

TABLE OF CONTENTS

PROPERTIES, TREATMENT, AND TESTING OF MATERIALS

THE ELEMENTS, HEAT, MASS, AND WEIGHT	STANDARD STEELS (Cont.)	
363 Elements	409 Standard Steel Numbering System	
364 Latent Heat	413 Standard Stainless Steels	
364 Specific Heat	415 Hardness and Hardenability	
368 Ignition Temperatures	417 Case Hardening	
368 Thermal Properties of Metals	418 Applications of Steels	
370 Specific Gravity	420 Carbon Steels	
372 Weights and Volumes of Fuels	422 Free Cutting Steels	
372 Weight of Wood	423 Carburizing of Steels	
373 Weight of Natural Piles	424 Hardenability of Alloy Steels	
PROPERTIES OF WOOD, CERAMICS, PLASTICS, METALS, WATER, AND AIR		
375 Properties of Wood	425 Characteristics of Stainless Steels	
375 Mechanical Properties	428 Chromium Nickel Austenitic Steels	
376 Density of Wood	429 Stainless Chromium Irons and Steels	
377 Machinability of Wood	430 Mechanical Properties of Steel	
379 Properties of Ceramics, Plastics and Metals	440 High-Strength, Low-Alloy Steels	
380 Properties of Investment Casting Alloys	TOOL STEELS	
383 Properties of Compressed and Sintered Powdered Metal Alloys	444 Tool Steels	
384 Elastic Properties of Materials	444 Properties of Tool Steels	
385 Tensile Strength of Spring Wire	448 Tool Faults, Failures and Cures	
386 Pressure and Flow of Water	450 Tool Steel Properties	
386 Water Pressure	451 Classification	
388 Flow of Water in Pipes	452 Tool Steel Selection	
390 Flow through Nozzle	457 High-Speed Tool Steels	
392 Friction Loss	457 Molybdenum-Type	
393 Properties of Air	458 Tungsten-Type	
393 Volumes and Weights	460 Tungsten High-Speed	
394 Density of Air	460 Hot-Work Tool Steels	
395 Expansion and Compression	462 Tungsten Types	
397 Horsepower Required to Compress Air	464 Molybdenum Types	
401 Flow of Air in Pipes	464 Cold-Work Tool Steels	
401 Flow of Compressed Air in Pipes	466 Oil-Hardening Types	
STANDARD STEELS		
403 Numbering Systems	466 Air-Hardening Types	
404 Unified Numbering System	467 Shock-Resisting Tool Steels	
406 Steel Classification	469 Mold Steels	
406 Compositions of Steels	469 Special-Purpose Tool Steels	
	470 Water-Hardening Tool Steels	
	471 Finished Bars	
	472 Tolerances of Dimensions	
	472 Allowances for Machining	
	472 Decarburization Limits	
	473 Physical Properties	
	475 Strength of Steels	
	475 Temperature effects on Strength	

TABLE OF CONTENTS

HARDENING, TEMPERING, AND ANNEALING

479	Heat-Treating Definitions
484	Slow Cooling
484	Rapid Cooling or Quenching
485	Heat-Treating Furnaces
486	Hardening
486	Hardening Temperatures
488	Heating Steel in Liquid Baths
488	Salt Baths
489	Quenching Baths
489	Hardening or Quenching Baths
489	Quenching in Water
490	Quenching in Molten Salt Bath
490	Tanks for Quenching Baths
493	Tempering
495	Color Indicates Temperatures
497	Case Hardening
498	Carburization
498	Pack-Hardening
498	Cyanide Hardening
499	Nitriding Process
500	Flame Hardening
501	Induction Hardening
504	SAE Carbon Steels
505	SAE Alloy Steels

HEAT-TREATING HIGH-SPEED STEELS

508	Cobaltcrom Steel
508	Tungsten High-Speed Steel
511	Molybdenum High-Speed Steels
514	Subzero Treatment of Steel
517	Brinell Hardness Test
518	Rockwell Hardness Test
518	Shore's Scleroscope
518	Vickers Hardness Test
519	Knoop Hardness Numbers
519	Monotron Hardness Indicator
519	Keep's Test
520	Hardness Scales
524	Creep

NONFERROUS ALLOYS

525	Copper and Copper Alloys
525	Cast Copper Alloys
526	Properties of Copper Alloys
533	Wrought Copper Alloys
542	Aluminum and Aluminum Alloys
542	Characteristics
543	Temper Designations
546	Designation Systems
547	Clad Aluminum Alloys
548	Composition of Casting Alloys
549	Principal Alloy Series Groups
550	Mechanical Property Limits
556	Compositions
557	Magnesium Alloys
558	Alloy and Temper Designation
561	Nickel and Nickel Alloys
561	Titanium and Titanium Alloys
562	Designations, Compositions
564	Mechanical Properties
565	Copper-Silicon and Copper-Beryllium Alloys
565	Everdur
565	Copper-Beryllium Alloys

PLASTICS

567	Properties of Plastics
567	Characteristics of Plastics
568	Plastics Materials
568	Structures
568	Mixtures
569	Physical Properties
571	Mechanical Properties
576	Strength and Modulus
577	Time Related Properties
578	Thermal Properties
579	Coefficient of Thermal Expansion
581	Electrical Properties
583	Chemical Resistance
584	Design Analysis
584	Structural Analysis
584	Design Stresses
586	Thermal Stresses
587	Design for Injection Moldings
591	Design for Assembly
595	Assembly with Fasteners
597	Machining Plastics
600	Development of Prototypes
601	Plastics Gearing