



THE VANDERBILT
RUBBER
HANDBOOK



Contents

	Page
1. <i>Introduction</i>	1
The Structure and Properties of Rubber	2
Basic Rubber Compounding	10
2. <i>Commercial Elastomers</i>	22
Natural Rubber (NR)	23
Synthetic Polyisoprene (IR)	57
Styrene-Butadiene Rubbers (SBR)	68
Polybutadiene (BR)	85
Isobutylene-Based Elastomers (IIR, BIIR, CIIR, BIMSM)	100
Ethylene Propylene Rubbers (EPM, EPDM)	138
The Neoprenes (CR)	199
Chlorinated Polyethylene (CPE)	221
Crosslinked Polyethylene (XLPE)	228
Nitrile Elastomers (NBR)	237
Hydrogenated Acrylonitrile Butadiene Rubber (HNBR)	258
Epichlorohydrin Elastomers (CO, ECO)	269
Polyacrylate Elastomers (ACM)	289
Ethylene Acrylic Elastomers (AEM)	314
Silicone Elastomers (MQ, VMQ, PMQ, PVMQ)	334
Fluorosilicone Elastomers (FVMQ)	355
Fluorocarbon Elastomers (FKM)	365
Polyurethane Elastomers (AU, EU)	380
Specialty Synthetic Rubbers (ACM, AEM, ECO, FEPM, FVMQ, FFKM)	397
Thermoplastic Elastomers (SBS, TPE, TEO, TPU)	418
3. <i>Compounding Materials and Uses</i>	431
Compounding Materials	432
Peroxide Crosslinking of Elastomers	455
Reinforcing Fillers - Carbon Black	492
Reinforcing Fillers - Silica	506
Mineral Fillers for Rubber	525
4. <i>Compound Design</i>	538
Natural Rubber Compounds	542
SBR Compounds	565
Butyl Compounds	577
EPDM Compounds	585
Neoprene Compounds	593
NBR Compounds	603
HNBR Compounds	615

	Page
5. <i>Laboratory Testing and Factory Processing</i>	616
Processability Tests and Curemeters	617
Vulcanizate Physical Property Measurements	648
Rubber Processing and Rubber Processing Machinery	674
6. <i>Rubber Product Applications</i>	703
Pneumatic Tire Compounding	704
Tire Retreading	720
Extruded Rubber Products	735
Molded Goods	748
Power Transmission Belts	757
Conveyor and Flat-Transmission Belting	774
Hose	783
Open-Cell Sponge Rubber	809
Closed-Cell Sponge Rubber	814
Rubber-Covered Rolls	817
Soles and Heels	842
Wire & Cable	851
Elastomeric Seals	879
Coated Fabrics	896
Rubber Membranes for Roofing and Liners	902
7. <i>General Information</i>	910
ASTM D 2000 / SAE J200 Classification System for Rubber	912
Products in Automotive Applications	
International System of Units (SI)	917
Density and Unit Volume	920
Conversion Tables	929
Time-Temperature Relations in Vulcanization	938
Mensuration Formulas and Conversion Factors	940
Standard Sieves (ASTM E 1101)	942
MOHS Hardness Scale	943
Abbreviations and Symbols	944
Trade Names and Suppliers	951
Subject Index	964