CHAPTER IV

EXPERIMENTAL RESULTS

Results from testing of test specimens and test models and calibrating of testing machine were shown by tables and figures on page 38 and page 70 to 183

Table 4-1 show the results from testing of 3 types of test specimens : pure plastic, glass fibre reinforced plastic and jute reinforced plastic. Nevertheless glass fibre reinforced plastic and jute reinforced plastic were also to 2 types: crosswise and lengthwise. Results shown in table 4-1: tensile strength, Young's modulus, flexural strength, flexural modulus, coefficient of thermal conductivity, Poisson's ratio and specific gravity were obtained from Table A-1 to A-6.

Table A-1 shows tensile strength of 216 specimens. Indicated load and corrected load were figured out from load-elongation curve and calibration curve in figure A-7 respectively. Tensile strength was obtained by dividing maximum corrected load by minimum cross-sectional area of specimen.

Table A-2 shows data and results from testing Young's modulus of 216 specimens. Load-elongation curve was transformed to stress-strain curve. Young's modulus was calculated by dividing tensile strength from table A-2 by strain in proportional limit from stress-strain curve.

Table A-3 shows flexural properties of 216 specimens. Flexural strength is the maximum stress in the outer fibre at the moment of break which was calculated from equation A-23. Flexural modulus is the ratio of stress to corresponding strain in elastic limit obtained from equation A-24.

Talbe A-4 shows coefficient of thermal conductivity. 20 test specimens -4 for each type were employed in this testing which was conducted by Science Service Department.

Table A-5 shows data and results of testing specific gravity of 216 specimens. Specific gravity is defined as weight of test object to weight of water having the same volume.

Table A-6 presents data and results of testing Poisson's ratio and Young's modulus of 16 tensile test specimen by employing KFC-2-D4-11 type strain gage. ϵ_a, ϵ_b, and ϵ_c

under different tensile load were employed in equation A-6 to obtain transverse strain and longitudinal strain. From strain-load curve and equation A-26 Poisson's ratio was calculated. Young's modulus is defined as ratio of stress to corresponding strain or slope of stress-strain curve in proportional limit.

Table A-7 and A-8 shows longitudinal stresses at different internal pressure in test models made of glass fibre reinforced plastic and jute reinforced plastic. Table A-9 and A-10 shows hoop stresses at different internal pressure in test models. Stresses were obtained from strains measured by KFC-1-C1-11 type strain gage and Hooke's law. From KFC-2-C17-11 type strain gage, ϵ_a, ϵ_b, and ϵ_c were measured. Employing measured strains, equation A-4 and A-2, principal stress and angle between maximum strain and principal strain were obtained respectively. Longitudinal stress and hoop stress were determined by using Mohr's circle.

TABLE 4-1 RESULTS OF AVERAGE MECHANICAL PROPERTIES OF PLASTIC

TYPE OF TESTED SPECIMENS		TENSILE MODULUS (ksc)	YOUNG'S MODULUS E (ksc)	FLEXURAL STRENGTH S (ksc)	FLEXURAL MODULUS E_B (ksc)	COEFFICIENT OF THERMAL CONDUCTIVITY (kcal/mChr)	POISSON's RATIO	SPECIFIC GRAVITY Sp gr
P P		375.981	6,372.742	748.249	21,241.738	0.1	0.42	1.192
GRP	Crosswise	1,285.183	16,219.667	2,017.825	30,369.586	0.1	0.359	1.404
	Lengthwise	1,422.330	18,016.511	2,214.666	32,254.161		0.396	
	Average	1.353.765	17,118.089	2,116.246	31,311.873		0.362	
JRP	Crosswise	405.752	4,937.783	609.002	23,199.561	0.125	0.296	1.115
	Lengthwise	262.200	4,609.891	448.876	20,656.721		0.232	
	Average	333.976	4,773.837	528.939	21,928.141		0.264	