



## We take **technical solutions** personally.

Selecting the right resin for your end application is mission critical. Finding a partner with the capabilities to guide you to the cutting edge of polymer resins, additives and manufacturing processes makes the difference. Our Technical Development Experts (TDEs) will get you there faster, with deep technical expertise and experience across a wide range of services. Specializing in application development, plastic resin selection, mold design and troubleshooting, M. Holland has everything you need to accelerate innovation and achieve industry-leading performance.

**To learn more about what M. Holland can do for you, visit [mholland.com](https://mholland.com) or call +1 800-872-7370.**

# Our Lab Services

Lab Service	Description/Relevance
Ash Content	Inorganic filler content
Carbon Black Content	Thermogravimetric analyzer
Color Measurement	Quantify color, color matching, degradation & degree of color change
Coefficient of Friction	Film property
Compression Molding	Sample preparation
Density, Specific Gravity	Key property for resin selection
Dielectric Strength	Insulating capacity
Extrusion	Tape extrusion, measure output, pressure & torque
Failure Analysis	Find solutions to customer problems
Field Emission Electron Microscopy with EDAX	High resolution imaging and elemental detection
Flammability	UL-94 and limiting oxygen index (LOI) level of flame retardancy
Flexibility	Flexibility or rigidity requirements
FT-IR Spectroscopy (Microscopic to 10 microns)	Identify contamination & material identification
Glass Transition Temperature	Engineering information for materials selection for specific applications
Halogen Detection	Semi-quantitative
Hardness	Customer specification requirements
ICP Mass Spectroscopy	Elemental detection liquids
Impact (Drop dart)	Customer specification requirements
Impact (Gardner)	Customer specification requirements
Impact (Izod)	Customer specification requirements
Limiting Oxygen Index	Flammability
Low Temperature Brittle Point	Low temperature operating capability
Material Identification	Customer support for material selection
Mechanical Water Absorption	Resistance to water uptake
Melt Flow Rate	Key property for resin selection
Melting Point	Key property for resin selection DSC
Mixing (Lab Scale)	Mixing additives into polymers to add value
Moisture & Water Content	Quality check & determine need for drying
Oil Resistance Testing	Resistance to oil
Optical Microscopy & Imaging	Troubleshooting
Quantification of Crosslinking	Hot creep, hot set & heat deformation
Tear Strength (ASTM & UL)	Customer specification requirements
Tear Strength (Elmendorf)	Customer specification requirements
Tensile & Elongation (Specific temperatures if required)	Customer specification requirements
Thermal Ratings (Heat aging)	Determine operating temperature range
Thermal Stability (Oxidative induction time)	Suitability for high temperature operation
Troubleshooting	Technical support
UL-94	Flame testing
Volume Resistivity	Material conductivity for electrical applications
VW-1 & HB	Flame testing (reference only)
X-Ray Diffraction	Characterization of structure
X-Ray Fluorescence	Elemental detection