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APPENDICES

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APPENDIX A.

TABLES AND CHARTS FOR CORRUGATED FIBREBOARD BOX

Table A.1 : Bursting Strength and Ring Crush Resistance of Linerboard and Corrugating Medium (Minimum Values).

Type of paper	Code	Basis weight (g./m ² .)	Bursting strength (kg./cm ² .)	RCT (kg./cm.)	
Linerboard	KA 125	125	3.5	0.85	
	KA 185	185	5.1	1.24	
	KA 230	230	6.4	1.73	
	KA 335	335	7.9	2.45	
	KI 125	125	2.6	0.59	
	KI 150	150	3.1	0.75	
	KI 185	185	3.8	0.98	
	KI 230	230	4.7	1.34	
	KB 115 ^{*)}	115	1.3	0.39	
	KB 125 ^{*)}	125	1.4	0.49	
	KB 185 ^{*)}	185	2.0	0.95	
	Corrugating medium	CA 115 ^{*)}	115	-	0.58
		CA 125	125	-	0.62
CA 135		135	-	0.67	
CB 115 ^{*)}		115	-	0.54	
CB 127 ^{*)}		127	-	0.60	

Remark : ^{*)} not manufactured at present.

Source : The Siam Kraft Paper Co., Ltd.

Table A.2 : Take-Up Factors (c), k-Values and Thickness of Corrugated Fibreboard.

Type	Flute	k	c	Flute height (inclusive of facings) in mm.
Single wall	A	1.10	1.52	5.1
	C	1.15	1.48	4.1
	B	1.20	1.36	3.0
Double wall	A , B	1.20	2.88	7.8
	C , B	1.20	2.84	6.8

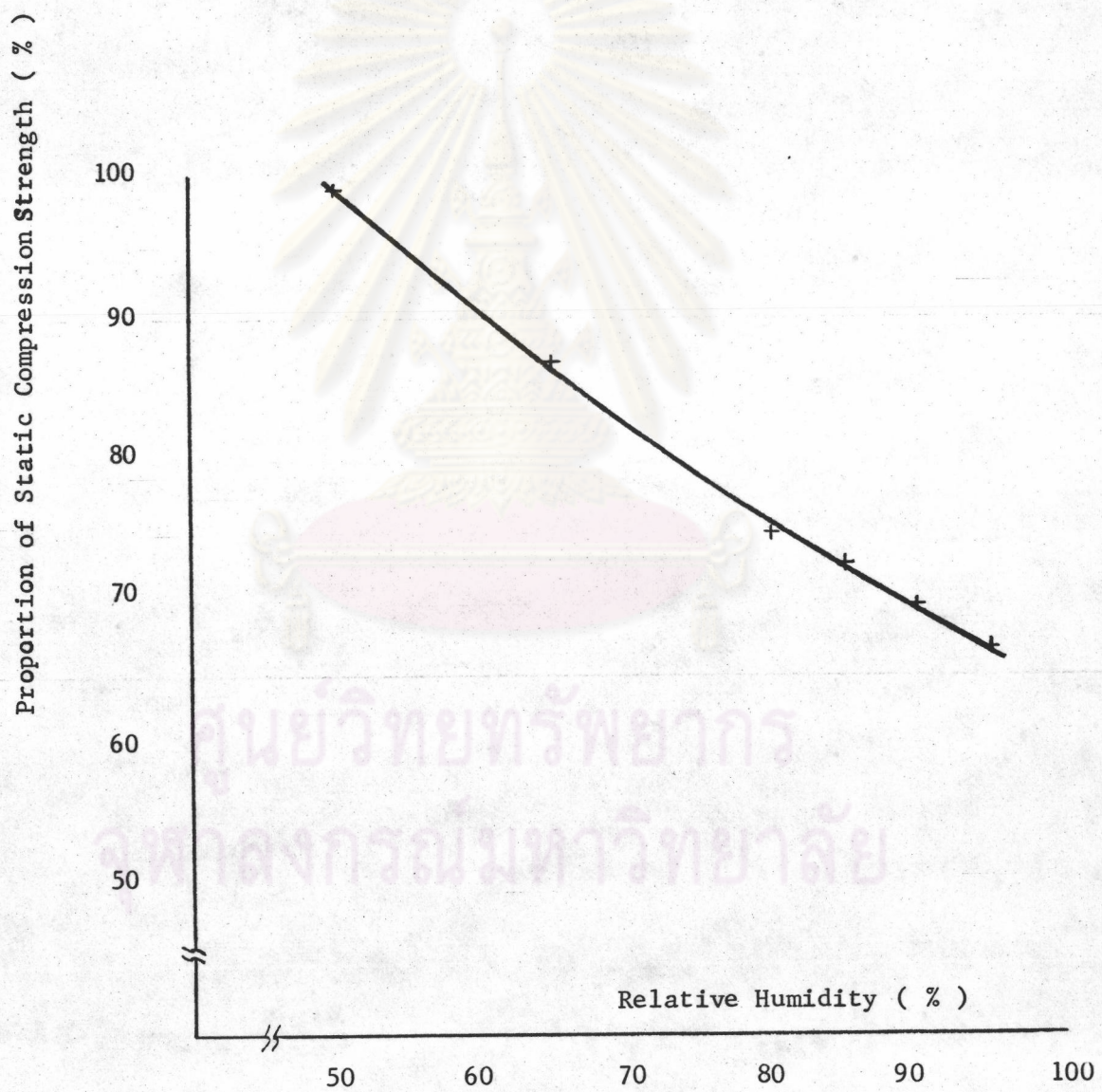
Source : The Siam Kraft Paper Co., Ltd.

Table A.3 : Effect of Stacking Pattern on Box Compression Strength (f_a).

Stacking pattern	BCT (% , residual)
No pallet, column stacking	85
No pallet, interlocking	60
On pallet, column stacking	75
On pallet, interlocking	50

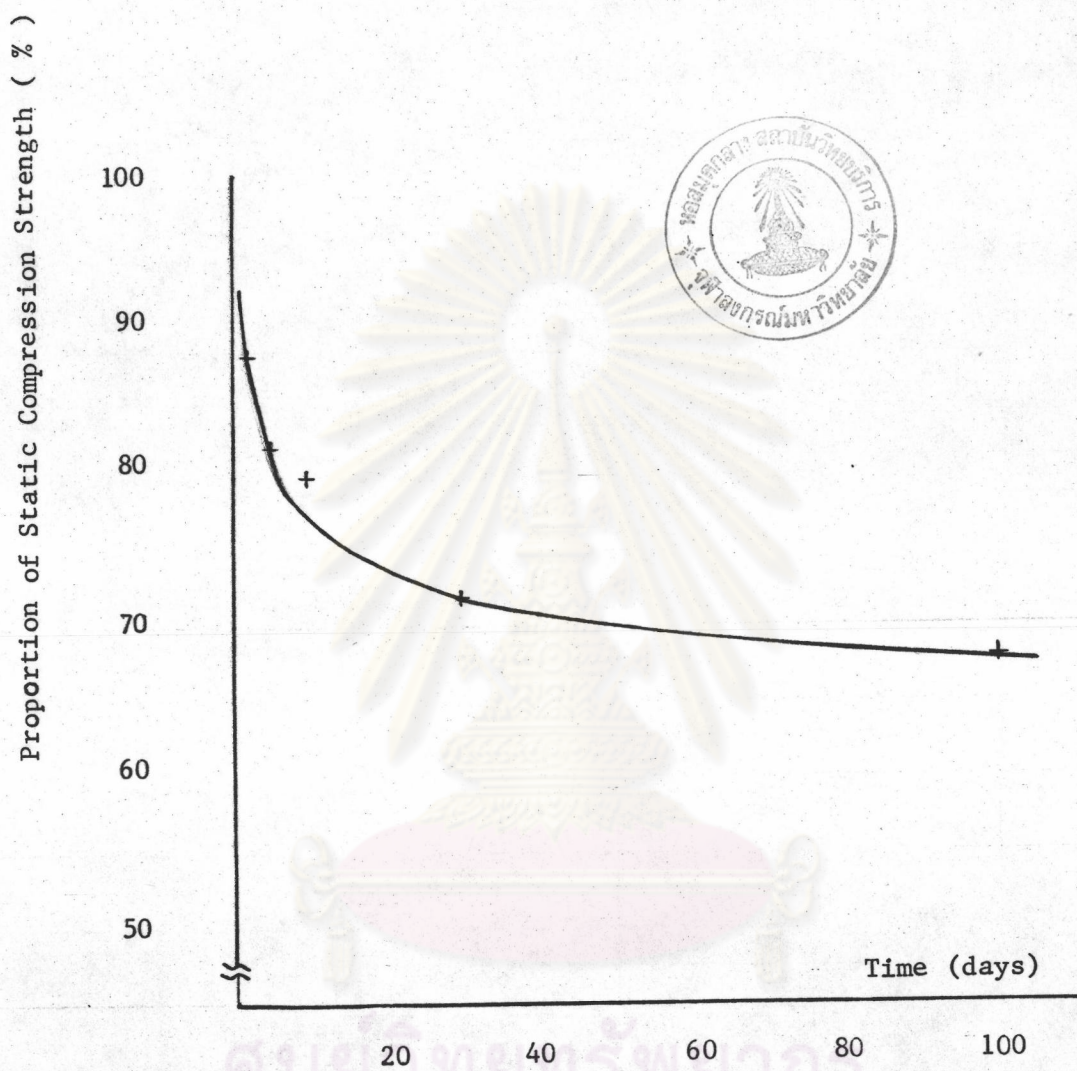
Remark : The Experiment of Michigan State University, U.S.A.

Figure A.1 : Effect of Relative Humidity
on Box Compression Strength (f_{rh}).



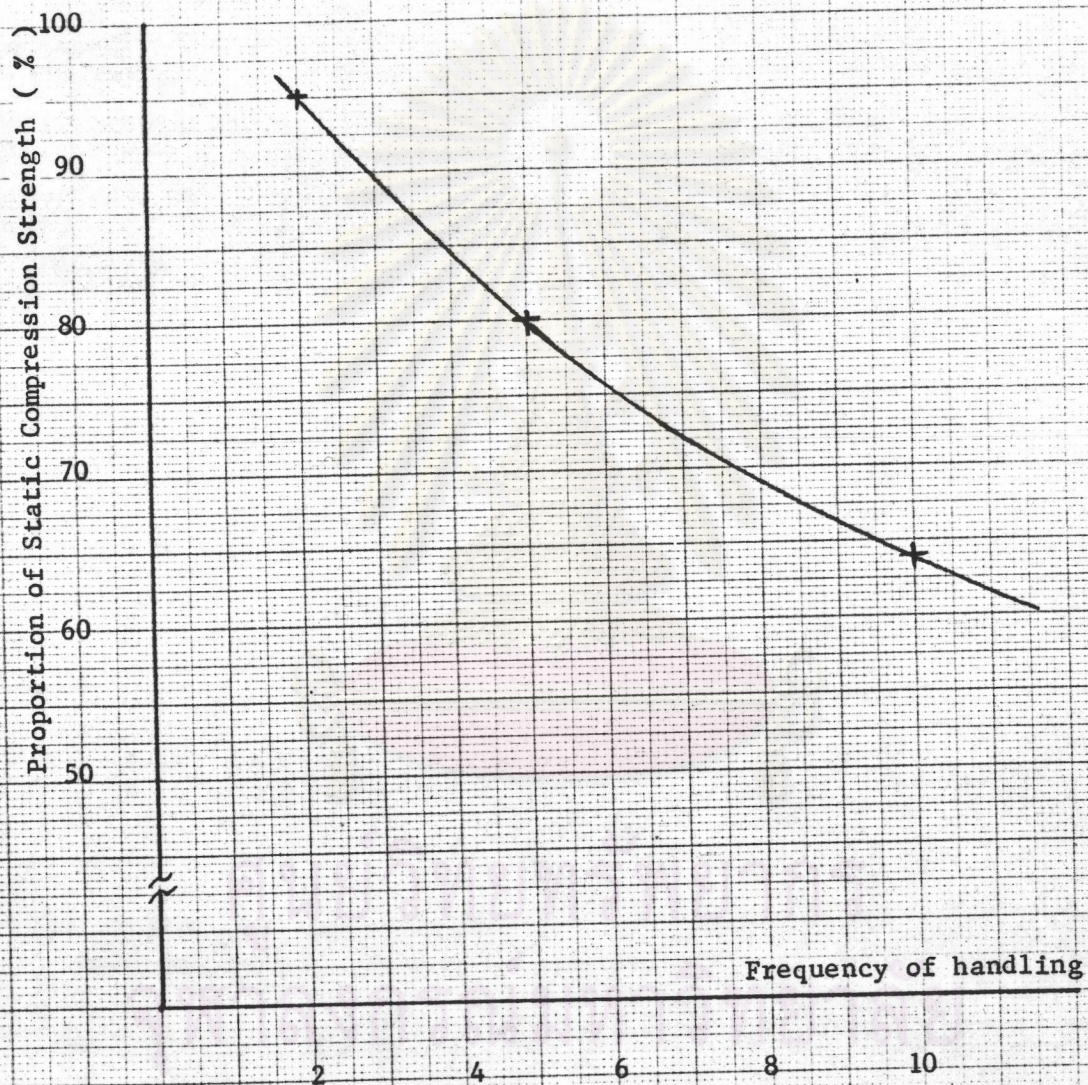
Remark : The Experiment of Michigan State University, U.S.A.

Figure A.2 : Effect of Storing Duration on
Box Compression Strength (f_t).



Remark : The Experiment of Michigan State University, U.S.A.

Figure A.3 : Effect of Frequency of Handling on
Box Compression Strength (f_h).



Remark : The Experiment of Michigan State University, U.S.A.

APPENDIX B.

Table B.1 : Proposed Alternate R20 Linerboard Grammages

Linerboard Grammages										
Proposed alternate R20 grammages			Standard of Thailand		Used in Britain		Eurostandard		North America Rule 41	
Diagrammatic representation	g/m ² lb/MSF ^{*)}		g/m ² lb/MSF ^{*)}		g/m ² lb/MSF ^{*)}		g/m ² lb/MSF ^{*)}		g/m ² lb/MSF ^{*)}	
—————	125	25.6	125	25.6	125	25.6	125	25.6		
					127	26			127	26
					146	30				
					150	30.7	150	30.7		
—————	160	32.8			161	33			161	33
					171	35				
					175	35.8	175	35.8		
			185	38					185	38
—————	200	41			200	41	200	41		
					205	42			205	42
					225	46.1	225	46.1		
					230	47.1	229	47		
—————	250	51.2			250	51.2	250	51.2		
					300	61.4	300	61.4		
—————	315	64.5			312	64				
			335	68.6	337	69			337	69
—————	400	81.9			439	90			439	90

Remark : *) lb/MSF = pounds/1,000 ft²

Source : 1. Thai Industrial Standards Institute. "Strong or Kraft Paper," (TIS.170-1976), Bangkok, 1976, pp.9-10.
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APPENDIX C.

MANUFACTURING ALLOWANCES OF
CORRUGATED FIBREBOARD BOXES

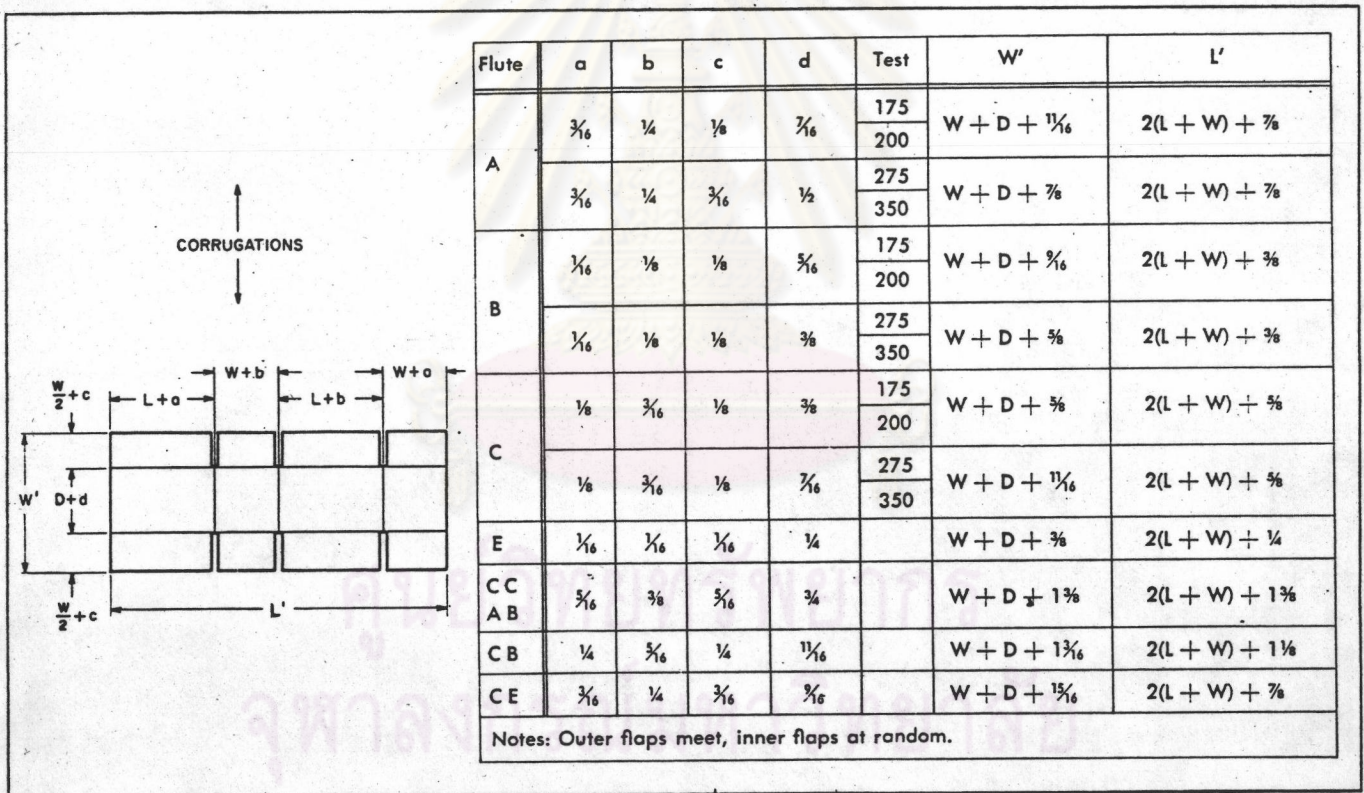
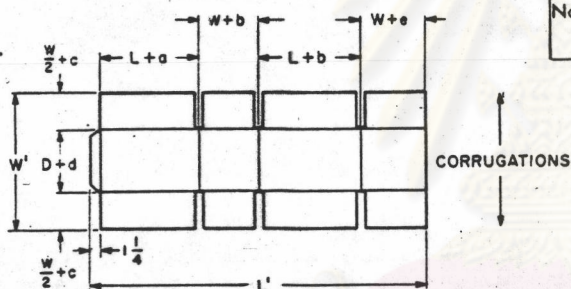


Figure C.1 Regular Slotted Container, Taped

Flute	a	b	c	d	e	Test	W'	L'	
A	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{8}$	175	$W + D + \frac{1}{16}$	$2(L + W) + \frac{1}{16} + S \text{ Lap}$
							200		
	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{8}$	275 350	$W + D + \frac{7}{16}$	$2(L + W) + \frac{1}{16} + S \text{ Lap}$	
B	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{8}$	175	$W + D + \frac{5}{16}$	$2(L + W) + \frac{1}{2} + S \text{ Lap}$
							200		
	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	275 350	$W + D + \frac{3}{8}$	$2(L + W) + \frac{1}{2} + S \text{ Lap}$	
C	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	175	$W + D + \frac{3}{8}$	$2(L + W) + \frac{3}{4} + S \text{ Lap}$
							200		
	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{2}$	275 350	$W + D + \frac{1}{16}$	$2(L + W) + \frac{3}{4} + S \text{ Lap}$	
E	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$		$W + D + \frac{3}{8}$	$2(L + W) + \frac{3}{16} + S \text{ Lap}$	
CC AB	$\frac{3}{16}$	$\frac{3}{8}$	$\frac{3}{16}$	$\frac{3}{4}$	$\frac{1}{4}$		$W + D + 1\frac{3}{16}$	$2(L + W) + 1\frac{1}{16} + S \text{ Lap}$	
CB	$\frac{3}{8}$	$\frac{5}{16}$	$\frac{1}{4}$	$1\frac{1}{16}$	$\frac{3}{16}$		$W + D + 1\frac{3}{16}$	$2(L + W) + 1\frac{1}{16} + S \text{ Lap}$	
CE	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{5}{16}$	$\frac{1}{8}$		$W + D + \frac{1}{16}$	$2(L + W) + \frac{1}{16} + S \text{ Lap}$	

Notes: Outer flaps meet, inner flaps at random. Outside lap.
S Lap—Stitch or glue lap.



Flute	a	b	c	d	e	Test	W'	L'	
A	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{8}$	175	$W - D + \frac{1}{16}$	$2(L + W) + \frac{7}{8} + S \text{ Lap}$
							200		
	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{8}$	275 350	$W - D + \frac{7}{16}$	$2(L + W) + \frac{7}{8} + S \text{ Lap}$	
B	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{16}$	0		175	$W - D + \frac{5}{16}$	$2(L + W) + \frac{3}{8} + S \text{ Lap}$
							200		
	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{8}$	0	275 350	$W - D + \frac{3}{8}$	$2(L + W) + \frac{3}{8} + S \text{ Lap}$	
C	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	175	$W + D + \frac{5}{8}$	$2(L + W) + 1\frac{1}{16} + S \text{ Lap}$
							200		
	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{2}$	275 350	$W + D + \frac{1}{16}$	$2(L + W) + 1\frac{1}{16} + S \text{ Lap}$	
E	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$		$W + D + \frac{3}{8}$	$2(L + W) + \frac{1}{4} + S \text{ Lap}$	
CC AB	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{16}$	$\frac{3}{4}$	$\frac{1}{4}$		$W + D + 1\frac{3}{8}$	$2(L + W) + 1\frac{3}{8} + S \text{ Lap}$	
CB	$\frac{3}{16}$	$\frac{5}{16}$	$\frac{1}{4}$	$1\frac{1}{16}$	$\frac{3}{16}$		$W + D + 1\frac{3}{16}$	$2(L + W) + 1\frac{1}{16} + S \text{ Lap}$	
CE	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{5}{16}$	$\frac{1}{8}$		$W - D + 1\frac{5}{16}$	$2(L + W) + \frac{7}{8} + S \text{ Lap}$	

Notes: Outer flaps meet, inner flaps at random. Inside lap.
S Lap—Stitch or glue lap.

Figure C.2 Regular Slotted Container, Stitched or Glued

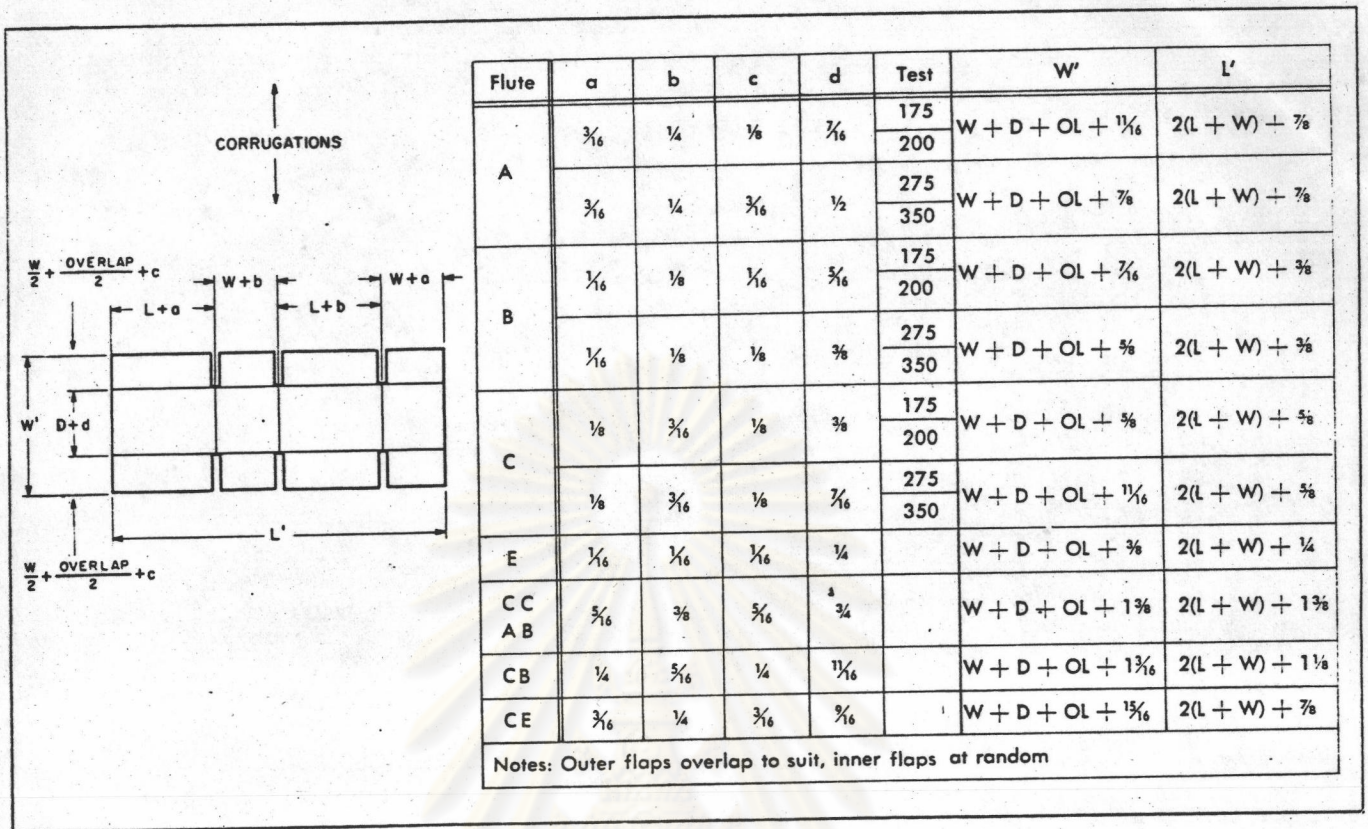


Figure C.3 Partial Overlap Slotted Container, Taped

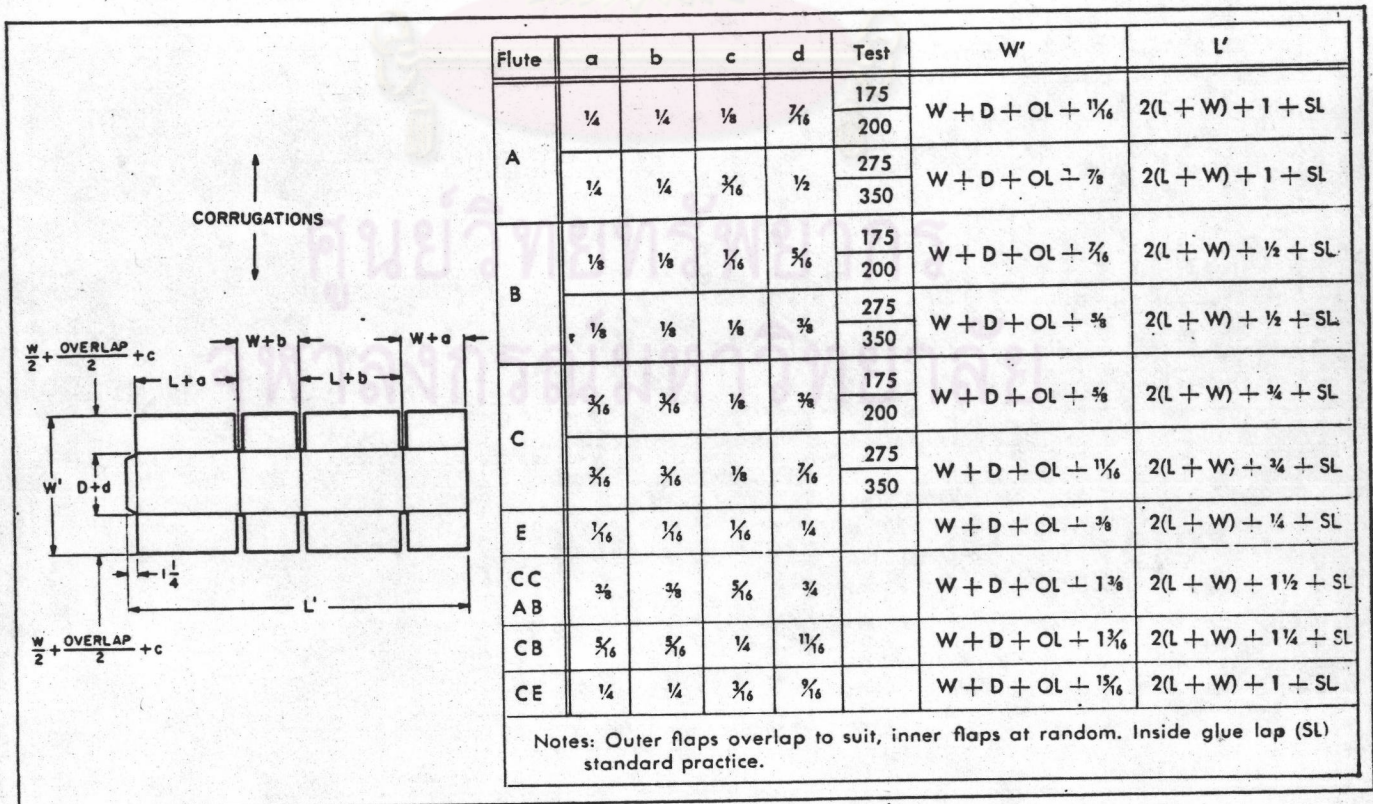
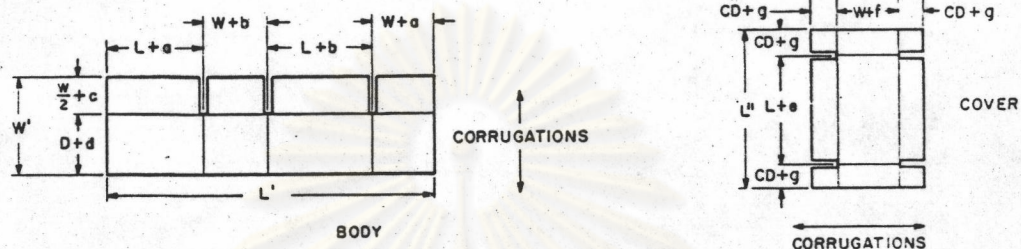


Figure C.4 Partial Overlap Slotted Container, Stitched or Glued



Flute	a	b	c	d	e	f	g	Test	W'	L'	W''	L''
A	3/16	1/4	1/8	3/16	3/8	7/8	1/8	175	$\frac{W}{2} + D + \frac{3}{16}$	$2(L + W) + \frac{7}{8}$	$2CD + W + 1\frac{1}{8}$	$2CD + L + \frac{7}{8}$
								200				
	3/16	1/4	3/16	1/4	3/4	1	1/8	275	$\frac{W}{2} + D + \frac{3}{16}$	$2(L + W) + \frac{7}{8}$	$2CD + W + 1\frac{1}{4}$	$2CD + L + 1$
								350				
B	3/16	1/8	1/8	1/8	3/8	1/2	3/16	175	$\frac{W}{2} + D + \frac{1}{4}$	$2(L + W) + \frac{3}{8}$	$2CD + W + \frac{5}{8}$	$2CD + L + \frac{1}{2}$
								200				
	3/16	1/8	1/8	3/16	3/16	5/8	3/16	275	$\frac{W}{2} + D + \frac{3}{16}$	$2(L + W) + \frac{3}{8}$	$2CD + W + \frac{3}{4}$	$2CD + L + \frac{3}{8}$
								350				
C	1/8	3/16	1/8	3/16	1/2	1 1/16	3/16	175	$\frac{W}{2} + D + \frac{3}{16}$	$2(L + W) + \frac{5}{8}$	$2CD + W + 1\frac{1}{16}$	$2CD + L + \frac{5}{8}$
								200				
	1/8	3/16	1/8	1/4	3/8	1 3/16	1/8	275	$\frac{W}{2} + D + \frac{3}{8}$	$2(L + W) + \frac{5}{8}$	$2CD + W + 1\frac{1}{16}$	$2CD + L + \frac{7}{8}$
								350				
E	3/16	3/16	3/16	1/8	1/8	1/4	3/16		$\frac{W}{2} + D + \frac{3}{16}$	$2(L + W) + \frac{1}{4}$	$2CD + W + \frac{3}{8}$	$2CD + L + \frac{1}{4}$
CC AB	3/16	3/8	3/16	3/8	1 1/8	1 1/2	1/4		$\frac{W}{2} + D + 1\frac{1}{16}$	$2(L + W) + 1\frac{1}{8}$	$2CD + W + 2$	$2CD + L + 1\frac{1}{8}$
CB	1/4	3/16	1/4	3/16	1 1/8	1 1/2	1/4		$\frac{W}{2} + D + \frac{3}{16}$	$2(L + W) + 1\frac{1}{8}$	$2CD + W + 2$	$2CD + L + 1\frac{1}{8}$
CE	3/16	1/4	3/16	1/4					$\frac{W}{2} + D + \frac{3}{16}$	$2(L + W) + \frac{7}{8}$		

Notes: If cover depth, CD, is other than 2 inches make as specified. All flaps are cover stitched or glued inside.

Figure C.5 Half Slotted Container with Cover, Taped

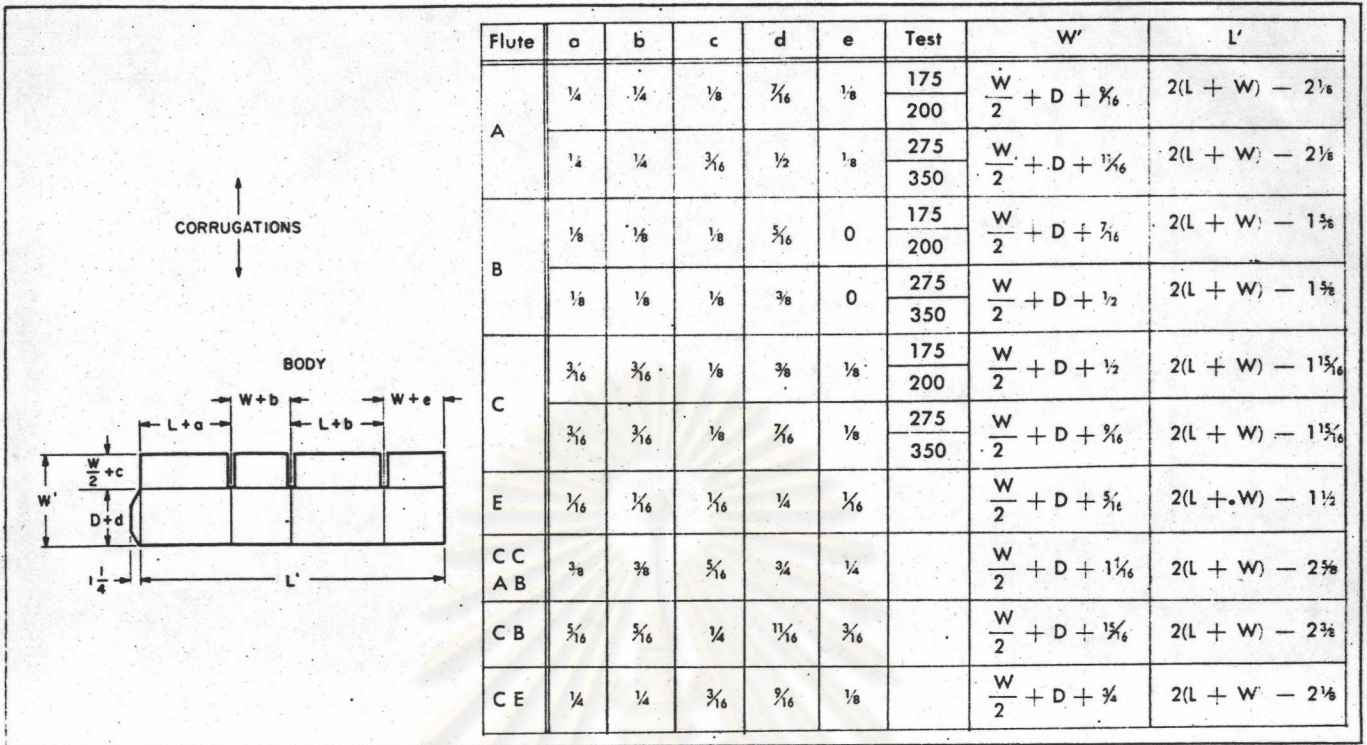


Figure C.6 Half Slotted Container, Stitched or Glued

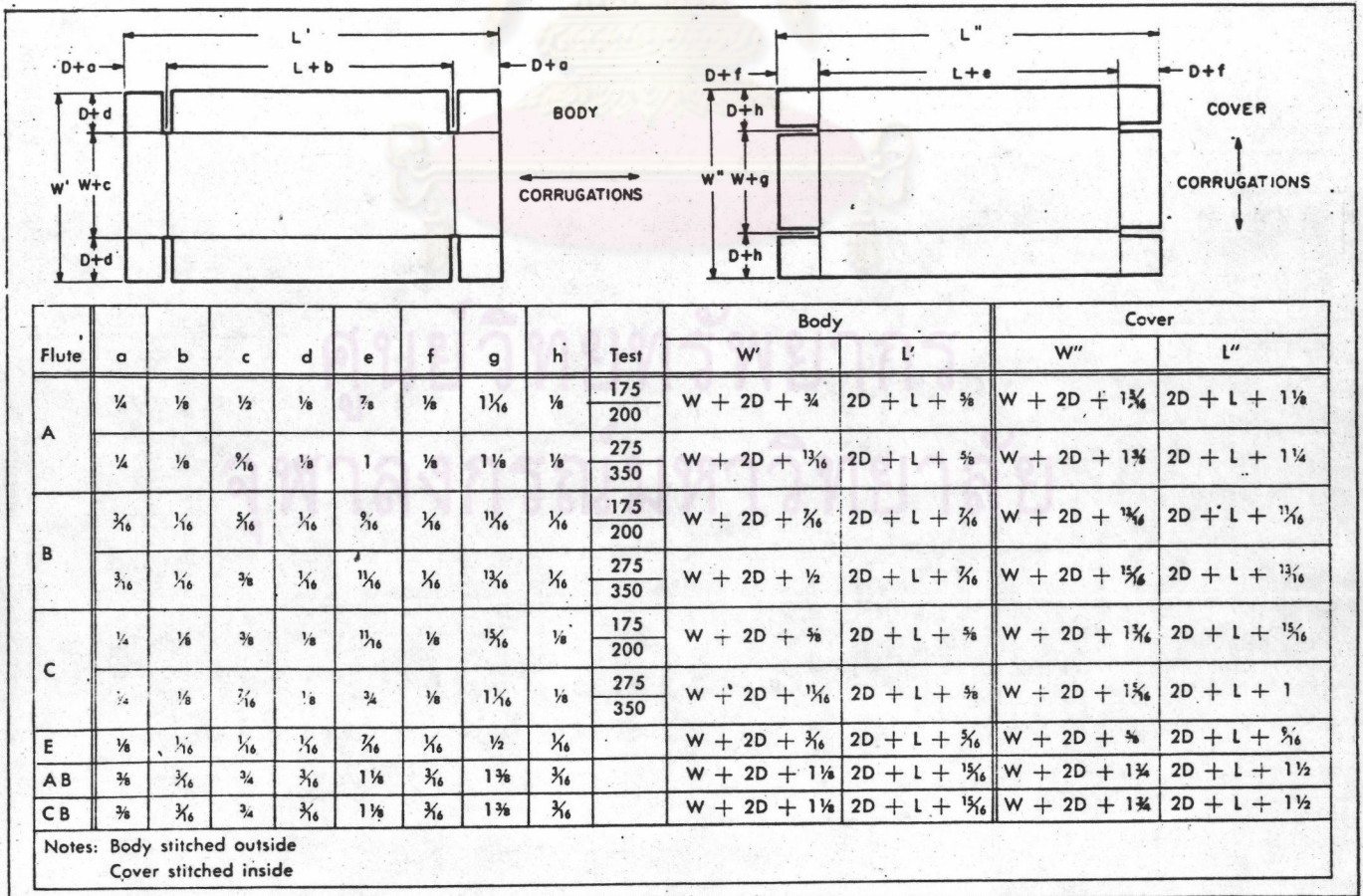


Figure C.7 Two-Piece Telescope Box, Cover End Slotted, Body Side Slotted.

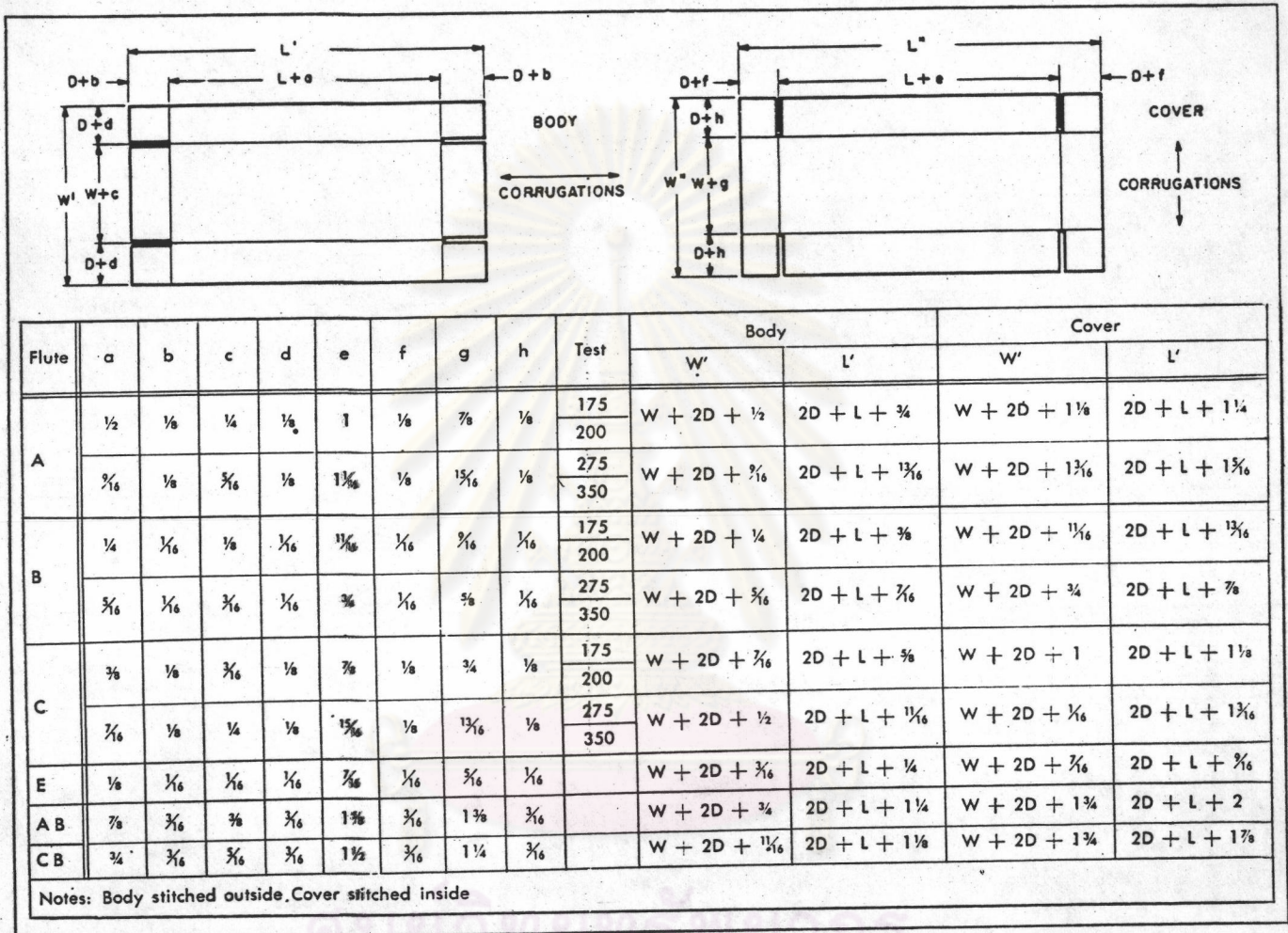


Figure C.8 Two-Piece Telescope Box, Cover Side Slotted, Body End Slotted

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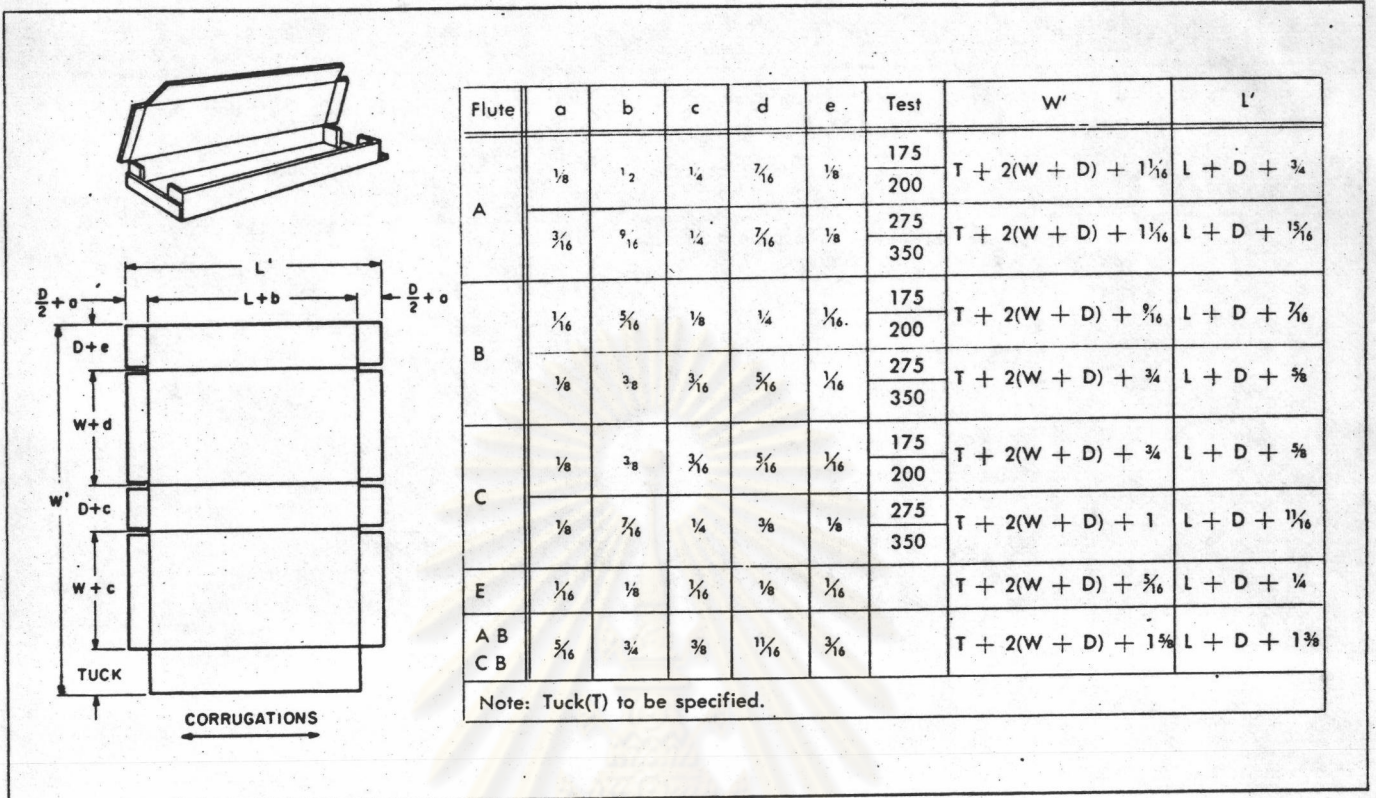


Figure C.9 Five Panel Folder with Regular Slotted Ends

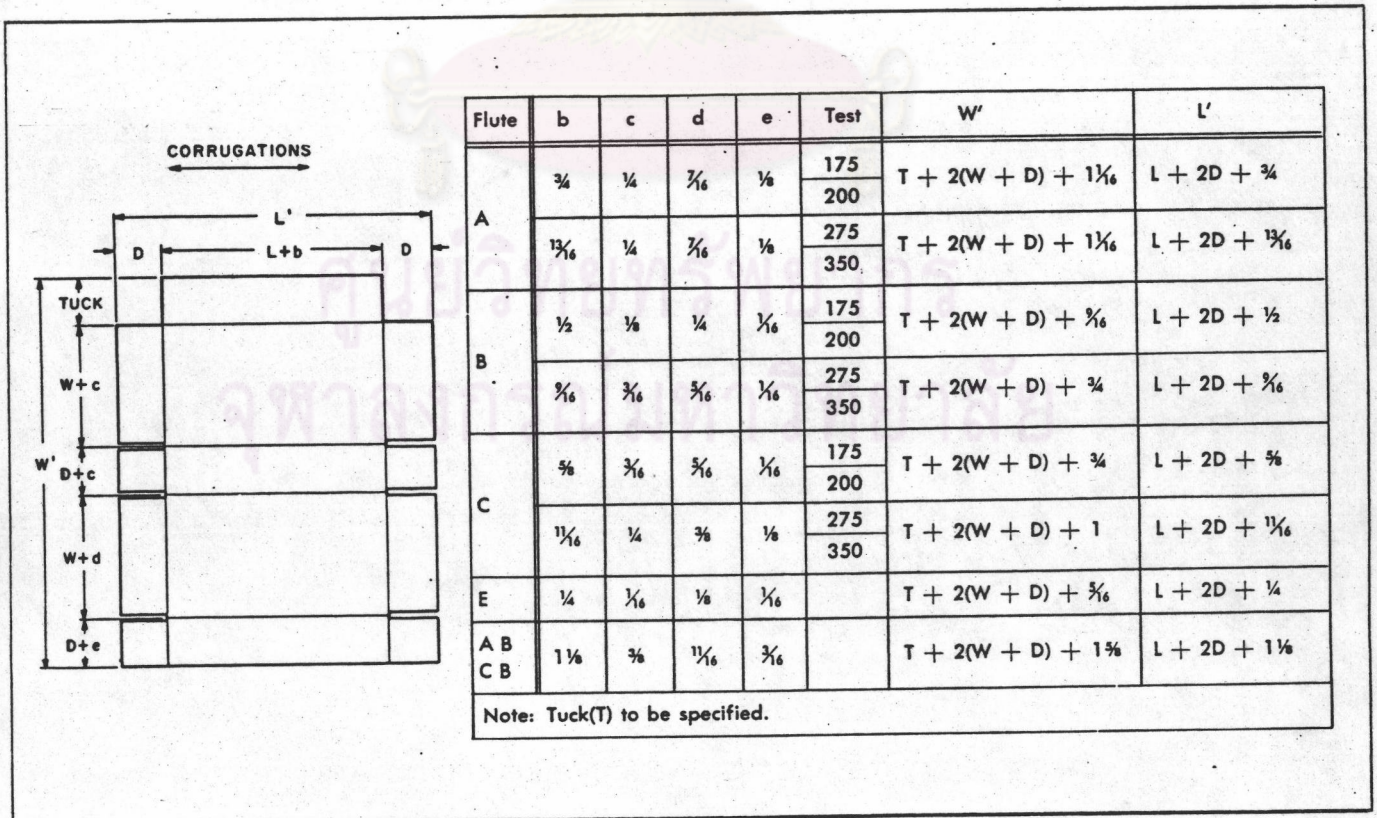
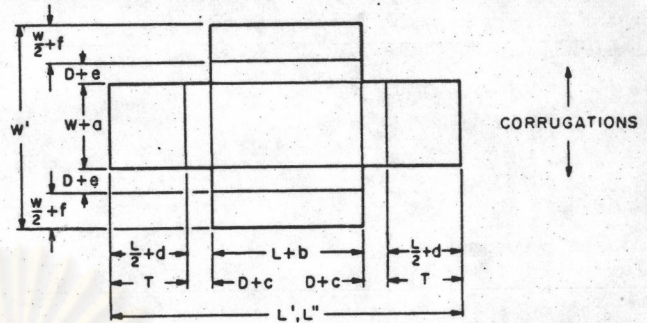
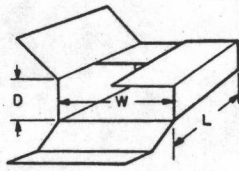


Figure C.10 Five Panel Folder with Full Overlap Ends



Flute	a	b	c	d	e	f	Test	W'	L'	For Tuck* L''
A	1/4	1/4	3/16	1/8	3/16	1/8	175	$2W + 2D + 1\frac{1}{8}$	$2L + 2D + \frac{7}{8}$	$2T + 2D + L + \frac{3}{8}$
	1/4	1/4	1/4	1/8	3/8	1/8	200	$2W + 2D + 1\frac{1}{4}$	$2L + 2D + 1$	$2T + 2D + L + \frac{3}{4}$
	1/2	1/4	1/4	1/8	3/8	1/8	275	$2W + 2D + 1\frac{1}{4}$	$2L + 2D + 1$	$2T + 2D + L + \frac{3}{4}$
	3/5	3/16	3/16	1/8	3/16	1/8	350	$2W + 2D + 1\frac{1}{16}$	$2L + 2D + 1\frac{1}{16}$	$2T + 2D + L + \frac{1}{16}$
B	1/8	1/8	1/8	1/16	3/16	1/16	175	$2W + 2D + \frac{3}{8}$	$2L + 2D + \frac{1}{2}$	$2T + 2D + L + \frac{3}{8}$
	1/8	1/8	1/8	1/16	1/4	1/16	200	$2W + 2D + \frac{3}{4}$	$2L + 2D + \frac{1}{2}$	$2T + 2D + L + \frac{3}{8}$
	3/16	3/16	1/8	1/16	1/4	1/16	275	$2W + 2D + 1\frac{1}{16}$	$2L + 2D + \frac{1}{16}$	$2T + 2D + L + \frac{3}{16}$
	3/16	3/16	3/16	1/16	3/16	1/16	350	$2W + 2D + 1\frac{1}{16}$	$2L + 2D + 1\frac{1}{16}$	$2T + 2D + L + \frac{1}{16}$
C	3/16	3/16	1/8	1/8	1/4	1/8	175	$2W + 2D + 1\frac{1}{16}$	$2L + 2D + 1\frac{1}{16}$	$2T + 2D + L + \frac{3}{16}$
	3/16	3/16	3/16	1/8	3/16	1/8	200	$2W + 2D + 1\frac{1}{16}$	$2L + 2D + 1\frac{1}{16}$	$2T + 2D + L + \frac{1}{16}$
	1/4	1/4	3/16	1/8	3/16	1/8	275	$2W + 2D + 1\frac{1}{8}$	$2L + 2D + \frac{3}{8}$	$2T + 2D + L + \frac{3}{8}$
	1/4	1/4	1/4	1/8	3/8	1/8	350	$2W + 2D + 1\frac{1}{4}$	$2L + 2D + 1$	$2T + 2D + L + \frac{3}{4}$
E	1/16	1/16	1/16	1/16	1/8	1/16		$2W + 2D + \frac{3}{16}$	$2L + 2D + \frac{5}{16}$	$2T + 2D + L + \frac{3}{16}$
AB CB	5/16	5/16	3/16	3/16	9/16	3/16		$2W + 2D + 1\frac{1}{16}$	$2L + 2D + 1\frac{1}{16}$	$2T + 2D + L + \frac{1}{16}$

* Note: When only outer flaps meet across width, inner flaps (tuck) are made 2 inches or to specified length.

Figure C.11 One-Piece Folder

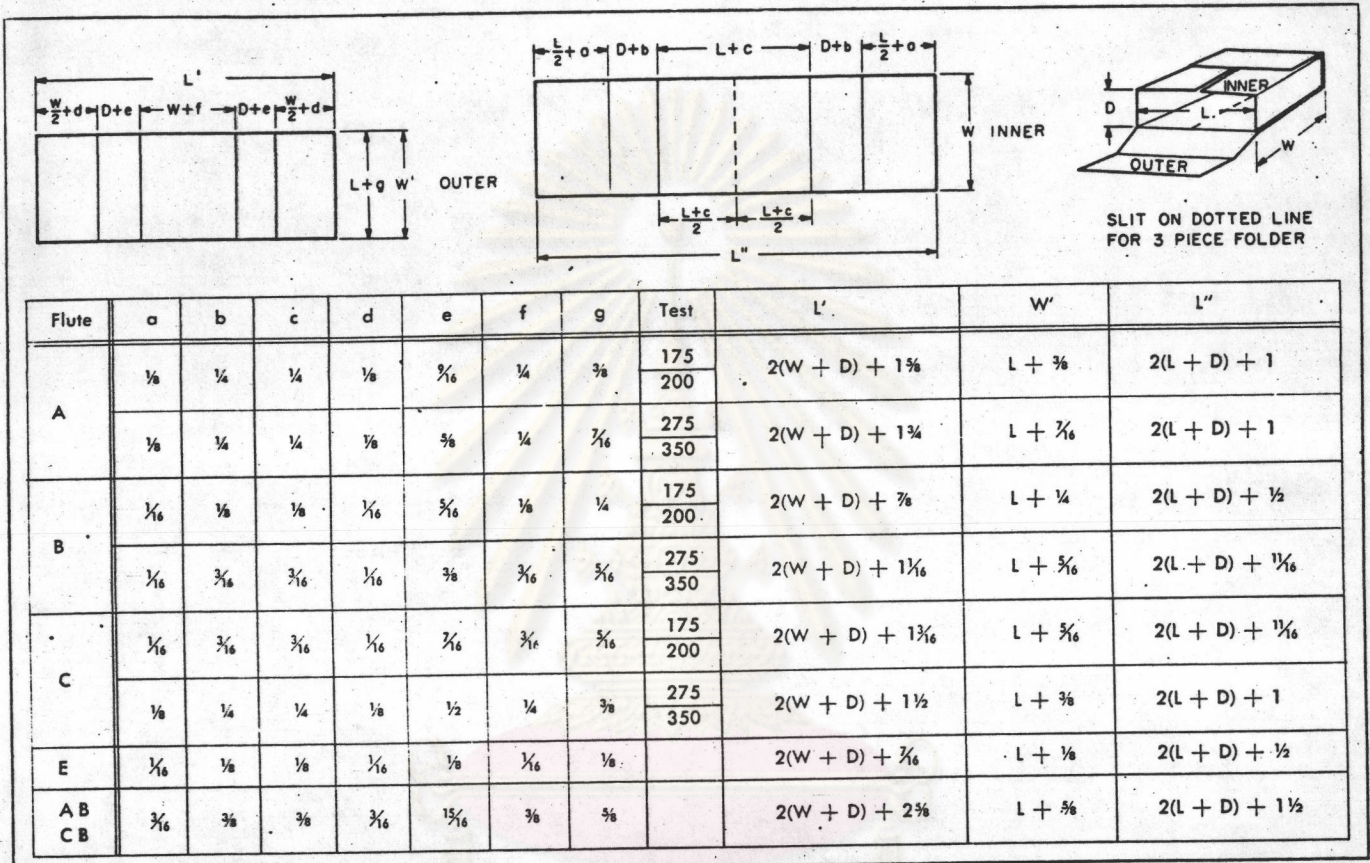


Figure C.12 Two-Piece and Three-Piece Folders

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APPENDIX D.

PROGRAM LIST OF CORRUGATED-BOX DESIGN

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10 REM This program is written in "BASIC" used for solving d
    imensions of corrugated fibreboard box, configuration of pr
    oduct inside the box, minimum-area of corrugated board requ
    ired, ect.
12 REM Please use "METRIC UNITS" (gramme for weight & centi
    metre for dimensions) or "BRITISH UNITS" (pound for weight
    & inch for dimensions)
14 REM This program is submitted in partial fulfillment of
    the requirements for the degree of master of engineering de
    partment of industrial engineering, 1984.
15 REM
16 REM *****

35 HOME
36 DIM AR(300),II(300),JJ(300),KK(300),V3(300),V4(300),GW(300)
    ,L(300),W(300),D(300),LB(300),WB(300)
37 S = 1
40 AO = 1E10
45 SPEED= 80
50 PRINT "THE OPTIMAL DESIGN OF CORRUGATED BOX"
60 PRINT "-----"
70 PRINT "          BY MR.LERTCHAI RATANA-ARFORN"
80 HOME
85 SPEED= 255
86 PRINT
87 PRINT
90 PRINT "DO YOU HAVE THE FOLLOWING DATA ON HAND? : "
100 PRINT "          -DIMENSIONS OF THE PRODUCT."
110 PRINT "          -UNIT WEIGHT OF THE PRODUCT."
120 PRINT "          -TOTAL UNITS OF PRODUCT CONTAINED IN EACH BOX
    THAT YOU REQUIRE."
130 INPUT "ARE YOU READY? :YES(Y) OR NO(N): ";R$
135 PRINT
136 PRINT
140 IF R$ = "Y" THEN 180
150 IF R$ = "N" THEN 160
160 PRINT "PLEASE PREPAIR YOUR INFORMATION ALREADY BEFORE RUNN
    ING THE PROGRAM."
170 GOTO 810
180 INPUT "WHAT TYPE OF YOUR PRODUCT:--CYLINDRICAL TYPE(1) OR C
    UBC TYPE(2) OR OTHERS TYPE(3);--SELECT THE NUMERIC IN THE B
    LANKET: ";A
185 PRINT
190 ON A GOTO 220,1440,1580
220 INPUT "WHAT TYPE OF UNITS USED IN THE SYSTEM:SI UNITS(METR
    IC UNITS)--GRAMME FOR WEIGHT,CENTIMETRE FOR DIMENSIONS(1) OR
    PFS UNITS(BRITISH UNITS)--POUND FOR WEIGHT,INCH FOR DIMENSI
    ONS(2):--SELECT THE NUMERIC IN THE BLANKET: ";B
225 PRINT
226 PRINT

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230 ON B GOTO 250,310
250 INPUT "WHAT IS THE QUANTITY OF PRODUCTS CONTAINED IN A BOX
: ";N
260 INPUT "GROSS WEIGHT(IN GRAMME) OF PRODUCT PER UNIT: ";LW
270 INPUT "DIAMETER(IN CENTIMETRE) OF THE CYLINDER: ";DI
280 INPUT "DEPTH(IN CENTIMETRE) OF THE CYLINDER: ";DE
290 IF LW * N > 25000 OR DI > 30 OR N > 20 OR DE > 30 THEN HOME
: PRINT "THERE ARE MORE FACTORS THAT HAVE TO BE STUDIED FO
R YOUR PRODUCT BEFORE THE DESIGN IS BEGUN.": GOTO 630
300 GOTO 370
310 INPUT "WHAT IS THE QUANTITY OF PRODUCT CONTAINED IN A BOX
THAT YOU REQUIRE: ";N
320 INPUT "GROSS WEIGHT(IN POUND) OF PRODUCT PER UNIT: ";LW
330 INPUT "DIAMETER(IN INCH) OF THE CYLINDER: ";DI
340 INPUT "DEPTH(IN INCH) OF THE CYLINDER: ";DE
350 IF LW * N > 60 OR DI > 12 OR N > 20 OR DE > 12 THEN HOME
: PRINT "THERE ARE MORE FACTORS THAT HAVE TO BE STUDIED FOR
YOUR PRODUCT BEFORE THE DESIGN IS BEGUN.": GOTO 630
360 REM Calculate the unit volume of each product
370 V1 = 0.7854 * DI ^ 2 * DE
375 PRINT
376 PRINT
395 PRINT "*****
*****"
410 PRINT "YOU CAN SELECT THE OPTIMAL BOX THAT YOU REQUIRE FRO
M THE FOLLOWING CASES:"
415 PRINT "*****
*****"
420 PRINT
430 PRINT
440 PRINT
450 FOR I = 1 TO N: FOR J = 1 TO N: FOR K = 1 TO N
480 IF I * J * K = N AND A = 1 THEN II(S) = I:JJ(S) = J:KK(S) =
K: GOSUB 830
490 IF I * J * K = N AND A = 2 THEN II(S) = I:JJ(S) = J:KK(S) =
K: GOSUB 850
500 IF I * J * K = N AND A = 3 THEN II(S) = I:JJ(S) = J:KK(S) =
K: GOSUB 870
510 NEXT : NEXT : NEXT
514 GOTO 1304
515 PRINT
516 PRINT
517 PRINT "*****
*****"
518 PRINT
520 PRINT
530 ON B GOTO 540,600
540 PRINT " THE MINIMUM-AREA OF CORRUGATED BOARD IS: ";AO
;" sq.cm."
550 GOTO 610
600 PRINT " THE MINIMUM-AREA OF CORRUGATED BOARD IS: ";AO
;" sq.in."
610 PRINT " TYPE OF BOX:- RSC"
620 PRINT " TYPE OF CORRUGATED BOARD:-SINGAL WALL"
630 PRINT

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640 PRINT "*****"
*****"
650 PRINT
670 INPUT "DO YOU NEED ANY MORE INFORMATION? :-YES(Y) OR NO(N)
: ";M$
675 PRINT
676 PRINT "*****"
*****"
677 PRINT
680 IF M$ = "Y" THEN 710
690 IF M$ = "N" THEN PRINT "HOPING THAT THIS PROGRAM CAN HELP
YOU AND YOU WILL COMEBACK FOR MY SERVICE AGAIN.....BYE-BYE
:"
700 GOTO 810
710 PRINT "IF YOU NEED SOME MORE INFORMATION ABOUT THE OPTIMA
L DESIGN OF CORRUGATED BOX,SUCH AS: "
720 PRINT " -STRENGTH OF BOX."
730 PRINT " -THE OPTIMAL TYPE OF CORRUGATED BOARD."
740 PRINT " -HOW TO SELECT THE OPTIMAL BOX FOR YOUR JO
B?"
750 PRINT " -ETC."
752 PRINT
754 PRINT "*****"
****"
755 PRINT
756 PRINT "PLEASE CALL FOR....."
760 PRINT
765 PRINT " MR.LERTCHAI RATANA-ARPNORN,B.ENG.,M.ENG."
770 PRINT " TEL.2817997-9 EXT.42"
780 PRINT " 2456167 "
790 PRINT " 8:00A.M.-6:00P.M."
800 PRINT " HOME : 211-7385"
805 PRINT
806 PRINT "YOU ARE WELCOME."
807 PRINT
808 PRINT "*****"
****"
810 END
820 REM Calculate the total-volume of corrugated board requ
ire: (V3)
830 V3(S) = (I * J * K) * (DI ^ 2 * DE)
840 GOTO 880
850 V3(S) = (I * J * K) * (ES ^ 3)
860 GOTO 880
870 V3(S) = (I * J * K) * (LE * WI * DE)
880 V4(S) = V3(S) - V1 * N
890 REM Calculate the gross weight of total products in a bo
x (GW)
900 GW(S) = UW * (I * J * K)
910 REM Calculate the dimensions of box
920 IF A = 1 AND B = 1 THEN 980
930 IF A = 1 AND B = 2 THEN 1040
940 IF A = 2 AND B = 1 THEN 1090
950 IF A = 2 AND B = 2 THEN 1140
960 IF A = 3 AND B = 1 THEN 1190
970 IF A = 3 AND B = 2 THEN 1250
980 L(S) = I * DI
990 W(S) = J * DI
1000 D(S) = K * DE

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1001 REM Calculate the total area of corrugated board includ
      ing scoring allowances & manufacturer's joint required.
1010 LB(S) = 2 * (I * DI + J * DI) + 4.152
1015 WB(S) = 2 * DI + K * DE + 1.429
1020 AR(S) = LB(S) * WB(S)
1030 GOTO 1300
1040 L(S) = I * DI
1050 W(S) = J * DI
1060 D(S) = K * DE
1065 LB(S) = 2 * (I * DI + J * DI) + 1.885
1066 WB(S) = J * DI + K * DE + 0.562
1070 AR(S) = LB(S) * WB(S)
1080 GOTO 1300
1090 L(S) = I * ES
1100 W(S) = J * ES
1110 D(S) = K * ES
1120 LB(S) = 2 * (I * ES + J * ES) + 4.152
1125 WB(S) = J * ES + K * ES + 1.587
1126 AR(S) = LB(S) * WB(S)
1130 GOTO 1300
1140 L(S) = I * ES
1150 W(S) = J * ES
1160 D(S) = K * ES
1165 LB(S) = 2 * (I * ES + J * ES) + 1.885
1166 WB(S) = J * ES + K * ES + 0.562
1170 AR(S) = LB(S) * WB(S)
1180 GOTO 1300
1190 L(S) = I * LE
1200 W(S) = J * WI
1210 D(S) = K * DE
1220 LB(S) = 2 * (I * LE + J * WI) + 4.152
1225 WB(S) = J * WI + K * DE + 1.429
1230 AR(S) = LB(S) * WB(S)
1240 GOTO 1300
1250 L(S) = I * LE
1260 W(S) = J * WI
1270 D(S) = K * DE
1275 LB(S) = 2 * (I * LE + J * WI) + 1.885
1276 WB(S) = J * WI + K * DE + 0.562
1280 AR(S) = LB(S) * WB(S)
1300 S = S + 1
1301 GOTO 1430
1304 ON B GOTO 1305,2000
1305 FOR P = 1 TO S - 1
1306 PRINT "VOLUMES OF EACH PRODUCT:";V1;" cu.cm."
1310 PRINT "TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: ";V3(
      P);" cu.cm."
1320 PRINT "TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: ";V4(P
      );" cu.cm."
1330 PRINT "UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE B
      OX: ";II(P)
1340 PRINT "UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BO
      X: ";JJ(P)
1350 PRINT "UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BO
      X: ";KK(P)
1355 PRINT "GROSS WEIGHT OF PRODUCTS PER BOX: ";GW(P);" gm."
1360 PRINT "TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: ";
      AR(P);" sq.cm."

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1365 PRINT "THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE &
      MANUFACTURER'S JOINT: "
1366 PRINT "      LENGTH: ";LB(P);" cm."
1367 PRINT "      WIDTH: ";WB(P);" cm."
1370 PRINT "THE INSIDE DIMENSIONS OF BOX:"
1380 PRINT "      LENGTH: ";L(P);" cm."
1390 PRINT "      WIDTH: ";W(P);" cm."
1400 PRINT "      DEPTH: ";D(P);" cm."
1410 PRINT
1415 PRINT
1416 NEXT
1420 FOR M = 1 TO S - 1
1422 IF AR(M) < AD THEN AD = AR(M)
1425 NEXT
1426 GOTO 515
1430 RETURN
1440 INPUT "WHAT TYPE OF UNITS USED IN THE SYSTEM: SI UNITS(ME
      TRIC UNITS)-GRAMME FOR WEIGHT, CENTIMETRE FOR DIMENSIONS(1)
      OR PFS UNITS(BRITISH UNITS)-POUND FOR WEIGHT, INCH FOR DIM
      ENSIONS(2):SELECT THE NUMERIC IN THE BLANKET: ";B
1445 PRINT
1446 PRINT
1450 ON B GOTO 1470,1520
1470 INPUT "WHAT IS THE QUANTITY OF PRODUCTS CONTAINED IN A BO
      X: ";N
1480 INPUT "GROSS WEIGHT(IN GRAMME) OF PRODUCT PER UNIT: ";UW
1490 INPUT "DIMENSIONS(IN CENTIMETRE) OF THE CUBIC-TYPE FOR EA
      CH SIDE : ";ES
1500 IF UW * N > 25000 OR ES > 30 OR N > 20 THEN HOME : PRINT
      "THERE ARE MORE FACTORS THAT HAVE TO BE STUDIED FOR YOUR PR
      ODUCT BEFORE THE DESIGN IS BEGUN.": GOTO 630
1510 GOTO 1560
1520 INPUT "WHAT IS THE QUANTITY OF PRODUCTS CONTAINED IN A BO
      X: ";N
1530 INPUT "GROSS WEIGHT(IN POUND) OF PRODUCT PER UNIT: ";UW
1540 INPUT "DIMENSIONS(IN INCH) OF THE CUBIC-TYPE FOR EACH SID
      E : ";ES
1550 IF UW * N > 60 OR ES > 12 OR N > 20 THEN HOME : PRINT "T
      HERE ARE MORE FACTORS THAT HAVE TO BE STUDIED FOR YOUR PROD
      UCT BEFORE THE DESIGN IS BEGUN.": GOTO 630
1560 V1 = ES ^ 3
1570 GOTO 375
1580 INPUT "WHAT TYPE OF UNITS USED IN THE SYSTEM: SI UNITS(ME
      TRIC UNITS)-GRAMME FOR WEIGHT, CENTIMETRE FOR DIMENSIONS(1)
      OR PFS UNITS(BRITISH UNITS)-POUND FOR WEIGHT, INCH FOR DIM
      ENSIONS(2):SELECT THE NUMERIC IN THE BLANKET: ";B
1585 PRINT
1586 PRINT
1590 ON B GOTO 1610,1680
1610 INPUT "WHAT IS THE QUANTITY OF PRODUCTS CONTAINED IN A BO
      X: ";N
1620 INPUT "GROSS WEIGHT(IN GRAMME) OF PRODUCT PER UNIT: ";UW

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1630 INPUT "THE LENGTH(IN CENTIMETRE) OF PRODUCT: ";LE
1640 INPUT "THE WIDTH(IN CENTIMETRE) OF PRODUCT: ";WI
1650 INPUT "THE DEPTH(IN CENTIMETRE) OF PRODUCT: ";DE
1660 IF UW * N > 25000 OR LE > 30 OR WI > 30 OR DE > 30 OR N >
    20 THEN HOME : PRINT "THERE ARE MORE FACTORS THAT HAVE TO
    BE STUDIED FOR YOUR PRODUCT BEFORE THE DESIGN IS BEGUN.": GOTO
    630
1670 GOTO 1740
1680 INPUT "WHAT IS THE QUANTITY OF PRODUCTS CONTAINED IN A BO
    X THAT YOU REQUIRE: ";N
1690 INPUT "GROSS WEIGHT(IN POUND) OF PRODUCT PER UNIT: ";UW
1700 INPUT "THE LENGTH(IN INCH) OF PRODUCT: ";LE
1710 INPUT "THE WIDTH(IN INCH) OF PRODUCT: ";WI
1720 INPUT "THE DEPTH(IN INCH) OF PRODUCT: ";DE
1730 IF UW * N > 60 OR LE > 12 OR WI > 12 OR DE > 12 OR N > 20
    THEN HOME : PRINT "THERE ARE MORE FACTORS THAT HAVE TO BE
    STUDIED FOR YOUR PRODUCT BEFORE THE DESIGN IS BEGUN.": GOTO
    630
1740 V1 = LE * WI * DE
1750 GOTO 375
2000 FOR P = 1 TO S - 1
2010 PRINT "VOLUMES OF EACH PRODUCT : ";V1;" cu.in."
2015 PRINT "TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: ";V3(
    P);" cu.in."
2020 PRINT "TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: ";V4(P
    );" cu.in."
2030 PRINT "UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE B
    OX: ";II(P)
2040 PRINT "UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BO
    X: ";JJ(P)
2050 PRINT "UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BO
    X: ";KK(P)
2055 PRINT "GROSS WEIGHT OF PRODUCTS PER BOX: ";GW(P);" lb."
2060 PRINT "TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: ";
    AR(P);" sq.in."
2070 PRINT "THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE &
    MANUFACTURER'S JOINT: "
2080 PRINT "          LENGTH: ";LB(P);" in."
2090 PRINT "          WIDTH: ";WB(P);" in."
2100 PRINT "THE INSIDE DIMENSIONS OF BOX:"
2110 PRINT "          LENGTH: ";L(P);" in."
2120 PRINT "          WIDTH: ";W(P);" in."
2130 PRINT "          DEPTH: ";D(P);" in."
2140 PRINT
2150 PRINT
2160 NEXT
2170 FOR M = 1 TO S - 1
2180 IF AR(M) < AO THEN AO = AR(M)
2200 NEXT
2222 GOTO 515

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OUTPUT



WHAT IS THE QUANTITY OF PRODUCTS CONTAINED IN A BOX: 12
 GROSS WEIGHT (IN GRAMME) OF PRODUCT PER UNIT: 416.67
 THE LENGTH (IN CENTIMETRE) OF PRODUCT: 30
 THE WIDTH (IN CENTIMETRE) OF PRODUCT: 15
 THE DEPTH (IN CENTIMETRE) OF PRODUCT: 20

 YOU CAN SELECT THE OPTIMAL BOX THAT YOU REQUIRE FROM THE FOLLOWING CASES:

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 12
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 24143.3032 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 94.152 cm.
 WIDTH: 256.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 30 cm.
 WIDTH: 15 cm.
 DEPTH: 240 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 2
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 6
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 18800.2132 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 124.152 cm.
 WIDTH: 151.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 30 cm.
 WIDTH: 30 cm.
 DEPTH: 120 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 3
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 4
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 19489.2832 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 154.152 cm.
 WIDTH: 126.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 30 cm.
 WIDTH: 45 cm.
 DEPTH: 80 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 4
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 3
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 22361.3932 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 184.152 cm.
 WIDTH: 121.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 30 cm.
 WIDTH: 60 cm.
 DEPTH: 60 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 6
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 2
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 32088.6532 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 244.152 cm.
 WIDTH: 131.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 30 cm.
 WIDTH: 90 cm.
 DEPTH: 40 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 12
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 1
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 85436.5132 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 424.152 cm.
 WIDTH: 201.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 30 cm.
 WIDTH: 180 cm.
 DEPTH: 20 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 2
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 6
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 21030.8032 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 154.152 cm.
 WIDTH: 136.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 60 cm.
 WIDTH: 15 cm.
 DEPTH: 120 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 2
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 2
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 3
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 16836.8332 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 184.152 cm.
 WIDTH: 91.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 60 cm.
 WIDTH: 30 cm.
 DEPTH: 60 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 2
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 3
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 2
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 18508.9432 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 214.152 cm.
 WIDTH: 86.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 60 cm.
 WIDTH: 45 cm.
 DEPTH: 40 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 2
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 6
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 1
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 33891.3532 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 304.152 cm.
 WIDTH: 111.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 60 cm.
 WIDTH: 90 cm.
 DEPTH: 20 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 3
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 4
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 20650.4632 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 214.152 cm.
 WIDTH: 96.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 90 cm.
 WIDTH: 15 cm.
 DEPTH: 80 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 3
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 2
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 2
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 17439.5332 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 244.152 cm.
 WIDTH: 71.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 90 cm.
 WIDTH: 30 cm.
 DEPTH: 40 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 3
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 4
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 1
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 24766.7932 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 304.152 cm.
 WIDTH: 81.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 90 cm.
 WIDTH: 60 cm.
 DEPTH: 20 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 4
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 3
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 20953.1632 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 274.152 cm.
 WIDTH: 76.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 120 cm.
 WIDTH: 15 cm.
 DEPTH: 60 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 4
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 3
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 1
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 22197.3832 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 334.152 cm.
 WIDTH: 66.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 120 cm.
 WIDTH: 45 cm.
 DEPTH: 20 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 6
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 2
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 22241.6032 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 394.152 cm.
 WIDTH: 56.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 180 cm.
 WIDTH: 15 cm.
 DEPTH: 40 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 6
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 2
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 1
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 21813.7132 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 424.152 cm.
 WIDTH: 51.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 180 cm.
 WIDTH: 30 cm.
 DEPTH: 20 cm.

VOLUMES OF EACH PRODUCT: 9000 cu.cm.
 TOTAL VOLUMES OF CORRUGATED BOARD REQUIRED: 108000 cu.cm.
 TOTAL SPACE OF LOSS-VOLUME INSIDE THE BOX: 0 cu.cm.
 UNITS OF PRODUCTS IN THE LENGTH-DIRECTION OF THE BOX: 12
 UNITS OF PRODUCTS IN THE WIDTH-DIRECTION OF THE BOX: 1
 UNITS OF PRODUCTS IN THE DEPTH-DIRECTION OF THE BOX: 1
 GROSS WEIGHT OF PRODUCTS PER BOX: 5000.04 gm.
 TOTAL AREAS OF CORRUGATED BOARD FOR THIS CASE: 27473.0032 sq.cm.
 THE DIMENSIONS OF THE BLANK INCLUDING ALLOWANCE & MANUFACTURER'S JOINT:
 LENGTH: 754.152 cm.
 WIDTH: 36.429 cm.
 THE INSIDE DIMENSIONS OF BOX:
 LENGTH: 360 cm.
 WIDTH: 15 cm.
 DEPTH: 20 cm.

THE MINIMUM-AREA OF CORRUGATED BOARD IS: 16836.8332 sq.cm.
 TYPE OF BOX:- RSC
 TYPE OF CORRUGATED BOARD:-SINGAL WALL

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BIO-DATA

Mr. Lertchai Ratana-arporn graduated with a Bachelor's Degree in Industrial Engineering, for the academic year 1980, from the Faculty of Engineering, Chulalongkorn University. He entered the Graduate School, Chulalongkorn University in 1982 to further his study for the Degree of Master of Engineering.

He is currently a government officer of the Thai Industrial Standards Institute, Ministry of Industry.



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