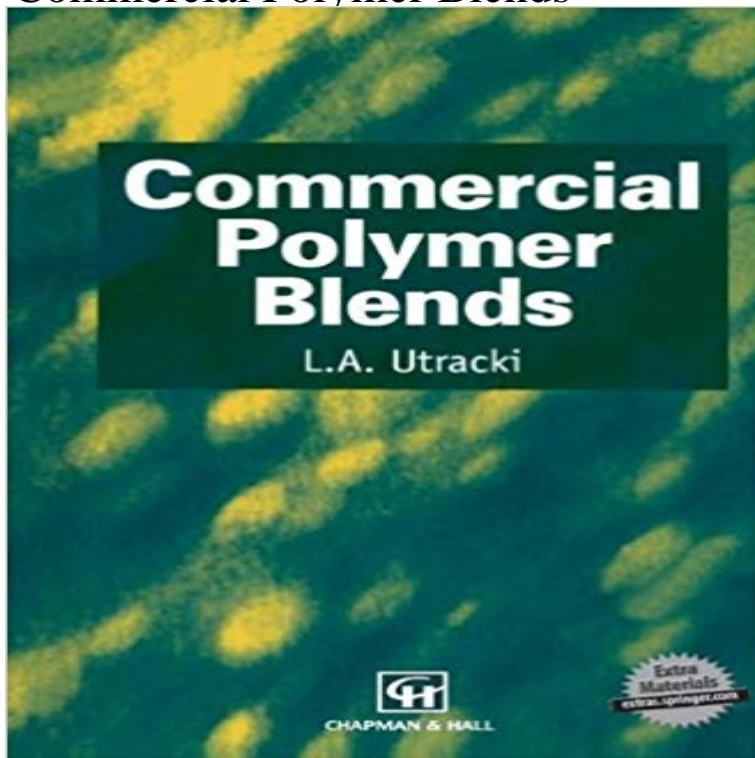


Commercial Polymer Blends



3 In 1992 the annual world production of plastics reached 102 x 10⁶ m at a value of 310 over US\$300 billion, while that of steel was 50 x 10⁶ m at a value of US\$125 billion (Table 1. 1). Furthermore, from 1980 to 1990, plastics production increased by 62%, while that of steel decreased by 21%. Considering the uneven polymer consumption around the world, polymer production will have to increase by a factor often before currently recorded levels of plastics sales in developed countries will be universally reached. Polymers are the fastest growing structural materials. In addition, the polymer blend segment of the plastics industry increases at a rate about three times higher than the whole. The aim of this book is to trace the historical evolution of the polymer blends industry. Table 1. 1

World production of steel and plastics for 1992	Production Steel	Plastics
Production volume (Mt/year)	3	102
Production volume (M(m ³)/year)	51	102
Production value (billion US\$/year)	125	310
Growth from 1980 to 1990 (%)	-21	62

121 Mt/year in 1996 A polymer (from the Greek poly = many and meros = units) is a substance composed of macromolecules built by covalently joining at least 50 molecular segments, called mers. The word polymer was introduced in 1832 by Jons Jacob Berzelius for substances that may have identical chemical composition but differ in molecular weight (e. g., acetylene, benzene and styrene, having the formula C_nH_n with n = 2, 6 and 8, respectively). During the years 1859-1863, Lourenço reported that condensation of ethylene glycol with ethylene dibromide resulted in a mixture of ethers, whose members, separated by distillation, were identified as HD-(C₂H₄O)_n-H with n = 2 to 6 (Stahl, 1981).

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