

STANDARDIZED FORMAT FOR USE IN THE PREPARATION OF PRODUCT TEST REPORTS

GENERAL INSTRUCTIONS

June 2003

These instructions are designed for use as a guide in preparing/formatting test reports in a consistent manner. Computer generated or typed test reports are acceptable. A Standardized Test report format is provided at Figure I and includes all tests approved for all refined products. The Test Codes used in this standard report format will be incorporated into future Electronic Data Interchange (EDI) transmissions of test result data.

The ASTM Aviation Turbine Fuel Report Form found in ASTM Method D-1655 was used as a template for the expanded "generic" standard test report form for other refined products. The codes containing an alpha character indicate alternative methods used to measure a property or characteristic. A numeric change of "1" unit indicates one or more measurements, ratings or test conditions which can be reported for a particular method. All measurements are in metric units, except for the API gravity reported at 60°F.

The use of this code provides flexibility in adding or deleting test methods while not affecting the existing methods and thus eliminates the need for additional programming. For example, an ASTM method may have an equivalent ISO or other method. If the ASTM test method number is used as a reference, the ISO equivalent may be lost unless new programming is established to make it a choice. With the code, the equivalency will continue without any additional programming. Another example is adding a new test method for Freezing Point. There are currently 3 methods (300A-C) for measuring the characteristic of freezing point. The new method would be assigned the code "300D" and would be available immediately as an alternative method for determination of freezing point while retaining the old methods without having to renumber the whole list and change associated database programming.

Each test report should be tailored to include only those rows of information that are applicable to the specific product being tested and the methods used to evaluate each property. Select only those methods authorized by the product specification unless otherwise stated in the contract. The code used should be limited to the actual test method used for a particular analysis. If an analysis is performed which is not cited by the specification, report the result, units and method used at the bottom of the report. If a test code does not appear for a specification or contract approved method, contact the Defense Energy Support Center (DESC) at commercial (703) 767-8356.

DETAILED INSTRUCTIONS FOR THE STANDARD TEST REPORT FORMAT (FIGURE 1)

Item 1: This date is the tank approval date, which is usually the date the testing is completed or the report date.

Item 2B: The City should match the "Shipped From" city on the DD 250-series document.

Item 6A: Record the basic slate of crudes from which this product is derived.

Item 6B: Annotate the refining processes used in the production of this product (e.g., Atmospheric Distillation; Hydrogenation, Hydrocracking, etc)

Item 8: Report the quantity in US Gallons shipped from the above batch in the above tank under DESC Contract. This entry need not be completed if the same batch will be used for subsequent shipments. In this case, assure that the tank number, batch number and report date are on the DD-250-series documents for shipments made from this tank

Items 600-series: The JFTOT test, although done using one ASTM test method, can be performed at different temperatures. Also, results for separate JFTOT analysis performed at two different temperatures can be reported on the same report. If test results for only one temperature is being reported, use Item 600 A-C to report the temperature of the test and 601, 602 and 603 as appropriate to report the results. If a second temperature is being reported, use Item 604 to report the temperature of this second run and Items 605-607 to report the corresponding values for the second test.

Item 750: Use this item to report the result of the Water Separometer Index - Modified (WSIM) which is performed for product acceptance.

Item 751: This code for this item describes what additives were present in the fuel sample tested for WSIM and for which the result was reported in Item 750. Each code value represents a combination of the five additives possible in jet fuel. The codes and corresponding combinations are found in Table A below.

Item 750X: This item is used to report the special hand blend of all additives which are required by the fuel specification, regardless of whether or not the additives are required by contract. These additives include anti-oxidant, corrosion inhibitor, fuel system icing inhibitor, static dissipater additive and, if permitted by contract, metal deactivator. The result for this special test is a report only and is used as a base line in determining if the time and/or place of additive injection affects fuel quality. This reporting requirement is in addition to other reporting requirements for WSIM.

Items 801, 811, 821, 831, and 841: These codes indicate when an additive was injected during the procurement process. It is a one-character field and is "S" if the additive was blended into the shipping tank, "I" if the additive was line injected, or blank if the additive was not injected at the refinery or terminal location.

Table A

<u>Code</u>	<u>Additives</u>								
01	Neat	07	AO/CI	13	CI/MDA	19	AO/CI/MDA	25	FSII/SDA/MDA
02	AO	08	AO/FSII	14	FSII/SDA	20	AO/FSII/MDA	26	AO/CI/FSII/SDA
03	CI	09	AO/SDA	15	FSII/MDA	21	AO/FSII/SDA	27	AO/FSII/SDA/MDA
04	FSII	10	AO/MDA	16	MDA/SDA	22	AO/SDA/MDA	28	CI/FSII/SDA/MDA
05	SDA	11	CI/FSII	17	AO/CI/FSII	23	CI/FSII/SDA	29	AO/CI/FSII/SDA/MDA
06	MDA	12	CI/SDA	18	AO/CI/SDA	24	CI/FSII/MDA		

FIGURE I - STANDARD TEST REPORT FORMAT

1 REPORT DATE: (MM/DD/YY) _____
 2A CONTRACTOR: _____
 2B REFINERY CITY: _____
 2C STATE/COUNTRY: _____
 3A CONTRACT NUMBER: (SPO600-YY-D-NNNN) _____
 3B CONTRACT LINE ITEM NUMBER: _____
 3C DESC ORDER NUMBER _____
 4A TANK NUMBER: _____
 4B BATCH NUMBER (In Tank): _____
 4C SAMPLE NUMBER: _____
 5 PRODUCT: _____
 6A CRUDE OIL SLATE: _____
 6B CRUDE PROCESSING TECHNIQUE: _____
 7 SHIPPED TO: _____
 8 QUANTITY FROM TANK SHIPPED TO DESC: _____ USG

APPEARANCE

<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>	<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>
010A	D-156	Saybolt Color	1-Color	021	D-4176	Haze Rating	Method
010B	D-6045	Saybolt Color (Spectro)	1-Color	030A	D-1500	ASTM Color	0.5-Color
020	D-4176	Visual appearance	Pass/Fail	030B	D-6045	ASTM Color (Spectro)	0.5-Color

COMPOSITION

<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>	<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>
100A	D-664	Total Acid Number – Potent	mg KOH/g	150A	D-129	Sulfur by Oxygen Bomb	mass %
100B	D-974	Acid Number - Color Titrat	mg KOH/g	150B	D-1266	Sulfur by Lamp	mass %
100C	D-3242	Acidity in Aviation Fuels	mg KOH/g	150C	D-1552	Sulfur - Furnace	mass %
100D	D-3339	Acid Number, Semi-Micro	mg KOH/g	150D	D-2622	Sulfur by X-Ray Spec	mass %
101	IP-182	Inorganic Acid Number	mg KOH/g	150E	D-3120	Trace Sulfur	ppm
102	FTM-5101	Neutrality	Method	150F	D-4294	Sulfur by X-Ray Flour	mass %
110A	D-1319	Aromatics	vol%	150G	D-5453	Sulfur by UV	ppm
110B	D-4420	Aromatics by GC	vol%	160A	D-3343	Hydrogen Content	mass %
115	D-1319	Olefins	vol%	160B	D-3701	Hydrogen Content - NMR	mass %
120	D-1840	Naphthalene	vol%	160C	D-4808	Hydrogen Cont LoRes NMR	mass %
125A	D-4420	Benzene	vol%	160D	D-5291	Hydrogen Cont – Instrument	mass%
125B	D-3606	Benzene	vol%	165	D-5184	Al plus Si (ISO 10478)	ppm
130	D-3227	Mercaptan Sulfur	mass %	170A	D-3237	Lead in Gasoline by AA	g/L
135	D-3231	Phosphorous	0.1 mg/L	170B	D-3341	Lead in Gasoline by ICI	g/L
140	D-4952	Doctor Test	Pos/Neg	170C	D-5059	Lead in Gasoline by X-Ray	g/L
				180A	D-4815	Ethers and Alcohols by GC	mass %
				180B	D-5845	Ethers and Alcohols by IR	mass %

<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>	<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>
190	D-3605	Trace Metals - Calcium	mg/L	193A	D-3605	Trace Metals - Vanadium	mg/L
191	D-3605	Trace Metals - Lead	mg/L	193B	ISO14597	Trace Metals – Vanadium	mg/L
192	D-3605	Trace Metals - Na & K	mg/L	195	D-3703	Peroxide Content	mg/kg

VOLATILITY

<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>	<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>
200A	D-86	Distillation by Auto/Manual		220D	D-3828	Flash Point - Seta, Method B	°C
200B	D-2887	Distillation by GC		220E	IP-170	Flash Point - Abel	°C
201		Initial Boiling Point	°C	221	D-3828	Flash Point - Seta (Flash/No F)	“F” or “N”
202		10% Recovered	°C	230A	D-1298	Density @ 15°C -Hydrom	kg/L
203		20% Recovered	°C	230B	D-4052	Density @ 15°C - Digital	kg/L
204		50% Recovered	°C	231A	D-1298	API Gravity @ 60°F	°API
205		85% Recovered	°C	231B	D-4052	API Gravity @ 60°F	°API
206		90% Recovered	°C	231C	D-287	API Gravity @ 60°F	°API
207		95% Recovered	°C	240A	D-323	RVP	kPa
208		Evaporated @ 70°C	vol%	240B	D-4953	Vapor Press - Dry Meth	kPa
209		Evaporated @ 100°C	vol%	240C	D-5190	Vapor Press - Automatic	kPa
210		Evaporated @ 180°C	vol%	240D	D-5191	Vapor Press - Mini Meth	kPa
211		Final Boiling Point	°C	240E	D-5482	Vapor Press - Mini -Atm	kPa
212		% Recovered	vol%	250A	D-2533	V/L Ratio - Buret	Unit@°C
213		% Residue	vol%	250B	D-5188	V/L Ratio - Evac Chamb	Unit@°C
214		% Loss	vol%	250C	D-4814	Estimated V/L Ratio	Unit@°C
215		% Residue + Loss	vol%	260	STANAG 7090	Vapor Lock Index	
220A	D-56	Flash Point - Tag	°C				
220B	D-93	Flash Point - P/M	°C				
220C	D-3828	Flash Point - Seta, Method A	°C				

FLUIDITY

<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>	<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>
300A	D-2386	Freezing Point	°C	320D	D-5773	Cloud Point (Constant Cool)	°C
300B	D-5901	Freezing Point	°C	321A	IP-309	Cold Filter Plugging Point	°C
300C	D-5972	Freezing Point	°C	321B	D-6371	Cold Filter Plugging Point	°C
300D	D-4305	Freezing Point, Low Temps	°C	321C	D-6371(M)	Cold Filter Plugging Point	°C
310	D-445	Viscosity	cSt	330A	D-97	Pour Point	°C
311	D-445	Viscosity Temperature	°C	330B	D-5949	Pour Point – Pulsing Method	°C
320A	D-2500	Cloud Point	°C	340	D-6079	Lubricity (Wear Scar)	0.01 mm
320B	D-5771	Cloud Point (Optical)	°C				
320C	D-5772	Cloud Point (Linear Cool)	°C				

COMBUSTION

<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>	<u>Code</u>	<u>Method</u>	<u>Test</u>	<u>Unit</u>
400A	D-240	Neat Heat by Bomb	MJ/kg	400D	D-4529	Net Heat (Dens-Anal(°C),S)	MJ/kg
400B	D-1405	Net Heat (Anal-Grav(°F),S)	MJ/kg	400E	D-4809	Net Heat by Bomb-Precision	MJ/kg
400C	D-3338	Net Heat (Aromat,API,Dist,S)	MJ/kg	400F	D-4868	Net and Gross Heat	MJ/kg

Code	Method	Test	Unit	Code	Method	Test	Unit
400G	D-6446	Net Heat of Aviation Fuels	MJ/kg	430	D-482	Ash Content	mass %
400H	D-2382	Net Heat by Bomb – Precision	MJ/kg	440A	D-189	Conradson Carbon Res	mass %
410	D-1740	Luminometer Number	Unit	440B	D-524	Ramsbottom Carbon Res	mass %
420	D-1322	Smoke Point	mm	440C	D-4530	Carbon Residue - Micro	mass %

CORROSION

Code	Method	Test	Unit	Code	Method	Test	Unit
500	D-130	Copper Strip Corrosion	Method	510	IP-227	Silver Strip Corrosion	Method

STABILITY

Code	Method	Test	Unit	Code	Method	Test	Unit
600A	D-3241	JFTOT @ 275°C		608	D-3241	Serial Number for 600A Tube	
600B	D-3241	JFTOT @ 260°C		609	D-3241	Serial Number for 604 Tube	
600C	D-3241	JFTOT @ 245°C		610A	D-525	Ox Stability -Gasoline	minute
601	D-3241	Pressure Change	mm Hg	610C	D-873	Ox Stability – Aviation Fuels	mg/100mL
602	D-3241	Visual Rating	Method	620A	D-2274	Accelerated Stability	mg/100mL
603	D-3241	Spun Rating	Method	620B	D-5304	Accelerated Stab - O ₂ Opres	mg/100mL
604	D-3241	Other JFTOT Temperature	°C	620C	ISO10307	Tot Sed in Residual Fuels	%mass
605	D-3241	Pressure Change @ Other Temp	mm Hg				
606	D-3241	Visual Rating @ Other Temp	Method				
607	D-3241	Spun Rating @ Other Temp	Method				

CONTAMINANTS

Code	Method	Test	Unit	Code	Method	Test	Unit
700	IP-225	Copper Content	ppb	761	D-4814	Phase Separation (Sep)	°C
710	D-381	Existent Gum	mg/100mL	770	D-1401	Demulsification @ 25°C	minutes
711	D-381	Washed Gum	mg/100mL	780A	D-1796	Water & Sed	vol%
720A	D-2276	Particulate Cont	mg/L	780B	D-2709	Water & Sed	vol%
720B	D-5452	Particulate Cont	mg/L	781A	D-95	Water by Distillation	vol%
720D	D-6217	Particulate Cont – Middle Dist	mg/L	781B	D-6304	Water by Karl Fischer	mg/kg
730	Annex	Filtration Time	minutes	782	D-473	Sediment by Extraction	mass %
740	D-1094	Water Reaction - Interface	Method	795	SW-846	EPA Metals - As	Method
741	D-1094	Water Reaction - Separation	Method	796	SW-846	EPA Metals - Cd	Method
742	D-1094	Water Reaction - Vol Chng	Method	797	SW-846	EPA Metals - Cr	Method
750	D-3948	WSIM	Method	798	SW-846	EPA Metals - Pb	Method
751		Additives Present (See Note)	(List A)	799	SW-846	Total Halogens	Method
750X	D-3948	WSIM - Special (See Note)	Method				
760	D-4814	Phase Separation (Haze)	°C				

ADDITIVES

Code	Method	Test/Additive	Unit	Code	Method	Test/Additive	Unit
800A	Antioxidant	Topanol A	mg/L	830C	FSII (FTM-5340)		vol%
800B	Antioxidant	HITEC 4733	mg/L	830D	FSII (FTM-5340) - EGME		vol%
800C	Antioxidant	AN 733	mg/L	830E	FSII – Calculated		vol%
800D	Antioxidant	AO-31	mg/L	831	Additive Injection Point		(Note)
800E	Antioxidant	AO-30	mg/L				
800F	Antioxidant	AO-29	mg/L	840A	Corr Inhibitor	PRI-19	mg/L
800G	Antioxidant	Nalco EC5208A	mg/L	840B	Corr Inhibitor	DCI-4A	mg/L
800H	Antioxidant	TOLAD 3915	mg/L	840C	Corr Inhibitor	DCI-6A	mg/L
800I	Antioxidant	TOLAD 3920	mg/L	840D	Corr Inhibitor	HITEC 580	mg/L
800J	Antioxidant	TOPANOL AN	mg/L	840E	Corr Inhibitor	Petrolite NC-351	mg/L
800K	Antioxidant	CHIMIC 4327	mg/L	840F	Corr Inhibitor	NALCO 5403	mg/L
800L	Antioxidant	AO-37	mg/L	840G	Corr Inhibitor	TOLAD 3220	mg/L
800M	Antioxidant	BETZ BQ203	mg/L	840H	Corr Inhibitor	UNICOR J	mg/L
800N	Antioxidant	Chemlink No 4650	mg/L	840I	Corr Inhibitor	IPC-4410	mg/L
800O	Antioxidant	Petroxylin E219	mg/L	840J	Corr Inhibitor	IPC-4445	mg/L
800P	Antioxidant	Kerobit TP-26	mg/L	840K	Corr Inhibitor	MOBILAD F800	mg/L
800Q	Antioxidant	Pet411K	mg/L	840L	Corr Inhibitor	NALCO 5405	mg/L
800R	Antioxidant	ISONOX 133	mg/L	840M	Corr Inhibitor	NUCHEM PCI-105	mg/L
800S	Antioxidant	AO-37B	mg/L	840N	Corr Inhibitor	TOLAD 249	mg/L
800T	Antioxidant	ISONOX 75	mg/L	840O	Corr Inhibitor	WELCHEM 91120	mg/L
800U	Antioxidant	HITEC 4775	mg/L	840P	Corr Inhibitor	SPEC-AID 8021	mg/L
800V	Antioxidant	BETZ 8Q2065	mg/L	840Q	Corr Inhibitor	RPS-613	mg/L
800W	Antioxidant	BHT	mg/L	840R	Corr Inhibitor	SPEC AID 8Q22	mg/L
800X	Antioxidant	HITEC 4778	mg/L	840S	Corr Inhibitor	TOLAD 4410	mg/L
800Y	Antioxidant	Octel 37/70	mg/L	841	Additive Injection Point		(Note)
801	Additive Injection Point		(Note)				
				850	Thermal Stability Additive		mg/L
810A	Metal Deactivator (DMD)		mg/L	851	Additive Injection Point		(Note)
810B	Metal Deactivator (DMD-2)		mg/L				
811	Additive Injection Point		(Note)	860	Diesel Fuel Stabilizer Additive		mg/L
				861	Additive Injection Point		(Note)
820	Conductivity Improver		mg/L				
821	Additive Injection Point		(Note)	870	Ignition Improver		mg/L
				871	Additive Injection Point		(Note)
830A	FSII (D-5006)		vol%				
830B	FSII (FTM-5327)		vol%				

OTHER TESTS

Code	Method	Test	Unit	Code	Method	Test	Unit
900	D-2624	Conductivity	pS/m	920A	D-2699	Research Octane Number	Method
901	D-2624	Temperature at Measurement	°C	920B	D-2885	Research Octane Number	Method
910A	D-976	Calc Cetane Index - 2 Var	Method	921A	D-2700	Motor Octane Number	Method
910B	D-4737	Calc Cetane Index - 4 Var	Method	921B	D-2885	Motor Octane Number	Method
911	D-613	Cetane Number	Method	930	D-611	Aniline Point	°C
				940	D-4814	Water Tolerance	°C