Electrical Insulating Presspapers

SENAPATHY WHITELEY

Estd 1960

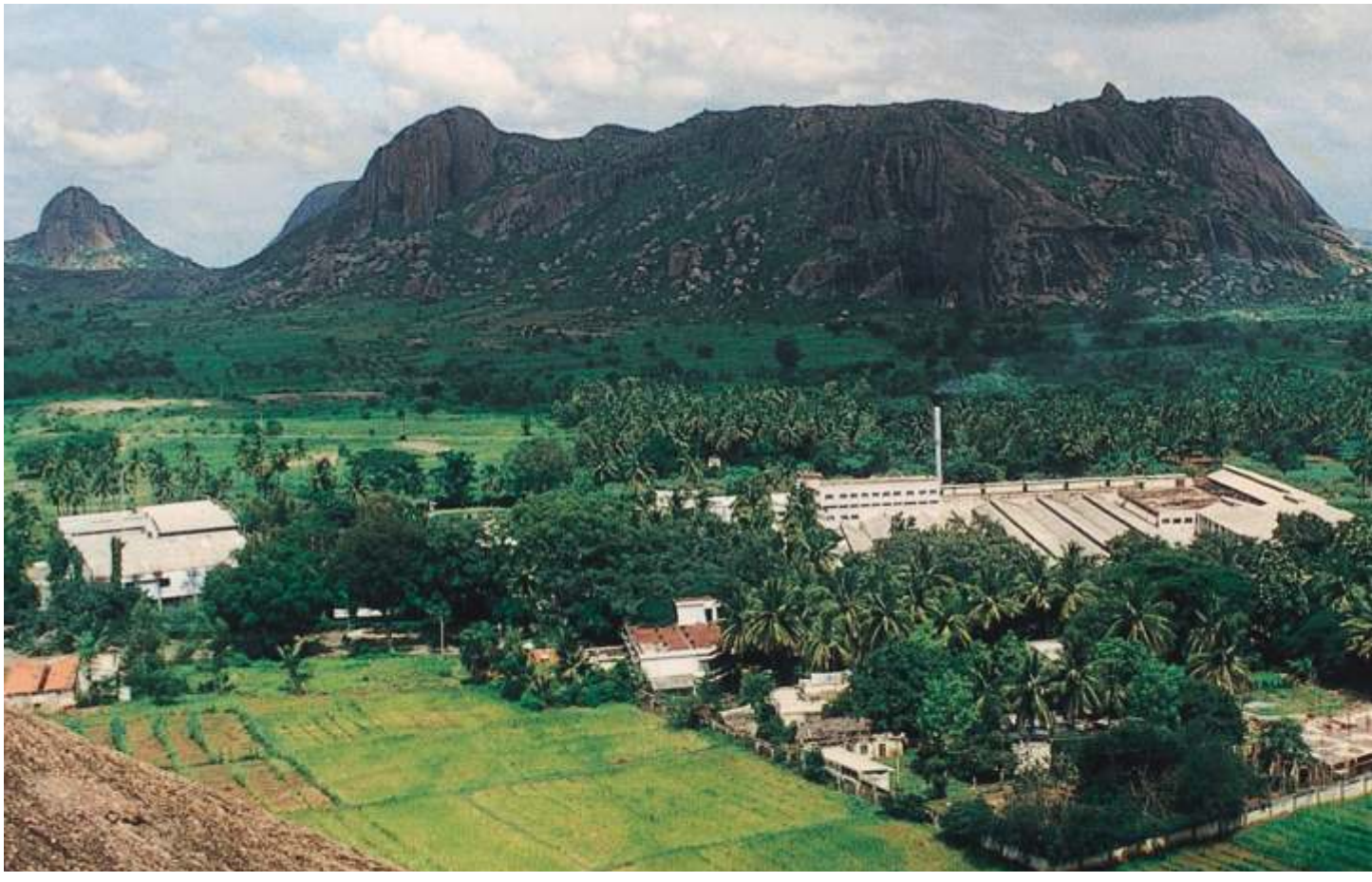
Company Profile

Senapathy Whiteley is the flagship enterprise of the Senapathy Group and an early pioneer in the manufacture of electrical insulation material required for the power supply and transformer industries.

The Company was established in 1960 under a technical collaboration with BS & W Whiteley Limited, UK. The promoters, AG Senapathy & Company were earlier handling the marketing and distribution of pressboards from BS & W Whiteley Limited.

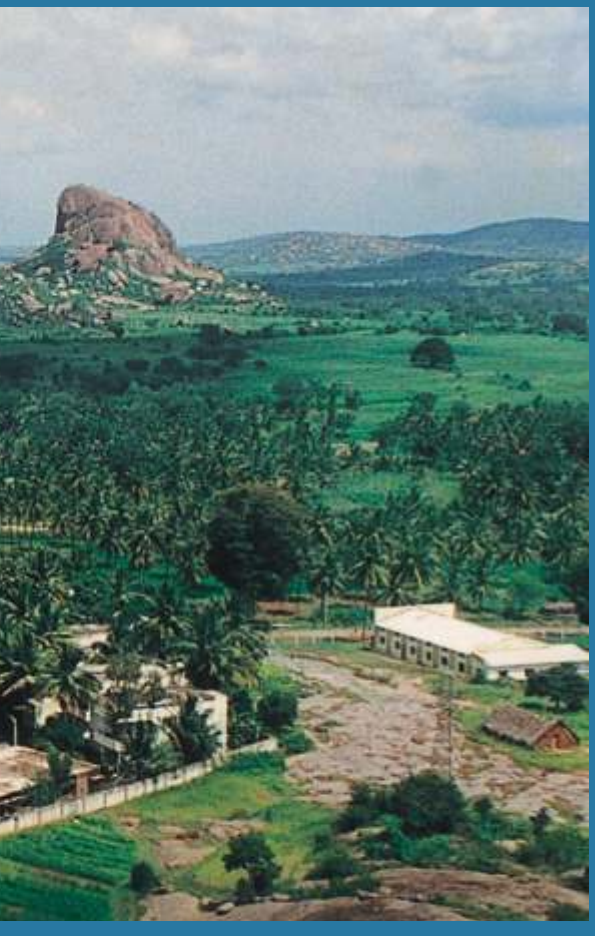
During the Company's early years, it broke new ground and played a leading role in the design, manufacture and testing of solid electrical insulating materials for generation, transmission and distribution equipment.

Senapathy Whiteley's manufacturing facilities are located in Achalu, Ramanagaram, on the banks of the Arkavathy River, 60 kilometers from Bangalore.



Our Quality Policy

The Quality Policy of the Company underlines an internal commitment to ensure improvements in quality and process in a sustained manner, achieve standards measurable against national and international levels and importantly, to raise customer satisfaction to new heights.



Total Quality Control. 100% Reliability.

Under the KHEDDAHIDE brand umbrella, Senapathy Whiteley manufactures and markets various grades of Pressboards - including machined and moulded components and presspapers. These products are manufactured according to customer specifications and meet the rigid industry norms under Indian and international standards.

The Company also manufactures base filter paper for air, fuel and lube oil filters used in automobile and industrial applications. To meet the ever-increasing demand of the filter media segment, Senapathy Whiteley has also diversified into Impregnated filter media – processed in a modern state-of-the-art environment.

Our Group Companies:

- Lakshmanan Isola manufactures mica paper based products for electrical rotating machines like generators, motors and traction equipment.
- Senapathy Symons manufactures electrical insulating materials to cover various thermal indices used in all types of electrical rotating machines in the form of both composite materials and varnished fabrics.
- Khedda Insulations manufactures various types of pressboard components used in the power & distribution transformers.

As part of the Company's growth and expansion plans, a series of centers for Insulation Kits will be set up at strategic locations. Production upgrade plans also include extended capability for larger size Pressboards.

The Company holds ISO 9001: 2008 Certification by BVC.

KHEDDAHIDE

SENAPATHY WHITELEY

50 Golden Years

Senapathy Whiteley is on the threshold of its 50th year in India's power and energy sector.

Seen as a pioneer committed to import substitution during the initial years, Senapathy Whiteley also helped develop a base for indigenous products across a wide range of electrical insulation applications.

Our Complete Range Of Presspaper Solutions

- Grade KP.4.1 Undyed / Dyed Multiply Presspaper
- Grade K2 Undyed / Dyed Multiply Presspaper
- Grade 4 Multiply Presspaper
- Grade Kheddatherm Thermally Upgraded Insulating Paper

Kheddahide Multiply Presspaper is manufactured from quality cellulose fibres to meet the requirements of Motor, Capacitor and Transformer manufacturers. It is made without using additives in a Multivat Cylinder Machine and subsequently calendered for a smooth finish. The Multilayer construction results in homogeneous products with excellent mechanical and electrical strengths, and prevents the exposure of pinholes.

The thermally upgraded paper is also used as diamond dotted press paper when cured with 'B' stage epoxy resin. This could be dotted on one / both sides in the form of squares and specifically meant for use in Distribution Transformers.

Salient Features

- High purity
- Heat resistance
- Resistance to ageing
- Excellent mechanical and electrical strength

Undyed / Dyed Multiply Presspaper - Grade KP.4.1

PROPERTIES		SPECIFICATION AS PER IEC: 60641-3-2 : TYPE P. 4.1A
Composition		100% Unbleached softwood sulphate Pulp.
Thickness Range		0.10 – 0.50 mm
Finish		Calendered
Thickness Tolerance		Max ± 10.0 %
Density		1.00 – 1.20 g/cm^3
Tensile Strength		
MD	≤ 0.2 mm > 0.2 mm	Min 75 MPa Min 80 MPa
CMD	≤ 0.2 mm > 0.2 mm	Min 35 Mpa Min 40 MPa
Elongation		
MD	≤ 0.2 mm > 0.2 mm	Min 1.5 % Min 2 %
CMD	≤ 0.2 mm > 0.2 mm	Min 6 % Min 7 %
Shrinkage	MD CMD Thickness	Max 1.0 % Max 1.5 % Max 7 %
Plybond resistance		Min 200 N/30mm
Moisture content		Max 8 %
Ash Content		Max 1 %
Conductivity of aqueous extract		Max 8mS/m
pH of Aqueous Extract		6 - 9
Oil Absorption		Min 10 %
Electrical Strength (In Air) BDV	≤ 0.2 mm > 0.2 mm	Min 9 kV/mm Min 10 kV/mm
Electrical Strength (In Oil) BDV		Min 60kV/mm

The above product conforms to IEC 60641-3-2 : TYPE P.4.1A. requirements.

The above is available in any width totalling to 2000 mm. Paper above 0.30 mm will be supplied in laminated form.

Undyed / Dyed Multiply Presspaper - Grade K2

PROPERTIES		SPECIFICATION AS PER COMPANY STANDARDS CS/PP/001	
Composition		Vegetable Fibre - Usually made from chemical Wood Pulp.	
Thickness Range		0.10 - 0.50 mm	
Preferred Nominal Thickness *		Tolerance	
	0.10 mm	+ 0.01 mm	- 0.01 mm
	0.15 mm	+ 0.02 mm	- 0.01 mm
	0.20 mm	+ 0.02 mm	- 0.02 mm
	0.25 mm	+ 0.02 mm	- 0.02 mm
	0.30 mm	+ 0.03 mm	- 0.02 mm
	0.40 mm	+ 0.04 mm	- 0.03 mm
	0.50 mm	+ 0.04 mm	- 0.04 mm
* For nominal thickness other than preferred value, the tolerance shall be that is given for the next thicker preferred nominal thickness.			
Finish		Calendered	
Density		Min 1.0 g/cm^3	
Electrical Strength (BDV) at 90°C		In Air (Min)	In Oil (Min)
	0.10 mm	1.00 kV	6.5 kV
	0.13 mm	1.25 kV	7.5 kV
	0.15 mm	1.40 kV	8.0 kV
	0.18 mm	1.65 kV	10.0 kV
	0.20 mm	1.75 kV	10.5 kV
	0.25 mm	2.10 kV	12.0 kV
	0.30 mm	2.30 kV	13.5 kV
	0.38 mm	2.60 kV	16.0 kV
	0.40 mm	2.70 kV	16.5 kV
	0.50 mm	3.00 kV	18.5 kV
Tensile Strength		MD (Min)	CMD (Min)
	0.10 mm	105 N/15mm	35 N/15mm
	0.13 mm	120 N/15mm	43 N/15mm
	0.15 mm	130 N/15mm	45 N/15mm
	0.18 mm	150 N/15mm	55 N/15mm
	0.20 mm	162 N/15mm	59 N/15mm
	0.25 mm	190 N/15mm	67 N/15mm
	0.30 mm	220 N/15mm	80 N/15mm
	0.38 mm	266 N/15mm	96 N/15mm
	0.40 mm	275 N/15mm	102 N/15mm
	0.50 mm	335 N/15mm	122 N/15mm
Ageing in Air		Max. 60 %	
Oil Absorption		Min 22 % @ Density 1.0 g/cm^3	
Conductivity of Aqueous Extract		Max 3.0 mS/m	
pH of Aqueous Extract		5.0 - 8.5	
Moisture Content		Max 8.0 %	
Mineral Ash Content		Max 2.0 %	
Freedom from conducting particles		Free from conducting particles	

This Product conforms in all respect to Company Standards CS/PP/001 requirements.

The above is available in any width totalling to 2000 mm.

Undyed / Dyed Multiply Presspaper - Grade K4

PROPERTIES		SPECIFICATION AS PER COMPANY STANDARDS CS/PP/003	
Composition		Vegetable Fibre	
Thickness Range		0.10 – 0.50 mm	
Preferred Nominal Thickness *		Tolerance	
	0.10 mm	+ 0.01 mm	- 0.01 mm
	0.15 mm	+ 0.02 mm	- 0.01 mm
	0.20 mm	+ 0.02 mm	- 0.02 mm
	0.25 mm	+ 0.02 mm	- 0.02 mm
	0.30 mm	+ 0.03 mm	- 0.02 mm
	0.40 mm	+ 0.04 mm	- 0.03 mm
	0.50 mm	+ 0.04 mm	- 0.04 mm
* For nominal thickness other than preferred value, the tolerance shall be that is given for the next thicker preferred nominal thickness.			
Finish		Calendered	
Density		1.0 – 1.2 g/cm^3	
Electrical Strength (BDV) at 900C		In Air (Min)	In Oil (Min)
	0.10 mm	1.00 kV	6.5 kV
	0.13 mm	1.25 kV	7.5 kV
	0.15 mm	1.40 kV	8.0 kV
	0.18 mm	1.65 kV	10.0 kV
	0.20 mm	1.75 kV	10.5 kV
	0.25 mm	2.10 kV	12.0 kV
	0.30 mm	2.30 kV	13.5 kV
	0.38 mm	2.60 kV	16.0 kV
	0.40 mm	2.70 kV	16.5 kV
	0.50 mm	3.00 kV	18.5 kV
Tensile Strength		MD (Min)	CMD (Min)
	0.10 mm	105 N/15mm	35 N/15mm
	0.13 mm	120 N/15mm	43 N/15mm
	0.15 mm	130 N/15mm	45 N/15mm
	0.18 mm	150 N/15mm	55 N/15mm
	0.20 mm	162 N/15mm	59 N/15mm
	0.25 mm	190 N/15mm	67 N/15mm
	0.30 mm	220 N/15mm	80 N/15mm
	0.38 mm	266 N/15mm	96 N/15mm
	0.40 mm	275 N/15mm	102 N/15mm
	0.50 mm	335 N/15mm	122 N/15mm
Ageing in Air		Max. 45 %	
Oil Absorption		Min 22 % @ Density 1.0 g/cm^3	
		Min 7 % @ Density 1.2 g/cm^3	
Conductivity of Aqueous Extract		Max 2.2 mS/m	
pH of Aqueous Extract		6.5 – 8.5	
Moisture Content		Max 8.0 %	
Mineral Ash Content		Max 1.5 %	
Freedom from conducting particles		Free from conducting particles	

This Product conforms in all respect to Company Standards CS/PP/003 requirements.

The above is available in any width totalling to 2000 mm.

Thermally upgraded insulation paper - Grade Kheddatherm

PROPERTIES		SPECIFICATION AS PER COMPANY STANDARD CS/PP/002
Composition		100% Unbleached softwood sulphate Pulp.
Thickness Range		0.125 – 0.25 mm
Finish		Calendered
Nominal Thickness		0.125 mm
		0.18 mm
		0.25 mm
Thickness Tolerance		± 8.0 %
Density		1.00 – 1.20 g/cm^3
Tensile Strength		
	MD	Min 80 N/mm^2
	CMD	Min 40 N/mm^2
Bursting Strength	0.125 mm	Min 0.59 N/mm^2
	0.18 mm	Min 0.69 N/mm^2
	0.25 mm	Min 1.07 N/mm^2
Shrinkage	MD	Max 1.0 %
	CMD	Max 1.5 %
	Thickness	Max 7.0 %
Moisture Content		Max 8 %
Oil Absorption		Min 13 %
pH of Aqueous Extract		6.0 – 9.0
Ash Content		Max 1.0 %
Electrical Strength		
(In Air) BDV	0.125 mm	Min 9 kV/mm
	0.18 mm	Min 10 kV/mm
	0.25 mm	Min 10 kV/mm
Electrical Strength		
(In Oil) BDV	0.125 mm	Min 60 kV/mm
	0.18 mm	Min 55 kV/mm
	0.25 mm	Min 55 kV/mm
Nitrogen Content		1.4 % – 2.4 %

The above product conforms to Company Standard CS/PP/002.

The above is available in any width totalling to 2000 mm.

R&D, Manufacture and Testing

Senapathy Whiteley has a highly sophisticated Research, Development and Engineering centre housing the entire range of quality evaluation and testing equipment. The engineering wing also has a high voltage laboratory for simulated and real-load testing.

The Company deploys the latest techniques and methods to inspect incoming raw materials to ensure that Presspapers meet customer specifications and are of the highest quality.

Stringent quality checks are carried out at prescribed stages during production and extensively before despatch. SQC techniques used help evaluate and control process parameters and system variations, if any.

For tests which are outside the installed capability, the company has strong relationships with external laboratories, research institutes and universities.

As a follow-through measure R & D Engineers continuously strive to ensure consistent, impeccable quality products are delivered to customers.

SENAPATHY WHITELEY PRIVATE LIMITED
"Casa Fina", 5, Primrose Road,
Bangalore - 560 025, INDIA
Phone : + 91-80-4112 4000
Fax no: + 91-80-2559 3392
Email: info@senapathy.com

www.senapathy.com

SENAPATHY WHITELEY ™
Estd 1960