

Coating Substrates and Textiles

A Practical Guide to Coating and Laminating Technologies

Bearbeitet von
Andreas Giessmann

1. Auflage 2012. Buch. xiv, 246 S. Hardcover

ISBN 978 3 642 29159 3

Format (B x L): 15,5 x 23,5 cm

[Weitere Fachgebiete > Technik > Verfahrenstechnik, Chemieingenieurwesen, Lebensmitteltechnik > Technologie der Oberflächenbeschichtung](#)

schnell und portofrei erhältlich bei


DIE FACHBUCHHANDLUNG

Die Online-Fachbuchhandlung beck-shop.de ist spezialisiert auf Fachbücher, insbesondere Recht, Steuern und Wirtschaft. Im Sortiment finden Sie alle Medien (Bücher, Zeitschriften, CDs, eBooks, etc.) aller Verlage. Ergänzt wird das Programm durch Services wie Neuerscheinungsdienst oder Zusammenstellungen von Büchern zu Sonderpreisen. Der Shop führt mehr als 8 Millionen Produkte.

Contents

1	The Coating Industry	1
1.1	Definitions	1
1.1.1	Classification and Delineation of Coating	2
1.1.2	Textile Coating	2
1.1.3	Intelligent Textiles	3
1.2	Historical Outline	5
1.3	Economic Activity	5
2	Demands of a Coating Facility	11
2.1	Logistic Integration Within a Coating Facility	12
2.1.1	Technical Performance/Services	13
2.1.2	Logistic Performance/Services	17
2.1.3	Sales Performance/Services	18
2.2	Realisation of Logistical Integration	19
3	Basic Elements of Coating Systems	23
3.1	The Roller	23
3.2	Application Equipment	27
3.2.1	Knife Systems	28
3.2.2	Roller Application Systems	36
3.2.3	Powder Coating	41
3.2.4	Hot-Melt Method	41
3.2.5	Injecting	45
3.2.6	Slot Die and Pouring Technologies	47
3.2.7	Dipping and Impregnating	49
3.2.8	Point and Double-Point Coating	50
3.2.9	Foam Coating	50
3.2.10	Other Methods	51
3.3	Material Transport	53
3.3.1	Winding	53
3.3.2	Guiding Web Movement	55
3.3.3	Material Reserves (Compensator)	56

3.3.4	Accumulator Trough	56
3.3.5	Tenter Frames	57
3.3.6	Drive Technology	58
3.4	Auxiliary Units	59
3.5	Drying Systems	61
3.5.1	Drying	61
3.5.2	Minimum Exhaust Volume Flow	70
3.5.3	Temperature Control Unit	70
3.5.4	Thermal Oil Boiler	70
3.5.5	Cooling	71
3.6	Recording Data on Coating Systems for Quality Assurance	
	Purposes	71
3.6.1	Recording Measured Values	71
3.6.2	Tension	73
3.6.3	Temperatures	73
3.6.4	Flow Conditions	74
3.6.5	Coating Weight	75
3.6.6	Material Moisture Level	75
4	Production Methods	77
4.1	Coating Methods	78
4.1.1	Transfer Coating	78
4.1.2	Direct Coating	79
4.2	Printing	80
4.3	Lacquering	81
4.4	Embossing	81
4.5	Tumbling	82
4.6	Combined Methods	83
4.7	Flock Coating	84
4.8	Laminating	85
4.8.1	Dry Laminating	87
4.8.2	Wet Laminating	88
4.8.3	Flame Laminating	88
4.9	Final Assembly and Inspection	88
4.10	Reference Formulae	90
5	Paste Preparation	93
5.1	Vacuum Sinus Dissolver	93
5.2	Vacuum Filter	94
5.3	Three-Roller Mill	95
5.4	Wall-Mounted High-Speed Mixer	95
5.5	Solvent Mixer	96
5.6	Plastisol	96
5.6.1	Preparations	96
5.6.2	Using a High Speed Mixer	97

5.6.3	Low Speed Mixers	98
5.6.4	De-Airing	99
5.6.5	Filtration	99
6	Substrate Coating	101
6.1	Properties of the End Product	101
6.1.1	Carrier Material	102
6.1.2	Coating of the Surface	108
6.1.3	Coated Textiles as Laminate Materials	108
6.2	Medical and Hygiene Products	116
6.2.1	Product Description	116
6.2.2	Substrates and Chemistry	118
6.2.3	Process Engineering	119
6.3	Prepreg	121
6.3.1	Product Description	121
6.3.2	Substrates and Chemistry	122
6.3.3	Process Engineering	124
6.4	Thin Film Coating (In the Field of Electronics)	126
6.4.1	Substrate Pre-Treatment	127
6.4.2	Coating	128
6.4.3	Activation	130
6.4.4	Substrate Post-Treatment (and Subsequent Processes)	132
7	Characteristics and Applications of Plastisols and Additives	135
7.1	Introduction	135
7.1.1	History	135
7.1.2	PVC Resins for Plastisol	135
7.1.3	What Is a Plastisol?	136
7.2	Rheology	137
7.2.1	Viscosity According to Newton	137
7.2.2	Shear Stress $\tau = F/S$ is in dyn/cm	138
7.2.3	Non-Newtonian Fluids	138
7.2.4	Rheologic Curves	139
7.2.5	A Look at Actual Practice	139
7.2.6	Thixotropy and Curing	140
7.2.7	Elements in the Composition of a Plastisol	140
7.2.8	PVC Resins for Plastisols	141
7.3	The Plasticisers	144
7.3.1	Function	144
7.3.2	What are Plasticisers Made of?	145
7.3.3	Their Performance Characteristics	145
7.3.4	Classification	147
7.4	Stabilising Agents, Accelerators and Co-Stabilising Agents	152
7.4.1	Background	153
7.4.2	Mercaptide Group	153

7.4.3	Carboxyl Group	154
7.4.4	Barium/Zinc Stabilising Agents	154
7.4.5	Calcium/Zinc Stabilising Agents	154
7.4.6	Accelerators	154
7.4.7	Conclusions	155
7.4.8	Co-stabilising Agents	156
7.4.9	Epoxy Stabilising Agents or Plasticisers	156
7.4.10	Epoxidised Soybean Oil	156
7.4.11	Epoxidised Linseed Oil	156
7.4.12	Octyl Epoxy Tallate and Isooctyl Epoxy Tallate	157
7.5	Foaming or Expanding Agents	157
7.5.1	Chemical Foaming	157
7.5.2	PVC Resin	158
7.5.3	Plasticisers	158
7.5.4	Accelerators	159
7.5.5	Foaming Agents	159
7.5.6	Azodicarbonamide	160
7.5.7	Sulfonhydrazide	161
7.5.8	Hydrocerole BIF (Böhringer Ingelheim)	161
7.5.9	Practical Aspects	162
7.5.10	Mechanical Foams	163
7.5.11	Surface-active Substances	164
7.5.12	Mixers for Mechanical Foams	164
7.5.13	Physical Foams	165
7.6	Extenders	165
7.6.1	Carbonate Extenders	165
7.6.2	Precipitated Calcium Carbonates	167
7.6.3	Carbonate-free Extenders	167
7.6.4	Additives with an Extender Function	168
7.6.5	General Influences of Extenders	169
7.7	Rheologic Modifiers	170
7.7.1	The Thickening Agents	170
7.7.2	Solvents	172
7.7.3	Substances for Flame Retardation and Smoke Suppression ..	173
7.8	UV Light Stabilising Agents	181
7.8.1	Other Successes in Weather Resistance	182
7.8.2	Important UV Light Stabilisers	182
7.9	Adhesion Promoters for Plastics	183
7.9.1	Single-Component Adhesives	183
7.9.2	Two-Component Adhesives	184
7.10	Biocides	184
7.10.1	Microbiological Attack	185
7.10.2	Fungi	185
7.10.3	Bacteria	186
7.10.4	Algae	186
7.10.5	Common Biocides for Plastics	186

7.11 Other Raw Materials	187
7.11.1 Antistatic Agents	187
7.11.2 Calcium Oxide	187
7.11.3 Air Releasing Agents	187
7.12 Economy	188
7.12.1 Relative Density	188
7.12.2 Formula Examples and Costs	188
8 Emission Control in Coating Companies	193
8.1 Air Pollution	193
8.1.1 Emission	196
8.1.2 Immissions	196
8.1.3 Threshold Values	196
8.1.4 Air Quality Control Regulations	197
8.2 Emission Control Procedure	198
8.2.1 Procedure with Solid and Liquid Pollutants	198
8.2.2 Procedure for Vaporous and Gaseous Pollutants	202
8.2.3 Combination Procedures	211
8.3 Requirements for Emission Control Systems	211
8.4 Emission Control System Selection	212
9 Investment Profitability Analysis	217
9.1 Strategic Profitability Analysis	219
9.2 The Business Strategy	220
9.3 Production Strategy	221
9.4 Coating Plant Cost Elements	222
9.4.1 Investment Spending	223
9.4.2 Operating Costs	223
9.4.3 Annuity	228
9.4.4 Total Costs	229
9.5 Performance Elements in Coating Plants	229
9.5.1 Flexibility	230
9.5.2 Quality	230
9.5.3 Quality	230
9.6 Operational Profitability Analysis	231
9.7 Planning Result Calculation	234
9.7.1 Annual Sales	234
9.7.2 Profits	235
9.7.3 Summary of All Costs and Profits	235
9.7.4 Comparison Figures	236
Bibliography	237
Index	241