Introduction to Material Science in Food Contact Surfaces Training Course

Professional Development Training Course Outline

Category	Food processing and Technology	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Material science plays a critical role in ensuring the safety, quality, and sustainability of food systems. Food contact surfaces, including packaging materials, processing equipment, and utensils, must be designed and manufactured to meet regulatory standards, ensure hygiene, and prevent contamination. Introduction to Material Science in Food Contact Surfaces Training Course introduces participants to the essential concepts of material science in the context of food contact applications, emphasizing safe design, testing procedures, and sustainable innovations. With the increasing demand for safe and eco-friendly food production systems, knowledge of materials used in contact with food is a vital competency.

The course further integrates trending knowledge on polymers, coatings, stainless steel, ceramics, and smart materials that contribute to food safety and shelf life. Participants will explore scientific principles, industry practices, and real-world case studies to enhance their understanding of material selection, risk assessment, regulatory compliance, and innovative technologies. This introduction aims to prepare learners for practical decision-making in food industries, packaging plants, quality assurance labs, and regulatory bodies, while equipping them with sustainable solutions for the future of global food security.

Programme Curriculum

Introduction to Material Science in Food Contact Surfaces Training Course

Introduction

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Course Objectives

1. Understand the fundamentals of material science and its application in food contact surfaces.
2. Analyze food safety hazards associated with contact materials.
3. Evaluate regulatory requirements for food contact materials.
4. Identify different types of polymers and their role in packaging and processing.
5. Apply knowledge of metals, ceramics, and glass in food systems.
6. Assess the importance of coatings and surface treatments in hygiene.
7. Explore innovative and sustainable materials for food packaging.
8. Examine migration testing and compliance strategies.
9. Investigate smart materials and nanotechnology in food contact applications.
10. Compare global standards and harmonization of regulations.
11. Review case studies of material failure and corrective actions.
12. Strengthen decision-making skills in material selection.
13. Develop practical knowledge for ensuring consumer protection and brand integrity.

Organizational Benefits

- Enhanced compliance with global food safety standards.
- Reduced risk of contamination and material-related hazards.
- Improved decision-making in procurement and quality control.
- Increased consumer trust through safe product design.
- Access to updated trends in sustainable food packaging.
- Strengthened internal auditing and risk assessment capabilities.
- Reduced legal risks through adherence to regulations.
- Greater innovation in product development.
- Cost savings through optimized material use.
- Enhanced corporate reputation in global markets.

Target Audiences

1. Food safety managers
2. Quality assurance professionals
3. Packaging technologists
4. Food production supervisors
5. Regulatory affairs specialists
6. R&D scientists in food industries
7. Environmental sustainability officers
8. Equipment manufacturers and engineers

Course Duration: 10 days

Course Modules

Module 1: Fundamentals of Material Science in Food Systems

- Introduction to materials and classification
- Basic properties of polymers, metals, ceramics, and glass
- Relationship between material properties and food safety
- The role of material science in modern food industries
- Practical examples of material applications
- Case study: Stainless steel use in dairy equipment

Module 2: Food Contact Materials and Food Safety Hazards

- Types of hazards from food contact surfaces
- Migration and leaching issues in materials
- Cross-contamination risks in food processing
- Testing procedures for food safety hazards
- Control measures and prevention strategies
- Case study: BPA migration from plastics

Module 3: Global Regulations and Standards for Food Contact Materials

- FDA regulations in the United States
- EFSA requirements in the European Union
- Codex Alimentarius standards
- Harmonization challenges between global systems
- Industry implications of compliance
- Case study: EU compliance for packaging manufacturers

Module 4: Polymers in Food Packaging and Processing

- Types of polymers used in packaging
- Functional properties of polymers
- Additives and their safety concerns
- Biodegradable and recyclable polymers
- Challenges in polymer-based packaging
- Case study: PET bottles in beverage industries

Module 5: Metals in Food Contact Surfaces

- Properties of stainless steel, aluminum, and tinplate
- Corrosion resistance and hygiene
- Metal coatings and their importance
- Applications in processing equipment
- Global best practices in metal usage
- Case study: Stainless steel in meat processing plants

Module 6: Ceramics and Glass in Food Systems

- Physical and chemical properties of ceramics and glass

- Applications in food storage and cooking
- Risks associated with heavy metals in ceramics
- Glass as a sustainable packaging option
- Durability and safety testing methods
- Case study: Glass packaging in baby food

Module 7: Coatings and Surface Treatments

- Role of coatings in enhancing durability
- Antimicrobial surface technologies
- Non-stick coatings and food safety
- Surface roughness and hygiene concerns
- Advances in nano-coatings for food contact
- Case study: Teflon coatings in cookware

Module 8: Sustainable and Innovative Materials

- Drivers for sustainable material use
- Bioplastics and edible films
- Compostable packaging innovations
- Eco-labeling and certification schemes
- Industry adoption challenges
- Case study: Edible packaging solutions in snacks

Module 9: Migration Testing and Compliance

- Principles of migration testing
- Analytical methods for detection
- Risk assessment procedures
- Interpretation of migration test results
- Regulatory acceptance criteria
- Case study: Migration testing of canned foods

Module 10: Smart Materials and Nanotechnology

- Introduction to smart materials
- Role of nanotechnology in packaging
- Active packaging systems
- Sensors for food freshness monitoring
- Future trends and innovations
- Case study: Nano-silver in antimicrobial packaging

Module 11: Failure Analysis of Food Contact Materials

- Causes of material failure
- Examples of product recalls
- Risk communication strategies
- Corrective actions in manufacturing
- Documentation and reporting requirements
- Case study: Contaminated packaging recall

Module 12: Cleaning and Hygiene of Contact Surfaces

- Importance of hygiene in materials
- Cleaning methods for different surfaces
- CIP systems in food processing
- Monitoring hygiene effectiveness
- Global hygiene standards
- Case study: Hygiene practices in beverage bottling

Module 13: Material Selection and Decision-Making

- Criteria for choosing food contact materials
- Balancing safety, cost, and sustainability
- Procurement considerations
- Supplier evaluation and audits
- Long-term material performance
- Case study: Decision-making in dairy packaging

Module 14: Global Perspectives and Trends

- Regional differences in material use
- Industry innovations worldwide
- Policy trends toward sustainability
- Consumer-driven material choices
- Impact of international trade agreements
- Case study: Bans on single-use plastics

Module 15: Integration and Future Outlook

- Integration of learned concepts
- Building organizational strategies
- Emerging research in material science
- Preparing for future regulations
- Industry collaboration and partnerships
- Case study: Future of biodegradable polymers

Training Methodology

- Interactive lectures with multimedia presentations
- Group discussions and brainstorming sessions
- Case study reviews and practical problem-solving
- Hands-on demonstrations with materials
- Role plays and scenario-based exercises
- Knowledge checks through quizzes and assignments

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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