

Handbook of Antiblocking, Release, and Slip Additives

CONTENTS:

- 1 Introduction
 - 1.1 Historical developments
 - 1.2 Expectations from commercial additives
 - 1.3 Definitions
 - 1.4 Classification
 - References

- 2 Generic Types
 - 2.1 Introduction
 - 2.2 Characteristic properties of commercial additives
 - 2.2.1 Antiblocking agents
 - 2.2.1.1 Inorganic
 - 2.2.1.1.1 Calcium carbonate
 - 2.2.1.1.2 Carbon nanotubes, fibers, graphite
 - 2.2.1.1.3 Ceramic and glass spheres and fly ash
 - 2.2.1.1.4 Diatomaceous earth and other natural silicas
 - 2.2.1.1.5 Synthetic silica
 - 2.2.1.1.6 Synthetic clay (Iaponite)
 - 2.2.1.1.7 Talc
 - 2.2.1.1.8 Zeolite
 - 2.2.1.2 Organic
 - 2.2.1.2.1 Microparticles
 - 2.2.2 Mold release agents
 - 2.2.2.1 Fluorocompounds
 - 2.2.2.2 Polydimethylsiloxanes
 - 2.2.2.3 Polymeric waxes
 - 2.2.2.4 Other chemical compounds
 - 2.2.3 Slip agents
 - 2.2.3.1 Acids
 - 2.2.3.2 Esters
 - 2.2.3.3 Fatty acid amides
 - 2.2.3.4 Natural wax and its substitutes
 - 2.2.3.5 Salts
 - References

- 3 Standard Methods of Control
 - 3.1 Adhesives
 - 3.2 Floor coverings
 - 3.3 Footwear and walkway surfaces
 - 3.4 Geosynthetics
 - 3.5 Leather and coated fabrics
 - 3.6 Lubricants
 - 3.7 Medical
 - 3.8 Paints and coatings
 - 3.9 Paper

- 3.10 Plastics and rubber
 - 3.11 Roads and pavement
 - 3.12 Sport equipment
 - 3.13 Textiles
 - References
-
- 4 Transportation and Storage
 - 4.1 Transportation
 - 4.2 Storage
 - References
-
- 5 Mechanisms of Action
 - 5.1 Antiblocking agents
 - 5.2 Slip agents
 - 5.3 Release agents
 - References
-
- 6 Compatibility and Performance
 - References
-
- 7 Diffusion and Migration
 - 7.1 Diffusion
 - 7.2 Distribution of additive in bulk and on surface
 - 7.3 How mobility affects additive selection?
 - 7.4 Additive transfer to material in contact
 - 7.5 Additive loss
 - References
-
- 8 Interaction with Other Components of Formulation
 - 8.1 Fillers
 - 8.2 Other components of formulation
 - 8.3 Synergy between surface additives
 - 8.4 Other properties
 - References
-
- 9 Processing and Additive Performance
 - References
-
- 10 Effect on Product Properties
 - 10.1 Mechanical properties
 - 10.2 Mar and abrasion
 - 10.3 Shrinkage and warpage
 - 10.4 Blocking force
 - 10.5 Adhesion to mold and demolding
 - 10.6 Coefficient of friction
 - 10.7 Residues on molds
 - 10.8 Residues on molded parts
 - 10.9 Optical properties
 - 10.10 Rheological properties
 - 10.11 Electrical properties
 - 10.12 Structure and orientation
 - 10.13 Thermal aging
 - 10.14 UV radiation

10.15 Effect on other properties
References

11 Use in Specific Polymers

11.1 ABS
11.2 Acrylics
11.3 Bromobutyl rubber
11.4 Cellulose acetate
11.5 Cellulose, acetate, butyrate and propionate
11.6 Cellulose nitrate
11.7 Chlorinated polyvinylchloride
11.8 Chlorosulfonated polyethylene
11.9 Copolymers
11.10 Cyanoacrylates
11.11 Ethyl cellulose
11.12 Ethylene-propylene-diene copolymer, EPDM
11.13 Ethylene-propylene rubber, EPR
11.14 Epoxy resin
11.15 Ethylene-vinyl acetate copolymer, EVA
11.16 Ionomers
11.17 Nitrile rubber
11.18 Polyamide
11.19 Polybutadiene
11.20 Polycarbonate
11.21 Polyester
11.22 Polyetherimide
11.23 Polyethylene
11.24 Polyimide
11.25 Polylactide
11.26 Polymethylmethacrylate
11.27 Polyoxymethylene
11.28 Poly(N-vinylcarbazole)
11.29 Polyphenylene ether
11.30 Polypropylene
11.31 Polystyrene
11.32 Polysulfone
11.33 Poly(phenylene sulfide)
11.34 Polyvinylacetate
11.35 Polyvinylalcohol
11.36 Polyvinylbutyral
11.37 Polyvinylchloride
11.38 Polyurethanes
11.39 Proteins
11.40 Rubber, natural
11.41 Silicone
11.42 Styrene-butadiene rubber
11.43 Styrene-butadiene-styrene
11.44 Starch
References

12 Use in Industrial Products

12.1 Adhesives and sealants
12.2 Aerospace
12.3 Agriculture
12.4 Automotive applications

12.5 Bottles
12.6 Ceramic materials
12.7 Composites
12.8 Coated fabrics
12.9 Cosmetics
12.10 Dental materials
12.11 Electronics
12.12 Fibers
12.11 Film
12.12 Food
12.13 Foams
12.14 Gaskets
12.15 Inks, varnishes, and lacquers
12.16 Medical devices
12.17 Membranes
12.18 Paints and coatings
12.19 Pharmaceutical products
12.20 Photographic materials
12.21 Pipes
12.22 Roofing materials
12.23 Tires
12.24 Toys
12.25 Wire & cable
References

13 Various Processing Methods

13.1 Blow molding
13.2 Calendering
13.3 Coextrusion
13.4 Compression molding
13.5 Compounding (mixing)
13.6 Dip coating
13.7 Dryblending
13.8 Extrusion
13.9 Extrusion blow molding
13.10 Injection molding
13.11 Printing
13.12 Reaction injection molding
13.13 Rotational molding
13.14 Rubber processing
13.15 Slip casting
13.16 Thermoforming
13.17 Transfer molding
References

14 Specialized Analytical Methods

14.1 Identification
14.2 Determination of concentration
14.3 Determination of volatility and molecular motion
14.4 Study of materials containing additives
References

15 Mathematical Modelling

References

- 16 Health, Safety and Environmental
- 16.1 Antiblocking agents
 - 16.1.1 Inorganic
 - 16.1.1.1 Calcium carbonate
 - 16.1.1.2 Carbon related materials
 - 16.1.1.3 Ceramic and glass spheres and fly ash
 - 16.1.1.4 Diatomaceous earth and natural silicas
 - 16.1.1.5 Synthetic silica
 - 16.1.1.6 Synthetic clay (laponite)
 - 16.1.1.7 Talc
 - 16.1.2 Organic
 - 16.1.2.1 Microparticles
- 16.2 Release agents
 - 16.2.1 Fluorocompounds
 - 16.2.2 Polydimethylsiloxane
 - 16.2.3 Polymeric waxes
 - 16.2.4 Other chemical compounds
- 16.3 Slip agents
 - 16.3.1 Acids
 - 16.3.2 Esters
 - 16.3.3 Fatty acid amides
 - 16.3.4 Natural wax
 - 16.3.5 Salts
- References

- 17 Regulations and Data
 - 17.1 Toxic substance control
 - 17.2. Carcinogenic effect
 - 17.3 Workplace exposure limits
 - 17.4 Food regulatory acts
- References

- 18 Personal Protection
 - 18.1 Clothing
 - 18.2 Gloves
 - 18.3 Eye protection
 - 18.4 Respiratory protection
- References