



Training Course Agenda

550-1 – Glass Breakage Analysis and Fractography

DAY 1

8:30 Trainer Introductions – Training Course Expectations

8:45 Module 1: From Raw Materials to Glass Containers

9:45 Coffee/Tea Break

10:00 Module 2: Glass Handling, Defects, Breakage in the Manufacturing Process
Tour of Vial Line and Follow-Up Discussion

Module 2: Glass Handling, Defects, and Breakage in the Manufacturing Process (cont.)

Glass Strength

- Brittle nature of glass
- Stress and strain basics
- Effect of flaws (primarily surface cracks) on strength
- Stress concentrations
- Strength equations
- Role of processing and handling on glass strength

12:00 Lunch

Module 2: Glass Handling, Defects, and Breakage in the Manufacturing Process (cont.)

Glass Strength

13:00

- Experiments (crack propagation and effects of flaws on glass strength)
- Performing a failure analysis

14:30 Coffee/Tea Break

14:45 Module 3: Fractography and Breakage Analysis: Examples and Hands-on Activity

16:00 End of Day 1

DAY 2

8:30 Review Day 1, Preview Day 2, and Attendee Questions

8:45 Module 3: Fractography and Breakage Analysis: Examples and Hands-on Activity (cont.)

10:00 Coffee/Tea Break

10:15 Module 3: Fractography and Breakage Analysis: Examples and Hands-on Activity (cont.)

12:00 Lunch

13:00 Module 3: Fractography and Breakage Analysis: Examples and Hands-on Activity (cont.)
With Attendee Presentations

14:30 Coffee/Tea Break

14:45 Module 3: Fractography and Breakage Analysis: Examples and Hands-on Activity (cont.)
With Attendee Presentations

16:00 End of Day 2



Training Course Agenda

550-1 – Glass Breakage Analysis and Fractography

DAY 3

8:30 **Review Day 2, Preview Day 3, and Attendee Questions**

8:45 Module 3: Fractography and Breakage Analysis: Examples and Hands-on Activity (cont.)
With Attendee Presentations

10:00 **Coffee/Tea Break**

10:15 Module 3: Fractography and Breakage Analysis: Examples and Hands-on Activity (cont.)
With Attendee Presentations

12:00 **Lunch**

13:00 Module 4: Improving Glass Handling Practices
Glass Handling Transportation Study

14:30 **Coffee/Tea Break**

14:45 Module 4: Improving Glass Handling Practices (cont.)
Glass Handling Equipment Improvements and Case Studies

16:00 **End of Training Course**