

## Research & Development Centre

# PRODUCT TESTING INFORMATION PACKAGE

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## RESEARCH & DEVELOPMENT CENTRE WELCOME

Quadro has a World class Research & Development Centre at its head office in Waterloo, which offers you the opportunity to test your products with our equipment to determine the best process solution.

The Centre provides all the facilities you require with a full range of our latest equipment, four test suites, product preparation, analysis area, boardroom and training facilities. This service is offered FREE OF CHARGE.

Testing is an important part of equipment selection and is a valuable tool to evaluate and select the correct model and tooling for your application.

If you prefer to arrange for testing, please contact your local Quadro Representative or complete the *Request for Test* form attached and fax it to us. Please also read the following information which describes in more detail our facility, equipment, test arrangement details and how to send product to us.

If you wish to discuss any of the above information, please feel free to contact us. Quadro prides itself in exceeding the expectation of its customers and welcomes challenges.

We hope you take full advantage of our Research & Development Centre to find the best process solution for your products.

## **Test Centre Overview:**

Since 1978, Quadro's R&D Test Centre has been giving customers the opportunity to run real-world tests of their products on Quadro equipment, without charge, and see the results first hand.

With a broad range of the latest Quadro units, support equipment and results analysis area, we can provide recommendations for both equipment and tooling choice, process optimization and scale-up.

Located at our Head Office in Waterloo Canada, both new and established customers are always welcome. If you cannot visit us, we can always video the test for you. All tests results are kept in our extensive database of 4000+ tests, which gives us essential application knowledge on hundreds of products. All test results are maintained in the strictest confidence.

## **Equipment Range:**

Quadro<sup>®</sup> Comil<sup>®</sup>, Ytron and Quadro Vac<sup>®</sup> units are situated in dedicated test cells with all the necessary ancillary equipment such as pumps, tanks, flow-meters and feeders for maximum process flexibility.

### **COMIL<sup>®</sup> - Size Reduction & Deagglomeration:**

Comil<sup>®</sup> equipment is available for low energy, low noise, low dust size reduction, deagglomeration and product conditioning. Test batches from 2lb (1kg) upwards can be accommodated. We can handle both wet and dry applications and cryogenic milling on both our Standard or Underdriven Comil<sup>®</sup> technology.

### **F10 – Fine Grinding:**

The Quadro<sup>®</sup> Fine Grind Model F10 has all the low energy features of the Comil<sup>®</sup>, but is capable of micronizing products. Typical test batches are 2lb (1kg). We can process products under normal, inert and cryogenic conditions.

## **YTRON – Mixing, Powder Dispersion and Emulsification:**

Ytron equipment can be used to test multi-ingredient products in batches from 2 - 200 gals. (7 - 700 litres) or in a continuous in-line dispersion and emulsification system at up to 60gpm (227lpm).

## **Quadro Vac<sup>®</sup> - Vacuum Conveying:**

The pneumatic conveying of product can be tested for both capacity and conveyability on our 800 series models.

## **Analysis Equipment:**

Our product preparation and analysis area has all the necessary equipment and instrumentation for sample analysis including:

- < **Particle Size Distribution**
- < **Particle or Droplet Size Evaluation**
- < **Viscosity Measurement**
- < **Moisture Analysis**
- < **Sonic Sieve Analysis**
- < **Malvern – Mastersizer 2000**

Quadro recently purchased a Malvern Mastersizer, which will now provide Quadro with the capability to perform **particle size distribution analysis**.

If required, arrangements for special analysis equipment can be made.

## **Arranging A Test:**

You can arrange for us to test your product or visit us and witness the test through your local Quadro Representative. To determine who your local Representative is, please contact us directly. If required, we would be pleased to make arrangements you're your accommodation requirements. If you are unable to travel to our Facility, we can video the test for you.



Obviously, the more information we can have about your processes and products, the easier it will be for us to conduct the test. Both the infeed product(s) and the desired end-result are key pieces of information, along with a description of your existing processes and any problems or process difficulties you currently experience.

If you wish to send us a small sample of the product, we may be able to make some initial equipment recommendations by using our comprehensive testing database.

## **Confidentiality:**

Quadro has a policy of keeping all information confidential. If required, we will be pleased to sign a confidentiality agreement prior to any testing or discussions taking place.

## **Test Reports:**

Once testing is complete, you will receive a test report with details of each test, results and equipment recommendations.

## **Test Materials:**

Before we accept delivery of any product **we require that an MSDS form be sent to us** for evaluation so that we can make suitable arrangements for the receipt and handling of your product. Where a test requires the mixing together of two (2) or more products, an **MSDS is also required for the finished product in addition to an EIN number and/or P.O. Number for shipping/border purposes**. At the end of the test, all materials will be returned to you, unless otherwise stated by you.

## **Production Tests:**

In some cases, Quadro can perform extensive tests on large quantities of material. Depending on the situation, there may be a charge for testing time on a per diem rate. Please discuss any special requirements with us.

## Test Material Quantities Required:

The following information outlines the quantities of material that are required. If in doubt, please contact us for assistance.

### Quadro® Comil®:

Generally, initial tests are conducted on a small scale to establish tooling requirements and capacities. Testing may also be conducted on a larger scale to simulate production volumes and capabilities. Sufficient material should be supplied for a minimum of three (3) tests.

The quantity of product required for testing will vary with bulk density. A low bulk density product test on the Comil® model 194, like puffed rice, would necessitate only 20lb (9kg). A high bulk density product for the same test, similar to dry sand, would require 125lb (57kg).

The following table is a guide by which to determine product quantities required for testing. All indicated weights are for one (1) test only:

Comil® Model	Product Required for One Test	
	lb	Kg
197 / U10	4 -12	2 - 6
194 / U20	20 -125	9 - 57
196 / U30	24 - 200	11 - 91

**Quadro® F10 Fine Grind:**

All F10 tests are conducted on a small scale to establish tooling requirements and capacities.

Model	Product Required for Testing	
	lb	Kg
F10	2 - 4	1 - 2

**Quadro Ytron™:**

As with the Comil®, we perform a small scale evaluation of between 2 -10 USgal (7 - 38 litres) before scaling up to our larger equipment. Please allow sufficient material for this plus adequate material for two - three full-scale tests.

Ytron Model	Product Required for One (1) Test	
	USgal	Litres
XC1 / ZC1	20	76
Z1	5	19
Z3	20	76
Y0	2 - 10	7 - 38
Y2	10 - 100	38 - 380
Y3	20 - 150	76 - 568

## **Quadro Vac<sup>®</sup>:**

Vacuum conveying testing requires a fixed volume of material for a successful test. Allow for 20Usgal (75litres) of product for each test. With the Quadro Vac<sup>®</sup> it is possible to perform a number of tests on the same quantity of product and therefore, generally only one (1) sample is required.

## **Equipment Sanitization:**

We test a very wide variety of products, and although our equipment is cleaned between tests it cannot be considered sanitized. Therefore, test material is not suitable for consumption after testing.

## **Material Shipping & Disposal Costs:**

Our knowledge and skills are free; however, we do not cover the cost of shipping product. Typical costs incurred are as follows:

- Shipping costs for your products to us and back to you.
- Your travel and accommodation costs, if you are visiting us
- Local sample purchases i.e. nitrogen for cryogenic testing, consumables.

All materials will be returned to the originator upon completion of testing, with the only exception being the equipment and floor washing residue and small quantities of food products.

In some circumstances, we can dispose of materials locally; however, we will establish an estimate for local disposal prior to pursuing this option.

## **Shipping Samples to Quadro:**

All incoming and out-going freight charges are the customer's responsibility. Please ensure that all necessary paperwork (customs forms, import licenses, etc.) is obtained before the material is shipped.

**Please provide a purchase order to cover return shipping costs.** Within North America, if preferred, a courier account number can be provided for shipping collect. Allow a minimum of one (1) week shipping time for samples to be received at Quadro.

Please send test material to: Quadro Engineering, LP  
613 Colby Drive  
WATERLOO, Ontario  
Canada N2V 1A1  
Attention: Research & Development

All shipments must be accompanied by three (3) copies of the MSDS (Material Safety Data Sheet).

If sending materials from outside Canada, a Canada Customs Invoice is required. Ensure the following statements are made on this form:

- All shipments must be marked "FREE DOMICILE" (all charges will be billed to the sender).
- Material for testing purposes only - no commercial value.
- Re: fair market value - FOR CUSTOMS PURPOSES ONLY - \$\_\_\_\_\_.
- Generic product name must be used on customs forms.

Attach these forms to the outside of the shipment (very visible to carrier) or give them to the freight carrier with the Bill of Lading. In special circumstances when the material is very expensive and for insurance purposes a low fair market value is not practical; please prepare a letter addressed to Canadian Customs. This letter must state that all material is being sent for test purposes only and that all material will be returned to originator. This letter must accompany all copies of Canada Customs Invoice.

## **Health & Safety:**

Quadro has a joint health and safety program. Basic safety equipment required for testing are safety glasses, safety shoes and clothing suitable to be around moving equipment / parts. If you have or require specific safety equipment for testing, please bring it with you on the scheduled test date.

## Hazard and Safe Handling Information & Labeling:

In accordance with Canadian Federal & Provincial legislation/regulations, it is the material supplier's responsibility, in compliance with Workplace Hazardous Materials Information System (WHMIS), to ensure all controlled products are labeled and that Material Safety Data Sheets (MSDS) are supplied.

Quadro reserves the right to refuse, at our discretion, any hazardous products. We are not equipped to handle substances that are extremely explosive, carcinogenic or otherwise biologically active so as to risk the short or long-term health and safety of our employees.

Every container must be labeled. The labels provide information that workers need in order to handle a controlled product safely. They must include:

1. Product Identifier
2. Supplier Information
3. Statement That MSDS Is Available
4. Appropriate Hazard Symbol
5. Risk Phrases
6. Precautionary Measures
7. First Aid Measures

## Material Safety Data Sheets:

The Material Safety Data Sheet (MSDS) is a document containing all hazard and safe handling information for a controlled product. It provides more safety information than is possible to put on a label. The format may vary depending on the supplier; however, the following information, in English, must be present:

- |                               |                             |
|-------------------------------|-----------------------------|
| 1. Product Information        | 6. Toxicological Properties |
| 2. Hazardous Ingredients      | 7. Preventive Measures      |
| 3. Physical Data              | 8. First Aid Measures       |
| 4. Fire and Explosion Hazards | 9. Preparation Information  |
| 5. Reactivity Data            |                             |

## **Special Sample Material Storage:**

If materials require special storage or handling please advise us in advance so that we can make the necessary arrangements.

## **Finally...**

Quadro takes pride in its ability to produce accurate and predictable test results. We are confident in our test results; however, we recognize that since all test data is obtained under controlled conditions, process warranties are neither expressed nor implied and in-process results may vary and can only be confirmed by plant trials.

# COMIL TEST REQUEST FORM

## Customer Information

Company	<input type="text"/>		
Contact Name	<input type="text"/>	E-mail Address	<input type="text"/>
Telephone	<input type="text"/>	Fax	<input type="text"/>
Your local Quadro Representative (if known)	<input type="text"/>		

Equipment to be tested	COMIL	Q-VAC	F-10
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## INFEEED MATERIALS

Product To Test	<input type="text"/>
Description of Material Bulk Density, Particle size, Flow	<input type="text"/>
Special Handling or Personal Protection Requirements	<input type="text"/>

## DISCHARGE

Production Capacity Required	<input type="text"/>
Description of Material Bulk Density, Particle size, Flow	<input type="text"/>

## PROCESS DESCRIPTION

The Existing / or Expected Process and any specific Problems that we should address (i.e. Feeding & Discharge Techniques).

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Please complete 2<sup>nd</sup> Comil page and return.

## Details of Results:

Do you wish to attend the test?	No	Yes	Contact Quadro to set date.
Would you prefer we videotape?	No	Yes	Prefer CD or VHS
Would you like samples returned for analysis? <b>**Note: We cannot return any goods without an EIN number, P.O. No./Account No. and ship to address*</b>	No	Yes	
If YES, <b>EIN Number:</b>			
<b>P.O. No. / Shipping Account No.:</b>			
<b>Ship to the Attention of:</b>			
<b>Address:</b>			
_____			
_____			
_____			

<b>SHIPPING ADDRESS</b> (if different than samples)	_____
	_____
	_____
	_____
<b>CARRIER NAME:</b>	_____
<b>P.O. #:</b>	_____
<b>EIN#:</b>	_____

Quadro can arrange for local proper disposal of materials at a cost.

<b>P.O. #</b>	
<b>Comments:</b>	

When you have completed this form, please fax it to Brenda Scott at (519) 884-0253. Feel free to attach any other information you think is relevant. We will contact you to arrange a test.

# YTRON TEST REQUEST FORM

## Customer Information

<b>Company</b>			
<b>Contact Name</b>		<b>E-mail Address</b>	
<b>Telephone</b>		<b>Fax</b>	
<b>Your local Quadro Representative (if known)</b>			

<b>Equipment to be tested:</b>	<b>JET MIXER</b>	<b>POWDER DISPERSER</b>	<b>EMULSIFIER</b>	<b>OTHER</b> _____
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To provide an innovative solution to your process problems, please define as clearly as possible – the ingredients, the recipe, the current process description and problems as well as a target “ideal” process result.

In-feed Materials, Quantity, % Bulk Density, Particle Size, Liquids, Quantity Characteristics Flow Rate, Viscosity, SG	
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Existing Process Problems	
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Production Capacity	<b>BATCH TANK</b>	<b>INLINE RATE</b>
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Finished Product Physical Description & Evaluation Criteria for Pass / Fail	
Variables to Control / Adjust Temperature Rates (Max / Min)	

**PROCESS DESCRIPTION / IDEAL SYSTEM**

When you have completed this form, please fax it to us at (519) 884-0253. Feel free to attach any other information you think is relevant. We will contact you to arrange a test.

- For return of test video, samples, report and unused materials please fill in the following:

**Details of Results**

Do you wish to attend the test?	No	Yes	Contact Quadro to set date.
Would you prefer we videotape?	No	Yes	Prefer: CD or VHS?
Would you like samples returned for analysis?	No	Yes	
<b>If YES, Sample Size:</b>			
<b>Federal Tax Number / EIN Number:</b>			
<b>Fed Ex# / PO Number:</b>			
<b>Ship to the Attention of:</b>			
<b>Address:</b>			

**TO HAVE BATCH INGREDIENTS RETURNED:**

<b>SHIPPING ADDRESS (if different than samples)</b>	



<b>CARRIER NAME:</b>	
<b>P.O. #:</b>	
<b>Federal Tax ID # / EIN#:</b>	
<b>FDA#:</b>	

**TO HAVE PRODUCT DISPOSED:**

**\*Disposal can be arranged through a Certified Disposal company at approximately \$400/drum (Product Dependent.)**

Quadro can arrange for local proper disposal of materials at a cost. Approximately \$400/5 gallon drum, through Hotz Environmental.	
<b>P.O. #</b>	
Comments:	