Actuator

Production Material

**CRG**

# Introducing CRG's
# In-Line Dynamic Mechanical Analysis (DMA)

is a material characterization device that enables real-time quality control and defect detection during continuous manufacturing processes. Using state-of-the-art actuators and force sensors to measure the modulus of materials as they are being produced, the device is able to provide real-time property assessments, inform process feedback controls, and identify defects in the produced materials. The In-Line DMA reduces the need for product sampling, as well as testing and facilitates process optimization for more efficient, higher quality, and less wasteful manufacturing.

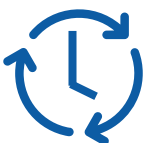## CRG's In-Line DMA provides the following features/benefits:

### Material Characterization
Using pre-determined variables and real-time measurements to determine various material properties

### Printability Assessment
Via material characterization and defect detection, the user can determine the suitability for future 3D printing

### Defect Detection
Caused by non-conforming initial input material or imperfections made during production processes

### Continuous Tracking
Operates during production process and does not require intermittent quality control sampling
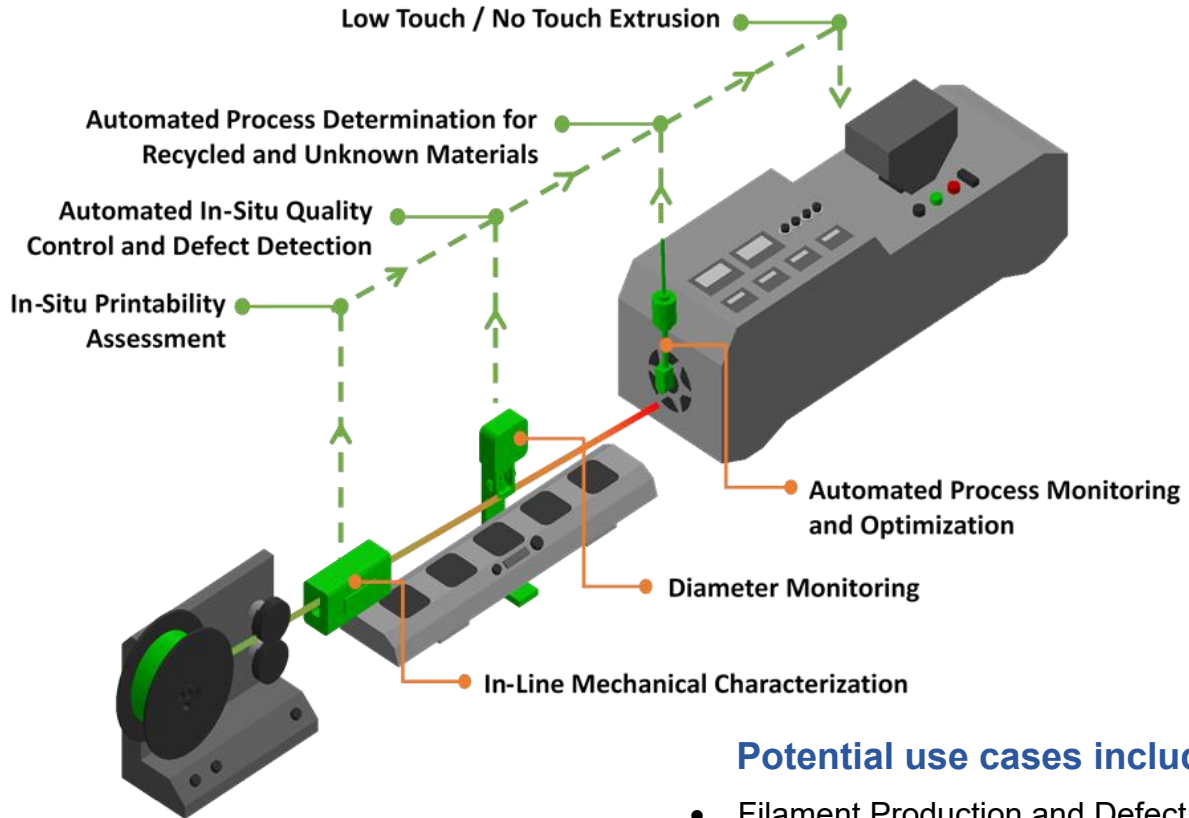
### Improved QC
Increased QC documentation for manufacturing of various methods and materials

### Increased Automation
Allows for automated feedback and process adjustments in many manufacturing settings

# Improve In-Situ Quality Control in Manufacturing Processes
## *via in-line dynamic mechanical analysis*

Low Touch / No Touch Extrusion

Automated Process Determination for Recycled and Unknown Materials

Automated In-Situ Quality Control and Defect Detection

In-Situ Printability Assessment

Automated Process Monitoring and Optimization

Diameter Monitoring

In-Line Mechanical Characterization

*Example of In-Line DMA adapted for use in an automated 3D printer filament production line

**Potential use cases include:**

- Filament Production and Defect Detection
- Carbon Fiber Manufacturing and QC
- Fiber Optic Cable Manufacturing and QC
- Other Continuous Production Efforts

## In-Line Dynamic Mechanical Analysis (DMA) Operational Status

Technology Readiness Level:  1 2 3 **4** 5 6 7 8 9 ☐☐☐☐☐☐

Manufacturing Readiness Level:  1 2 **3** 4 5 6 7 8 9 10 ☐☐☐☐☐☐☐

Validation Testing:  Ongoing

Interested in CRG Technology?

Contact us at sales@crgrp.com

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www.crgrp.com