

## Engineering Seal Analysis Lab

### Taking 'Right the First Time' to another Level

In 2013, Hi-Tech Seals made the strategic decision to continue to re-invest capital in our technical capabilities with the construction of our engineering Seal Analysis Lab. The lab is housed in our head office, located in Edmonton, Alberta. It has become a vital component in our commitment to quality and providing superior value to our customers.

By investing in new technology, we have greatly increased our capabilities and service offering. The lab contains several pieces of key equipment; this equipment helps to ensure we deliver quality to our clients by providing the right product, in the right material, to the required specifications.

#### Optical Measurement Machines

We utilize both an automated and manual optical measurement machine in temperature-controlled environments. This allows us to reliably verify dimensional accuracy of a wide range of sizes and quantities. These machines are used extensively for quality control and reverse engineering purposes.

#### Mid Infrared FT-IR Spectrometer

The Fourier Transform Infrared (FT-IR) Spectrometer is used in all facets of our technical processes, from material identification and verification, to failure analysis and trouble shooting. By exposing a sample to different wavelengths of infrared light, then measuring which wavelengths are absorbed, the FT-IR machine can convert this spectrum data into a readable spectrum. The spectrum is then compared against a library of spectra to find a match. We are continually adding and updating our spectra library to expand the accuracy and capability of this versatile instrument.

#### X-Ray Fluorescence Gun

Our X-ray fluorescence (XRF) gun performs material inspections on metal components. It is a non-destructive testing method that uses X-rays to determine the elemental composition of the testing material. We can perform inspections on various sizes and shapes of product or material samples.



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### Instron Universal Testing Machine (UTS)

The UTS machine is used to evaluate mechanical properties of materials. With the capability to test both elastomers and thermoplastics, verification that materials are within specified requirements is achievable. The UTS provides tensile strength, elongation, and modulus values.

### Thermo Scientific Convection Oven

The precision oven enables verification and testing of key properties, such as heat aging and compression set. It also provides us the ability to perform in-house heat treatments on products and materials.

In addition to this technology, we have a hardness tester, surface finish tester, specific gravity tester, and an optical flat tester to round out our equipment library. Some of the key tests, analysis, and services our dedicated engineering and drafting staff use the equipment and lab for include:

### Failure Analysis Reports (FAR)

When provided with failed seal or gaskets samples and application conditions, we use our experiences, expertise and lab equipment to perform failure analysis for our customers. FARs include a root cause analysis and a product and material recommendation.

### Positive Material Identification (PMI)

We can perform PMI on unknown elastomers, plastics, and other materials. Using the customer provided material samples and various lab equipment, we can accurately analyze the sample and determine the base material.

### Dimensional Inspection Reports

We utilize our optical comparator equipment and other tools to quickly and reliably measure components to a high level of accuracy. This allows us to determine if parts are within the provided specifications. This information can then be turned into a report for the customers use.

Additional analysis, reports, and services can be performed using our Seal Analysis Lab, including drafting services and comparative material analysis. For more information or to request an engineering service, email [engineering@hitechseals.com](mailto:engineering@hitechseals.com) or contact your local Hi-Tech Seals representative.

