

Client:	DEF Products, LLC
Contact:	Sharon Stegmuller
Address:	422 East Barioni Blvd Imperial, CA 02251
Email:	defproducts@gmail.com
Phone:	760 355 7997

Analytic ID:	E1803021-001
Batch Number:	303072018
Sample ID:	DEF 32.7%
Date Sampled:	3/7/2018
Date Received:	3/13/2018
Report Date:	3/16/2018

Certificate of Analysis

Diesel Exhaust Fluid Analytical ISO-22241
 Client ID: 32.7% DEF Batch# 303072018

Test Parameter/Method	Units	Test Method (ISO)	Acceptable Limit	Results	Chemist	Analysis Date	Pass/Fail
Urea Content	wt%	22241-2 Annex C	31.8-33.2	32.4	SPT	3/14/2018	Pass
Density @ 20degC	g/cm ³	3675	1.0870-1.0930	1.0910	CLB	3/15/2018	Pass
Refractive Index @ 20degC	N _D ²⁰	22241-2 Annex C	1.3814-1.3843	1.3825	CLB	3/14/2018	Pass
Alkalinity as NH ₃	%	22241-2 Annex D	<0.2	<0.01	CLB	3/14/2018	Pass
Biuret	%	22241-2 Annex E	<0.3	<0.1	CLB	3/14/2018	Pass
Aldehyde	mg/kg	22241-2 Annex F	<5	<1.0	CLB	3/15/2018	Pass
Insolubles	mg/kg	22241-2 Annex G	<20	<2.0	SPT	3/19/2018	Pass
Phosphate	mg/kg	22241-2 Annex H	<0.5	<0.25	SPT	3/16/2018	Pass
Calcium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/13/2018	Pass
Iron by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/13/2018	Pass
Copper by ICP-OES	mg/kg	22241-2 Annex I	<0.2	<0.02	BDK	3/13/2018	Pass
Zinc by ICP-OES	mg/kg	22241-2 Annex I	<0.2	<0.02	BDK	3/13/2018	Pass
Chromium by ICP-OES	mg/kg	22241-2 Annex I	<0.2	<0.02	BDK	3/13/2018	Pass
Nickel by ICP-OES	mg/kg	22241-2 Annex I	<0.2	<0.02	BDK	3/13/2018	Pass
Aluminum by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/13/2018	Pass
Magnesium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/13/2018	Pass
Sodium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/13/2018	Pass
Potassium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/13/2018	Pass
Identity by FTIR (attached)	Spectra	22241-2 Annex J	Match	Reference Match	BDK	3/15/2018	Pass

Note 1: All ISO standards are up to date with the latest revisions.

"The undersigned certifies that the value(s) reported have met the highest analytical quality control standards."



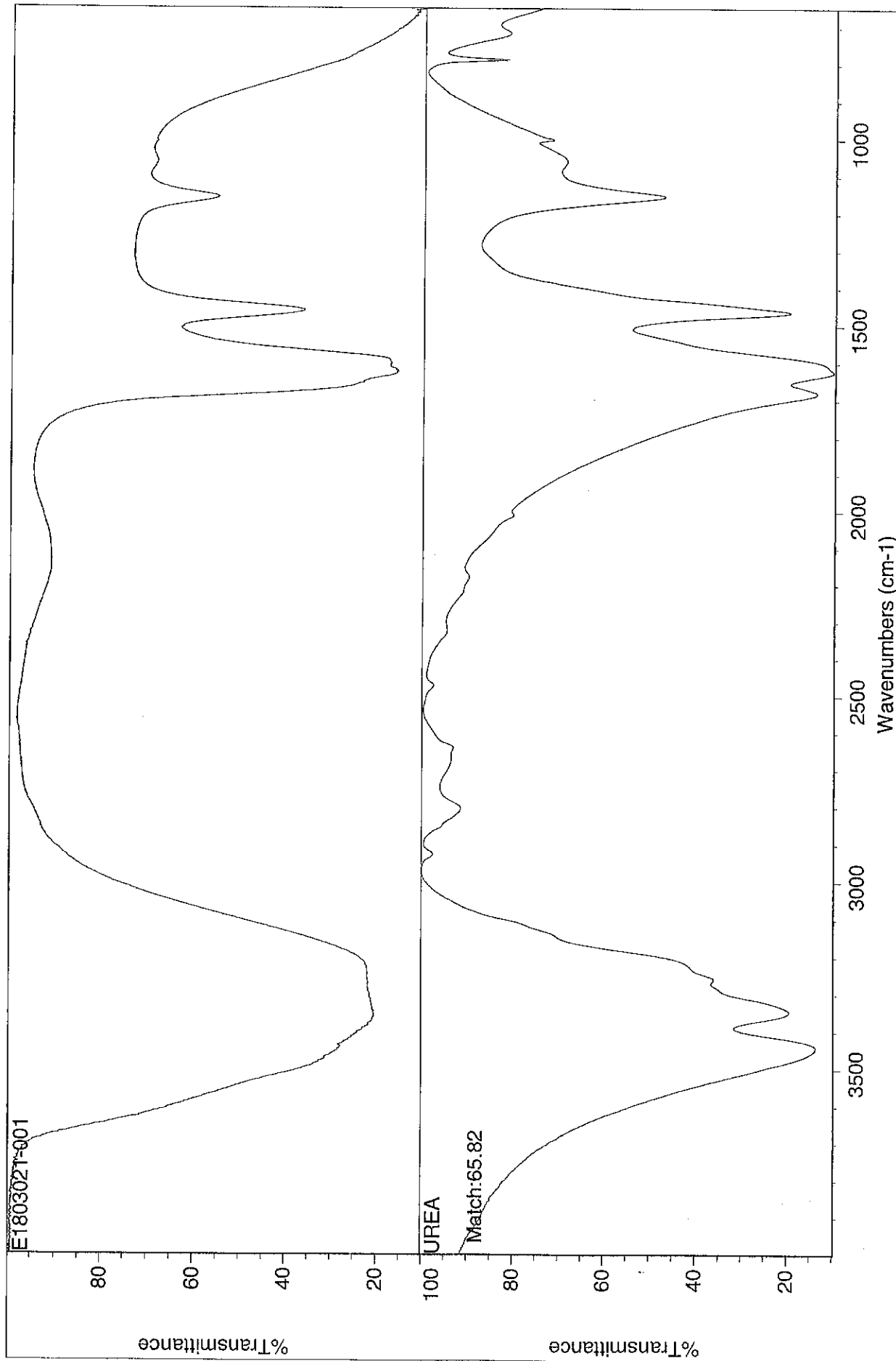
Certification Approval _____

Laboratory Director: Anthony J Scala

Analytic FDA Reg. Number: 02-636-0096

Date: 3/19/2018 _____

Search results for: E1803021-001
Date: Thu Mar 15 08:55:24 2018 (GMT-04:00)
Search algorithm: Search Expert
Regions searched: 2600.00-450.00



Client:	DEF Products, LLC
Contact:	Sharon Stegmuller
Address:	422 East Barioni Blvd Imperial, CA 02251
Email:	defproducts@gmail.com
Phone:	760 355 7997

Analytic ID:	E1803035-001
Batch Number:	303162018
Sample ID:	DEF 32.6
Date Sampled:	3/16/2018
Date Received:	3/19/2018
Report Date:	3/22/2018

Certificate of Analysis

Diesel Exhaust Fluid Analytical ISO-22241
 Client ID: 32.6% DEF Batch# 303162018

Test Parameter/Method	Units	Test Method (ISO)	Acceptable Limit	Results	Chemist	Analysis Date	Pass/Fail
Urea Content	wt%	22241-2 Annex C	31.8-33.2	32.4	SPT	3/22/2018	Pass
Density @ 20degC	g/cm ³	3675	1.0870-1.0930	1.0910	CLB	3/20/2018	Pass
Refractive Index @ 20degC	N _D ²⁰	22241-2 Annex C	1.3814-1.3843	1.3825	CLB	3/22/2018	Pass
Alkalinity as NH ₃	%	22241-2 Annex D	<0.2	<0.01	CLB	3/19/2018	Pass
Biuret	%	22241-2 Annex E	<0.3	<0.1	CLB	3/22/2018	Pass
Aldehyde	mg/kg	22241-2 Annex F	<5	<1.0	CLB	3/20/2018	Pass
Insolubles	mg/kg	22241-2 Annex G	<20	<2.0	CLB	3/22/2018	Pass
Phosphate	mg/kg	22241-2 Annex H	<0.5	<0.25	CLB	3/21/2018	Pass
Calcium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/20/2018	Pass
Iron by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/20/2018	Pass
Copper by ICP-OES	mg/kg	22241-2 Annex I	<0.2	0.02	BDK	3/20/2018	Pass
Zinc by ICP-OES	mg/kg	22241-2 Annex I	<0.2	<0.02	BDK	3/20/2018	Pass
Chromium by ICP-OES	mg/kg	22241-2 Annex I	<0.2	<0.02	BDK	3/20/2018	Pass
Nickel by ICP-OES	mg/kg	22241-2 Annex I	<0.2	<0.02	BDK	3/20/2018	Pass
Aluminum by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/20/2018	Pass
Magnesium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/20/2018	Pass
Sodium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/20/2018	Pass
Potassium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	3/20/2018	Pass
Identity by FTIR (attached)	Spectra	22241-2 Annex J	Match	Reference Match	BDK	3/20/2018	Pass

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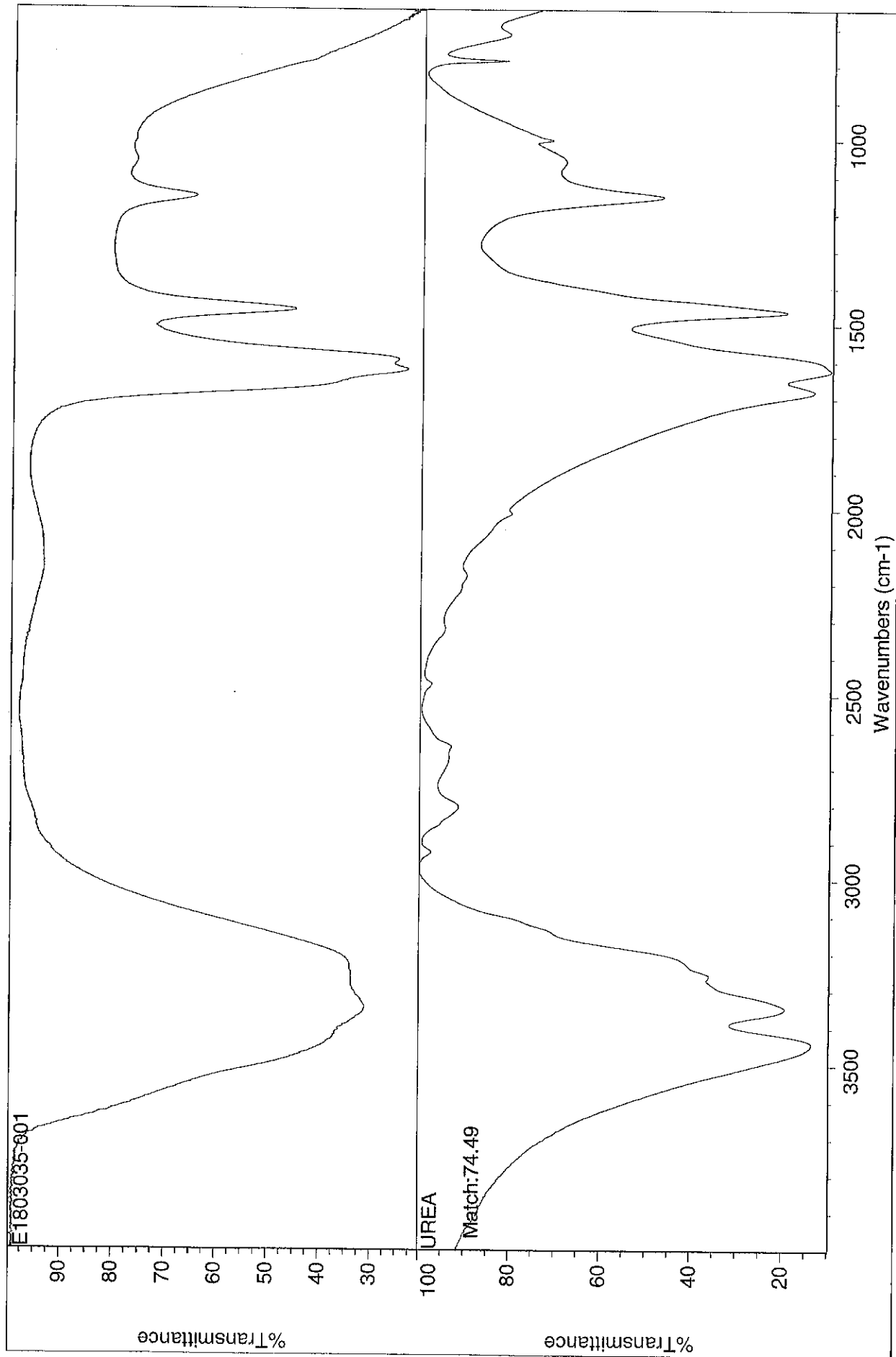
Certification Approval _____

Laboratory Director: Anthony J Scala

Analytic FDA Reg. Number: 02-636-0096

Date: 3/22/2018 _____

Search results for: E1803035-001
Date: Tue Mar 20 09:44:39 2018 (GMT-04:00)
Search algorithm: Search Expert
Regions searched: 2600.00-450.00



Client:	DEF Products, LLC
Contact:	Sharon Stegmuller
Address:	422 East Barioni Blvd Imperial, CA 02251
Email:	defproducts@gmail.com
Phone:	760 355 7997

Analytic ID:	E1803059-001
Batch Number:	303212018
Sample ID:	DEF 32.6
Date Sampled:	3/21/2018
Date Received:	3/28/2018
Report Date:	4/3/2018

Certificate of Analysis

Diesel Exhaust Fluid Analytical ISO-22241

Client ID: 32.6% DEF Batch# 303212018

Test Parameter/Method	Units	Test Method (ISO)	Acceptable Limit	Results	Chemist	Analysis Date	Pass/Fail
Urea Content	wt%	22241-2 Annex C	31.8-33.2	32.2	SPT	4/3/2018	Pass
Density @ 20degC	g/cm ³	3675	1.0870-1.0930	1.0910	CLB	4/2/2018	Pass
Refractive Index @ 20degC	N _D ²⁰	22241-2 Annex C	1.3814-1.3843	1.0910	CLB	4/2/2018	Pass
Alkalinity as NH ₃	%	22241-2 Annex D	<0.2	<0.01	CLB	4/3/2018	Pass
Biuret	%	22241-2 Annex E	<0.3	0.26	CLB	4/3/2018	Pass
Aldehyde	mg/kg	22241-2 Annex F	<5	<1.0	CLB	3/29/2018	Pass
Insolubles	mg/kg	22241-2 Annex G	<20	<2.0	CLB	3/29/2018	Pass
Phosphate	mg/kg	22241-2 Annex H	<0.5	<0.25	CLB	3/28/2018	Pass
Calcium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	0.11	BDK	4/2/2018	Pass
Iron by ICP-OES	mg/kg	22241-2 Annex I	<0.5	0.11	BDK	4/2/2018	Pass
Copper by ICP-OES	mg/kg	22241-2 Annex I	<0.2	<0.02	BDK	4/2/2018	Pass
Zinc by ICP-OES	mg/kg	22241-2 Annex I	<0.2	<0.02	BDK	4/2/2018	Pass
Chromium by ICP-OES	mg/kg	22241-2 Annex I	<0.2	0.07	BDK	4/2/2018	Pass
Nickel by ICP-OES	mg/kg	22241-2 Annex I	<0.2	0.05	BDK	4/2/2018	Pass
Aluminum by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	4/2/2018	Pass
Magnesium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	4/2/2018	Pass
Sodium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	4/2/2018	Pass
Potassium by ICP-OES	mg/kg	22241-2 Annex I	<0.5	<0.05	BDK	4/2/2018	Pass
Identity by FTIR (attached)	Spectra	22241-2 Annex J	Match	Reference Match	BDK	4/2/2018	Pass

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Certification Approval _____

Laboratory Director: Anthony J Scala

Analytic FDA Reg. Number: 02-636-0096

Date: _____ 4/3/2018

Search results for: E1803059-001
Date: Mon Apr 02 11:42:50 2018 (GMT-04:00)
Search algorithm: Search Expert
Regions searched: 2600.00-450.00

