Competitive

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THE ROCKBESTOS COMPANY
NEW HAVEN, CONNECTICUT 06504 USA

INTERNAL MEMORANDUM

SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR DATE: June 7, 1977

TO: G. S. Buettner, E. S. Reed
A. J. Rausch, M. E. Schmidt, A. C. Dean

FROM: F. R. Postma

SUBJECT: ANACONDA WIRE & CABLE COMPANY/CVCT CONTROL CABLE

Tony Rausch obtained a copy of Anaconda's literature on the above and I believe you will find it interesting reading, particularly when you draw comparisons to our Firewall III product line. Your particular attention is drawn to the last three pages relative to selling to the paper industry. I suggest you inform all of your salesmen at the earliest possible moment.

Frank R Postma
bjs

FRP:bjs

ANACONDA WIRE AND CABLE COMPANY

F-6008A INTER-OFFICE CORRESPONDENCE

TO: ALL CONTINENTAL REPRESENTATIVES DATE February 9, 1976

FROM: Paul S. Cardello OFFICE York

SUBJECT: New Product Information

REFERRING TO: CVTC Control Cable

FILE REFERENCE:

We are pleased to announce that Continental's CVTC Control Cable has met all the requirements for Type TC Power and Control Cable per Article 340 of the National Electrical Code.

The attached "Issued as Tentative" CWC product specification will provide you with more detailed information and should be well received by your potential clients. This specification covers control-cable sizes (14-3 AWG), which is the main thrust of our present sales effort and stock program. Our listing also covers XLP/PVC multi-conductor power cable and we will quote up to 4/0 conductors where appropriate.

Your respective regional managers will discuss marketing strategy and product advantages over competitive offerings with you.

Within the next few weeks, permanent brochure and specification sheets will be available. In the meantime, we hope the interim foremat sheets and the appropriately printed 7/C No. 12 AWG CVTC samples will be beneficial to you.

Contact your regional manager or the York Sales Office for additional information on price and delivery, stock status or additional printed matter and samples.

RECEIVED
JUN 06 1977
F. R. P.

RBB 00002

ANACONDA

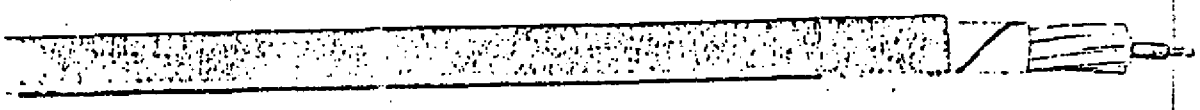
CONTINENTAL WIRE & CABLE

Flame Retardant

CROSSLENE® CONTROL CABLE

CVTC

Normal 90°C
*Emergency Overload 130°C 600 Vol.
*Short Circuit 250°C
AWG Sizes #14 Thru #9



FLAME RETARDANT CROSSLINKED POLYETHYLENE INSULATION—ASBESTOS BINDER TAPE—FLAME RETARDANT POLYVINYL CHLORIDE JACKET

CONSTRUCTION SPECIFICATIONS

No. of Conductors	AWG 14 (7/.0242)			AWG 12 (7/.0305)			AWG 9 (7/.0432)		
	Jacket Thickness (Mils)	Nominal* O.D. (Inch)	Approx. Ship. Wgt. (#/M')	Jacket Thickness (Mils)	Nominal* O.D. (Inch)	Approx. Ship. Wgt. (#/M')	Jacket Thickness (Mils)	Nominal* O.D. (Inch)	Approx. Ship. Wgt. (#/M')
2R	45	.378	104	45	.416	120	45	.492	177
3	45	.400	125	45	.441	165	60	.554	245
4	45	.431	149	45	.477	194	60	.598	306
5	45	.469	172	60	.551	230	60	.652	357
7	45	.510	226	60	.597	301	60	.711	484
9	60	.623	266	60	.692	396	60	.869	606
12	60	.699	342	60	.777	466	80	.970	793
15	60	.773	410	80	.902	577	80	1.082	957
19	60	.812	500	80	.947	720	80	1.137	1185

Note: All Insulation Walls are 30 Mils minimum average and 27 Mils minimum at any point.
* ±5% Tolerance

The insulation system of CVTC is available in other configurations of instrumentation and control cable and for thermocouple extension cable. Contact Continental Wire & Cable Corp. with your specific requirements.

RBB 00003

CONTINENTAL WIRE & CABLE CORP.

Product Specification For:

ANACONDA-CONTINENTAL FLAME-GUARD XLP INSULATED CONTROL CABLE TYPE CVTC, 600 VOLT.

1.0 SCOPE

1.1 This specification covers multi-conductor Flame-Guard XLP, flame retardant cross-linked polyethylene insulated, flame retardant low chlorine content polyvinylchloride jacketed, control cable, Type CVTC, 600 volt.

2.0 RATINGS

2.1 Temperature

2.1.1 Maximum normal operating temperature: 90 C (194 F) dry.
75 C (167 F) wet.

2.1.2 Maximum emergency operating temperature: 130 C (266 F).

2.1.3 Underwriters' Laboratories, Inc. listing: 90 C dry.
75 C wet.

2.2 Voltage

2.2.1 Maximum rated circuit voltage: 600 volts DC or AC.

3.0 APPLICATIONS

3.1 This cable is designed for installation inside or outside industrial plants, above or below grade in conduit, duct, cable trays or direct burial in earth.

3.2 NEC Applications: Underwriters' Laboratories, Inc. listed as Power and Control Tray Cable in accordance with Article 340 - Type TC.

3.3 Type TC cable is suitable for use in Class I, Division 2, hazardous locations, as indicated in Section 501-4(b) of the NEC.

4.0 GENERAL CONSTRUCTION

4.1 Multiple conductor cable, copper conductor sizes No. 14 through 9 AWG, Anaconda Crosslene®, cross-linked polyethylene insulation, conductors cabled with suitable fillers, asbestos/polyester binder tape and an overall jacket of Anaconda LCFR-PVC.

ISSUED AS TENTATIVE,
JANUARY 14, 1976

RBB 00004

5.0 CONDUCTORS

5.1 Wire Requirements

5.1.1 Soft or annealed copper, coated, meeting before stranding the requirements of ASTM B 33, "Specification for Tinned Soft or Annealed Copper Wire for Electrical Purposes", latest edition.

5.2 Stranding

5.2.1 Stranding shall be Class B in accordance with ASTM B 8, "Specification for Concentric-Lay-Stranded Copper Conductor", latest edition.

5.3 Size

5.3.1 Sizes shall be No. 14 through 9 AWG, Class B stranding.

6.0 INSULATION

6.1 Material

6.1.1 Flame retardant cross-linked polyethylene, "Crosslene®".

6.2 Thickness

6.2.1 The average thickness shall not be less than .030 inches. The minimum thickness at a point shall not be less than 90 percent of the specified average thickness.

6.3 Requirements: The cross-linked polyethylene shall be capable of meeting and exceeding the (UL) requirements for Type XHHW with the following values:

6.3.1 Initial Requirements

6.3.1.1	Tensile strength, minimum, psi	1500
6.3.1.2	Elongation at rupture, minimum percent	150

6.3.2 Physical requirements after accelerated aging in Air Oven at 121 C ± 1 C for 168 hours.

6.3.2.1	Tensile strength, minimum, percentage of original	70
6.3.2.2	Elongation at rupture, minimum, percentage of original	70

6.3.3 Physical requirements after oxygen bomb aging at 80 C for 168 hours at 300 PSI.

6.3.3 Physical requirements (Cont'd)

6.3.3.1	Tensile strength, minimum, percentage of original	75
6.3.3.2	Elongation at rupture, minimum, percentage of original	75

6.3.4 Physical requirements after air bomb aging at 127 C for 42 hours at 80 PSI.

6.3.4.1	Tensile strength, minimum, percentage of original	70
6.3.4.2	Elongation at rupture, minimum, percentage of original	70

6.3.5	Heat distortion 121 C ± 1 C, maximum percent	20

6.3.6 Moisture absorption requirements when tested by the Electrical method (immersed in 75 C ±.1 C water and tested at an average stress of 80 volts per mil, 60 Hertz).

6.3.6.1	Dielectric constant after 24 hours immersion, maximum	6.0
6.3.6.2	Increase in capacitance, 1 to 14 days, maximum, percent	4.0
6.3.6.3	Increase in capacitance, 7 to 14 days, maximum, percent	2.0
6.3.6.4	Stability factor after 14 days, maximum	1.0
6.3.6.5	Alternate to stability factor, 1 to 14 days, maximum	0.5

6.3.7 Moisture absorption requirements when tested by the Gravimetric method (immersed in 70 C ± 1 C water for 7 days).

6.3.7.1	Moisture absorption, maximum, milligrams per square inch	10.0

7.0 COLOR CODE

7.1 Method: Conductor identification shall be by colored compounds and tracers in accordance with IPCEA S-19-81, Section 5.6.3, Control Cables, Method 1, latest edition, except that the color sequence shall be as follows:

no white or green

Conductor Number	Background or Base Color	Tracer Color
1	Black	.....
2	Red	.....
3	Blue	.....
4	Orange	.....
5	Yellow	.....
6	Brown	.....
7	Red	Black
8	Blue	Black

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Conductor Number	Background or Base Color	Tracer Color
9	Orange	Black
10	Yellow	Black
11	Brown	Black
12	Black	Red
13	Blue	Red
14	Orange	Red
15	Yellow	Red
16	Brown	Red
17	Black	Blue
18	Red	Blue
19	Orange	Blue
20	Yellow	Blue
21	Brown	Blue
22	Black	Orange
23	Red	Orange
24	Blue	Orange
25	Yellow	Orange
26	Brown	Orange
27	Black	Yellow
28	Red	Yellow
29	Blue	Yellow
30	Orange	Yellow
31	Brown	Yellow
32	Black	Brown
33	Red	Brown
34	Blue	Brown
35	Orange	Brown
36	Yellow	Brown

The sequence is repeated for cables with more than 36 conductors.

8.0 IDENTIFICATION

8.1 Each length of cable shall carry an Anaconda/Continental marker tape throughout its entire length. This tape shall include company name and location, year of manufacture and a unique 7 or more digit sequential footage number every foot along its length.

8.2 The marker tape shall be placed in the cable core on directly under the binder tape.

8.3 The cable shall also be identified by surface printing on the overall jacket with no greater than one (1) foot spacing betwe legends. The print shall contain the following information:

> Company identification, CWC type, number and size of conductors, NEC identification of insulated conductors, sunlight resistance, voltage and (UL) logo.

8.3 Continued

Example for 7/C No. 12.

"ANACONDA-CONTINENTAL CVTC, 7/C 12, TYPE TC WITH XHHW CDRS, SUN RES, 600V (UL)"

9.0 CABLE ASSEMBLY

9.1 Cables shall be assembled as described in Section 4.0

9.2 The required number of conductors arranged in the color sequence specified in Section 7.0 shall be cabled with suitable fillers, where needed, to achieve a substantially round cross section.

9.3 Lay: The direction and length of lay shall be in accordance with IPCEA S-66-524, Section 5.2, latest edition.

9.4 Grounding Conductors: Bare or fully insulated conductors of the same metal as the circuit conductors may be provided for grounding purposes. The grounding conductor may be a single conductor, or may be sectioned into 2 or more parts provided the size of each part is No. 18 AWG or larger. Also a bare, concentrically distributed grounding conductor may be used. These conductors shall be sized in accordance with the table below, based on the largest circuit conductor provided in the cable. The insulation for this conductor, if provided, shall be green or green with one or more yellow stripes.

Largest Circuit Conductor - (AWG)	Min. Size of Grounding Conductor - AWG
14	14
12	12
10-9	10

9.5 Tape Binder: All core assemblies shall be covered with a 4 mil minimum, helically applied, flame retardant, laminated asbestos/polyester binder tape.

9.6 Shield. (Optional) A polyester and metal laminated tape shield with an uninsulated bare, or tinned copper drain wire; a wrap or braid of bare or tinned copper wires; or a copper tape or equivalent may be used over single conductors, over the cabled conductor assembly, or over one or more groups of cabled conductors.

10.0 JACKET

10.1 Material

10.1.1 Flame retardant, low-chlorine content, polyvinylchloride compound, "LCFR-PVC".

10.2 Thickness

10.2.1 The average thickness shall not be less than shown in Table I. The minimum thickness at any point shall not be less than 80 percent of the specified average thickness.

10.3 Requirements: The polyvinylchloride jacket shall be capable of meeting the following physical and aging properties when tested in accordance with IPCEA S-61-402:

10.3.1	Initial Requirements*	
10.3.1.1	Tensile strength, minimum, psi	1500
10.3.1.2	Elongation at rupture, minimum, percent	100
10.3.2	Aging Requirements*	
10.3.2.1	After air oven test at 121 C ± 1 C for 168 hours.	
10.3.2.1.1	Tensile strength, minimum, percentage of original	70
10.3.2.1.2	Elongation at rupture, minimum, percentage of original	45
10.3.2.2	After oil immersion test at 70 C ± 1 C for 4 hours.	
10.3.2.2.1	Tensile strength, minimum, percentage of original	80
10.3.2.2.2	Elongation at rupture, minimum, percentage of original	60
10.3.3	Heat distortion, 121 C ± 1 C, maximum, percent	50
10.3.4	Heat shock, 121 C ± 1 C	No Crack
10.3.5	Cold bend, minus 35 ± 1 C	No Crack
10.3.6	Minimum installation temperature	Minus 10

10.3.7 When subjected to the vertical tray flame test described in Paragraph 11.2 the compound shall not exhibit thermoplastic drip of burning particles.

* These requirements are only applicable to buffed die-cut cable specimens in excess of 45 mils in final thickness.

11.0 TESTS

11.1 Electrical Tests

11.1.1 High-Voltage AC: Each length of completed cable shall withstand for five minutes the alternating-current voltage of 4.0 KV.

11.1.2 Insulation Resistance: Each length of completed cable, following the 5-minute voltage test, shall show an insulation resistance corrected to 15.6 C (60 F), of not less than the value of R as calculated from the formula given below. Temperature correction factors for correcting readings taken at other than 15.6 C (60 F) are given in Table II.

$$R = K \log_{10} \frac{D}{d}$$

Where R = insulation resistance in megohms - 100
K = 10,000
D = diameter over insulation
d = diameter under insulation

11.1.3 Methods of Testing: Test methods shall be in accordance with IPCEA S-66-524, latest edition, except modified herein. Each length of completed cable shall be tested dry with the voltage applied to each conductor to all other conductors.

11.1.4 Each length of completed cable shall be tested for conductor continuity and DC resistance of conductors.

11.2 Flame Tests

11.2.1 Method:

Six lengths of 9-conductor No. 12 AWG cable shall be arranged in a single layer in a vertical tray with a separation of 1/2 the cable diameter between each cable The group of 6 cables shall be centered in the tray. T tray shall be a ladder type made of cold rolled steel, inches deep, 12 inches wide and approximately 8 feet hi The tray may be bolted to a length of steel angle (or equivalent) for support. The samples shall be fastened in the tray by suitable nonmetallic cable ties except a the very top of the ladder where steel wire is used for support. The flame source to be used shall be an Ameri Gas Furnace Co., 10 inch wide, 11-55 drilling, ribbon-t burner (Cat. No. 10x11-55) with air-gas American Gas Furnace Co. Venturi mixer Cat. No. 14-18 (7 psig maximu pressure) with means for controlling the air and gas mixture to regulate the Btu input. The burner shall be mounted horizontally behind the tray, 6 feet from the t of the vertical tray, midway between the tray side rail and so that the burner face is 3 inches behind the clos surface of the cables. Under dynamic conditions, the a pressure shall be 4.3 ± 0.5 centimeters of water at the

11.0 TESTS (CONT'D)

11.2 Flame Tests (Cont'd)

11.2.1 Method (Cont'd)

supply side of the Venturi mixer and the propane gas flow shall be adjusted so that an even, steady flow rate is maintained for the entire 20 minute test duration. The flow setting is to allow the proper weigh of gas to be consumed, with respect to the heating val of the fuel as provided by the supplier. The flame created is to be approximately 14 to 16 inches high, with a flame temperature between 1600°F and 1750°F at a point 3 inches from the burner face, centered, and 1-1/4 inches above the center-line of the burner. The potential heating value of the flame with the above settings would be approximately 70,000 Btu/hr. The following data shall be recorded after the flame has been allowed to burn for 20 minutes: (1) length of time of afterburn, (2) overall distance of damage to the jacket above the level of the burner, and (3) overall distance of damage to the individual conductor above the level of the burner.

The cable may be destroyed in the area of flame contac but shall not propagate the flame. The cable is considered to have not propagated the flame if the damage to the cable (blistering or charring of the jacket) do not reach the top of the 8 foot samples.

12.0 METHODS AND FREQUENCY OF TESTS

12.1 Specific test procedures, sampling frequencies and inspection methods covering the requirements in this standard are contained in Anaconda's Inspection Standards which cover all policies, raw materials, process, final and special inspectio test methods, data forms, and Inspection Office procedures. This manual is not available for distribution outside of the Company.

13.0 UNDERWRITERS' LABELS

13.1 Underwriters' Labels shall be applied as required.

TABLE I

JACKET WALL THICKNESS OVER MULTICONDUCTOR CORES

Core Diameter* Inches	Average Thickness Mils	Minimum Thickn Mils
0--0.425	45	36
0.426--0.700	60	48
0.701--1.500	80	64
1.501--2.500	110	88

* Calculated diameter over cabled assembly, including tape binder.

TABLE II

TEMPERATURE CORRECTION FACTORS

Temperature F	Temperature C	Correction Factor	Temperature F	Temperature C	Correction Factor
50	10.0	0.82	68	20.0	1.16
51	10.6	.83	69	20.6	1.20
52	11.1	.85	70	21.1	1.22
53	11.7	.87	71	21.7	1.25
54	12.2	.89	72	22.2	1.27
55	12.8	.90	73	22.8	1.30
56	13.3	.92	74	23.3	1.33
57	13.9	.94	75	23.9	1.35
58	14.4	.96	76	24.4	1.38
59	15.0	.98	77	25.0	1.41
60	15.6	1.00	78	25.6	1.44
61	16.1	1.02	79	26.1	1.47
62	16.7	1.04	80	26.7	1.50
63	17.2	1.06	81	27.2	1.53
64	17.8	1.08	82	27.8	1.56
65	18.3	1.11	83	28.3	1.59
66	18.9	1.13	84	28.9	1.62
67	19.4	1.15	85	29.4	1.66

RBB 00012

ANACONDA WIRE AND CABLE COMPANY

0400A INTER-OFFICE CORRESPONDENCE CO

TO: ALL CONTINENTAL REPRESENTATIVES DATE February 9, 1976

FROM: Paul S. Cardello OFFICE York

SUBJECT: Paper Mills

REFERRING TO: PC/New Product memo of 2/9/76 (attached)

FILE REFERENCE:

Although CVTC is intended for all-purpose 90°C control cable for any appropriate industrial application; the pulp and paper segment has shown the most interest thus far.

Two significant orders have already been received:

1. Scott Paper, Philadelphia, Pa.
   Scott was not satisfied with the performance of their standard thermoplastic cables during two fires in their Maine plant. Scott engineers visited our plant, witnessed flame tests and approved our CVTC Control and Power Cables for general use in new or re-wire applications.

2. International Paper, Mobile, Ala.
   Based on IP Central Design Engineering's analysis of several candidate cables, they chose CVTC for their entire maintenance requirements for 1976.

These two orders alone were in excess of $250,000.00 If you like more figures, this industry is expected to spend between 1975 and 1977, $3,810,117,000.00 for production related projects and $1,391,348,500.00 for environmental related projects (see attachment A). Note that there is some activity virtually all over the U.S. Attachment B gives you an idea of the sales and earnings of companys in this industry. Note that most made money, even in 30, 75.

Attachment C - Ed Holland's hints on selling the mills. Ed has considerable experience dealing with these people since in his affiliation with Combustion Engineering before joining us, he sold large CE paper processing equipment.

Your regional managers have a detailed list of the planned capital expenditure projects throughout the U.S. for 1975-1977. They also will want to discuss with you, other applications for CWC products for general "critical environment" industrial applications.

PSC:ts

UNITED STATES — REPORTED CAPITAL EXPENDITURES FOR 1975-77 BY REGIONS, AND BY TYPE OF FACILITY

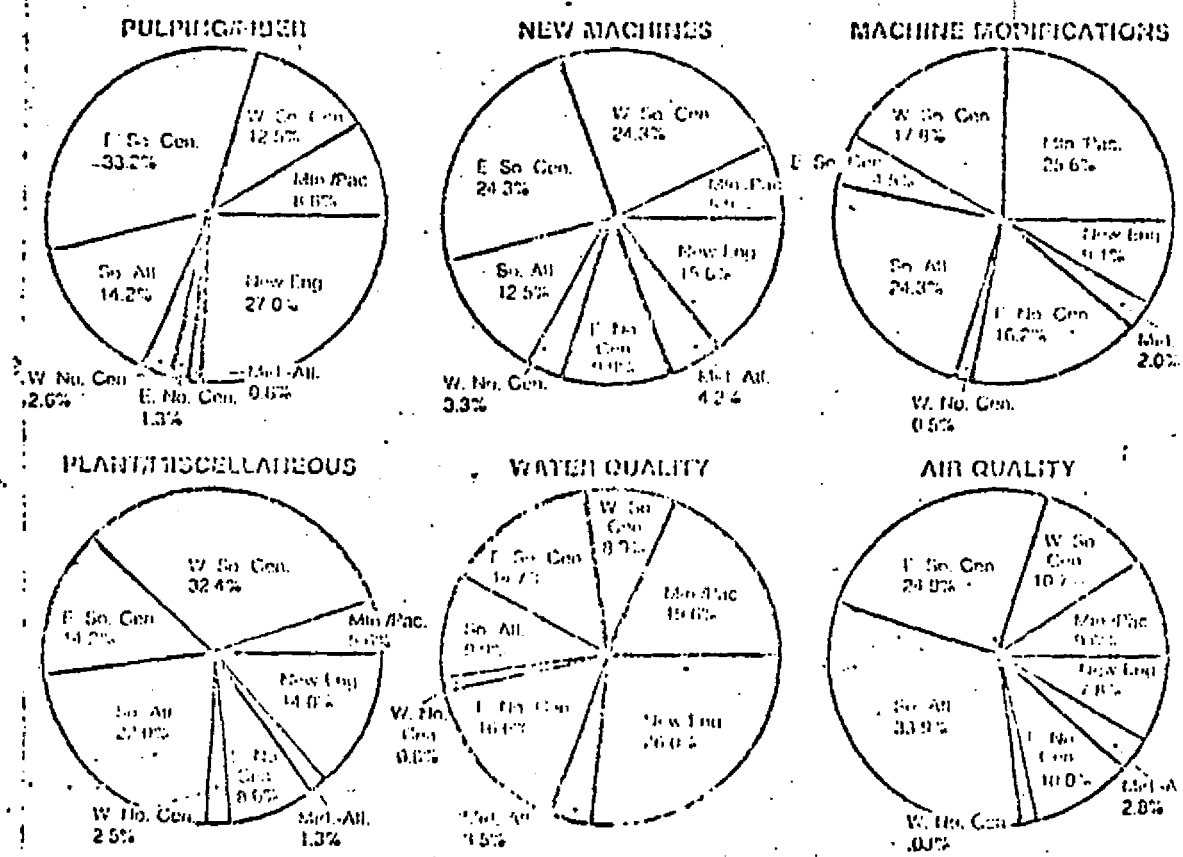
Region	Pulping/fiber	New machines	Machine modifications	Plant and miscellaneous	Production total	Environment Water	Environment Air	Environment Total
New England	$ 395,730,000	$ 91,500,000	$ 23,370,000	$ 152,760,000	$ 665,370,000	$162,920,000	$ 59,050,000	$ 216,950,000
Mid-Atlantic	6,530,000	25,020,000	5,157,000	14,297,000	63,019,000	22,140,000	20,145,000	42,291,000
E. No. Central	16,417,000	50,020,000	41,382,000	88,012,000	203,782,000	103,837,000	71,185,000	175,022,000
W. No. Central	38,139,000	20,000,000	1,345,000	27,674,000	87,153,000	4,998,000	1,672,000	6,635,000
So. Atlantic	201,538,000	73,000,000	62,266,000	240,935,000	582,759,000	61,875,000	242,913,000	304,618,000
E. So. Central	488,000,000	145,500,000	11,410,000	155,653,000	799,303,000	97,112,000	173,383,000	270,500,000
W. So. Central	163,715,000	145,000,000	45,000,000	351,124,000	720,432,000	55,621,000	76,654,000	132,275,000
Mount/Pacific	126,181,000	35,000,000	65,414,000	61,347,000	267,942,000	122,324,000	68,722,500	191,310,500
TOTALS	$1,451,250,000	$579,000,000	$255,944,000	$1,091,923,000	$3,410,117,000	$525,581,000	$715,707,500	$1,341,348,500

(Expenditures of approximately $900,000,000, not specified for location, omitted from above data)

Regions are as follows:

New England: Me., Vt., N.H., Conn., R.I., Mass.
Mid-Atlantic: N.Y., N.J., Pa.
East North Central: Wis., Mich., Ill., Ind., Ohio
West North Central: N.D., S.D., Neb., Kans., Minn., Iowa, Mo.
South Atlantic: Del., Md., W. Va., Va., N.C., S.C., Ga., Fla.
East South Central: Ky., Tenn., Miss., Ala.
West South Central: Okla., Tex., Ark., La.
Mountain/Pacific: Wash., Ore., Calif., Alaska, Ida., Nev., Mont., Wyo., Utah, Ariz., Colo., N.M.

PERCENTAGE OF SPENDING IN UNITED STATES REGIONS, BY CATEGORY



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