
Section Title: Appendix - Sections

Document Title: Pratt & Whitney Materials Control Laboratory Qualified Commercial Laboratory List

WARNING

This document is the property of United Technologies Corporation (UTC). You may not possess, use, copy or disclose this document or any information in it, for any purpose, including without limitation to design, manufacture, or repair parts, or obtain FAA or other government approval to do so, without UTC's express written permission. Neither receipt nor possession of this document alone, from any source, constitutes such permission. Possession, use, copying or disclosure by anyone without UTC's express written permission is not authorized and may result in criminal and/or civil liability.

APPLIES TO: Pratt & Whitney Group

1. PURPOSE AND SCOPE:

This Appendix provides a listing of Commercial Laboratories Qualified by the Pratt & Whitney Group, Materials Control Laboratory (a.k.a. Quality & Standards Laboratory), and identifies the Type of Testing that each listed Laboratory is qualified for.

2. OWNERSHIP AND APPROVAL:

The Chief, Quality & Standards Laboratories (Q&SL), PW South & Supervisor Supplier Metallurgical Development PW North are the owners of this procedure. All revisions to this procedure must be approved by the owners and balloted in accordance with MCL Manual Section C-5.

3. DEFINITIONS:

- 3.1 **Pratt & Whitney Group** – encompasses both Pratt & Whitney Canada (PW North) and Pratt & Whitney US (PW South).
- 3.2 **Semi-quantitative Spectrographic Analysis** – The Determination of a material's chemistry to detect the presence of the alloying elements to a degree by which a positive identification can be made as to the alloy type, as well as the ability to distinguish between similar alloys.
- 3.3 **Quantitative Spectrographic Analysis** – P&W defines quantitative spectrographic analysis as “utilization of a least squares calibration curve”.
- 3.4 **Wet Chemical Analysis** – P&W defines wet chemical analysis as “gravimetric or titrametric analysis”.

3.5 **Optical Emission Spectroscopy (OES)** – OES is defined as testing which utilizes “ICP (Inductively Coupled Plasma), DCP (Direct Current Plasma) and DR (Direct Reader)”.

4. **PROCEDURE:**

- 4.1 The commercial laboratories listed in [Table I](#) and [Table II](#) have been reviewed by Pratt & Whitney-Materials Group Control Laboratory (P&W-MCL) and found capable of performing the types of tests for which they are listed. This list shall not be construed as a guarantee by P&W-MCL that testing will be done properly, nor does it relieve the supplier from his contractual obligation to deliver conforming materials and parts based on accurate and valid test results.
- 4.2 The listing of a laboratory in the applicable Tables signifies only that, at the time of review, the laboratory was found capable of performing the tests for which it is listed. The laboratory is not relieved of responsibility for continued conformance as determined by calibrations and operational checks of testing and measuring equipment.
- 4.3 This list shall not be reproduced without written permission from P&W-MCL and should not be considered completely up-to-date at any time, as deletions and additions may be made by P&W-MCL.
- 4.4 Laboratories listed in [Table I](#) are required to comply with MCL Manual Section F-23, “Test and Calibration Requirements for Commercial and In-House Laboratories”, when that section is specified on orders from their customers. Failure to comply with MCL-Manual Section F-23 will disqualify the laboratory as a testing source for materials or parts.
- 4.4.1 Laboratories listed in [Table I](#) shall forward test specimens together with the applicable test results to P&W-MCL for correlation testing on a yearly basis as outlined in MCL Manual Section F-23. MCL Form 404 (See MCL Manual Section F-23) will be submitted with all correlation testing packages.
- 4.5 Laboratories listed in [Table II](#) are required to comply with MCL Manual Section FC-23, “Test and Calibration Requirements for Commercial and In-House Laboratories”, when that section is specified on orders from their customers. Failure to comply with MCL-Manual Section FC-23 will disqualify the laboratory as a testing source for materials or parts.
- 4.6 At the discretion of P&W-MCL, any laboratory may be removed from this listing when no longer deemed qualified or when the services are no longer required by P&W or its subcontractors.

4.7 The following laboratories may be used for qualitative analysis using mass spectrograph for information only and will not be surveyed:

- Accu-Labs Research, Inc.
11485 West 48th Avenue
Wheat Ridge, CO 80033
- Commercial Testing & Engineering Company
Instrumental Analysis Division
14335 West 44th Avenue
Golden, CO 80401
- Ledoux & Company
359 Alfred Avenue
Teaneck, NJ 07666
- Shiva Technologies Inc.
6707 Brooklawn Parkway
Syracuse, NY 13211

5. **RECORDS/FORMS:**

- MCL Form 404

6. **REFERENCES:**

- MCL Manual Section F-23
- MCL Manual Section FC-23
- MCL Manual Section S-8

7. NATURE OF CHANGE FOR THIS ISSUE:

- Table 1 updated:
 - Deleted Code 2 and added codes 18 & 23 to IMR Test Labs
 - Changed Commercial Lab. Metals Technology Inc. SQE name from Silvia to Duffy
 - Removed SQE name Zweifel from Allvac C.T.S.; IncoTest and Timet UK Ltd
 - Changed Accutek Testing Laboratory, Ohio SQE name from Griffin to Farmer
 - Changed Element Materials Technology, Daleville, In SQE name from Griffin to Simos
 - Changed Exova Mexico SQE name from Duffy to Griffin
 - Changed Omega Research Inc. SQE name from Lawrence to Griffin

P&W - MCL - Qualified Commercial Laboratory - Table I

Commercial Laboratories	<p>Yellow highlighted fields represent correlation testing per MCLM F23.</p> <p>Light blue highlighted fields represent labs found capable to perform this type of test.</p> <p>Light green highlighted fields with letters represent specific test recognitions.</p>																																			Totals	SQE																					
	Specific Test Codes		Tensile, Room Temperature	Tensile, Elevated Temperature	Stress Rupture	Creep Rupture	Hardness	Impact	Metallurgical Examination - All Others (See Note 10)	ME - Microstructure/Grain Size (See Note 10)	ME - Abrasive Machining E166 Supp A (See Note 10)	ME - Surface Contamination of Titanium (See Note 10)	ME - Braze (See Note 10)	ME - Weld (See Note 10)	ME - Nonconventional Machining, ECDMR, EDMR, LBMR, EBMR (See Note 10)	ME - Fasteners (See Note 10)	ME - Heat Treat (See Note 10)	ME - Coatings (Vapor/Pack/Thermal) (Commercial Labs by Exception Only) (See Note 10)	Wet Chemical Analysis (See Note 2)	OES Quantitative Spectrographic Analysis (See Notes 3, 4, & 5)	Salt Spray	Heat Treating (to condition lab specimens)	Gas Analysis - Combustion (C, S)	Gas Analysis - Inert Gas Fusion O-Oxygen, N-Nitrogen, H-Hydrogen	Semi-quantitative Analysis (See Note 1)	Sieve Analysis	Plastics (See Note 8)	Rubber Materials including Polymers (See Note 8)	Atomic Absorption (See Notes 5 & 6)	AA - Tramp Elements (See Notes 5 & 6)	XRF Quantitative Spectrographic Analysis - All Others (See Notes 4 & 5)	XRD (See Note 7)	Fatigue	Fracture Toughness	Sodium Chloride, Fluoride Analysis			Microscopic Contamination Analysis-SEM	Mass Spectroscopy	NonMetals - Tensile/Compressive	NonMetals - Uncured Properties	NonMetals - Flex/Short Beam	Particles Size Distribution - Laser Light Scattering	Tensile, Cryogenic	Cryogenic, Coefficient of Thermal Expansion	Humid Stress Rupture	RT and ET - Coefficient of Thermal Expansion	Thermal Conductivity - Metal	Plating Embrittlement									
	1	2	3	4	5	6	7	7-a	7-b	7-c	7-d	7-e	7-f	7-g	7-h	7-i	8	9	10	11	12	12-a	13	14	15	16	17	17-a	18	19	20	21	22	23	24			25	26	27	28	29	30	31	32	33	34	35										
15	Element Materials Technology 3200 S. 166th Street New Berlin, Wisconsin 53151-2701																																																	8	Works							
16	Element Materials Technology 9301 Innovation Drive Suite 175 Daleville, IN 47334-0569																																																				22	Simos				
17	Exova Inc. - Freeman 10005 Freeman Avenue Santa Fe, Springs, California 90670																																																				18	Jacobson				
18	Exova Inc. - Glendale Heights Lab 194 International Blvd Glendale Heights, Illinois 60139																																																					21	Works			
19	Exova Mexico Carretera Monterrey-Saltito #3279-B Col: Privada de Santa Catarina Santa Catarina, Nuevo Leon, Mexico																																																				6	Griffin				
20	IMR KHA - Portland 5687 S. E. International Way, Ste. A Portland, Oregon 97222																																																				13	Matze				
21	IMR Singapore Pte. Ltd. 30 Loyang Way #03-16 Singapore 508769																																																				15	Santangelo				
22	IMR Test Labs 131 Woodsege Drive Lansing, New York 14882																																																					31	Santangelo			
23	IncoTest Homer Road Hereford, HR4 9SL United Kingdom																																																						15	TBD		
24	Joliet Metallurgical Laboratories 305 North Republic Avenue Joliet, Illinois 60435																																																						5	Works		
25	Laboratory Testing Inc. 2331 Topaz Drive Hatfield, Pennsylvania 19440																																																						22	McCallister		
26	Lehigh Testing Laboratory 308 West Basin Road P.O. Box 903 New Castle, Delaware 19720																																																						6	McCallister		
27	Luvak Inc. P. O. Box 597 Boylston, Massachusetts 01505-597																																																							7	Berube	
28	Massachusetts Materials Research, Inc. 1500 Century Drive West Boylston, Massachusetts 01583																																																								15	Berube

P&W - MCL - Qualified Commercial Laboratory - Table I

Commercial Laboratories	Tensile, Room Temperature	Tensile, Elevated Temperature	Stress Rupture	Creep Rupture	Hardness	Impact	Metallographic Examination - All Others (See Note 10)	ME - Microstructure/Grainsize (See Note 10)	ME - Abusive Machining E166 Supp A (See Note 10)	ME - Surface Contamination of Titanium (See Note 10)	ME - Braze (See Note 10)	ME - Weld (See Note 10)	ME - Nonconventional Machining, ECMR, EDMR, LBMR, EBMR (See Note 10)	ME - Fasteners (See Note 10)	ME - Heat Treat (See Note 10)	ME - Coatings (Vapor/Pack/Thermal) (Commercial Labs by Exception Only) (See Note 10)	Wet Chemical Analysis (See Note 2)	OES Quantitative Spectrographic Analysis (See Notes 3, 4, & 5)	Salt Spray	Heat Treating (to condition lab specimens)	Gas Analysis - Combustion (C, S)	Gas Analysis - Inert Gas Fusion O-Oxygen, N-Nitrogen, H-Hydrogen	Semi-quantitative Analysis (See Note 1)	Sieve Analysis	Plastics (See Note 8)	Rubber Materials including Polymers (See Note 8)	Atomic Absorption (See Notes 5 & 6)	17-a AA - Tramp Elements (See Notes 5 & 6)	XRF Quantitative Spectrographic Analysis - All Others (See Notes 4 & 5)	XRD (See Note 7)	Fatigue	Fracture Toughness	Sodium, Chloride, Fluoride Analysis	Microscopic Contamination Analysis-SEM	Mass Spectroscopy	NonMetallics - Tensile/Compressive	NonMetallics - Uncured Properties	NonMetallics - Flex/Short Beam	Particles Size Distribution - Laser Light Scattering	Tensile, Cryogenic	Cryogenic, Coefficient of Thermal Expansion	Humid Stress Rupture	RT and ET - Coefficient of Thermal Expansion	Thermal Conductivity - Metal	Plating Embrittlement	Totals	SQE	
	1	2	3	4	5	6	7	7-a	7-b	7-c	7-d	7-e	7-f	7-g	7-h	7-i	8	9	10	11	12	12-a	13	14	15	16	17	17-a	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
	<p>Yellow highlighted fields represent correlation testing per MCLM F23.</p> <p>Light blue highlighted fields represent labs found capable to perform this type of test.</p> <p>Light green highlighted fields with letters represent specific test recognitions.</p>																																															

- Code numbers with an element suffix (e.g.; 17Pb) designate qualification for analysis of that element on cast turbine airfoil alloys by the specified test method.
- The letter "C" suffix to Code 17 (Atomic Absorption) also designates qualification for residual cerrobend analysis in hollow core blades and vanes.
- The letter "R" suffix to Code 19 (XRD) also designates qualification for retained austenite.
- Qualification for Codes 15 and 16 is not required for simple identification tests such as those listed in MCL Manual Section S-8.
- The letter "A" suffix to Code 29 (yttrium analysis) indicates the ICP method. The letter "B" suffix to Code 29 (yttrium analysis) indicates the DCP method.
- Code 7 does not include metallographic examination of thermal spray coatings, pack process diffusion coatings, plasma or vapor deposition coatings at qualified commercial laboratories.

PWC - MCL - Qualified Commercial Laboratory - Table II

Commercial Laboratories		Tensile, Room Temperature	Tensile, Elevated Temperature	Stress Rupture	Creep Rupture	Hardness	Impact	Metallographic Examination	Chemical Analysis (See Note 2)	Spectrographic Analysis (Quantitative) <i>(See Notes 3, 4, & 5)</i>	Salt Spray	Heat Treating (to condition lab specimens)	Gas Analysis	Spectrometric Analysis (semi-quantitative, as defined below)	Sieve Analysis	Plastics (See Note 8)	Rubber Materials including Polymers (See Note 8)	Atomic Absorption (See Notes 5 & 6)	XRF (See Notes 4 & 5)	XRD (See Note 7)	Low Cycle Fatigue	Fracture Toughness	Sodium, Chloride, Fluoride Analysis	Microscopic Contamination Analysis	Particles Size Distribution - Laser Light Scattering	EDAX Analysis on S.E.M.	Fuel Analysis (See Note 9)	Hardenability on Disc & Jominy (See Note 9)	Flash Point Testing (See Note 9)	Totals	SQE
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	28	29	C30	C31	C32		
1	Pratt & Whitney Canada Corp. Plant 1 "Chemical Technology & Test" Department 1000 Marie Victorin Longueuil, Quebec J4G 1A1																													7	Halle
2	Allvac Ltd. Atlas House, Attercliffe Rd. Sheffield, United Kingdom S4 7UY																													4	Jones
3	Exova Cambridge 15 Highridge Court P.O. Box 363 Cambridge, Ontario, N1R 7L3																													6	Bale
4	Exova Pointe-Claire 121 boul. Hymus Pointe-Claire, Québec, H9R 1E6																													8	Lobo
5	Etablissement de Nantes 74, route de la Jonalière B.P. 82617 44326 Nantes Cedex 3																													3	Jones
6	Allvac Ltd. - Commercial Testing Services Ltd. Blackmore Street Sheffield, United Kingdom, S4 7TZ																													6	Jones
7	Genitest Inc. 3472 Frontenac, Montréal, Québec. H2K 3A5																													10	Routhier
8	Team Industrial Services TCM Division 105 Chester Road Woodlawn, Cincinnati OH 45215																													2	Mackenzie
9	Mitchell Aerospace Inc. 350 Décarie Ville St-Laurent, Québec, H4L 3K1																													4	Lu
10	SGS Canada 11000-A Sherbrooke E. Montréal, Québec, H1B 5W1																													2	Caron
11	SGS Canada Inc. - Industrial Services 3420 St-Joseph Blvd East Montréal, Québec H1X 1W6																													1	Caron

PWC - MCL - Qualified Commercial Laboratory - Table II

Commercial Laboratories	Specific Test Codes																																Totals	SQE
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	28	29	C30	C31	C32						
12 Acuren Group Inc. 2412 Drew Road Mississauga, Ontario, L5S 1A1																															6	Bale		
13 WSK/ PZL- Kalisz 62-800 Kalisz,, St.Czestowchowska, 140, Poland																															3	Skoczylas		
14 Engineering Material Research 35 Carl Hall Road, Unit 3 Downsview, Ontario, M3K 2B6 CANADA																															3	Bale		
15 Exova Plzen Podnikatelska 39Plzen 301 00 Czech Republic																															5	Jones		
16 Vac Aero Kalisz 62-800 Kalisz / Poland ul. Elektryczna 8																															3	Skoczylas		
17 Metcut Research Inc. 3980 Rosslyn Drive Cincinnati, OH, USA 45209-9511																															4	Mackenzie		
18 Exova Mississauga 2395 Speakman Drive Mississauga, Ontario L5K 1B3, CANADA																															3	Bale		
19 Holwick Road Middlesbrough, Cleveland TS2 1QS United Kingdom																															3	Jones		
20 Red Jacket Works, Neath SA11 1NJ South Wales United Kingdom																															3	Jones		
21 WSK "PZL-Rzeszow" S.A. Hetmanska 120 35-78 Rzeszow Poland																															8	Skoczylas		
22 R&D Laboratory for Aerospace Materials Rzeszow University of Technology Ul. W.Pola 2 Rzeszow, Poland 35-959																															6	Skoczylas		

PWC - MCL - Qualified Commercial Laboratory - Table II

Commercial Laboratories	Specific Test Codes General Testing Codes																																SQE
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	28	29	C30	C31	C32	Totals	SQE			
Inspectorate - A Bureau Veritas Group Company 9756 Notre-Dame Est Montréal, Québec H1L 3R4																															1	Caron	
Timet UK Ltd. P.O. Box 704 Witton, Birmingham B6 7UR England																															1	Jones	
Exova (UK) Ltd. 182 Halesowen Road Netherton, Dudley DY2 9PL United Kingdom																															1	Jones	
Totals	12	8	4	2	12	2	11	9	9	4	2	4	4	0	0	0	4	2	0	4	1	0	0	2	3	2	1	1	103				

Notes:

1. P&W defines semi-quantitative spectrographic analysis as "The Determination of a material's chemistry to detect the presence of the alloying elements to a degree by which a positive identification can be made as to the alloy type, as well as the ability to distinguish between similar alloys".
2. P&W defines wet chemical analysis as "gravimetric or titrimetric analysis".
3. ICP, DCP, Direct Reader.
4. P&W defines quantitative analysis as "utilization of a least squares calibration curve".
5. Code numbers with an element suffix (e.g.; 17Pb) designate qualification for analysis of that element on cast turbine airfoil alloys by the specified test method.
6. The letter "C" suffix to Code 17 (Atomic Absorption) also designates qualification for residual cerrobend analysis in hollow core blades and vanes.
7. The letter "R" suffix to Code 19 (XRD) also designates qualification for retained austenite.
8. Qualification for Codes 15 and 16 is not required for simple identification tests.
9. Codes C30, C31 and C32 are formerly PWC Codes 30, 31, and 32, respectively

*** End of Document ***