COBBLESTONE

COURSE ID 2886

Starches: Fundamentals and Process Applications in Industrial Operations

DIRECTED BY

Herberto Dutra, Sr. Manager - Engineering

90 MINUTE

ACCREDITED COURSE

- Retrogradation mechanism
- Starches during gelatinization
- Troubleshoot operations
- Impact of starches
- Extraction process
- Synthesis of the plant-based macromolecules

about the course

This 90-minute comprehensive training course is on the fundamentals of starch science and its applications in various industries. The course will cover the basics of starch chemistry, structure, and properties, and how these properties can be tailored to suit different industrial applications.

Participants can expect to learn about the different types of starches and their functional properties, such as thickening, gelling, binding, and stabilizing. The course will also cover the impact of starches on product texture, flavor, and shelf-life.

Case studies will be used to illustrate how starches are used in various industrial processes, such as food and beverage production, cosmetics, chemicals, and pharmaceuticals. Participants will also learn about troubleshooting and designing process equipment to ensure the best performance of starch-based products.

Upon completion of the course, participants will have a better understanding of the role of starches in various industries and the factors to consider when selecting and using them in product formulations. This knowledge will be beneficial for professionals in the food, beverage, cosmetics, chemical, and pharmaceutical industries who are involved in product development, quality control, and process optimization.

Experience top-notch training LIVE from an industry expert that goes beyond traditional lectures. You will engage in an interactive and stimulating learning experience that will help you develop the skills you need to excel in your field.

Those attending the LIVE training event must have a webcam on their computer equipped with a microphone and speakers/headset to fully participate.

who should attend

This course is intended for professionals in Research and Development, Quality Control, Operations, Engineering, and any individual involved with the research and manufacturing of products, which require a good understanding of the behavior of starches in their formulations.

The course will cover applications in industries such as food, beverages, cosmetics, and pharmaceuticals.

learning objectives

Upon completion of this course, you will be able to:

- Explain the synthesis of the plant-based macromolecules, particularly the starch forms Amylose and Amylopectin
- Describe the changes experienced by starches during gelatinization under thermal processes
- Explain the retrogradation mechanism
- List the types of rheological behaviors of gelatinized starches during the various stages in the thermal processes
- Explain the differences, advantages, and limitations of the various types of viscometers (RVA, Rheometers, Brookfield, etc.), as well as how to use these instruments as analytical and troubleshooting tools
- Describe the extraction process of starches from grains
- Explain the impact of starches in formulas processed via extrusion, pressed powders, cooked processes, etc.
- Troubleshoot operations with starch products in their formulas

course outline

Review of Learning Objectives

Module 1: Fundamentals

- Plant-based macromolecules
- Starch granules
- Thermal transformation of starches during gelatinization and retrogradation
- Rheology of gelatinized starches

Module 2: Measurements and analytical tools

- Viscosity measurements
- RVAs, Brookfield Viscometers, Rheometers, etc.
- Optical measurements

Module 3: Applications

- Wet milling
- Extrusion
- Cooking processes
- Pressed powders

Question and Answer Session

Assessment Opportunity

course instructor

Herberto Dutra, Mechanical Engineer with 30 years of experience in processing industries with careers at Kraft Foods, Nestle, Bay Valley and Sensient, including 20 years of hands-on experience in Process Development, with numerous applications where starches are the main ingredients (i.e. soups, sauces, breakfast cereal, snacks, pasta, bakery, beverages, etc.). Mr. Dutra's expertise ranges from pilot plant scaling up, design and construction of numerous plants, day-to-day operation, troubleshooting and optimization. Academically, Mr. Dutra holds a Bachelor's Degree in Mechanical Engineering from UERJ (Rio de Janeiro, Brazil), an MBA from Keller Graduate School and is currently finishing his Master's in Mechanical Engineering at Purdue University. Through his employers, Mr. Dutra has written and taught a number of training courses in food technology related topics such as Starches Technology, Spray Drying, Atomization, Powder Handling, Agglomeration, Liquids Handling, Cooking Processes, Plant Design, Packaging and many other programs developed for Operations Professionals, Engineering, Scientists, etc.

Accreditations

International Accreditors for Continuing Education and Training (IACET)
Cobblestone has been approved as a CEU Accreditor by IACET and awards CEUs for participation in qualified courses. Cobblestone has demonstrated that it complies with the ANSI/IACET Standards and is authorized to offer IACET CEUs for its programs. CEUs will be awarded for participation in Cobblestone's courses at the rate of .1 CEU per contact hour upon successful completion of the entire course and 70% accuracy in the required Learners' Assessment. A minimum score of 80% is required for all courses within a Cobblestone Certification Program. This course offers a total of 1.5 contact hours or .2 CEUs. For further information, visit www.iacet.org