

Laboratory

Quality Control Laboratory, Ordnance Factory Itarsi, Distt.:  
Hoshangabad, Madhya Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7583 (in lieu of T-0026)

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**CHEMICAL TESTING**

I.	<b>EXPLOSIVE &amp; PYROTECHNIC</b>			
1.	<b>Explosive Chemical &amp; Allied Material</b>			
A.	<b>Nitro Cellulose</b>	Mineral matter / ash content dry material, % by mass	JSS 1376-10:2011 (Rev No:2) Appendix-B	0.01 % to 5.0 %
		Alkalinity calculated as calcium carbonate on dry material, % by mass	JSS 1376-10:2011 (Rev No:2) Appendix-C	0.01 % to 1.0 %
		Nitrogen Content calculated on dry material free from mineral matter, % by mass	JSS 1376-10:2011 (Rev No:2) Appendix-D	10 % to 20 %
		Organic matter, soluble in Ether Alcohol calculated as percent on dry material, % by mass	JSS 1376-10:2011 (Rev No:2) Appendix-E	1 % to 100 %
		Organic matter insoluble in acetone, calculated on dry material, % by mass	JSS 1376-10:2011 (Rev No:2) Appendix-G	0.05 % to 10 %
		Pulping Fineness (Settling test), ml	JSS 1376-10:2011 (Rev No:2) Appendix-H	60ml to 130ml
		B&J Test at 132°C at 0.5°C mg of N <sub>2</sub> /gm of NC, calculated on dry material	JSS 1376-10:2011 (Rev No:2) Appendix-R	0.07N <sub>2</sub> /gm of NC to 2.0N <sub>2</sub> /gm of NC
		Heat test at 76.7°C at 0.3°C, Minutes	JSS 1376-10:2011 (Rev No:2) Appendix-Q	1min to 30min

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		Sulphate calculated as Sulphuric acid on dry material, % by mass	JSS 1376-10:2011 (Rev No:2) Appendix-J	0.001 % to 10 %
		Viscosity falling ball method in second	JSS 1376-10:2011 (Rev No:2) Appendix-N	2s to 40s
<b>B.</b>	<b>Nitro Guanidine</b>	Volatile Matter, % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-A	0.01 % to 1 %
		Acidity, calculated as Sulphuric acid, % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-B	0.01 % to 1 %
		pH of water extract	JSS:1376-03-2016 (Rev No:3) Appendix-C	1.00 to 14.0
		Water soluble impurities, % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-D	0.05 % to 10 %
		Water insoluble impurities, % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-E	0.1 % to 5.0 %
		Chlorides calculated as Sodium chloride (NaCl), % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-F	0.01 % to 0.5 %
		Sulphates, calculated as Sodium Sulphate (Na <sub>2</sub> SO <sub>4</sub> ), % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-G	0.01 % to 0.5 %
		Nitrates calculated as Sodium Nitrate (NaNO <sub>3</sub> ), % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-H	Qualitative
		Ash content, % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-J	0.01 % to 1.0 %

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		Nitroguanidine (Picrite) content, % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-K	86 % to 100 %
		Specific surface cm <sup>2</sup> /cm <sup>3</sup> (particle size), micrometer	JSS:1376-03-2016 (Rev No:3) Appendix-L	10000 cm <sup>2</sup> /cm <sup>3</sup> to 25000 cm <sup>2</sup> /cm <sup>3</sup>
		Iron compounds calculated as Iron (Fe), % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-M	Qualitative
		Grit, % by mass	JSS:1376-03-2016 (Rev No:3) Appendix-N	Qualitative
<b>C.</b>	<b>Nitro Glycerine</b>	Volatile matter % by mass	JSS:1375-04:2016 (Rev. No:4) Appendix-A	0.1 % to 1.00 %
		Alkalinity, calculated as Sodium, % by mass	JSS:1375-04:2016 (Rev. No:4) Appendix-B	0.0001 % to 0.01%
		Nitrogen content calculated on the material, free from VM % by mass	JSS:1375-04:2016 (Rev. No:4) Appendix-E	10.00 % to 20.00%
		Heat test at 82.2°C in minutes	JSS:1375-04:2016 (Rev. No:4) Appendix - F	1 min to 30 min
<b>II.</b>	<b>INDUSTRIAL AND FINE CHEMICALS</b>			
<b>1.</b>	<b>Organic Chemicals</b>			
<b>A.</b>	<b>Bleached Cotton Linter</b>	Moisture content, % by mass	JSS:83052-14:2015 (Rev. No:4) Appendix-A	1 % to 20 %
		Acidity	JSS:83052-14:2015 (Rev. No:4) Appendix - B	Qualitative

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		Mineral matter, % by mass	JSS:83052-14:2015 (Rev. No:4) Appendix-C	0.01 % to 2.0 %
		Ether soluble matter, % by mass	JSS:83052-14:2015 (Rev. No:4) Appendix-D	0.1 % to 2.0 %
		Matter soluble in 3% boiling alkali % by mass	JSS:83052-14:2015 (Rev. No:4) Appendix-E	0.1 % to 5.0 %
		Matter soluble in 1% boiling alkali % by mass	JSS:83052-14:2015 (Rev. No:4) Appendix-F	0.1 % to 5.0 %
		Malachite Green Dye Test	JSS:83052-14:2015 (Rev. No:4) Appendix-G	Qualitative
		Copper number	JSS:83052-14:2015 (Rev. No:4) Appendix-H	0.01 % to 2.0 %
		Alpha-Cellulose content, % by mass	JSS:83052-14:2015 (Rev. No:4) Appendix-J	90 % to 100 %
		Dynamic Viscosity in N s/m <sup>2</sup>	JSS:83052-14:2015 (Rev. No:4) Appendix-K	0.04 Ns/m <sup>2</sup> to 20 Ns/m <sup>2</sup>
<b>B.</b>	<b>Glycerine (Dynamite Grade)</b>	Glycerol, % by mass	IS 1796-1986 (RA 2011) Appendix-A-2	95 % to 100 %
		Relative density at 30/30°C	IS 1796-1986 (RA 2011) Appendix-A-3	1.0 to 2.0
		Ash % by mass	IS 1796-1986 (RA 2011) Appendix-A-5	0.01 % to 1.0 %

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		Chloride (as Cl), parts per million	IS 1796-1986 (RA 2011) Appendix-A-11	10 ppm to 60 ppm
		Sulphates (as SO <sub>4</sub> ), parts per million	IS 1796-1986 (RA 2011) Appendix-A-12	0.001 % to 0.01 %
		Alkalinity (as Na <sub>2</sub> O), % by mass	IS 1796-1986 (RA 2011) Appendix-A-13	Qualitative
		Fatty Acid and Esters (as Na <sub>2</sub> O) % by mass	IS 1796-1986 (RA 2011) Appendix-A-15	0.01 % to 1.0 %
		Ether soluble matter, % by mass	IS 1796-1986 Appendix-A-20	0.01 % to 1.0 %
		Colour reading on Lovibond scale (in 5¼ inch cell)	IS 1796-1986 Appendix-A-4	Qualitative
		Reducing substances	IS 1796-1986 Appendix-A-17	Qualitative
		Sulphuric acid test	JSS-6810-109-2013 (Rev. No:3) Appendix-A	Qualitative
		Water content % by mass	JSS-6810-109-2013 (Rev. No:3) Appendix-C (RA 2005)	0.01 % to 20 %
		Nitrogen content % by mass	JSS-6810-109-2013 (Rev. No:3) Appendix-B	0.01 % to 0.05 %
<b>C.</b>	<b>Guanidine Nitrate</b>	Bulk density, g/ml	JSS-6810-95-2013 (Rev. No:3) Appendix-A	0.5 g/ml to 1.0 g/ml
		Melting point ° C	JSS-6810-95-2013 (Rev. No:3)	200°C to 220°C

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		Guanidine Nitrate, % by mass	JSS-6810-95-2013 (Rev. No:3) Appendix-C	90 % to 100 %
		Ammonium Nitrate, % by mass	JSS-6810-95-2013 (Rev. No:3) Appendix-D	0.01 % to 1.0 %
		Residue on ignition, % by mass	JSG:0112-2015 (Rev. No-2) Method No.2 (a)	0.01 % to 0.5 %
		Moisture Content % by mass	JSG:0112-2015 (Rev. No:2) Method No.1 (a)	0.01 % to 20 %
		pH of water extract	JSG:0112-2015 (Rev. No:2) Method No.5 (b)	1 to 14
<b>D.</b>	<b>Graphite (Dry Sulphur Free)</b>	Volatile matter after drying for 2 hours at 105 at 2°C % by mass	JSG:0112-2015 (Rev. No:2) Method No.1 (a)	0.10 % to 1.0 %
		pH of aqueous extract	JSG:0112-2015 (Rev. No:2) Method No.5 (a)	1 to 14
		Matter soluble in cold water % by mass	JSS-9620-01-2016 (Rev. No:3) Appendix-A	0.01 % to 0.5 %
		Matter soluble in ethyl ether % by mass	JSS-9620-01-2016 (Rev. No:3) Appendix-B	0.05 % to 1.0 %
		Sulphur and compounds of sulphur calculated as Sulphuric acid, % by mass	JSS-9620-01-2016 (Rev. No:3) Appendix-C	0.05 % to 1.0 %
		Ash % by mass	JSS-9620-01-2016 (Rev. No:3) Appendix-D	0.1 % to 10 %

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		Gritty particles in the ash % by mass	JSS-9620-01-2016 (Rev. No:3) Appendix-E	Qualitative
		Sieving requirement, Grain distribution	JSS-9620-01-2016 (Rev. No:3) Appendix-F & IS 460 (Part I)	Qualitative
<b>E.</b>	<b>Carbamite</b>	Melting Test	JSS-6810-125-2014 (Rev. No:3) Appendix-A	Qualitative
		Setting point	JSS-6810-125-2014 (Rev. No:3) Appendix-A	50 to 100
		Volatile matter at 60°C for 2 hours,% by mass	JSG:0112-2015 (Rev. No-2) Method No.1 (a)	0.01 % to 10 %
		Ash, % by mass	JSG:0112-2015 (Rev. No-2) Method No.2 (a)	0.01 % to 0.5 %
		Acidity, % by mass	JSG:0112-2015 (Rev. No-2) Method No.5 (a)	0.001 % to 0.1 %
		Size requirement	JSG:0112-2015 (Rev. No-2) Method No. 18	0.1 to 1.0
<b>F.</b>	<b>Protein Colloid</b>	Moisture content %	IND/ME/915(prov.) Appendix-A	1 % to 20 %
		Insoluble residue %	IND/ME/915(prov.) Appendix-B	0.01 % to 5.0 %
		Total Ash content %	IND/ME/915 (prov.) Appendix-C	0.01 % to 10 %
		Acidity (Inorganic)	IND/ME/915 (prov.) Appendix-D	Qualitative

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		Organic Acidity as Acetic Acid %	IND/ME/915 (prov.) Appendix-E	0.01 % to 1.0 %
		Gum with tannin base	IND/ME/915 (prov.) Appendix-F	Qualitative
		Starch & Dextrin	IND/ME/915 (prov.) Appendix-G	Qualitative
<b>G.</b>	<b>Di-n-Butyl phthalate (Plasticizer Ester)</b>	Relative Density at 27/27°C	IS 9591-1996 Clause No.7	1.0 to 2.0
		Ash, % by mass	IS 9591-1996 Clause No.10	0.001 % to 0.5 %
		Acidity (as phthalic acid), % by mass	IS 9591-1996 Clause No.11	0.001 % to 0.5 %
		Ester Value (as mg KOH/gm)	IS 9591-1996 Clause No.12	10 mgKOH/g to 1000 mgKOH/g
		Water content % by mass	IS 9591-1996 Clause No.9 IS 2362-1993 (RA 2005)	0.01 % to 10 %
		Refractive Index at 27°C	IS 9591-1996 Clause No.8	0.1 to 2
		Colour in Hazen units	IS 9591-1996 Clause No.6	Qualitative
		Colour after heat treatment in Hazen units	IS 9591-1996 Clause No.13	Qualitative
<b>H.</b>	<b>Di-Phenyl amine</b>	Moisture over caustic potash in vacuum desiccator % by mass	JSG:0112-2015 Method No 1(b)	0.01 % to 2 %
		Reaction Alkalinity % as Na <sub>2</sub> CO <sub>3</sub> Acidity % as H <sub>2</sub> SO <sub>4</sub>	JSS-6810-129-2009 Appendix-A	(Qualitative) 0.001 % to 0.01%
		Organic matter insoluble in Ether Alcohol, % by mass	JSS-6810-129-2009 Appendix-B	0.01% to 1%
		Mineral Matter	JSS-6810-129-2009	0.01% to 1 %

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		(i.e residue on ignition) % by mass	Method No 2(b) of JSG:0112	
		Primary, Amine, Calculated as Aniline, % by mass	JSS-6810-129-2009 Appendix-C	Qualitative
		Organic bases alkaline to Methyl orange calculated as Aniline % by pass	JSS-6810-129-2009 Appendix-D	0.01 % to 5 %
		Setting Point °C	JSS-6810-129-2009 Appendix-E	1.0 % to 100 %
<b>I.</b>	<b>Iso-propyl alcohol</b>	Relative density at 27/ 27 °C	IS 229-1972 of A-1	0.7 to 0.8
		Distillation range	IS1448(Part 18)-1967 Method B	Qualitative
		Residue on evaporation g/100ml	IS 2631-1976 Appendix-A-1	0.001 % to 0.5 %
		Acidity as Acetic acid % by mass	IS 229-1972 of A-4	0.001 % to 0.5 %
		Aldehydes & Ketones (as acetone) % by mass	IS 2631-1976 Appendix-A-2	0.01 % to 0.1 %
		Water content % by mass	IS 2362-1973	0.01 % to 20 %
<b>J.</b>	<b>Acetone</b>	Relative density at 27/27°C	IS 82:1992 Method No. 6	0.1 to 2.0
		Residue on evaporation, mg/100 ml	IS 82:1992 Method No. 8	0.001 mg/10 ml to 1.0 mg/100ml
		Acidity(as acetic Acid), g/100ml	IS 170-2004 Appendix-C	0.001 g/100ml to 0.1 g/100ml
		Alkalinity	IS 170-2004 Appendix-D	0.001 % to 0.01 %
		Colour in Platinum-cobalt scale	IS 8768:2000	Qualitative
		Permanganate Test, minutes	IS 170-2004 Appendix-E	20 to 60
		Alcoholic impurities	IS 170-2004	Qualitative

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			Appendix-F	
<b>K</b>	<b>Ethyl Acetate</b>	Relative density at 27/27°C	IS 229-1993 (RA 2004) Annexure-A	0.5 to 1.0
		Residual on evaporation % by mass	IS 229-1993 (RA 2004) Annexure-B	0.001 % to 1 %
		Acidity as acetic acid % by mass	IS 229-1993 (RA 2004) Annexure-C	0.001 % to 0.5 %
		Ester content as ethyl acetate % by mass	IS 229-1993 (RA 2004) Annexure-D	52 % to 100 %
		Distillation Range	IS 229-1993 (RA 2004) Annexure-E	Qualitative
		Water content, % by mass	IS 2362-1993	0.01 % to 20 %
<b>2.</b>	<b>Inorganic Chemicals</b>			
<b>A.</b>	<b>Soda Ash</b>	Total alkalinity (as Na <sub>2</sub> CO <sub>3</sub> ), % by mass	IS 251:1998 (Rev.No:4) (RA 2015) Clause No.C-3	80 % to 100 %
		Matter insoluble in water % by mass	IS 251:1998 (Rev. No:4) (RA 2015) Clause No.C-4	0.01 % to 2.0 %
		Sulphate (as Na <sub>2</sub> SO <sub>4</sub> ), % by mass	IS 251:1998 (Rev. No:4) (RA 2015) Clause No.C-5	0.01 % to 0.5 %
		Chlorides (as NaCl), % by mass	IS 251:1998 (Rev. No:4)	0.01 % to 5.0 %

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			(RA 2015) Clause No.C-6	
		Iron (as Fe <sub>2</sub> O <sub>3</sub> ), % by mass	IS 251:1998 (Rev. No:4) (RA 2015) Clause No.C-7	Qualitative
<b>B.</b>	<b>Potassium Sulphate</b>	Moisture at 105°C, % by mass	JSG:0112-2015 (Rev. No:2) Method No 1(a)	0.01 % to 1.0 %
		Water insoluble matter % by mass	JSG:0112-2015 (Rev. No:2) Method No-4	0.01 % to 1.0 %
		Reaction of 10% aqueous extract to Bromo thymol blue indicator. Acidity as Sulphuric acid, % by mass Alkalinity as Potassium hydroxide, % by mass	JSG:0112-2015 (Rev. No:2) Method No-5(a)	0.001 % to 0.01 %
		Ammonium compound calculated as Ammonia % by mass	JSG:0112-2015 (Rev. No:2) Method No-9	Qualitative
		Chloride calculated as Potassium chloride, % by mass	JSS-6810-110-2011 (Rev. No:3) Appendix-B	0.01 % to 0.5 %
		Potassium Sulphate content, % by mass	JSS-6810-110-2011 (Rev. No:3) Appendix-C	90 % to 100 %
		Compounds of metals other than Potassium, calculated as their oxides, total % by mass	JSS-6810-110-2011 (Rev. No:3) Appendix-A	Qualitative
<b>C.</b>	<b>Potassium Nitrate</b>	Hygroscopicity % by mass	IS 301-1982 (RA 2011) Appendix-B-2	0.1 % to 0.5 %

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		Matter insoluble in water % by mass	IS 301-1982 (RA 2011) Appendix-B-3	0.01 % to 5 %
		Water insoluble organic matter, % by mass	IS 301-1982 (RA 2011) Appendix-B-2	0.001 % to 0.2 %
		Matter insoluble in Aqua regia % by mass	IS 301-1982 (RA 2011) Appendix-B-5	0.01 % to 0.1 %
		Grit	IS 301-1982 (RA 2011) Appendix-B-2	Qualitative
		Metallic radicals other than Potassium & Sodium	IS 301-1982 (RA 2011) Appendix-B-6	Qualitative
		Acidity	IS 301-1982 (RA 2011) Appendix-B-7	Qualitative
		Alkalinity	IS 301-1982 (RA 2011) Appendix-B-8	Qualitative
		Chlorides (as KCl) % by mass	IS 301-1982 (RA 2011) Appendix-B-9	0.01 % to 0.1 %
		Chlorates	IS 301-1982 (RA 2011) Appendix-B-10	Qualitative
		Per chlorates (as KClO <sub>4</sub> ) % by mass	IS 301-1982 (RA 2011) Appendix-B-11	0.01 % to 0.2 %
		Sulphate (as K <sub>2</sub> SO <sub>4</sub> ), % by mass	IS 301-1982 (RA 2011) Appendix-B-12	0.01 % to 0.2 %

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		Ammonium compound (as NH <sub>3</sub> )	IS 301-1982 (RA 2011) Appendix-B-13	Qualitative
		Sodium compound (as NaNO <sub>3</sub> )	IS 301-1982 (RA 2011) Appendix-B-14	Qualitative
		Nitrite (as KNO <sub>2</sub> )	IS 301-1982 (RA 2011) Appendix-B-15	Qualitative
		Potassium Nitrate (as KNO <sub>3</sub> ) % by mass	IS 301-1982 (RA 2011) Appendix-B-16	40 % to 100 %
<b>D.</b>	<b>Sodium Sulphate</b>	Sodium Sulphate (as Na <sub>2</sub> SO <sub>4</sub> ), % by mass	IS 255-1982 (RA 1999) Appendix-A-3	90 % to 100 %
		Matter insoluble in water % by mass	IS 255-1982 (RA 1999) Appendix-A-3	0.01 % to 1 %
		Chlorides (as NaCl), % by mass	IS 255-1982 (RA 1999) Appendix-A-5	0.01 % to 1 %
		Iron, Aluminium & Chromium (as R <sub>2</sub> O <sub>4</sub> ) % by mass	IS 255-1982 (RA 1999) Appendix-A-6	0.01 % to 0.1 %
		Iron (as Fe), % by mass	IS 255-1982 (RA 1999) Appendix-A-7	Qualitative
		Loss on drying % by mass	IS 255-1982 (RA 1999) Appendix-A-8	0.1 % to 10 %
		pH (of 10% solution)	IS 255-1982 (RA 1999) Appendix-A-9	1 to 14

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
E.	<b>Oleum for the mfr. of mixed acid for NG</b>	Strength (as H <sub>2</sub> SO <sub>4</sub> ), % by mass	IS 1089-1986 (RA 2015)	90 % to 120 %
		Free Sulphur trioxide (as SO <sub>3</sub> ) % by mass	IS 1089-1986 (RA 2015) Appendix-A-2	1.0 % to 30.0 %
F.	<b>Concentrate Sulphuric Acid</b>	Total Acidity (as H <sub>2</sub> SO <sub>4</sub> ), % by mass	IS 266-1993 (RA 2015) Annex-A Method-A-2	95 % to 100 %
G.	<b>Residual Sulphuric Acid</b>	Total Acidity (as H <sub>2</sub> SO <sub>4</sub> ), % by mass	IS 266-1993 (RA 2015) Annex-A Method-A-2	50 % to 75 %
H.	<b>Strong Nitric Acid Technical grade A, B &amp; C</b>	Total Acidity (as HNO <sub>3</sub> ), % by mass	IS 264-2005 (RA 2017) Annx-A	95 % to 100 %
		Nitrous as (HNO <sub>2</sub> ), % by mass	IS 264-2005 (RA 2017) Annx-F	0.01 % to 1 %
I.	<b>Weak Nitric Acid</b>	Total Acidity(as HNO <sub>3</sub> ), % by mass	IS 264-2005 (RA 2017) Annx-A	50 % to 60 %