

FOR PULP PRODUCTION

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The papermaking potential of *Cupressus lusitanica*, *Cupressus sempervirens* and *Cupressus arizonica* was investigated using *Pinus pinaster* and *Pinus sylvestris* as reference.

MATERIAL AND METHODS

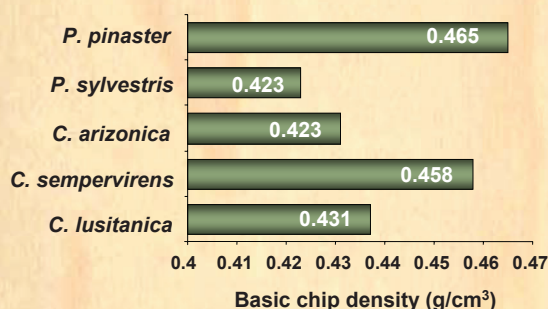
→ Two trees per species were collected in a stand located at the centre interior of Portugal (Castelo Branco).

→ kraft cooking process conditions: effective alkali charge = 21.3% (as NaOH); sulfidity index= 30%; liquor/wood ratio = 5:1; time to T_{máx} (170 °C) = 90 min; time at T_{máx} = 150 min.

→ The pulps were bleached according to the D₀E₁D₁D₂ elemental chlorine free sequence. The bleached pulps were beaten in a PFI mill at 1000, 4000 and 7000 revolutions under a refining intensity of 3.33 N/mm.

→ Paper handsheets were prepared and tested regarding structural, mechanical and optical properties.

RESULTS AND DISCUSSION

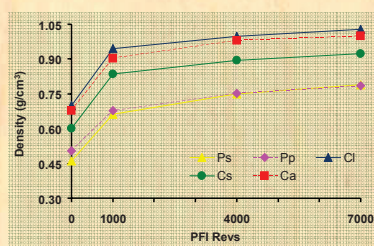
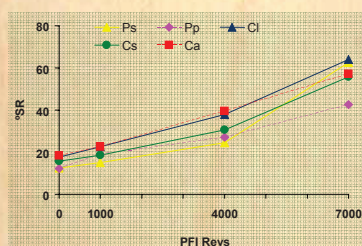


Cooking results

	<i>C. lusitanica</i>	<i>C. sempervirens</i>	<i>C. arizonica</i>	<i>P. pinaster</i>	<i>P. sylvestris</i>
Pulp yield (%)	36.7	38.7	37.7	40.8	42.8
Rejects (%)	0.9	0.6	0.7	0.02	0.05
Alkali consumption (%)	18.0	17.3	17.4	17.0	16.9
Kappa number	31.6	28.7	32.0	23.4	21.4
Pulp viscosity (cm ³ /g)	772	717	657	830	890

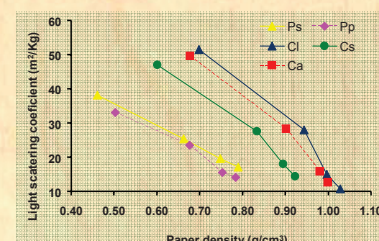
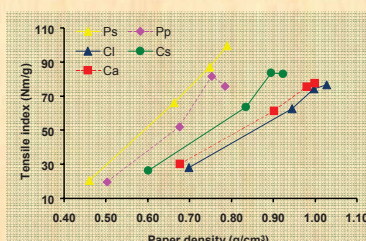
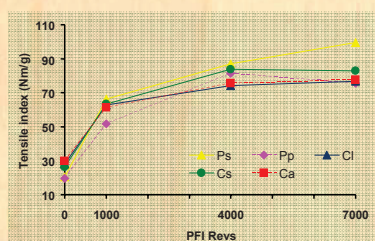
Pulp fibre characteristics

	<i>C. lusitanica</i>	<i>C. sempervirens</i>	<i>C. arizonica</i>	<i>P. pinaster</i>	<i>P. sylvestris</i>
Fibre width (mm)	25	29	28.5	33.9	32.1
Length (mm)	1.19	1.53	1.1	1.97	1.90
Coarseness (mg/m)	0.090	0.140	0.085	0.322	0.212



Legend

Ps: *P. sylvestris*; Pp: *P. pinaster* ;
 Cl: *C. lusitanica* ; Cs: *C. sempervirens*; Ca: *C. arizonica*



CONCLUSIONS

The results have shown that the cypress wood samples investigated exhibit lower yield and higher residual lignin content than the pine wood samples used as a comparison. More work is required to evaluate if older trees can overcome this disadvantage. Cypress fibres exhibit lower fibre length, lower coarseness and higher number of fibres per gram, compared with pines. The study has shown that the paper produced from cypress fibres has, in general, lower mechanical performance than that produced from pine fibres. Papers produced from *C. arizonica* and *C. lusitanica* are similar and *C. sempervirens* are properties intermediate between the other cypress species and pine.

However, cypress species, with their relatively short, flexible and collapsible fibres, have potential to be incorporated into papers with good light scattering/tensile strength and smoothness/tensile strength relationships, at low energy consumption in refining.

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