
Paperbase Alerting Service Sample

Paper and board grades and specialities

00001

PI: 20203955 JA: 0203

TI: Paper in Steiermark till 1450

AU: Schweizer G

CI: IPH Congress Book. Vol. 13. Papers of the 25th international congress of paper historians, Dortund, Germany, 8-14 Sept. 2000, pp 160-167 <Marburg, Germany: International Association of Paper Historians, 2001, 236pp (ISBN 3025083402)> (K)

CT: CONFERENCE/ HISTORY/ PAPER/ PAPER HISTORY/ UTILISATION/

CN: International Association of Paper Historians

AB: A mandate for a Steiermark abbey issued by Frederick II in 1228 from Southern Italy is the oldest surviving paper document from the Holy Roman Empire. The paper has a soft handle, and uniform formation with no watermark. Its 120gsm grammage is rather lighter than earlier board-like Italian papers. Paper was not regarded as a permanent material at the time. A 1221 edict required all official paper documents to be copied on to parchment within two years. Early examples of paper in Steiermark include the account book of Prince Otto III of Liechtenstein-Murnau made in Genoa around 1327-1333 with a watermark. Other account books from Cistercian abbeys dated 1370-1375 use 0.020mm thick watermarked paper of 120gsm bound in parchment. Other contemporary books are written on parchment. Recent analysis of a 650 year old Codex paper shows this was made from flax fibre rags, with 0.202mm thickness and 112gsm. The 56.5 WP whiteness of the top surface matches that of current newsprint and its long and cross directional breaking length matches that of current writing papers. (7 fig, 29 ref)

SO: B

00002

PI: 20203957 JA: 0203

TI: Marvelling at marbling: a project on characterisation and conservation of marbled

paper, using transcription and reconstruction of traditional marbling recipes: set-up and preliminary results

AU: Herrmann C; Porck H

CI: IPH Congress Book. Vol. 13. Papers of the 25th international congress of paper historians, Dortmund, Germany, 8-14 Sept. 2000, pp 185-187 <Marburg, Germany: International Association of Paper Historians, 2001, 236pp (ISBN 3025083402)> (K)

CT: CHARACTERISATION/ CONFERENCE/ CONSERVATION/ MARBLED PAPER/ PAPER HISTORY/

CN: International Association of Paper Historians

AB: Marbled paper has been used in book applications since the early 18th century. A study of 19th century hand-written recipe books for decorated paper at the Koninklijke Bibliotheek in The Hague, Netherlands, is to establish a database on processes, ingredients and characteristics of marbling. Initial trials to reproduce tiger-eye and other marble patterns show that recipes need to be accurately formulated. A joint research project is to be set up with Bonn and Cologne Universities. (3 fig)

SO: B

00003

PI: 20203987 JA: 0203

TI: The influence of composition and surface treatment on the optical stability of graphic boards

AU: Cernic Letnar M; Kropar Vancina V

JN: Papir \$IS=0350-6614

CI: vol. 29, no. 3-4, Sept. 2001, pp 69-76 (K)

CT: BOARD PROPERTIES/ CHEMICAL PROPERTIES/ COATING/ COMPOSITION/ DURABILITY/ RETENTION/ SURFACE TREATMENT/

AB: Coated and uncoated boards, of various producers and the same nominal grammage, about 250gsm, were studied. Accelerated ageing of the boards was carried out according to ISO 6530 to determine the quality and durability of the boards. The durability of basic, surface and chemical properties, mechanical endurance, optical and colour stability of the boards were examined. It was found that the retention of chemical, mechanical and optical properties was mainly dependent on the board composition and type of coating. Chemical and mechanical stability were proportional to the content of thermomechanical pulp (TMP), chemithermomechanical pulp (CTMP) and recycled fibres. Considerable changes in the optical properties of the investigated boards were observed. Brightness was decreased, while yellowness increased, according to the surface treatment of board and optical brightener content and coatings. (13 fig, 1 tab, 9 ref)

SO: B

00004

PI: 20203990 JA: 0203

TI: Flake orientation effects on physical and mechanical properties of sweetgum flakeboard

AU: Shupe T F; Hse C Y; Price E W

JN: Forest Prod. J. \$IS=0015-7473

CI: vol. 51, no. 9, Sept. 2001, pp 38-43 (K, S)

CT: DRYING/ FLAKEBOARD/ LIQUIDAMBAR STYRACIFLUA/ MECHANICAL PROP-

ERTIES/ ORIENTED STRAND BOARD/ PARTICLEBOARD/ PHYSICAL PROPERTIES/
AB: To determine the effect of flake orientation on the physical and mechanical properties of sweetgum flakeboard, the physical properties of single layer panels with random and oriented flake distribution, three layer, five layer and seven layer panels were investigated. The single layer oriented panels were found to have panel directional property ratios of 11.8 and 12.9 for bending strength and modulus of elasticity (MOE). The bending strength and MOE for the random panels in the single layer construction were slightly less than that of the average for the oriented panel. Multilayer panels had higher bending properties than the random panels. MOE was influenced more than the bending strength by a change in fabrication pattern, while internal bond was unaltered with the panel construction variability. Compared with random single layer panels, multilayered panels did not have a decrease in dimensional change properties. (2 fig, 5 tab, 24 ref)

SO: B

00005

PI: 20204026 JA: 0203

TI: Anaerobic treatment of fibreboard manufacturing wastewaters in a pilot scale hybrid USBF reactor

AU: Fernandez J M

JN: Water Res. \$IS=0043-1354

CI: vol. 35, no. 17, Dec. 2001, pp 4150-4158 (C, K)

CT: COD/ DETOXICATION/ EFFLUENT TREATMENT/ FIBREBOARD/ GRANULATION/ PHENOLIC COMPOUND/ PILOT PLANT/ UASB/ UPFLOW ANAEROBIC SLUDGE BLANKET/ UPFLOW REACTOR/ WASTE WATER/

AB: A study was conducted to investigate the feasibility of applying anaerobic effluent water treatment techniques to fibreboard manufacturing (FBM) waste waters in an industrial pilot plant, consisting of a hybrid upflow sludge bed filter (USBF) anaerobic reactor and a coagulation-flocculation unit as a pretreatment. Experiments were conducted to determine the maximum organic loading rates (OLR) compatible with stable long term operation, as well as the evolution of the characteristics of the biomass developed. Flocculent sludges were used as inoculum, and granulation was observed in the USBF reactor after 120 days of operation. The overall linear upward velocity was seen to be the key factor controlling biomass retention and, therefore, a stable operation at high OLR. Chemical oxygen demand (COD) removal efficiencies of 90%-93% were attained in the anaerobic reactor operating at 37 deg C at OLR values of 6.5-8.5kg/sq m. The efficiency of removal of phenolic compounds was found to be 90%. Measurement of ecotoxicity values indicated that the wastewaters were partially detoxified, being EC50 values for the liquid effluent 25 times lower than those corresponding to the influent. (6 fig, 3 tab, 20 ref)

SO: B

00006

PI: 20204031 JA: 0203

TI: Corrugated, paperboard market grows: study reveals increase in US sales

AU: Anon

JN: Flexo \$IS=10517324

CI: vol. 26, no. 10, Oct. 2001, pp 25-27 (K)

CT: CORRUGATED BOARD/ CORRUGATED BOX/ MARKET/ PAPERBOARD/

AB: Major manufacturers in the corrugated sector are increasingly buying up their competitors and taking advantage of the new economies of scale and established customer bases. Environmental and other considerations have made the use of recycling products increasingly prevalent and it has been estimated that over 90% of the corrugated products shipped into retail grocery stores are recycled. In 1999, it was estimated that the annual growth rate was 2.4% with sales at USD37,268.3m, in which 15%-20% of all linerboard production was recycled. In 2000 the sales are estimated to reach USD38,207.7m. The main element in sales growth is in the corrugated and paperboard container industry during the 1990s was the growth in sales of corrugated and solid boxes where the major estimated end-user market for this sector in 2000 is expected to be food and kindred products (40%). In future the manufacturers of folding paperboard boxes will begin to break into more nontraditional markets, including high value pharmaceuticals, and cosmetics and soap. (1 fig, 2 tab)

SO: B

00007

PI: 20204033 JA: 0203

TI: Folding cartons by flexo: a folding carton converter compares central impression, in-line presses

AU: Jones M R

JN: Flexo \$IS=10517324

CI: vol. 26, no. 10, Oct. 2001, pp 39-43 (K)

CT: FLEXOGRAPHY/ FOLDING CARTON/ PRINTING/

AB: H J Jones is a long-established folding carton converting company based in London, Ontario, Canada and specialising in folding cartons and blister cards using offset lithography, offline coaters and sheetfed diecutters. It installed its first flexographic press in 1994, a seven colour, inline press with flatbed diecutter and have been running folding cartons and blister cards on this machine since then. In 2000 the company installed a central impression (CI) press with inline rotary diecutting. The company encountered problems in the first year of operation of the CI system including plate bounce, doctor blade flutter, trapping problems, problems associated with the extreme degree of reliance on electronics and computers, waste removal, and delivery/handling of cartons on large runs. Nevertheless, the company is quite happy with its decision and the way in which the flexographic press is now running.

SO: B

00008

PI: 20204057 JA: 0203

TI: Production of veneer-reinforced corrugated particleboard and effect of board density on bending properties

AU: Hayashi K

JN: J. Jpn Wood Res. Soc. \$IS=0021-4795

CI: vol. 47, no. 5, 2001, pp 420-430 (K, S)

CT: COMPOSITE/ CORRUGATED BOARD/ DENSITY/ PARTICLEBOARD/

AB: Experiments were conducted to determine the effect of board density on bending properties for veneer reinforced corrugated particleboard. Although the apparent density of the composite board was 0.23gsm, compared to 0.41gsm for conventional corru-

gated board, its strength was found to be equivalent to that of 13-type particleboard described in JIS A 5908, while that of the conventional particleboard was equivalent to that of 8-type particleboard. The modulus of rupture (MOR) was improved by increasing the density of the corrugated particleboard and laminating more veneers. (13 tab, 3 ref)
SO: B

00009

PI: 20204063 JA: 0203

TI: Paper products: electronic paper combines programmability, portability and reusability

AU: Sprague R

JN: oe Mag. \$IS=

CI: Dec. 2001, pp 30-31 (P)

CT: ELECTRONIC MEDIA/ NEW TECHNOLOGY/

AB: Since paper has many advantages over a laptop computer screen, Gyricon is developing a new display medium for electronic data based on electronic paper. The electronic paper comprises bichromal spheres, each situated in its own individual cavity and filled with silicone oil, embedded in a thin layer of elastomeric material. The spheres are free to rotate in their cavities and are built up from two hemispheres, one white and the other black, each with a different, permanent charge. Under normal conditions the spheres gravitate to one side of the cavity and adhere to the wall. The application of an electric field causes the spheres to unstick, float free and are able to rotate. After the ball has rotated it settles and becomes stuck to the wall until another charge is applied. If an image is converted into a planar voltage pattern applied to the sheet's surface, the image is transferred to the spheres and light is reflected off the spheres to give an image. The electric field needed to change the image can be generated by a circuit board laminated to the paper, from an active matrix array or from a printer that deposits charge on the surface of the material. An early practical application of this electronic paper is for retail signage, where the material has been made into retail and point of sale signs. Future uses could include: fold out displays and rewriteable/downloadable books and newspapers. (1 fig, 1 tab)

SO: B

00010

PI: 20204071 JA: 0203

TI: Control of resin release from particleboards by gamma irradiation. I: thermal decomposition behavior and structure morphology

AU: El-Naggar A M

JN: J. Appl. Polym. Sci. \$IS=

CI: vol. 82, no. 12, 13 Dec. 2001, pp 2869-2881 (S)

CT: GAMMA RADIATION/ MORPHOLOGY/ PARTICLEBOARD/ RELEASE/ RESIN/

AB: A study was conducted to determine whether the use of gamma radiation to bind the UF to the cellulose structure might be effective in reducing the tendency of urea formaldehyde (UF) resins used as binding agents for particleboards to migrate and be released. Experiments were conducted using particleboards based on farm residues and polymers as adhesives, made by thermal compression in a hot press at 120 deg C and subsequently exposed to various doses of gamma irradiation. The release or emission of resins, modified through gamma radiation, was characterised in terms of the

thermal decomposition (TGA) and structure morphology (SEM). In general, gamma irradiation improves the thermal stability of the particleboards regardless of the type of the farm residues or the type of adhesive. The thermal stability was found to increase with increasing irradiation dose as shown by the percentage loss in weight at different decomposition temperatures and the temperatures of the maximum values of the rate of reaction. Particleboards based on cotton or flax stalks and polystyrene (PS) displayed higher thermal stability than did those based on the epoxy resin (E150) and wood sawdust. Particleboards treated with the E150 resin showed higher thermal stability. (10 fig, 3 tab, 20 ref)

SO: B

00011

PI: 20204618 JA: 0203

TI: Diagnostics and repair of a defibrator Sunds L-44 used in a MDF mill

AU: Osses Zapata P; Ruiz Arroyo M

JN: Celul. Pap. (Chile) \$IS=0716-2308

CI: vol. 14, no. 2, June 1998, pp 30-38 (C, K, P, S)

CT: DEFIBRATOR/ FAILURE/ MAINTENANCE/ MEDIUM DENSITY FIBREBOARD/ VIBRATION/

AB: A case study is presented describing the repairing of the Sunds defibrator of MDF's Trupan plant in the Chilean province of Nuble. The defibrator, a Sunds model L-44 with capacity to handle 10tph, is formed by a fixed disk and a mobile rotor, being powered by a Stromberg electric motor of 2,800KW. The problem was confirmed by graphic tests and it consisted of a substantial increase in the vibration, which started after seven and a half years of use. MDF's own maintenance staff worked in partnership with the manufacturer, and together they came out with the corrective measures needed to solve the problem. These involved changing some parts as well as installing a system of continuous monitoring of the TM-2000 and adopting standard testing procedures during the maintenance stops. (10 fig, 11 tab, 5 ref)

SO: B

00012

PI: 20204635 JA: 0203

TI: Development of technology for the production of heliographic paper

AU: Alvarez O

JN: Invest. Tec. Pap. \$IS=0368-0789

CI: vol. 36, no. 141, July 1999, pp 357-365 (C, K, P, S)

CT: NEW TECHNOLOGY/ PAPER PROPERTIES/ SPECIALITY PAPER/ SUNLIGHT/

AB: A study was devised to develop an improved holographic paper, both in the laboratory and at industrial scale. This is a speciality paper which must have a series of properties regarding density, thickness and resistance to humidity. Due to such characteristics, the cost of production is far above that of common printing papers, although it can be reduced by increasing the batch sizes. (3 fig, 3 tab, 8 ref)

SO: B

00013

PI: 20204638 JA: 0203

TI: The future of digital printing?

AU: Lamminmaki T

JN: KCL tiedotta KCL Inf. \$IS=0359-0704

CI: no. 2, 2001, p. 5 (C, K, P, S)

CT: DIGITAL PRINTING/ ELECTROPHOTOGRAPHY/ FOREST/ INK JET PRINTING/
PRINTING INK/

AB: The range of digitally printed products is extremely wide and they are characterised by small print runs and a limited product lifetime. The most important digital printing methods are electrophotography and inkjet printing, although other potential digital printing methods include thermotransfer and electrocoagulation. The first digital colour printers were launched in the market in 1993 and in 2001 around 13% of all printed products are printed digitally. This growth was slower than expected, due to several factors. The price of a digitally printed page has not decreased as expected; there has not yet emerged a really good product in which digital printing could be utilised to its full extent; and the quality of digitally printed products is still partly substandard. However, the trend towards ever-growing print runs and the quality of digitally printed products becoming very close to the conventional standard mean that in the future, digital printing presses will compete even more intensively with traditional printing presses. (1 fig)

SO: B

00014

PI: 20204660 JA: 0203

TI: A national profile of the US hardwood sawmill industry

AU: Bowe S A; Smith R L; Araman P A

JN: Forest Prod. J. \$IS=0015-7473

CI: vol. 51, no. 10, Oct. 2001, pp 25-31 (K, S)

CT: HARDWOOD/ SAWMILL INDUSTRY/ SURVEY/

AB: The objectives of this study were to generate a current demographic profile of the US hardwood sawmill industry, including company demographics and individual respondent demographics; and to identify the preferred information sources for the hardwood sawmill industry. Over 2,000 sawmills were used, including all National Hardwood Lumber Association (NHLA) member hardwood sawmills and a random selection of non NHLA member hardwood sawmills. The results of the survey showed that the average yearly lumber production was 7.6m board feet/sawmill. Headrig optimisation, one of the oldest and broadest technologies was used by only 27% of responding mills, while advanced scanning and optimising technology, such as edger optimisers and trimmer optimisers, were only in use by 10% and 5% of the respondents, respectively. Plant visits and peer conversations were rated as the highest information sources, with the Internet rated at the bottom. Generally, the use of advanced technology within the hardwood sawmill was not common. Production was a key issue and hardwood sawmillers preferred hands-on or personal interaction for their information needs. Association forums would be well suited for research and outreach activities. (1 fig, 8 tab, 11 ref)

SO: B

00015

PI: 20204663 JA: 0203

TI: Step-closing pressing of medium density fiberboard. Part 2: influences on panel

performance and layer characteristics

AU: Wang S

JN: Holz Roh. Werkst. \$IS=0018-3768

CI: vol. 59, no. 5, Oct. 2001, pp 311-318 (K, S)

CT: CHARACTERISATION/ DENSITY/ FIBREBOARD/ LAYER/ MEDIUM DENSITY FIBREBOARD/

AB: Previous research has discussed the step closure schedule to change the vertical density profile (VDP) of laboratory made medium density fibreboard (MDF) panels. This work investigated the effect of the step closure schedule on the end product performance, especially on the layer thickness swell and its relationship with layer density. The step closure schedules resulted in improved internal bond strength of the tested specimens. Core density was significantly increased and face density decreased, resulting in lower bending properties. The greater core density did not result in higher internal bond strength. It was found that the more unsteady phase in a mat resulted in the poorer quality of the bond formation. The layer thickness swell after three water exposure times was found to be significantly and positively related to layer density in all the panels studied. The correlation coefficient between the actual layer thickness swell and layer density increased with prolonged water exposure time. The greater thickness well in the surface layers of MDF indicate that endeavours to improve dimensional stability should be focused on stabilising the high-density surface layers. (5 fig, 6 tab, 9 ref)

SO: B

00016

PI: 20204664 JA: 0203

TI: Effect of chemical modification of wood on the mechanical and adhesion properties of wood fiber/polypropylene fiber and polypropylene/veneer composites

AU: Mahlberg R

JN: Holz Roh. Werkst. \$IS=0018-3768

CI: vol. 59, no. 5, Oct. 2001, pp 319-326 (K, S)

CT: CHEMICAL MODIFICATION/ MECHANICAL PROPERTIES/ POLYPROPYLENE/ VENEER/ WOOD FIBRE/

AB: The effect of different organic anhydrides as wood modifiers on the mechanical properties of fibre boards bonded either with polypropylene (PP) or phenol formaldehyde resin (PF) or a combination thereof was determined. A procedure was also developed to make modified fibre boards without an additional step for fibre modification. Chemical modification of wood fibre by means of anhydrides is most beneficial for the fibre boards bonded with polypropylene, giving significant improvement in the mechanical properties and dimensional stability of the PP-bonded boards. Modification of wood fibres using maleic anhydride led to a reduction in the modulus of rupture of the PF- and PF/PP-bonded boards, while acetylation and modification with succinic anhydride did not cause any significant changes in the modulus of rupture of the boards. Adhesion between the PP films and wood veneer revealed an increasing trend as function of the degree of modification. Scanning electron microscopy (SEM) micrographs of the fibre boards and PP-coated veneer showed improved interaction between the two components due to the anhydride modifications. (3 fig, 2 tab, 21 ref)

SO: B

00017

PI: 20204671 JA: 0203

TI: Rapid production of high-strength cement-bonded particleboard using gaseous or supercritical carbon dioxide

AU: Hermawan D

JN: Journal of Wood Science \$IS=1435-0211

CI: vol. 47, no. 4, pp 294-300 (K, S)

CT: BENDING PROPERTIES/ BONDING STRENGTH/ CARBON DIOXIDE/ CURING/ DIMENSIONAL STABILITY/ ELASTIC STRENGTH/ MECHANICAL PROPERTIES/ PARTICLEBOARD/ RUPTURE MODULUS/ WOOD CEMENT BOARD/

AB: The fundamental properties of cement bonded particleboard (CBP) manufactured by a conventional cold-pressing method for setting the cement cured with gaseous or supercritical carbon dioxide at various curing times were assessed. Degrees of cement hydration in relation to the mechanism of strength development with the carbon dioxide addition were also studied using x ray diffractometry (XRD), thermal gravimetry (TG-DTG), and scanning electron microscopy (SEM). It was found that the curing of cement was accelerated concomitantly with the improvement in mechanical and dimensional properties of CBP significantly by curing with gaseous or supercritical carbon dioxide. Supercritical carbon dioxide curing imparted boards optimal properties at a faster rate compared with gaseous curing. The main reasons for the superior strength of carbon dioxide cured boards are considered to be accelerated formation of calcium silicate hydrate and calcium carbonate and the interlocking of those hydration products on the wood surface. (7 fig, 13 ref)

SO: B

00018

PI: 20204675 JA: 0203

TI: Nondestructive evaluation of modulus of elasticity of yellow-poplar LVL: effect of veneer-joint design and relative humidity

AU: Lee J N; Tang R C; Kaiserlik J

JN: Wood Fiber Sci. \$IS=0753-6161

CI: vol. 33, no. 4, Oct. 2001, pp 510-521 (K, S)

CT: DENSITY/ ELASTIC PROPERTIES/ HUMIDITY/ LAMINATE/ LIRIODENDRON TULIPIFERA/ NONDESTRUCTIVE TEST/ TEST METHOD/ VENEER/ VIBRATION/

AB: Stress wave propagation and transverse vibration were used to evaluate the modulus of elasticity (MOE) of laminated veneer lumber (LVL) fabricated with rotary peeled yellow poplar (YP) (*Liriodendron tulipifera*) veneers and phenol formaldehyde resin. Three groups, with 50 specimens in each group, were studied. Group I specimens had scarred veneer-joints; group II had crushed-lap veneer-joints; and the control group III had no veneer-joints. Twenty-five specimens in each group were preconditioned and equilibrated prior to evaluation. It was found that MOEs of YP-LVL were influenced by the presence of veneer-joints and the difference existed between the nondestructive testing methods used. The relative humidity effect was not accurately demonstrated by both methods, except in control group. The increase of relative humidity resulted in significant increase of moisture content in the LVLs, however, change in densities was relatively small. Regardless of the veneer-joint types, analysis indicated that the MOE predictions based on the stress-wave method were better correlated with those determined by static bending tests. (3 fig, 9 tab, 26 ref)

SO: B

00019

PI: 20204676 JA: 0203

TI: Simulation of the mat formation process

AU: Zombori B G; Kamke F A; Watson L T

JN: Wood Fiber Sci. \$IS=0753-6161

CI: vol. 33, no. 4, Oct. 2001, pp 564-579 (K, S)

CT: BONDED AREA/ COMPOSITE/ FIBRE MAT/ FLAKE/ FORMATION/ ORIENTED STRAND BOARD/ VOID VOLUME/

AB: To improve on the prediction of previous models, a more realistic description of the mat structure in the formation of wood based composites was developed. In the improved model, the mat formation includes the geometry of the wood elements as random variables and certain limitations can be imposed on the orientation of the elements. The mat formation process model was validated by comparison of the simulated horizontal density distribution to a measured horizontal density distribution. The dimensions of the strands are considered as random variables and a stochastic density value can be assigned to each strand, allowing the incorporation of the density variability represented by mixed species. The model is capable of calculating properties such as the change of the strand contact area and several void volume fractions within the mat during the consolidation. The model was used to simulate the structure of an oriented strandboard mat, however, it is robust enough to describe the mat formation of a wide range of wood based composites and with modifications, is capable of incorporating the tilting and bridging or the shape of the strands. (8 fig, 4 tab, 23 ref)

SO: B

00020

PI: 20204677 JA: 0203

TI: An adaptive wood composite: theory

AU: Smittakorn W; Heyliger P R

JN: Wood Fiber Sci. \$IS=0753-6161

CI: vol. 33, no. 4, Oct. 2001, pp 595-608 (K, S)

CT: COMPOSITE/ FEM/ FINITE ELEMENT METHOD/ LAMINATE/ PIEZOELECTRICITY/ THEORY/ WOOD/

AB: A theoretical model for the steady state and transient behaviour of adaptive wood composite plates composed of layers of wood and other piezoelectric materials is presented. Effects of the mechanical, electrical, temperature and moisture fields were studied simultaneously using a discrete layer model of the governing equations, which were solved using the finite element method. The computational model utilises a one-dimensional Lagrange linear interpolation function in the through thickness direction and two-dimensional quadratic finite element for the in plane approximations. The displacements, potential, temperature, and moisture are treated as the nodal unknowns. Representative examples of adaptive wood composites have been modelled and potential applications are described. The results of this study provide an indication of the level of response of adaptive wood composites and the model provides a means of studying any laminated wood plate where the elastic, temperature, moisture, and electric fields influence the overall structural response. (3 fig, 2 tab, 52 ref)

SO: B