



Mediciones



Laboratorio



Ingeniería



Diagnóstico



Asesoría

ANEXO 5

Certificados de Gases Patrones y atenuadores

INFORME DE RESULTADOS DE LOS ENSAYOS DE VALIDACIÓN (IREV)
Guacolda Energía S.A.- Unidad 4 – Validación 2016



ANEXO 5: CERTIFICADOS DE GASES PATRONES

5.1 Certificados de Gases Patrones

**CERTIFICATE OF ANALYSIS**
Grade of Product: EPA Protocol

Airgas Specialty Gases
600 Union Landing Road
Cinnaminson, NJ 08077
(856) 829-7878 Fax: (856) 829-8576
www.airgas.com

Part Number: E04NI99E15A00KC Reference Number: 82-124387489-7
Cylinder Number: CC434612 Cylinder Volume: 144.4 CF
Laboratory: ASG - Riverton - NJ Cylinder Pressure: 2015 PSIG
PGVP Number: B52013 Valve Outlet: 660
Gas Code: CO,NO,NOX,SO2,BALN Certification Date: Aug 21, 2013

Expiration Date: Aug 21, 2016

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 6.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	20.00 PPM	20.32 PPM	G1	+/- 1.4% NIST Traceable	08/14/2013, 08/21/2013
NITRIC OXIDE	20.00 PPM	20.28 PPM	G1	+/- 1.4% NIST Traceable	08/14/2013, 08/21/2013
CARBON MONOXIDE	25.00 PPM	24.94 PPM	G1	+/- 0.7% NIST Traceable	08/14/2013
SULFUR DIOXIDE	75.00 PPM	74.69 PPM	G1	+/- 1.0% NIST Traceable	08/14/2013, 08/21/2013
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061808	CC280980	20.23 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Apr 11, 2015
PRM	12312	680179	10.01 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Feb 14, 2012
GMIS	124206889108	CC322664	4.879 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Apr 08, 2016
NTRM	09061825	CC282602	24.35 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	May 24, 2019
NTRM	12060211	CC350119	95.30 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Jan 10, 2018

The SRM or PRM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 APW1100391 CO	FTIR	Jul 20, 2013
Nicolet 6700 APW1100391 NO	FTIR	Jul 24, 2013
Nicolet 6700 APW1100391 NO2	FTIR	Jul 24, 2013
Nicolet 6700 APW1100391 SO2	FTIR	Aug 10, 2013

Triad Data Available Upon
Request

Notes:

**Airgas****CERTIFICATE OF ANALYSIS**
Grade of Product: EPA Protocol**Airgas Specialty Gases**600 Union Landing Road
Cinnaminson, NJ 08077
(856) 829-7878 Fax: (856) 829-6576
www.airgas.com

Part Number: E04NI99E15A00LC Reference Number: 82-124387489-13
Cylinder Number: CC434920 Cylinder Volume: 144.4 CF
Laboratory: ASG - Riverton - NJ Cylinder Pressure: 2015 PSIG
PGVP Number: B52013 Valve Outlet: 660
Gas Code: CO,NO,NOX,SO2,BALN Certification Date: Aug 21, 2013

Expiration Date: Aug 21, 2016

Certification performed in accordance with EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012) document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	44.00 PPM	44.43 PPM	G1	+/- 1.2% NIST Traceable	08/14/2013, 08/21/2013
NITRIC OXIDE	44.00 PPM	44.39 PPM	G1	+/- 1.2% NIST Traceable	08/14/2013, 08/21/2013
CARBON MONOXIDE	55.00 PPM	55.04 PPM	G1	+/- 0.7% NIST Traceable	08/14/2013
SULFUR DIOXIDE	155.0 PPM	155.1 PPM	G1	+/- 1.0% NIST Traceable	08/14/2013, 08/21/2013
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRMplus	12060809	CC281027	49.95 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Dec 16, 2017
PRM	12312	680179	10.01 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Feb 14, 2012
GMIS	124206889106	CC322654	4.879 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Apr 08, 2016
NTRM	12060511	CC353903	49.53 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	Dec 20, 2017
NTRM	11060803	CC338247	241.0 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.9%	May 13, 2017

The SRM or PRM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 APW1100391 CO	FTIR	Jul 20, 2013
Nicolet 6700 APW1100391 NO	FTIR	Jul 24, 2013
Nicolet 6700 APW1100391 NO2	FTIR	Jul 24, 2013
Nicolet 6700 APW1100391 SO2	FTIR	Aug 10, 2013

Triad Data Available Upon

Request

Notes:

**Airgas****CERTIFICATE OF ANALYSIS**
Grade of Product: EPA Protocol**Airgas Specialty Gases**600 Union Landing Road
Cinnaminson, NJ 08077
(856) 829-7876 Fax: (856) 829-6576
www.airgas.com

Part Number: E03NI90E15A02KC Reference Number: 82-124387489-79
Cylinder Number: CC433448 Cylinder Volume: 147.4 CF
Laboratory: ASG - Riverton - NJ Cylinder Pressure: 2015 PSIG
PGVP Number: B52013 Valve Outlet: 580
Gas Code: CO2,O2,BALN Certification Date: Aug 21, 2013

Expiration Date: Aug 21, 2021

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	5.000 %	5.010 %	G1	+/- 0.6% NIST Traceable	08/21/2013
OXYGEN	5.000 %	5.048 %	G1	+/- 0.4% NIST Traceable	08/21/2013
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061309	CC359863	11.002 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 11, 2018
NTRM	09060215	CC262427	9.961 % OXYGEN/NITROGEN	+/- 0.3%	Nov 08, 2018

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-LDH9LRNS	NDIR	Jul 29, 2013
Siemens Oxymat 6E-O2-N1-M1-0603	Paramagnetic	Jul 22, 2013

Triad Data Available Upon Request

Notes:



Approved for Release

**Airgas****CERTIFICATE OF ANALYSIS**
Grade of Product: EPA Protocol**Airgas, Inc.**
600 Union Landing Rd
Cinnaminson, NJ 08077
856-829-7878 Fax: 856-829-6576
airgas.comPart Number: E03NI64E15A1063
Cylinder Number: CC474931
Laboratory: ASG - Riverton - NJ
PGVP Number: B52015
Gas Code: CO2, O2, BALNReference Number: 82-124528103-1
Cylinder Volume: 157.6 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 590
Certification Date: Dec 21, 2015

Expiration Date: Dec 21, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	18.00 %	17.91 %	G1	+/- 0.7% NIST Traceable	12/21/2015
OXYGEN	18.00 %	18.37 %	G1	+/- 0.4% NIST Traceable	12/21/2015
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060819	CC417106	24.04 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 16, 2019
NTRMplus	09061404	CC267783	22.53 % OXYGEN/NITROGEN	+/- 0.4%	Mar 08, 2019

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-LDH9LRNS	NDIR	Dec 09, 2015
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Dec 04, 2015

Triad Data Available Upon Request

f/INST = 26-04-2016 = UNIDAD 4.



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**Airgas****CERTIFICATE OF ANALYSIS**
Grade of Product: EPA ProtocolAirgas, Inc.
600 Union Landing Rd
Cinnaminson, NJ 08077
856-829-7878 Fax: 856-829-8576

Part Number: E04NI99E15A04K9 Reference Number: 82-124528102-1
Cylinder Number: CC474992 Cylinder Volume: 144.4 CF
Laboratory: ASG - Riverton - NJ Cylinder Pressure: 2015 PSIG
PGVP Number: B52015 Valve Outlet: 660
Gas Code: CO,NO,NOX,SO2,BALN Certification Date: Dec 24, 2015

Expiration Date: Dec 24, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	72.00 PPM	71.20 PPM	G1	+/- 1.0% NIST Traceable	12/14/2015, 12/24/2015
NITRIC OXIDE	72.00 PPM	71.28 PPM	G1	+/- 1.0% NIST Traceable	12/14/2015, 12/24/2015
CARBON MONOXIDE	90.00 PPM	88.76 PPM	G1	+/- 1.0% NIST Traceable	12/14/2015
SULFUR DIOXIDE	270.0 PPM	267.0 PPM	G1	+/- 1.1% NIST Traceable	12/14/2015, 12/24/2015
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13061030	CC423359	99.86 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Nov 19, 2019
PRM	12312	680179	10.01 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Oct 15, 2014
GMIS	124206889144	CC300380	4.244 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Oct 13, 2017
NTRM	12062243	CC366848	97.56 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%	May 25, 2018
NTRMplus	11060814	CC338389	241.0 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.9%	May 13, 2017

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801933 CO	FTIR	Nov 21, 2015
Nicolet 6700 AHR0801933 NO	FTIR	Dec 18, 2015
Nicolet 6700 AHR0801933 NO2	FTIR	Dec 18, 2015
Nicolet 6700 AHR0801933 SO2	FTIR	Dec 11, 2015

Triad Data Available Upon Request



Approved for Release

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04

F. inst: 08/04/2016




EPA PROTOCOL STANDARD

Certified Concentrations

Component	CASNumber	Concentration	Accuracy	Procedure
CARBON DIOXIDE	124-38-9	10.93 %	+/- 0.6%	G1
OXYGEN	7782-44-7	11.11 %	+/- 0.4%	G1
NITROGEN	7727-37-9	Balance		

Cylinder Number: CC45916
Cylinder Pressure: 2015 PSIG
Certification Date: Sep 09, 2014
Expiration Date: Sep 09, 2022
Reference Number: 82-124450532-1
Part Number: E03NI78E15A08BC
PGVP Number: B52014
Gas Code: CO2,O2,BALN



Notes:
Do not use cylinder below 100 psig.
Certification performed in accordance with "EPA Traceability Protocol (May 2012)" using assay procedures listed.
To reorder this mixture, use Part Number: E03NI78E15A08BC
Empty Material: MT-15ACO
600 Union Landing Road . Riverton NJ 08077-0000

**Opacity Certification Services, LLC***A Proud Veteran-Owned Business*

8600 Harbor Drive
 Raleigh, North Carolina 27615
 Phone 919.215.9384
 Fax 919.846.6041
 Web: www.opacitycert.com

Results of NIST-Traceable **Opacity Filter** (Audit Attenuators) Certification

Customer: **Durag, Inc.**Date of Certification: **May 6, 2016**Date of Expiration: **May 5, 2017**Document No. **050616-02**

Filters (Attenuators) are certified in accordance with 40 CFR Part 60, Subpart B, "Performance Specification 1", as well as the most current ASTM D6216 standard and Opacity Procedure 3. Laboratory spectrophotometer is calibrated daily by use of NIST SRM2031b standard reference materials.

Spectrophotometer

Spectrophotometer: Varian (HP) Cary 50 Conc	Serial Number: EL06023153
Scanning Range: 380-780nm	Data Interval: 10nm Spectral Bandpass: 1.5nm
Maximum Accuracy: ± 0.25 Absolute Opacity	Laboratory Temperature: 72° F (± 3°)/22° C (± 1°)

NIST Standard Reference Material (SRM)

SRM Type: NIST 2031b series	Serial Number: Blank; 709-10; 709-30; 709-90
SRM Date of Certification: January 27, 2015	SRM Date of Expiration: January 31, 2017

Opacity Monitor

Opacity Monitor Make/Model:		Durag D-R 290 series	
Monitor Light Source:	L.E.D. (Full-Spec)	Straight stack correction factor:	1.000
Angle of Incidence:	15 degrees	Correction factor (if given):	1.000

Opacity Filter Data

Serial Number	Opacity	Transmittance	Optical Density
W24A	7.47%	92.53%	0.0337
W25A	16.42%	83.58%	0.0779
W26A	26.36%	73.64%	0.1329

Signature of Spectrophotometer Operator

New and Existing Opacity and
PM Filter Testing

24-48 Hour Service
Standard

PS-1, Procedure 3, Appendix F &
ASTM D6216-12 Compliant

Filter Certification Results for : **Durag, Inc.**Filter Serial No : **W24A**

Date of Scan : 5/6/2016

Expiration Date : **5/5/2017**

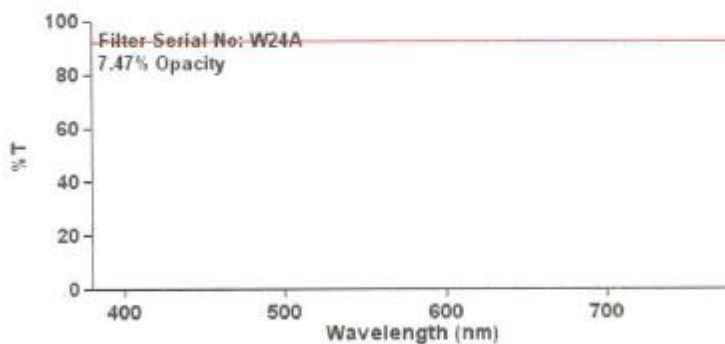
Monitor : Durag D-R 290

Angle of Incidence : 15 deg

Opacity Value = **7.47%**Transmittance = **92.53%**Optical density = **0.0337**

Table 1-1: Opacity filter Scan Data at 10 nm Intervals

Lambda	Scan 1	Scan 2	Average	% Trans	Lambda	Scan 1	Scan 2	Average	% Trans
780	92.3	92.3	92.3	0.0	570	92.5	92.6	92.5	846345.
770	92.3	92.4	92.3	0.0	560	92.6	92.5	92.5	910626.
760	92.3	92.3	92.3	92.3	550	92.5	92.4	92.5	909036.
750	92.4	92.3	92.4	92.4	540	92.5	92.4	92.5	850080.
740	92.4	92.3	92.4	184.7	530	92.5	92.5	92.5	733760.
730	92.4	92.3	92.3	277.0	520	92.5	92.5	92.5	597648.
720	92.4	92.3	92.3	554.1	510	92.5	92.5	92.5	446945.
710	92.4	92.4	92.4	1293.6	500	92.5	92.4	92.4	314418.
700	92.5	92.4	92.4	2680.9	490	92.5	92.5	92.5	218064.
690	92.5	92.4	92.4	5728.7	480	92.4	92.4	92.4	149947.
680	92.5	92.4	92.4	12387.5	470	92.4	92.4	92.4	97722.9
670	92.5	92.4	92.4	23937.3	460	92.3	92.4	92.4	64094.9
660	92.5	92.5	92.5	46614.9	450	92.4	92.4	92.4	40929.3
650	92.4	92.5	92.5	81926.4	440	92.3	92.2	92.3	24173.2
640	92.5	92.5	92.5	133442.	430	92.2	92.3	92.2	11252.3
630	92.5	92.4	92.5	202483.	420	92.3	92.2	92.2	3412.0
620	92.5	92.5	92.5	291592.	410	92.3	92.3	92.3	830.5
610	92.5	92.5	92.5	386249.	400	92.2	92.2	92.2	184.4
600	92.5	92.5	92.5	491786.	390	92.1	92.2	92.2	0.0
590	92.5	92.5	92.5	612834.	380	92.0	92.0	92.0	0.0
580	92.5	92.5	92.5	739160.		0.0	0.0	0.0	0.0



Filter Certification Results for : **Durag, Inc.**Filter Serial No : **W25A**

Date of Scan : 5/6/2016

Expiration Date : 5/5/2017

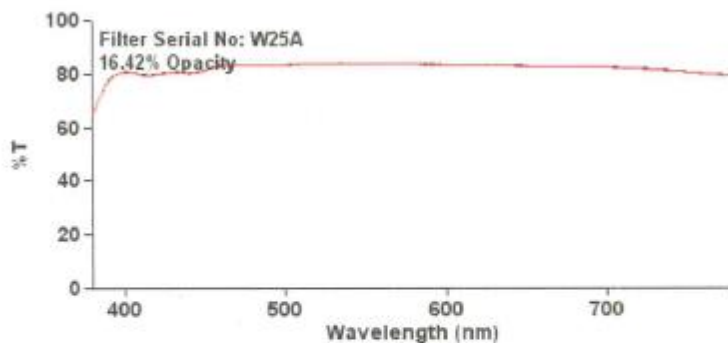
Monitor : Durag D-R 290

Angle of Incidence : 15 deg

Opacity Value = **16.42%**Transmittance = **83.58%**Optical density = **0.0779**

Table 1-1: Opacity filter Scan Data at 10 nm Intervals

Lambda	Scan 1	Scan 2	Average	% Trans	Lambda	Scan 1	Scan 2	Average	% Trans
780	79.2	79.0	79.1	0.0	570	83.8	83.7	83.7	766058.
770	79.7	79.6	79.6	0.0	560	83.9	83.8	83.8	825317.
760	80.2	80.1	80.1	80.1	550	83.9	83.8	83.8	824074.
750	80.7	80.6	80.6	80.6	540	83.9	83.8	83.8	770837.
740	81.2	81.1	81.1	162.3	530	83.8	83.7	83.8	664548.
730	81.6	81.5	81.5	244.6	520	83.7	83.6	83.6	540352.
720	82.0	81.9	81.9	491.5	510	83.6	83.4	83.5	403563.
710	82.3	82.2	82.3	1151.5	500	83.3	83.2	83.3	283209.
700	82.6	82.5	82.5	2392.8	490	83.3	83.2	83.2	196301.
690	82.6	82.5	82.5	5117.4	480	83.3	83.1	83.2	134632.
680	82.7	82.6	82.6	11069.3	470	83.2	83.1	83.2	88006.0
670	82.6	82.5	82.6	21386.1	460	83.0	82.8	82.9	57527.6
660	82.7	82.6	82.7	41666.5	450	81.6	81.5	81.6	36135.4
650	82.9	82.8	82.8	73387.9	440	80.3	80.1	80.2	21005.3
640	83.1	83.0	83.0	119801.	430	80.7	80.5	80.6	9833.6
630	83.2	83.1	83.1	182090.	420	79.7	79.7	79.7	2950.0
620	83.3	83.2	83.3	262530.	410	79.8	79.7	79.8	718.0
610	83.4	83.2	83.3	347886.	400	80.7	80.6	80.7	161.3
600	83.4	83.3	83.4	443140.	390	77.3	77.2	77.3	0.0
590	83.4	83.3	83.4	552561.	380	64.9	64.9	64.9	0.0
580	83.6	83.5	83.6	667844.		0.0	0.0	0.0	0.0





Filter Certification Results for : **Durag, Inc.**

Filter Serial No : **W26A**

Date of Scan : 5/6/2016

Expiration Date : **5/5/2017**

Monitor : Durag D-R 290

Angle of Incidence : 15 deg

Opacity Value = **26.36%**

Transmittance = **73.64%**

Optical density = **0.1329**

Table 1-1: Opacity filter Scan Data at 10 nm Intervals

Lambda	Scan 1	Scan 2	Average	% Trans	Lambda	Scan 1	Scan 2	Average	% Trans
780	64.7	64.7	64.7	0.0	570	74.0	74.0	74.0	677088.
770	65.6	65.6	65.6	0.0	560	74.2	74.2	74.2	730441.
760	66.6	66.6	66.6	66.6	550	74.2	74.2	74.2	729428.
750	67.6	67.6	67.6	67.6	540	74.2	74.3	74.2	682519.
740	68.5	68.5	68.6	137.1	530	74.1	74.1	74.1	587693.
730	69.4	69.4	69.4	208.2	520	73.9	73.9	73.9	477279.
720	70.2	70.2	70.2	421.0	510	73.5	73.6	73.5	355418.
710	70.8	70.8	70.8	991.1	500	73.2	73.2	73.2	248915.
700	71.3	71.3	71.3	2067.0	490	73.1	73.1	73.1	172317.
690	71.5	71.4	71.4	4429.8	480	72.9	72.9	72.9	117988.
680	71.5	71.5	71.5	9585.2	470	73.0	73.0	73.0	77245.4
670	71.6	71.5	71.5	18531.4	460	72.4	72.4	72.4	50238.2
660	71.7	71.7	71.7	36155.0	450	69.7	69.6	69.7	30858.7
650	72.1	72.0	72.1	63838.8	440	67.1	67.1	67.1	17582.2
640	72.4	72.4	72.4	104489.	430	67.9	67.9	67.9	8287.3
630	72.7	72.7	72.7	159302.	420	66.3	66.3	66.3	2452.1
620	72.9	72.9	72.9	229996.	410	66.3	66.3	66.3	596.7
610	73.0	73.0	73.0	304917.	400	68.1	68.1	68.1	136.2
600	73.1	73.1	73.1	388567.	390	61.6	61.5	61.5	0.0
590	73.2	73.3	73.3	485435.	380	40.9	40.9	40.9	0.0
580	73.6	73.6	73.6	588200.		0.0	0.0	0.0	0.0

