

# Order Form

Please Provide Sample Description (10 Grams Preferred): \_\_\_\_\_

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Please Indicate Tests To Be Performed:

- Standard Analysis \$900.00
- Complete Analysis (Extract Analysis) \$2,200.00

	Optional Tests	Individual Prices	Standard Analysis	Complete Analysis
<input type="checkbox"/>	% ACN (In Total Sample)	\$150.00	\$150.00	\$150.00
<input type="checkbox"/>	% Ash	\$150.00	Included	Included
<input type="checkbox"/>	Beilstein (Cl or Br)	\$55.00	Included	Included
<input type="checkbox"/>	% Carbon Black	\$250.00	Included	Included
<input type="checkbox"/>	Carbon Black Typing	\$500.00	\$500.00	\$500.00
<input type="checkbox"/>	Density	\$55.00	Included	Included
<input type="checkbox"/>	DSC Analysis	\$450.00	\$450.00	\$450.00
<input type="checkbox"/>	% Extractables	\$150.00	Included	Included
<input type="checkbox"/>	Free Sulfur Content	\$250.00	\$250.00	\$250.00
<input type="checkbox"/>	Plasticizer ID	Consult Lab	Consult Lab	Consult Lab
<input type="checkbox"/>	GC/MS - Qualitative*	\$475.00	\$475.00	Included
<input type="checkbox"/>	GC/MS - Quantitative	Consult Lab	Consult Lab	Consult Lab
<input type="checkbox"/>	Halogen Content	\$350.00	\$350.00	\$350.00
<input type="checkbox"/>	Polymer Identification	\$200.00	Included	Included
<input type="checkbox"/>	Pyrolysis GC/MS	\$375.00	\$375.00	\$375.00
<input type="checkbox"/>	Qualitative Accelerator Analysis	\$850.00	\$850.00	Included
<input type="checkbox"/>	Resin ID	\$475.00	\$475.00	Included
<input type="checkbox"/>	% Rubber Hydrocarbon	\$450.00	Included	Included
<input type="checkbox"/>	Semi-Quantitative Ash Analysis	\$300.00	Included	Included
<input type="checkbox"/>	TGA Analysis	\$300.00	\$300.00	\$300.00
<input type="checkbox"/>	Total Sulfur	\$150.00	Included	Included
<input type="checkbox"/>	Wax Content	\$225.00	\$225.00	\$225.00
<small>*GC/MS - Qualitative Analysis includes plasticizer, antioxidant, antiozonant and additional processing aid identifications.</small>				
<small>**General Prices - Pricing May Be Different Based on Sample Type and Testing Specific Details.**</small>				

**Total Price of Requested Testing**      \$ \_\_\_\_\_      \$ \_\_\_\_\_      \$ \_\_\_\_\_

TERMS: DOMESTIC ORDERS (US & CANADA): PURCHASE ORDER IS REQUIRED TO BEGIN TESTING. NET 30, FOB AKRON  
OUTSIDE OF THE US & CANADA: PRE PAYMENT IN FULL IS REQUIRED TO BEGIN TESTING.  
Prices Subject to Change Without Notice.

WARRANTY: All work proposed is on the basis of our best effort using good judgement and established standard laboratory practices and procedures where applicable. All work will be performed promptly and professionally. We offer no other warranties, written or implied.



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## Chemical Testing

What's In Your Compound?

ARDL's chemical services laboratory specializes in analyzing composite rubber along with thermoset and thermoplastic material compounds. A full range of services is available, from single material identification to complete analysis and theoretical formula reconstruction.

Why Perform Such a Detailed Analysis?

Complex analysis performed at ARDL, such as the chemical reconstruction of an elastomeric compound, can aid you in:

- Assuring the quality of ingredients in your compound
- Finding the root cause of catastrophic or premature failure
- Reducing the cost of material development
- Supporting you during forensic investigation and litigation
- Enabling you to keep up with your competitors
- Eliminating product performance variations
- Investigating possible patent infringement
- Determining ingredients for FDA approval
- Ensuring specification compliance
- Verifying the approval and acceptance of imported goods by US Customs

ARDL is an independent laboratory and will work to identify the root cause of failure, regardless of its origin, and will assist you in rectifying the problem.



**Contact Us Today**

Whether you need a single test method or a full program of tests and consultation to perfect your product, we're here to help and can provide you with a quote that's customized to your needs.

**Contact Us Today**

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Rubber. Plastic. Latex.

## Example: Typical Rubber Compound Analysis & Carbon Black Typing

COMPOUND ANALYSIS	
<b>Date:</b> January 10, 2018 <b>Attention:</b> Ms. Maryann Jones <b>Company:</b> XYZ Corporation	<b>Sample I.D.:</b> Competitor's Rubber <b>Sample Color:</b> Black <b>Project No:</b> 123456
<b>A. Polymer Identification; ASTM D3677</b> (Infrared Spectroscopy) Percent of RHC 1. <i>Polyisoprene Rubber</i> 80 2. <i>Styrene-Butadiene Rubber</i> 20 3.	<b>H. Extractables, ASTM D297</b> Acetone Extractables, %..... 8.1% 1. Color..... <i>Amber</i> 2. Consistency..... <i>Semi-Solid</i>
<b>B. Ash Content; ASTM D297</b> .....9.8%	<b>I. Carbon Black, ASTM D297</b> Carbon Black.....25.0% 1. ASTM Series Black..... <i>N300</i>
<b>C. Semi-Quantitative Ash Analysis</b> (ICP Atomic Absorption or EDX) a. >10%..... <i>Si</i> b. 5-25%..... <i>Zn</i> c. 1-10%..... d. 0.5-5%..... e. 0.1-1%..... <i>Ca</i> f. 0.05-0.5%..... g. 0.01-0.1%..... <i>Mg, Al</i> i. Below Detection..... <i>Bi, P, Ti, Mn, Sn, Te, Na, Fe, Ni, Cu, Se, Sb, Ba, Pb</i>	<b>J. Extract Analysis</b> <b>1. Plasticizers; ASTM D2702</b> a. <i>Hydrocarbon Oil</i> b. c. <b>2. Antioxidants; ASTM D3156</b> a. <i>Santoflex 6PPD</i> b. c. <b>3. Accelerators (Suggested)</b> a. <i>Sulfenamide (TBBS)</i> b. <i>Santogard PVI</i> c.
<b>D. Total RHC, ASTM D297</b> .....55.5%	<b>K. Beilstein, Presence of Halogens</b> ..... <i>Negative</i>
<b>E. Total Sulfur, Leco Method</b> .....1.62%	<b>L. Microhardness, ASTM D1415</b> <b>IRHD</b> .....61
<b>F. Density, Mg/m<sup>3</sup></b> .....1.138	
<b>G. Wax Content</b> ..... <i>Present</i>	

What information will a chemical analysis provide?

- Accelerators – Qualitative Only
- Antioxidant Identification
- Carbon Black Content
- Halogen Presence
- Percent Ash
- Percent Total Extract
- Plasticizer Identification
- Polymer/Polymer Blend Identification
- Rubber Hydrocarbon Content
- Semi-Quantitative Ash Analysis (Filler Types and Percents)
- Specific Gravity
- Theoretical Formula Reconstruction
- Total Sulfur Content

## Example: Reconstructed Formulation

RECONSTRUCTED FORMULATION				
Ingredient	PHR	Extractables	Ash	Volume
Polyisoprene Rubber	80.0	0.8		86.0
Styrene-Butadiene Rubber	20.0	0.2		21.3
Carbon Black (N300 Series)	44.8			24.9
Silicon Dioxide	15.2		14.6	7.6
Zinc Oxide	3.0		3.0	0.5
Hydrocarbon Oil	7.2	7.2		8.0
Stearic Acid	1.0	1.0		1.1
Santoflex 6PPD	2.5	2.5		2.5
Hydrocarbon Wax (C19-C37)	2.0	2.0		2.3
Misc. Extractables*	0.5	0.5		0.6
Sulfenamide (TBBS)	1.0	0.3		0.7
Santogard PVI	0.3	0.1		0.2
Sulfur	1.9			0.9
<b>Totals</b>	<b>179.4</b>	<b>14.6</b>	<b>17.6</b>	<b>156.6</b>
Calculated Ash Content.....			9.8%	
Calculated Extractables.....		8.1%		
Calculated Carbon Black.....		25.0%		
Calculated Density (Mg/m <sup>3</sup> ).....				1.145

\*Comments: it may contain rosin acids, accelerator fragments and other reaction products, etc.

Note: Reconstructed formulation is based on analytical data from your sample. The above calculated percentages are based on the reconstructed formulation.

To further enhance and more exactly match an unknown material, the following tests can be performed at an additional charge:

- Acrylonitrile Content
- Antioxidant/Antiozonant Quantification
- Carbon Black Typing
- Free Sulfur Content
- Fiber Identification
- Halogen Content Analysis
- Pyrolysis GC/MS
- Resin Identification
- Thermal Analysis (DSC, DMA, TMA and TGA)
- Wax Content