recovery Act, requires that the majority of underground tanks and their associated pipes which are intended to store or transport petroleum fluids and/or chemical waste be provided with special means to prevent against leaks to the surrounding environment. With respect to piping systems, this now usually entails providing a separate outer pipe to house the inner pipe, so as to contain any leaks that may occur, and to provide a means to facilitate the detection of such leaks. We refer to such a system in this book as a double containment piping system.

To many, the thought of placing one pipe inside of another sounds like a relatively simple and straightforward task, and without much challenge involved. I can certainly be included among those who felt this way upon first considering this concept. However, as one gets involved in trying to design and implement such systems, one is soon overwhelmed with the enormous number of subtleties and complexities that arise. One can quickly be overwhelmed just by the task of even considering the sheer number of combinations of materials and systems types that exist for each and every design condition. The vast number of considerations and options that exist are quickly realized by examining the size of this handbook and the amount of information that is contained in it. This book reflects my ten years of study of and experience in dealing with this topic.

When I first started out on this project, I was aware of the challenge of incorporating the many types of material systems and their varying physical properties into one all-encompassing handbook. I have attempted to maintain a balance and neutrality with respect to the various materials considered. However, it is inevitable that some of my experiences with and preferences for certain materials have at times led to subjective coverage. It is my hope that the reader will bear this in mind, and keep an open mind with respect to material choices and system design options. It is my belief, and this is reflected in the text, that in any given application there is likely to be at least one suitable choice of metallic, RTRP (fiberglass), or thermoplastic material. The reader is encouraged to keep this in mind.

Chapter One presents a general introduction to the subject. It also provides information related to groundwater resources. Chapter Two covers material considerations, with particular emphasis on the three major classes of piping and tank materials: metallic, RTRP (fiberglass) and thermoplastic. The proper selection of materials is the first step in the process of designing a system. It is a step that can never be underestimated.

Chapter Three provides the reader with an understanding of when to use the various combinations of inner and outer material systems. It classifies system material combinations into 17 broad categories and attempts to point out major considerations and complications that each present. Chapter Four covers fluid dynamic considerations for both the inner and outer pipes. Fluid dynamics is the scientific basis by which piping systems are typically sized, at least initially. Ultimately the sizing of pipes involves economic factors, which is true for both primary and secondary containment pipe systems.