MILITARY HANDBOOK

PACKAGE CUSHIONING DESIGN

TO ALL HOLDERS OF MIL-HDBK-304B:

1. THE FOLLOWING REVISED PAGES OF MIL-HDBK-304B SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
73	28 Nov 1988	73	31 October 1978
74	28 Nov 1988	74	31 October 1978
74a	28 Nov 1988		
75	28 Nov 1988	75	31 October 1978
76	28 Nov 1988	76	31 October 1978
77	28 Nov 1988	77	31 October 1979
78	28 Nov 1988	78	31 October 1978
78a	28 Nov 1988		
78b	28 Nov 1988		
79	28 Nov 1988	79	31 October 1978
79a	28 Nov 1988		
79b	28 Nov 1988		
80	28 Nov 1988	80	31 October 1978
80a	28 Nov 1988		
80b	28 Nov 1988		
81	28 Nov 1988	81	31 October 1978
82	28 Nov 1988	82	31 October 1978
82a	28 Nov 1988		
178a	28 Nov 1988		

NO DELIVERABLE DATA REQUIRED BY THIS DOCUMENT

AREA PACK

2. HOLDERS OF THIS HANDBOOK MAKE THE FOLLOWING PEN AND INK CHANGES.

TITLE PAGE

Delete "MILITARY STANDARDIZATION HANDBOOK " and substitute "MILITARY HANDBOOK"

PAGE ii

3, lines 3 and 4. Delete "Air Force Packaging Evaluation Agency (AFALD/PTPT), Wright-Patterson AFB OH 45433" and substitute "Air Force Packaging Evaluation Activity (AFPEA), HQ AFLC/DSTZ, Wright-Patterson AFB OH 45433-5999."

PAGE 1

Chapter 1, line 27. Delete "Agency" and substitute "Activity (AFPEA)."

PAGE 9

2.1.1.1, line 14. Delete "MIL-STD-794" and substitute MIL-STD-2073.

2.1.1.1, line 14. Delete MIL-E-5272

PAGE 14

2.1.2.2, line 13. Delete "envelop" and substitute '*envelope"

PAGE 72

3.3.2, line 5. Delete "10" and substitute "4".

3.3.2, line 10. Delete "17-1/4 x 9 x 9" and substitute "20-1/4 x 11 x 11."

PAGE 102

Footnote, line 3. Delete "Air Force Packaging Evaluation Agency (PTPT), Wright-Patterson AFB OH 45433" and substitute "Air Force Packaging Evaluation Activity (AFPEA), HQ AFLC/DSTZ, Wright-Patterson AFB, OH 45433-5999."

PAGE 134

6.1.2.6.3, line 6. Delete "3 ± 3/8 inches" and substitute "3 ± 3/8 in^2."

PAGE 136

6.1.2.7.3, line 11. Delete "hold" and substitute "hole".

PAGE 218

Appendix V, Graph 1.24. Add "Conforms to MIL-P-26514, Types I and III, Class 2, Grade A".

PAGE 221

Appendix V, Graph 2.24. Add "Conforms to MIL-P-26514, Types I and III, Class 2, Grade A".

PAGE 225

Appendix V, Graph 3.24. Add "Conforms to MIL-P-26514, Types I and III, Class 2, Grade B".

PAGE 232

Appendix V, Graph 5.24. Add "Conforms to MIL-P-26514, Types I and III, Class 2, Grade C".

PAGE 235

Appendix V, Graph 6.24. Add "Conforms to MIL-P-26514, Types I and III, Class 2, Grade C".

3. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

4. Holders of MIL-HDBK-304B will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with the appended pages, is a separate publication. Each notice is to be retained by stocking points until the Military Handbook is completely revised or cancelled.

Custodians
Army - AR
Navy - AS
Air Force - 69

Review activities
Army - AT, SM, GL, CR
Navy - SH, SA
Air Force - 11, 99

User activities
Army - ME
Navy - MC, YD
Air Force - 10

Preparing activity
Air Force - 69

(Project PACK-0837)

For the 8 x 4-inch faces* Material No.	Thickness	For the 4 x 4-inch faces* Material No.	Thickness
1	1-1/2	1	2
2	1-1/2	2	2
3	1-1/2	3	2
4	2-1/2	4	2-1/2
5	2	5	2
6	2	6	2
7	3-1/2	7	5-1/2
8	2	8	3
9	2	9	3
16	2	16	4
17	2	17	3
18	2	18	4
19	3	19	3
20	2	20	2-1/2
21	3	21	3
22	4-1/2	22	4

*Decode by reference to 3.2.1.2.1.1.

Since the shape of the item is fairly complex, it will probably be easiest to consider wrap-type materials (in ply thicknesses of 1/2 inch or less) because no interior container or blocking and bracing will be required. This limitation eliminates materials 7, 8, and 9. The polyurethanes (1 through 6) are also not considered because, in this case, only two and three-inch thicknesses are stocked by the packaging activity. These thicknesses are too thick to bend easily around the protrusions on the item. Cost analysis shows flexible cellular plastic film (#20) to be most economical.

Step (3). The resulting container dimensions (with 3-1/2 inches cushioning on all faces--3 inches for cushioning, 1/2 inch for creep) are 14 x 10 x 10. The container dimensions are not increased to allow for the extra material added because of creep.

Step (4). Instrumented drop tests of the packaged item show 61G for the required 42 inch flat drop; therefore, the material selected will adequately protect the item.

3.4 CUSHION DESIGN BY COMPUTER.

3.4.1 AFPEA Package Cushioning Design Program. The design procedures outlined in preceding sections of this chapter are, of necessity, detailed and often tedious. If all design possibilities are fully considered, including the many cushion materials, application techniques, container styles and materials, and comparative labor and transportation costs, the design procedure becomes very time-consuming. In fact, if this process is carried to the extreme of finding the absolute optimum design, the expense of the packaging engineer's labor may become a significant percentage of total package costs.

A simplified means for these calculations is available through computer technology. AFPEA has available a computer program which considers all of the parameters above and finds the most economical package cushioning design. This program is available in two forms, either on magnetic tape for use on main frame computers or floppy disk for use on PC compatible personal computers. Generally, the heavier the package (both cushion weight and container weight) the greater the transportation cost. This cost also increases with distances, such that an optimum design will show greater savings the farther it is shipped.

3.4.2 Program Details.

The program language for the Package Cushioning Design Program is Fortran. See figure 3-10 for a printout of the program instructions which shows the options and materials available.

The materials in the program are the same materials in Appendix V Peak Acceleration - Static Stress curves in this handbook.

With two exceptions, cushion data for each material is available in thicknesses of one through six inches in one-inch increments and drop heights of 12 through 48 inches in 6 inch increments. The exceptions are convoluted polyurethanes which are presented in 1-, 2-, 3- or 2-, 4-, 6-inch thicknesses because of their configuration and cellular polyethylene film (Aircap), which is in multiples of l-inch thicknesses.

The program utilizes dynamic compression test data per procedure in paragraph 6.1.2.1 of this handbook. The data feeds into a curve-fitting routine which uses multiple regression analysis for generation of mathematical equations of the peak acceleration versus static stress curves in Appendix V. These equations form the data base for the program.

Material costs are representative of industry averages. AFPEA periodically updates material costs which compensates for inflationary trends and supply fluctuations.

The program lists four types of container materials, associated costs and weights. Presently there are two container styles available. They are the regular slotted container (RSC) and full telescope container (FTC).

The package design cost calculations also include transportation costs (if desired). The basis for these costs is transportation mode and distance.

Generally, the heavier the package (both cushion weight and container weight) the greater the transportatin cost. This cost also increases with distances, such that an optimum design will show greater savings the farther it is shipped.

AIR FORCE PACKAGING EVALUATION ACTIVITY'S PACKAGE CUSHION DESIGN VOLUME 3.4)
DESIGN OPTIONS

Option 1 - Peak acceleration for an existing cushion pack.
Option 2 - Complete cushioning encapsulation of an item.
Option 3 - Corner pad cushioning.
Option 4 - Cushion wrap.

MATERIALS USED

Material	Material Name	Uses			Density	cost
		Encap	C-Pads	Wrap	Lbs/Cu Ft	$/Bd Ft
1	Polyurethane-Ether	X	X	X	1.500	.1959
2	Polyurethane-Ether	X	X	X	2.000	.2490
3	Polyurethane-Ether	X	X	X	4.000	.3725
4	Polyurethane-Ester	X	X	X	1.500	.2975
5	Polyurethane-Ester	X	X	X	2.000	.3650
6	Polyurethane-Ester	X	X	X	4.000	.6883
7	Rubberized Hair Type II	X	X		1.100	.0000
8	Rubberized Hair Type III	X	X		1.500	.0000
9	Rubberized Hair Type IV	X	X		2.000	.0000
10	Polyethylene Foam	X	X		2.000	.6433
11	Polyethylene Foam	X	X		4.000	.8300
12	Polystyrene Foam	X	X		1.500	.1433
13	Polystyrene Foam	X	X		2.500	.2600
14	Polyethylene Minicell L-200	X	X		20000	.0000
15	Conv. Ether Poly. 1" 2" 3"	X		X	1.150	.2088
16	Conv. Ether Poly. 2" 4" 6"	X		X	1.150	.2088
17	Conv. Ether Poly. 1" 2" 3"	X		X	1.500	.2492
18	Conv. Ether Poly. 2" 4" 6"	X		X	1.500	.2550
19	Cellulose Wadding	X		X	2.000	.1891
20*	Flex. Cellular Plastic Film	X		X	.691	.1515

* Data available for 1-, 2-, & 3- inch thicknesses only.

SPECIAL MATERIAL COST

Material	1"	2"	3"	4"	5"	6"
7	.1850	.1250	.1500	.1350	.1350	.1350
8	.2075	.1550	.2075	.1650	.1650	.1650
9	.2275	.1900	.2200	.2150	.2150	.2150
14	.7173	.7160	.7015	.5900	.5900	.5900

FIGURE 3-10. COMPUTER PRINTOUT OF PROGRAM INSTRUCTIONS.

CONTAINER MATERIALS USED

Number	Material Type	Cost/Sq. Ft.	Wgt./Sq. Ft.
1	Single Wall V3C	$0.0762	.22 lbs.
2	Double Wall V11C	$0.1187	.39 lbs.
3	Solid Wall V2S	$0.0832	.32 lbs.
4	Solid Wall V3S	$0.0699	.31 lbs.

TRANSPORTATION TABLE

MODE	Type	Distance
1	Parcel Post	Zone 1-8 (0 for local)
2	Commercial Air	Air Miles
3	Truck	Road Miles
4	Logair	Air Miles
5	No shipping cost computation.	

(Note: Material costs shown are subject to change. Current prices should be obtained before cost analysis is made).

FIGURE 3-10 COMPUTER PRINTOUT OF PROGRAM INSTRUCTIONS.

3.4.2.1 Two Basic Functions. The Package Cushion Design Program performs two basic functions, either a performance evaluation of a known package design or the determination of the package design for a specific item under known conditions. The second function is subdivided into three options-- complete encapsulation, corner pads, or cushion wrap.

The first function (peak acceleration) is for evaluation of an already existing design that appears inadequate. The packaging engineer inputs the drop height, material number, item weight, surface area for each face, and cushion thickness. Then the computer responds with the estimated peak acceleration of that packaging/product system. This process is easily repeatable for various surfaces, materials and drop heights.

The other three options essentially design the total package. For each option the drop height, item dimensions, item weight, fragility, container style and material, and transportation mode and distance are the required input. The program then computes total costs for all materials available. If a particular material is not feasible for an item (i.e., the cushion characteristics show that the cushion will not protect the item), a "O" is printed. All feasible materials are printed in order of increasing cost. Complete design data can then be obtained by inputting the number of the material desired. This data includes cushion dimensions (complete encapsulation, corner pads, or cushion wrap, depending on option), container dimensions (ID), total package weight, and costs for cushioning materials, container, transportation, and labor. This step may be repeated for all materials which were considered feasible in the initial cost table. The complete data input procedure must be repeated for each additional option and for each separate material.

3.4.3 Example Problems (Computer Solutions).

The Example Problems from 3.3.1 through 3.3.3 are repeated here (Figures 3-11 thru 3-14) in the form of computer printouts of their solutions. Each design procedure was carried out in a few minutes instead of the several hours required using the manual computational techniques presented in para 3.

In each example, all three options (complete encapsulation, corner pads, and cushion wrap) were run (only the best solutions are shown here) and then expanded to complete the design data for the least-cost material. Of course, complete data may be output for other materials, if desired.

```
                    OPTIONS

1.  Peak Acceleration
2.  Complete Encapsulation
3.  Corner Pads
4.  Cushion Wrap

Type an option number (1-4) :2

                  DROP HEIGHT

The drop heights are available from 12 to 48 inches in six inch
increments.  Enter the drop height (inches) :30

                ITEM DIMENSIONS

The length, width, and height are used for sizing the item.  The
length must be greater than or equal to the width, which must be
greater than or equal to the height.

The item dimensions are in inches,  and the item weight is in pounds.

Enter the length dimension of the item (inches) :12
Enter the width dimension of the item (inches) :6
Enter the height dimension of the item (inches) :6
Enter the weight of the item (pounds) :7.5

                    FRAGILITY

Separate fragility ratings are used for each of the three major sides.
The fragility rating is measured in Gs.

Enter the top face fragility rating :40
Enter the side face fragility rating :40
Enter the end face fragility rating :40

                  CONTAINER TYPE

The container type can be a regular slotted container, or a full
telescoping container.

Enter:   RSC - Regular slotted
         FTC - Full telescoping

Enter type of container :rsc
```

FIGURE 3-11. COMPUTER PRINTOUT OF 3.3.1 EXAMPLE PROBLEM.

CONTAINER MATERIAL

1. Single Wall V3C
2. Double Wall V11C
3. Solid Wall V2S
4. Solid Wall V3S
5. User selectable material data

Enter container material number (1-4 are standard) :1

TRANSPORTATION MODE

1. Parcel Post
2. Commercial Air
3. Truck
4. Logair
5. No shipping cost computation

Enter transportation mode :1
Enter the parcel post zone :0

TABLE OF PRICES FOR COMPLETE ENCAPSULATION

Material	Material Name	cost
2	Polyurethane-Ether	$ 4.47
1	Polyurethane-Ether	$ 5.02
3	Polyurethane-Ether	$ 5.38
8	Rubberized Hair Type III	$ 6.29
5	Polyurethane-Ester	$ 7.46
9	Rubberized Hair Type IV	$ 7.71
6	Polyurethane-Ester	$ 9.39
4	Polyurethane-Ester	$ 9.54

Material number to view data of, zero (0) to quit ==> 2

Cushion dimensions (complete encapsulation) for Material Number: 2

	Length	Width	Thickness
Top Face	12.00 in.	6.00 in.	2.00 in.
Side Face	12.00 in.	10.00 in.	2.00 in.
End Face	10.00 in.	10.00 in.	3.00 in.

FIGURE 3-11. COMPUTER PRINTOUT OF 3.3.1 EXAMPLE PROBLEM.

Container dimensions are as follows:

Length	Width	Height
18.00 in.	10.00 in.	10.00 in.

Total weight: 10.49 lbs.

Cushion cost	Container cost	Shipping cost	Other costs	Total cost
$2.37	$ .86	$ .86	$ .38	$4.47

Please press (RETURN) to continue

FIGURE 3-11. COMPUTER PRINTOUT OF 3.3.1 EXAMPLE PROBLEM.

```
                    OPTIONS

1.  Peak Acceleration
2.  Complete Encapsulation
3.  Corner Pads
4.  Cushion Wrap

Type an option number (1-4) :2

                  DROP HEIGHT

The drop heights are available from 12 to 48 inches in six inch increments.
Enter the drop height (inches) :30

                ITEM DIMENSIONS

The length, width, and height are used for sizing the item. The
length must be greater than or equal to the width, which must be
greater than or equal to t-he height.

The item dimensions are in inches, and the item weight is in pounds.

Enter the length dimension of the item (inches) :11.25
Enter the width dimension of the item (inches) :5
Enter the height dimension of the item (inches) :5
Enter the weight of the item (pounds) :31

                    FRAGILITY

Separate fragility ratings are used for each of the three major sides.
The fragility rating is measured in Gs.

Enter the top face fragility rating :60
Enter the side face fragility rating :60
Enter the end face fragility rating :60

                  CONTAINER TYPE

The container type can be a regular slotted container, or a full
telescoping container.

Enter:   RSC - Regular slotted
         FTC - Full telescoping

Enter type of container :rsc
```

FIGURE 3-12. COMPUTER PRINTOUT OF 3.3.2 EXAMPLE PROBLEM.

CONTAINER MATERIAL

1. Single Wall V3C
2. Double Wall V11C
3. Solid Wall V2S
4. Solid Wall V3S
5. User selectable material data

Enter container material number (1-4 are standard) :1

TRANSPORTATION MODE

1. Parcel Post
2. Commercial Air
3. Truck
4. Logair
5. No shipping cost computation

Enter transportation mode :1
Enter the parcel post zone :0

TABLE OF PRICES FOR COMPLETE ENCAPSULATION

Material	Material Name	Total Cost
12	Polystyrene Foam	$ 5.12
4	Polystyrene-Ester	$ 7.40
5	Polyurethane-Ester	$ 7.49
10	Polyethylene Foam	$ 7.52
11	Polyethylene Foam	$ 8.49
14	Polyethylene Minicell L-200	$ 9.78
6	Polyurethane-Ester	$11.69

Material number to view data of, zero (0) to quit ==> 4)

Cushion dimensions (complete encapsulation for Material Number: 4

	Length	Width	Thickness
Top Face	11.25 in.	5.00 in.	3.00 in.
Side Face	11.25 in.	11.00 in.	3.00 in.
End Face	11.00 in.	11.00 in.	4.50 in.

FIGURE 3-12. COMPUTER PRINTOUT OF 3.3.2 EXAMPLE PROBLEM.

Container dimensions are as follows:

Lenght	Width	Height
20.25 in.	11.00 in.	11.00 in.

Total Weight: 34.61 lbs.

Cushion cost	Container cost	Shipping cost	Other costs	Total cost
$ 4.48	$1.02	$1.47	$ .43	$7.40

Please press (RETURN) to continue.

FIGURE 3-12. COMPUTER PRINTOUT OF 3.3.2 EXAMPLE PROBLEM.

OPTIONS

1. Peak Acceleration
2. Complete Encapsulation
3. Corner Pads
4. Cushion Wrap

Type an option number (1-4) :1
Enter the drop height (inches) :30

Material	Material Name	Density
1	Polyurethane-Ether	1.500
2	Polyurethane-Ether	2.000
3	Polyurethane-Ether	4.000
4	Polyurethane-Ester	1.500
5	Polyurethane-Ester	2.000
6	Polyurethane-Ester	4.000
7	Rubberized Hair Type II	1.100
8	Rubberized Hair Type III	1.500
9	Rubberized Hair Type IV	2.000
10	Polyethylene Foam	2.000
11	Polyethylene Foam	4.000
12	Polystyrene Foam	1.500
13	Polystyrene Foam	2.500
14	Polyethylene Minicell L-200	2.000
15	Conv. Ether Poly. 1" 2" 3"	1.150
16	Conv. Ether Poly. 2" 4" 6"	1.150
17	Conv. Ether Poly. 1" 2" 3"	1.500
18	Conv. Ether Poly. 2" 4" 6"	1.500
19	Cellulose Wadding	2.000
20	Flex. Cellular Plastic Film	.691

Enter the number of the selected material :4
Enter the weight (lbs) of the item :31
Enter the area (sq. in.) of the item :56.25
Enter the thickness of the material :3

Peak Acceleration = 50.825

Do you want another Peak Acceleration run (Y/N)? Y
Enter the drop height (inches) :30

FIGURE 3-13. COMPUTER PRINTOUT OF 3.3.2 EXAMPLE PROBLEM PEAK ACCELERATION VERIFICATION.

Material	Material Name	Density
1	Polyurethane-Ether	1.500
2	Polyurethane-Ether	2.000
3	Polyurethane-Ether	4.000
4	Polyurethane-Ester	1.500
5	Polyurethane-Ester	2.000
6	Polyurethane-Ester	4.000
7	Rubberized Hair Type II	1.100
8	Rubberized Hair Type III	1.500
9	Rubberized Hair Type IV	2.000
10	Polyethylene Foam	2.000
11	Polyethylene Foam	4.000
12	Polystyrene Foam	1.500
13	Polystyrene Foam	2.500
14	Polyethylene Minicell L-200	2.000
15	Conv. Ether Poly. 1" 2" 3"	1.150
16	Conv. Ether Poly. 2" 4" 6"	1.150
17	Conv. Ether Poly. 1" 2" 3"	1.500
18	Conv. Ether Poly. 2" 4" 6"	1.500
19	Cellulose Wadding	2.000
20	Flex. Cellular Plastic Film	.691

Enter the number of the selected material :4
Enter the weight (lbs) of the item :31
Enter the area (sq. in.) of the item :25
Enter the thickness of the material :4.5

Peak Acceleration = 57.501

Do you want another Peak Acceleration run (Y/N)? Y
Enter the drop height (inches) :30

Material	Material Name	Density
1	Polyurethane-Ether	1.500
2	Polyurethane-Ether	2.000
3	Polyurethane-Ether	4.000
4	Polyurethane-Ester	1.500
5	Polyurethane-Ester	2.000
6	Polyurethane-Ester	4.000
7	Rubberized Hair Type II	1.100
8	Rubberized Hair Type III	1.500
9	Rubberized Hair Type IV	2.000
10	Polyethylene Foam	2.000
11	Polyethylene Foam	4.000

FIGURE 3-13. COMPUTER PRINTOUT OF 3.3.2 EXAMPLE PROBLEM PEAK ACCELERATION VERIFICATION.

Material	Material Name	Density
12	Polystyrene Foam	1.500
13	Polystyrene Foam	2.500
14	Polyethylene Minicell L-200	2.000
15	Conv. Ether Poly. 1" 2" 3"	1.150
16	Conv. Ether Poly. 2" 4" 6"	1.150
17	Conv. Ether Poly. 1" 2" 3"	1.500
18	Conv. Ether Poly. 2" 4" 6"	1.500
19	Cellulose Wadding	2.000
20	Flex. Cellular Plastic Film	.691

```
Enter the number of the selected material :4
Enter the weight (lbs) of the item :31
Enter the area (sq. in.) of the item :63.7
Enter the thickness of the material :3

Peak Acceleration = 49.693

Do you want another Peak Acceleration run (Y/N)? N
```

FIGURE 3-13. COMPUTER PRINTOUT OF 3.3.2 EXAMPLE PROBLEM PEAK ACCELERATION VERIFICATION.

OPTIONS

1. Peak Acceleration
2. Complete Encapsulation
3. Corner Pads
4. Cushion Wrap

Type an option number (1-4) :2

DROP HEIGHT

The drop heights are available from 12 to 48 inches in six inch increments.

Enter the drop height (inches) :42

ITEM DIMENSIONS

The length, width, and height are used for sizing the item. The length must be greater than or equal to the width, which must be greater than or equal to the height.

The item dimensions are in inches, and the item weight is in pounds.

Enter the length dimension of the item (inches) :8
Enter the width dimension of the item (inches) :4
Enter the height dimension of the item (inches) :4
Enter the weight of the item (pounds) :1.5

FRAGILIY

Separate fragility ratings are used for each of the three major sides. The fragility rating is measured in Gs.

Enter the top face fragility rating :80
Enter the side face fragility rating :80
Enter the end face fragility rating :80

CONTAINER TYPE

The container type can be a regular slotted container, or a full telescoping container.

Enter: RSC - Regular slotted
FTC - Full telescoping

Enter type of container :rsc

FIGURE 3-14. COMPUTER PRINTOUT OF 3.3.3 EXAMPLE PROBLEM.

CONTAINER MATERIAL

1. Single Wall V3C
2. Double Wall V11C
3. Solid Wall V2S
4. Solid Wall V3S
5. User selectable material data

Enter container material number (1-4 are standard) :1

TRANSPORTATION MODE

1. Parcel Post
2. Commercial Air
3. Truck
4. Logair
5. No shipping cost computation

Enter transportation mode :1
Enter the parcel post zone :0

TABLE OF PRICES FOR COMPLETE ENCAPSULATION

Material	Material Name	Total Cost
2	Polyurethane-Ether	$ 1.82
1	Polyurethane-Ether	$ 2.02
20	Flex. Cellular Plastic Film	$ 2.26
8	Rubberized Hair Type III	$ 2.52
3	Polyurethane-Ether	$ 2.60
9	Rubberized Hair Type IV	$ 2.66
17	Conv. Ether Poly. 1" 2" 3"	$ 2.89
16	Conv. Ether Poly. 2" 4" 6"	$ 2.91
19	Cellulose Wadding	$ 3.00
5	Polyurethane-Ester	$ 3.12
18	Conv. Ether Poly. 2" 4" 6"	$ 3.21
4	Polyurethane-Ester	$ 3.34
7	Rubberized Hair Type II	$ 4.24
6	Polyurethane-Ester	$ 4.58

Material number to view data of, zero (0) to quit ==> 20

Cushion dimensions (complete encapsulation) for Material Number: 20

FIGURE 3-14. COMPUTER PRINTOUT OF 3.3.3 EXAMPLE PROBLEM.

	Length	Width	Thickness
Top Face	8.00 in.	4.00 in.	2.00 in.
Side Face	8.00 in.	8.00 in.	2.00 in.
End Face	8.00 in.	8.00 in.	2.50 in.

Container dimensions are as follows:

Length	Width	Height
13.00 in.	8.00 in.	8.00 in.

Total Weight: 2.61 lbs.

Cushion cost	Container cost	Shipping cost	Other costs	Total cost
$ .74	$ .56	$ .67	$ .29	$2.26

Please press (RETURN) to continue.

FIGURE 3-14. COMPUTER PRINTOUT OF 3.3.3 EXAMPLE PROBLEM.

6.5 SUBJECT TERM (key word) Listing.

Computer program
Cushioning design
Cushioning design computer program
Package
Packaging
Packaging design
Packaging design computer program