

LCR7000 COMPREHENSIVE OPERATOR TRAINING

1. **PURPOSE:** To provide explanation and education of relevant ASTM test methods for obtaining apparent viscosity and shear rate measurements of polymers, which will include comprehensive training on the set up, LABKARS software interface, operation, and general maintenance of the equipment.
2. **SCOPE:** This procedure applies to all model variations in the LCR7000 series, and will cover the ASTM standard D3835 (extension of ASTM D1238)
3. **APPLICATION:** All new and existing end users of this equipment.

4. **DEFINITIONS:**

- ASTM = American Standard of Test Methods
- LCR= Laboratory Capillary Rheometer
- AV= Apparent Viscosity
- SR = Shear rate
- DS= Die Swell
- PP= Polypropylene
- PPE = Personal protection equipment
- PPT = Power point training
- Pa= Pascal seconds
- s^{-1} = Reciprocal seconds



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5. PROCEDURE:

- Introduction to ASTM methods, and purpose of testing polymers, explanation of test apparatus, and review table of polymer test conditions. (PPT)
- Review of cleaning and operating tools, discuss safety and PPE (Hands on training)
- Conduct actual operator interface with LCR (Set up test parameters within LABKARS, review software capabilities, die selection, laser die swell if applicable, and reporting functions)
- Run reference material (PP) and obtain AV and SR of the polymer sample (Hands on training, and LABKARS software interface)

6. PROCEDURE DETAILED

- A. The power point presentation will introduce the end user to the LCR, the American Standard of Test Method, for testing polymers (ASTM D1238 and D3835) while also providing an explanation of the different polymer testing conditions and the purpose of testing.
- B. The hands-on training will include review of cleaning and operating tools, PPE and safety practices listed in the LCR user guide and practiced in actual application. Each spare part, cleaning tool, and piece of operation equipment will be identified and discussed in order to acquaint the end user with use of these items.
- C. Actual operator interface will provide the end user the opportunity to program the test set up in LABKARS required to capture AV and SR of various polymers, while also learning the powerful analysis capabilities of the equipment.
- D. The goal will be to build a foundation for general understanding of ASTM standards, the equipment, and software interface. Each participant will have the opportunity to put these keys take away items to immediate use, prior to the completion of the training course.

OVERALL TIME TO ADMINISTER TRAINING WILL DEPEND ON AUDIENCE SIZE, AND EQUIPMENT AVAILABILITY (Target = 4 hours)

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