

Laboratory **QA/QC Lab, Reliance Industries Limited, Hazira Manufacturing Division, Surat- Hazira Road, Village: Mora, Post Bhattha, Surat, Gujarat**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-6841** (in lieu of T-0797, T-0798)

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Validity **08.02.2018 to 07.02.2020**

Last Amended on --

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
<u>CHEMICAL TESTING</u>				
I.	INDUSTRIAL AND FINE CHEMICALS			
1.	Benzene	HC imp in Benzene by GC	ASTM D 4492-10	Purity : 99.8 % or higher (100- impurities) TNA Imp : 20 mg/kg to 300 mg/kg n-Heptane : 10 mg/kg to 1000 mg/kg Methylcyclohexane : 10 mg/kg to 1000 mg/kg Toluene : 10 mg/kg to 1000 mg/kg
		Bromine Index	ASTM D 1492-13	0.5 mg /100gm to 30 mg /100gm
2.	Toluene	Purity	ASTM D 2360-11	99.8 % or higher (100- impurities)
		Cu Corrosion	ASTM D 849-15	1a to 4c
		HC imp in Toluene by GC	ASTM D 2360-11	NA. Imp.: 30 mg /100gm to 2000 mg/kg Benzene Imp :- 8 to 500 mg/kg
3.	Aromatics (Common for Benzene / Toluene)	Acid Wash Colour	ASTM D 848-14	1 to 5
		Sp Gr @ 15.5 /15.5 °C	ASTM D 4052-15	0.8500 to 0.9000
		Moisture	ASTM E 203-16	20 mg/kg to 500 mg/kg
		Distillation Range 1 to 96 % volume	ASTM D 850-16	60°C to 150 °C
		Acidity	ASTM D 847-16	0 to 5 mg NaOH / 100 ml
4.	CBFS (Carbon Black)	Viscosity@ 99 °C	ASTM D 445-15a	1.0 cps to 5 cps
		Sp.Gr @15 °C	ASTM D 1298-12B	0.8500 to 1.200

Bhumi Rajyaguru
Convener

Alok Jain
Program Director

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	Feed Stock)	Asphaltene	ASTM D 6560-12	5% to 20 %
5.	Mix Xylene solvent	Total aromatic HC	ASTM D 6563-12	≥ 95.0 wt %
		Ethyl Benzene		50 wt % to 85 wt %
		Mixed xylene		15 wt % to 40 wt %
		Benzene		0.01 wt % to 10.0 wt %
		Toluene		0.01 wt % to 10.0 wt %
		Non Aromatic		0.01 wt % to 1.5 wt %
		Relative Density @ 15.5/15.5 °C	ASTM D 4052-15	0.8500 to 1.13
		Distillation Range	ASTM D 850-16	100°C to 160°C
		Acid Wash Colour	ASTM D 848-14	1 to 5
		Acidity	ASTM D 847-16	0 to 5 mg NaOH/100ml
		Cu Corrosion	ASTM D 849-15	1a to 4c
6.	Ethylene	Methane	ASTM D-6159-97	3 ml/m3 to 300 ml/m3
		Ethane	(2012)	3 ml/m3 to 1000 ml/m3
		Ethylene		99.9 to 99.99 %
		Propane		3 ml/m3to 300 ml/m3
		Propylene		3 ml/m3 to 300 ml/m3
		Propadiene		3 ml/m3 to 300 ml/m3
		Acetylene		1 ml/m3 to 10 ml/m3
		T-Butene		3 ml/m3 to 300 ml/m3
		Carbon Dioxide	ASTM D 2505-15	0.2 ml/m3 to 10 ml/m3
		Carbon Monoxide	ASTM D 2504-15	0.05 ml/m3 to 10 ml/m3
7.	1,3 Butadiene	Purity	ASTM D 2593-93 (2014)	96.0 wt %to 99.9 wt %
		Total Acetylene	ASTM D 2593-93 (2014)	5 mg/kg to 50 mg/kg
		Butadiene Dimer	ASTM D 2426-93 (2014)	30 mg/kg to 1000 mg/kg
		Nonvolatile Matter	ASTM D 1025-15	5 mg/kg to 100 mg/kg
		Moisture	ASTM E 203-16	20 mg/kg 100 mg/kg
		Tertiary Butyl Catechol	ASTM D 1157-91 (2014)	20 mg/kg 500 mg/kg

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8.	Propylene	Methane	ASTM D 2712-16	3 ml/m3 to 300 ml/m3
		Ethane		3 ml/m3 to 300 ml/m3
		Propane		0.1 to 1.0 %
		Propylene		99.0 % to 99.8 %
		Iso Butane		2 ml/m3 to 50 ml/m3
		Propadiene		3 ml/m3 to 50 ml/m3
		n-Butane		2 ml/m3 to 50 ml/m3
		T-2 Butene		2 ml/m3 to 50 ml/m3
		Acetylene		1 ml/m3 to 10 ml/m3
		1-Butene		2 ml/m3 to 50 ml/m3
		Iso Butylene		2 ml/m3 to 50 ml/m3
		Carbon Dioxide	ASTM D 2505-15	0.2 ml/m3 to 10 ml/m3
		Carbon Monoxide	ASTM D 2504-15	0.05 ml/m3 to 10 ml/m3
9.	Para Diethyl Benzene	Sp. Gr.@ 15.5/15.5°C	ASTM D 4052-15	0.8500 to 0.9000
		Carbonyl	ASTM E 411-12	0.5 mg/kg to 5 mg/kg
		Purity	UOP 744 (modified)	98 wt % to 99.9 wt %
		Bromine index	ASTM D 1492-13	1 mg /100gm to 10 mg /100gm
10.	Cyclohexane	Benzene Impurities	ASTM D 7266-13 ^{e1}	2 mg/kg to 100 mg/kg
		Methyl Cyclo Hexane impurities	ASTM D 7266-13 ^{e1}	10 mg/kg 300 mg/kg
		Moisture	ASTM E 203-16	20 mg/kg 500 mg/kg
		Boiling Range	ASTM D 850-16	70° to 90°C
11.	MTBE	Purity	ASTM D-5441-98 (2013)	95.0 % or higher
		Methanol		0.01 wt % to 2.00 wt %
		C4's		0.01 wt % to 2.00 wt %
		C5's		0.01 wt % to 2.00 wt %
		TBA		0.01 wt % to 2.00 wt %
		MSBE		0.01 wt % to 2.00 wt %

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		DIB		0.01 wt % to 2.00 wt %
		Density @ 20 °C	ASTM D 4052-15	0.7000 gm/ml to 0.8000 gm/ml
		Moisture	ASTM D 1364-02(2012)	20 mg/kg to 500 mg/kg
12.	Butene-1	Methane	IFP- 9801 / ASTM 4424-09 (2014)	0.010% to 0.100 %
		Ethane		0.010 % to 0.100 %
		Ethylene		0.010 % to 0.100 %
		Propane		0.010 % to 0.100 %
		Propylene		0.010 % to 0.100 %
		i-butane		0.010 % to 0.100 %
		n-butane		0.010 % to 0.100 %
		T-But-2-ene		0.010 % to 0.100 %
		I-butylene		0.010 % to 0.100 %
		Cis-But-2-ene		0.010 % to 0.100 %
		i-pentane		0.010 % to 0.100 %
		n-pentane		0.010 % to 0.100 %
		1,3 Butadiene		3 ml/m ³ to 100 ml/m ³
		Propadiene		3 ml/m ³ to 100 ml/m ³
		MA		3 ml/m ³ to 100 ml/m ³
		Acetylene		1 ml/m ³ to 10 ml/m ³
13.	Mono Ethylene Glycol (MEG)	Aldehyde as CH ₃ CHO	ASTM E 2313-15	0.5 mg/kg to 50 mg/kg
		Iron as Fe	ASTM E 394-15	0 to 0.5 mg/kg
		DEG in MEG	ASTM E 2409-13	0.0005% to 0.3 %
14.	Diethylene Glycol (DEG)	MEG & TEG in DEG	ASTM E 2409-13	0.0005 % to 0.3 %
15.	Triethylene Glycol (TEG)	MEG,DEG & TTEG in TEG	ASTM E 2409-13	0.0005 %to 0.3 %
16.	Glycols	Water	ASTM E 1064-16	10 mg/kg to 20000 mg/kg

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	(Common for Mono / Di / Tri Ethylene Glycol)	Sp.Gr@20/20°C	ASTM D 4052-15	0.85 to 1.13
		Dist. Range	ASTM D 1078-11	100 °C to 310 °C
		Acidity as CH ₃ COOH	ASTM E 2679-16	3 mg/kg to 100 mg/kg
17.	Ethylene Oxide	Water	ASTM E 203-16	10 mg/kg to 1000 mg/kg
		Aldehyde as CH ₃ CHO	SMS 2786-2005	3 mg/kg to 40 mg/kg
		Carbon dioxide	SMS 1968-2000	4 mg/kg to 50 mg/kg
18.	Pure Terephthalic Acid (PTA)	b* Value	QAC-PTA-3.202-2015	0.2 to 2.0
		Millipore	QAC-PTA-3.206-2015	0.40 to 0.98
		Water	QAC-PTA-3.205-2015	0.05 wt. % to 5.0 wt. %
		4-Carboxy Benzaldehyde	ASTM D7884-13	5 mg/kg to 50 mg/kg
		p-Toluic Acid	ASTM D7884-13	20 mg/kg to 350 mg/kg
		p-Toluic Acid + 4-Carboxy benzaldehyde	ASTM D7884-13	--
		Acid Number	QAC-PTA-3.212-2015	500 mg KOH / gm to 1000 mg KOH / gm
		Cobalt	QAC-PTA-3.502-2016	0.5 mg/kg to 50 mg/kg
		Manganese	QAC-PTA-3.502-2016	0.5 mg/kg to 50 mg/kg
		Iron	QAC-PTA-3.502-2016	0.5 mg/kg to 50 mg/kg
		Chromium	QAC-PTA-3.502-2016	0.5 mg/kg to 50 mg/kg
		MPS (Median Particle Size)	QAC-PTA-3.214-2015	30 μ to 200 μ
19.	Polypropylene	Xylene Soluble	ASTM D 5492-10	0.1 wt% to 12 wt%
20.	Poly-Vinyl Chloride (PVC)	Residual Vinyl Chloride Monomer	ASTM D 3749-13	0.1 mg/kg to 50 mg/kg
II.	POLLUTION & EFFLUENT			
1.	Final Effluent Water Discharge	pH	APHA 4500-H ⁺ B – 22 nd Edition	4.0 to 9.0 / 0.1
		COD	APHA 5220 B – 22 nd Edition	25 mg/Ltr to 500 / 25 mg/Ltr

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<u>MECHANICAL TESTING</u>				
1.	TEXTILE MATERIAL			
1.	Partially Oriented Yarn (POY)	Denier	QAF- PTL- 3.203 Ref- ASTM D 6587 :- 12 (Re approved in 2012)	50 den to 750 den
		Draw Tension	QAF- PTL- 3.204 Ref - ASTM D 5344: 1999 (Reapproved in 2011)	Upto 300 gm
		Uster %	QAF- PTL- 3.206 Ref- ASTM D 1425 :1425M: 2014	Upto 2.0 %
		<i>Tensile property</i> Tenacity	QAF- PTL- 3.208 Ref- ASTM D 2256 : 2010 (Reapproved in 2015)	1.50 g/d to 3.0 g/d
		Elongation	QAF- PTL- 3.208 Ref- ASTM D 2256 : 2010	100% to 165 %
		Finish on the Yarn	QAF- PTL- 3.210 Ref- vendor Manual	0.1% to 1.0 %
2.	Polyester PET chips & POY	L* Colour	QAF- PCL- 3.211:2015 (Ref: ASTM D6290- 13)	50 CIE to 100 CIE
		b* Colour	QAF- PCL- 3.211:2015 (Ref: ASTM D6290- 13)	-7.0 to +10CIE
		% Crystallinity by Density Gradient Column (DGC)	QAF- PCL- 3.415:2014 (Re: ASTM D1505- 10)	40% to 60 %
3.	Polyester Fiber Fill (PFF)	Denier	ASTM D 1577- 07 (Reapproved 2012)	1.0 Den to 25.0 Den
		Tenacity	ASTM D 3822/D3822M- 14	1.0 g/den to 10.0 g/den
		Elongation	ASTM D 3822/D3822M- 14	5.0 % to 200 %

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		Crimp Per Centimeter	QAF – PSF – 3.209	1.0 Crimp/cm to 5 Crimp/cm
4.	Polyester Staple Fiber (PSF)	Denier	ASTM D 1577- 07 (Reapproved 2012)	0.60 Den to 10.0 Den
		Tenacity	ASTM D 3822/D3822M- 14	1.0 g/den to 10.0 g/den
		Elongation	ASTM D 3822/D3822M- 14	5.0 % to 100%
		Crimp Per Centimeter	QAF – PSF – 3.209	1.0 Crimp/cm to 6.0 Crimp/cm
		Dry Heat Shrinkage	QAF – PSF – 3.210	1.0 % to 15 %
		Tto10 (Tenacity at 10% elongation)	ASTM D 3822/D3822M- 14	0.5 g/den to 10.0g/den
II.	PLASTIC, RUBBER & LEATHER			
1.	Poly Vinyl Chloride (PVC)	Heat Loss	ASTM D 6980-12	0.01 % to 0.6 %
		Average Particle Size	ASTM D 1921-12	120 μ to 180 μ
		Porosity	QAP- QA- 3.204	0.2 ml/gm to 0.4 ml/gm
		Inherent Viscosity	ASTM D 1243-14	0.60to1.00
2.	Poly Ethylene (PE)	Melt Flow Index	ASTM D 1238-13	0.15 g/10 min to 70 g/10 min
3.	Poly Propylene (PP)	Melt Flow Index	ASTM D 1238-13	0.5 g/10 min to 70 g/10 min
		Yellowness Index	ASTM D 6290-13	-5.0 to 7
		Izod Impact	ASTM D 256- 10	1 J/M to 700 J/M
		Flexural Modulus	ASTM D 790- 10	50 MPa to 1800 MPa
4.	Poly Butadiene Rubber (PBR)	Mooney viscosity	ASTM D1646- 07 (Reapproved 2012)	20 to 100 ML(1+4) @ 100°C
		Volatile Matter	ASTM D5668- 09 (Reapproved 2014)	0.1 %to 10 %
5.	Styrene Butadiene Rubber (SBR)	Mooney viscosity	ASTM D1646- 07 (Reapproved 2012)	20 to 100 ML(1+4) @ 100 °C
		Volatile Matter	ASTM D5668- 09 (Reapproved 2014)	0.1 %to 10 %

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