

CONTENTS

Preface	V	2.2 Chemical composition	34
Introduction	VII	2.3 Wood properties	39
Acknowledgements	XI	3. WOOD-BASED PANELS	51
Chapter 1		3.1 Solid wood panels	52
Gluing. Theory and practice	1	3.2 Particleboards	54
1. INTRODUCTION	1	3.3 Fibreboards	59
2. DEFINITIONS	3	3.4 Plywood	61
3. BONDING THEORY	3	3.5 Composite panels	63
3.1 Mechanical theory	7	Appendix.	
3.2 Electrostatic theory	8	Formaldehyde emission	66
3.3 Chemical adsorption theory	9	1. INTRODUCTION	66
3.4 Diffusion theory	10	2. FORMALDEHYDE	66
3.5 Adsorption theory	10	2.1 Safety	67
4. BONDING PRACTICE	12	3. THE USE OF FORMALDEHYDE	67
4.1 Surface cleaning	12	3.1 Formaldehyde emission	68
4.2 Wettability	13	4. STANDARDS AND LAWS	71
4.3 Rheology	20	5. THE EMISSION SCENARIO	74
4.4 Application	22	Chapter 3	
4.5 Pressure	23	Covering materials	
4.6 The final use	26	1. INTRODUCTION	79
Chapter 2		2. MATERIALS APPLIED	79
Wood and wood-based substrates		2.1 Wood veneers	79
1. INTRODUCTION	27	2.2 Multilaminar wood veneers	85
2. WOOD	27	2.3 Impregnated papers	87
2.1 Wood structure	28	2.4 Laminates	90
		2.5 Polymeric foils	93
		3. EDGES	97

3.1 Composition	98	8.4 Epoxide	156
3.2 Properties	99	8.5 Polyisocyanate	157
		8.6 Emulsions polymer isocyanates	160

Chapter 4
Composition and classification of adhesives

1. INTRODUCTION	105
2. COMPOSITION	105
2.1 Polymeric substances	107
2.2 Organic solvents	114
2.3 Additives	115
2.4 Fillers	116
3. CLASSIFICATION	117
4. GLUES	118
4.1 Animal glues	119
4.2. Vegetal glues	120
5. SOLVENT-BASED ADHESIVES	123
5.1 Contact adhesives	123
6. DISPERSION ADHESIVES	125
6.1 Polyvinyl acetate dispersions	126
6.2 Polyurethane dispersions	134
7. HOT MELT ADHESIVES	136
7.1. Ethylene-vinyl acetate	137
7.2 Polyolefin	139
7.3. Polyamide	141
7.4. Polyisocyanate	142
7.5. Silane	144
8. REACTION ADHESIVES	146
8.1 Urea-formaldehyde	147
8.2. Melamine-formaldehyde	152
8.3 Phenolic	154

Chapter 5
Selection of adhesives

1. INTRODUCTION	165
2. MATERIALS TO BE GLUED	167
2.1 Solubility	167
2.2 Permeability	167
2.3 Porosity and absorption	168
2.4 Surface energy (or tension)	169
2.5. Chemical interactions	169
2.6 Moisture content	170
2.7. Setting conditions	170
2.8 Morphology	171
2.9 Surface preparation	171
3. ADHESION PERFORMANCE	171
3.1 Significance of tests	174
3.2 Intended use	174
3.3 Mechanical stresses	175
3.4 Safety for end-users	178
4. ADHESIVE FEATURES	179
4.1 Composition and safety	179
5. OPERATIONAL ASPECTS	191
5.1 Application	191
5.2 Setting (drying)	196

Chapter 6
Furniture assembly

1. INTRODUCTION	203
2. SOLID WOOD ASSEMBLY	203
2.1 Wood	204

2.2 Wood joints	206	2.1 Adhesive selection – final use	266
2.3 Adhesives	210	2.2 Materials to be glued	267
2.4 Assembly	211	2.3 Wrapping process	267
2.5 Defects	212	2.4 Defects	272
3. PANEL ASSEMBLY	215	3. PROFILE WRAPPING WITH WOOD VENEERS	274
3.1 Dowel (pins)	215	3.1 Defects	278
3.2 Adhesives	218		
3.3 Assembly	218	4. PROFILE WRAPPING WITH CELLULOUSIC MATERIALS	280
3.4 Gluing defects	219	4.1 Defects	281
4. BONDING PERFORMANCE	221		
Chapter 7			
Lamination of wood based panels			
1. INTRODUCTION	225	5. PROFILE WRAPPING WITH POLYMERIC FOILS	282
2. APPLICATION OF VENEERS	226	5.1 Defects	284
2.1 Defects	231	6. BONDING PERFORMANCE	285
3. APPLICATION OF IMPREGNATED PAPERS AND LAMINATES	242	6.1 Adhesion tests	286
3.1 Post-forming	245	6.2 Resistance to climatic variations	287
3.2 Defects	248		
4. APPLICATION OF POLYMERIC FOILS	253		
4.1 Defects	255		
5. BONDING PERFORMANCE	259		
5.1 Adhesion tests	259		
5.2 Resistance to climatic variations	260		
Chapter 8			
Profile wrapping			
INTRODUCTION	265	1. INTRODUCTION	289
GENERALITIES	266	2. EDGE-BANDING PROCESSES	289
		2.1 Influence of substrate	291
		2.2 Influence of edge composition	291
		2.3 Influence of final destination	291
		2.4 Influence of application process	292
		2.5 Selection of hot melt adhesives	297
		2.6 Automatic edge-banding of linear and square elements	298
		2.7 Semi-automatic edge-banding of linear or curved elements	303
		2.8 Automatic edge-banding of curved elements with CNC	305