TU ELECTRIC
CPSES

CALCULATION REQUEST FORM

REQUESTED BY: Gary Grabruck (Please print) DATE: 1-22-93

COMPANY: Impell LOCATION: _____ EXT#: 6255

COPY/VIEW REQUEST

REQUEST FOR COPY ☑ VIEW ☐ REQUEST NEEDED BY: _____ (DATE)

PROVIDE SUPPLEMENTAL/SUPERSEDED CALCS: YES ☐ NO ☐

INDICATE IN COLUMN 4. BELOW IF REQUESTED CALCULATION(s) IS TO BE USED AS A DESIGN INPUT.

1. CALC. TYPE	2. CALCULATION NUMBER	3. REV/ CCN	4. DESIGN INPUT (Y/N)
CND2	0218-CO-0429	R/0	
CND2	0218-CO-0271	R/4	

REQUEST FOR NEW CALC. NO./REV. NO./CCN NO.

EXISTING TYPE	EXISTING CALC. NO.	EXISTING REV/CCN

TYPE	CHECK ONE	NUMBER ASSIGNED BY CPG:
_____	_____ NEW CALC. NO.	_____
_____	_____ NEW REV. NO.	_____
_____	_____ NEW CCN NO.	_____

DESCRIPTION: _____

UNIT DISCIPLINE ~~CS~~ ~~EE~~ ~~ME~~ ~~OD~~ CLASS ~~I OR II~~ ~~NON-SAFETY~~

CALC. PAGES NEEDED FOR REV. OR CCN

____ORIGINAL (ALL) FOR CCN IDENTIFY SELECTED PAGE(S): _____

RECEIPT ACKNOWLEDGEMENT OF ABOVE ORIGINAL PAGES:

_____ (signature) _____ (date)

CPG REQUEST COMPLETED BY: _____ DATE: 1-22-93

ACCESS INDEXED BY: _____ DATE: _____

VERIFIED BY: _____ DATE: _____

FIGURE 7.1

2EP-5.08
REVISION 3
PAGE 1 OF 1

CALCULATION TITLE PAGE

TEXAS UTILITIES ELECTRIC CO. / CPSES UNIT 2	PAGE 1 TOTAL NO. OF PAGES 20
CALCULATION TITLE (Indicative of the Objective): CALCULATION OF WEIGHTS DUE TO FIRE PROTECTION MATERIAL	CALCULATION CLASSIFICATIONS: ☒ CLASS I or II ☐ NON-SAFETY

CALCULATION IDENTIFICATION

ORGANIZATION:	CALCULATION NUMBER	
	TYPE	NUMBER
ABB IMPELL CORP.	CNDZ	0218-CO-0429

WPST NUMBER	COMPUTER OUTPUT	SYSTEM/SUB-SYSTEM	
3 2 F M B (OR)	YES ☐ NO ☒	NA	
WPN _ _ _	ATTACHED YES ☐ NO ☒		

APPROVALS - PRINT NAME, SIGN, AND DATE			REV. NO.	SUPPLEMENTS/ SUPERSEDES (TYPE/NUM./REV.)	CONFIRMATION REQUIRED	
PREPARER(S)	CHECKER(S)/ REVIEWER(S)	APPROVAL(S)/ INDEPENDENT REVIEWER(S)			YES	NO
KEITH E. RIDING Keith E Riding 9-9-92	PIYUSH DOGRA 9-9-92	D C PANDYA 9/11/92	0	NONE		X

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REVISION LOG

REV NO.	DESCRIPTION OF CHANGES
0	Initial Issue

Table of Contents

NO. OF PAGES= 20

1.0 Introduction/Purpose

Train A and B conduits carry electrical cables essential to the safe shutdown of the plant. Therefore, the conduits, associated junction boxes and supports identified during the fire safe shutdown analysis (FSSA), must be capable of withstanding a fire. One fire resistive material used at Comanche Peak to protect conduit systems is thermolag.

DCA 95794, revision 6 against specification CPES-M-2032 was written to incorporate the additional requirements for installation of raceways with thermolag based on the recent testing of thermolag material at Omega Labs.

The purpose of this calculation is to derive unit weights, density and weights for conduits and components covered with thermolag as listed below based on the requirements of DCA 95794, revision 6.

A. To calculate the weight per foot of thermolag for different sizes of conduits.

B. To calculate the equivalent density with respect to the conduit metal area and cables plus thermolag.

C. To calculate the equivalent weight of fittings (weight of fitting minus conduit run) for different sizes of conduits when covered with thermolag.

D. To calculate the additional weight imposed by thermolag on tube steel members and junction boxes.

2.0 Assumptions

The stress skin used to reinforce box enclosures is approximated by a 1/4" thick by 3" wide strip of the flag.

All units are pounds and inches unless otherwise noted.

Other assumptions will be listed in the body of the calculation as applicable.

3.0 References

1. ABB Impell Procedure 2IM-5.02-CND, Revision 2, Job No.'s 0217 & 0218, "Conduit and Conduit Support Design".
2. S2-0910 series of generic drawings as referenced within the calculation.
3. Not Used.
4. Pre-engineered Standard Design (PESD) Series of S2-0910 drawings. For a list of revisions of drawings see S2-0910 SH. PESD-I-A, revision CP-3.
5. AISC, American Institute of Steel Construction, Steel Construction Manual, 7th Edition.
6. DCA 95794, Revision 6.
7. Ebasco Calculation, Span 1220 Revision 1, "Thermolag and B & B (R.E.S.) weight calculation.
8. Specification, CPES-M-2032, Revision 0, "Procurement and Installation of Fire Barrier and Fireproofing Materials"

4.0 SCOPE

This calculation develops the weights due to thermolag for preshaped sections. The loads developed for both conduits and fittings are for use in the qualification of conduit runs covered with thermolag.

The fitting weights do not represent the actual weight of the fitting plus the box thermolag but is this weight minus the weight of preshape thermolag already included with the conduit density.

5.0 Methodology [REF 7, p. 5-6]

For weight calculation of conduit fittings with thermolag the following steps are considered.

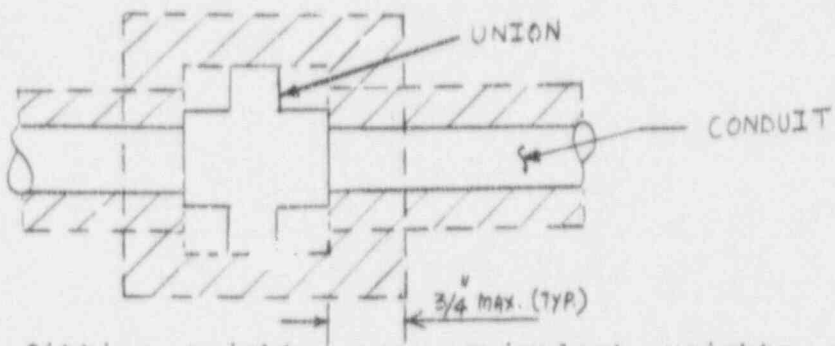
1. Thermolag panel thickness is considered to be 1/2" minimum and 3/4" maximum.

2. For fitting dimensions, the information in reference 7 attachment B is used.

3. Thermo-lag 350 water based spill resistant topcoat is applied to thermolag. This will prevent thermo-lag from getting wet. Thus, wet weight is not considered in the calculation.

4. LBD with thermolag is considered to be in a box with the largest dimension of the LBD plus 1.5" used.

5. The following detail is considered for unions with thermo-lag.



6. Conduit fitting weights are equivalent weights per reference 2, SH. PESD-2-2 Rev. CP-3.

7. Fitting weights are based on preshaped conduit sections.

6.0 DESIGN INPUT

The documents listed below were used as design input.

1. Ebasco Calculation Span 1220, Revision 1.

2. DCA 95794, Revision 6.

3. Specification CPES-M-2032, Revision 0.

REV	BY	DATE	CHECKED	DATE
0	TEE	9-9-92	RD	9-9-92

ABB COMBUSTION ENGINEERING

JOB NO 0218
CALC NO 0218 - CO - 0429
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7.0 CALCULATIONS

Conduit with Preshaped Thermo-Lag Sections

Conduit Size (in)	Conduit (1) wt/ft (lb)	Conduit (2) Metal Area (in ^ 2)	TL (3) wt/ft (lb)	Cond + TL wt/ft (lb)	Conduit (4) Density (lb/in ^ 3)	Cond + TL Density (lb/in ^ 3)
0.75	1.50	0.333	5.34	6.84	0.375	1.711
1.0	2.00	0.494	6.34	8.34	0.337	1.406
1.5	4.00	0.799	7.67	11.67	0.417	1.217
2.0	5.00	1.070	8.60	13.60	0.389	1.060
3.0	13.00	2.230	5.94	18.94	0.486	0.708
4.0	19.00	3.170	7.27	26.27	0.499	0.691
5.0	23.00	4.300	8.67	31.67	0.446	0.614

NOTES:
1. Ref. 4 SH. PESD-2-2 Rev CP-3
2. Ref. 5 page 1-102
3. Ref. 6 page 19 (for TL wt)
   For 3/4" to 2" conduits: TL wt/ft = 2 * (1/2" TL wt + 1/4" TL wt) / 3
   For 3" to 5" conduits: TL wt/ft = 2 * (1/2" TL wt) / 3
4. Ref. 1 page 45

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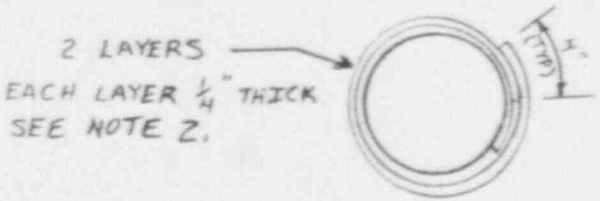
0	XEE	9.9.92	DB	9-9-92

ABB IMPELL CORPORATION

JOB NO 0218

CALC NO 0218-CO-0429

Weight of Thermo-lag 330-660 Flexi Blanket



Formulas

O.D. = 2 x 0.75 + Conduit OD

L1 = 3.14159 x (OD + 0.25 x 2) + 4

L2 = 3.14159 x (OD + 0.25 x 4) + 4

L3 = 3.14159 x (OD + 0.25 x 6) + 4

A = (L1 + L2 + L3) x 12 / 144 = (L1 + L2 + L3)/12

W = A x 2.1

Conduit Size (in)	Conduit (1) O.D. (in)	O.D. (in)	L1 (in)	L2 (in)	L3 (2) (in)	L1+L2+L3 (in)	A (ft^2)	W (lbs/ft)	W + 15% (3) (lbs/ft)	Flex (4) (lbs/ft)	Flex + TL(5) (lbs)	Airdorp (lbs)	Airdrop + TL(6) (lbs)
0.75	1.050	2.55	13.58	15.15	16.72	45.46	3.788	7.96	9.15	0.73	39.51	1.7	42.87
1.00	1.315	2.82	14.41	15.99	17.56	47.96	3.996	8.39	9.65	1.19	43.36	1.7	45.13
1.50	1.900	3.40	16.25	17.82	19.39	53.47	4.456	9.36	10.76	2.40	52.64	5.8	54.22
2.00	2.375	3.88	17.74	19.32	20.89	57.95	4.829	10.14	11.66	2.73	57.57	6.0	58.48
3.00	3.500	5.00	21.28	22.85	0.00	44.13	3.677	7.72	8.88	8.78	70.64	27.0	66.96
4.00	4.500	6.00	24.42	25.99	0.00	50.41	4.201	8.82	10.15	12.64	113.93	38.6	84.25
5.00	5.563	7.06	27.76	29.33	0.00	57.09	4.758	9.99	11.49	15.36	134.25	38.6	90.30

NOTES:

1. Ref. 5 page 1-102
2. Apply 0.25" thick third layer for conduits 2" and smaller.
3. Increase by 15% to account for over wrap or contour increase.
4. Ref. 4 SH. PESD-2-2 Rev CP-3
5. Use maximum flex length from reference 4.
6. Use maximum airdrop length as 4'-6".

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0	TJB	9-9-92	PD	9-9-92

ABB WELL CORPORATION

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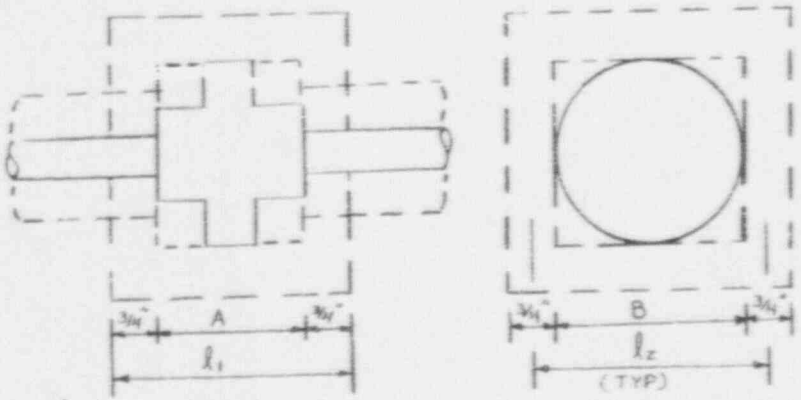
Thermo-lag Weight for Unions



Formulas

L1 = A + 2 * 0.75 OR = OD + 2 * 0.75 (whichever is greater)
L2 = B + 0.75 OR = OD + 2 * 0.75 (whichever is greater)
V = L1 * L2 * 0.75 * 4 = 3 * L1 * L2
W1 = V * 0.0487
W2 = A * (unit weight) / 12
W = W1 – W2

Conduit Size (in)	TL wt/ft (lb)	Conduit (1) O.D. (in)	Union (2) wt (lbs)	A (3) (in)	B (3) (in)	L1 (in)	L2 (in)	V (in ^ 3)	TL WT W1 (lbs)	COND TL W2 (lbs)	W (lbs)	WT of Union + TL (lbs)
0.75	5.34	1.050	0.60	1.47	1.75	2.97	2.55	22.72	1.11	0.65	0.45	1.1
1.00	6.34	1.315	0.80	1.72	2.00	3.22	2.82	27.19	1.32	0.91	0.42	1.2
1.50	7.67	1.900	1.80	2.19	3.06	3.69	3.81	42.18	2.05	1.40	0.65	2.5
2.00	8.60	2.375	2.80	2.31	3.72	3.81	4.47	51.09	2.49	1.66	0.83	3.6
3.00	5.94	3.500	8.00	3.38	5.38	4.88	6.13	89.74	4.37	1.67	2.70	10.7
4.00	7.27	4.500	10.80	3.50	6.44	5.00	7.19	107.85	5.25	2.12	3.13	13.9
5.00	8.67	5.563	15.10	3.88	8.38	5.38	9.13	147.36	7.18	2.80	4.37	19.5

NOTES:
1. Ref. 5 page 1–102
2. Ref. 4 SH. PESD–2–2 Rev CP–3
3. Ref. 7 Attachment B

REV	BY	DATE	CHECKED	DATE
0	RSE	9-9-92	DD	9-9-92

ABB ANDERSON BROWN BOVERI ABB IMPELL CORPORATION

JOB NO 0218
CALC NO 0218-CO-0429

Thermo-lag Weight for Unions

THERMOLAG DENSITY [REF. 6, PAGE 8]

Formulas

$W3 = 3.0 * 0.25 * (L1 + L2 + L2) * 4 * 0.0487$

$= 0.1461 * (L1 + L2 + L2)$

Total WT = WT of Union + WT TL + WT Stress Skin

Conduit Size (in)	Stress Skin W3 (lbs)	Total WT (lbs)
0.75	1.18	2.2
1.00	1.29	2.5
1.50	1.65	4.1
2.00	1.86	5.5
3.00	2.50	13.2
4.00	2.83	16.8
5.00	3.45	22.9

NOTE: Use column labeled total weight for design.

7

REV	BY	DATE	CHECKED	DATE
0	MEE	9-9-92	TD	9-9-92

ABB IMPELL CORPORATION

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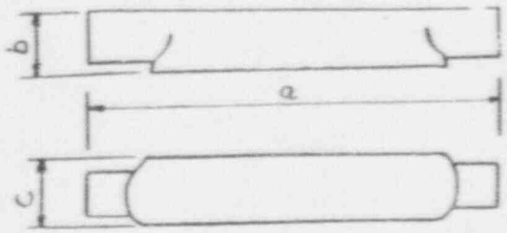
Thermo-lag Weight for BC



Formulas

L1 = a + 2 * 0.75 + 0.5 = a + 2
L2 = b + 0.75
L3 = c + 0.75
V = (L1 * L2 + L1 * L3) * 2 * 0.75
= 1.5 * L1 * (L2 + L3)
W = V * 0.0487
W1 = W – (a / 12) * (TL wt/ft)

Conduit Size (in)	TL wt/ft (lb)	Conduit (1) O.D. (in)	BC (2) wt (lbs)	a (3) (in)	b (3) (in)	c (3) (in)	L1 (in)	L2 (in)	L3 (in)	V (in ^ 3)	W (lbs)	W1 TL WT (lbs)	WT of BC + TL (lbs)
0.75	5.34	1.050	7.80	13.75	2.5625	3.00	15.75	3.3125	3.75	166.85	8.13	2.01	9.8
1.00	6.34	1.315	7.40	13.75	2.5625	3.00	15.75	3.3125	3.75	166.85	8.13	0.86	8.3
1.50	7.67	1.900	6.20	13.75	2.5625	3.00	15.75	3.3125	3.75	166.85	8.13	0.66	5.5
2.00	8.60	2.375	5.90	13.75	3.1250	3.00	15.75	3.8750	3.75	180.14	8.77	-1.08	4.8
3.00	5.94	3.500	9.00	18.38	4.3750	4.25	20.38	5.1250	5.00	309.45	15.07	5.97	15.0
4.00	7.27	4.500	15.70	23.75	5.3750	5.25	25.75	6.1250	6.00	468.33	22.81	8.42	24.1
5.00	8.67	5.563	–	–	–	–	–	–	–	–	–	–	–

NOTES:

1. Ref. 5 page 1-102
2. Ref. 4 SH. PESD-2-2 Rev CP-3
3. Ref. 7 Attachment B

REV	BY	DATE	CHECKED	DATE
0	MEP	9-9-92	PD	9-9-92

ABB
ASEA BROWN BOVERI
ABB IMPELL CORPORATION

JOB NO 0218
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Thermo-lag Weight for BC

Formulas

$W3 = 3.0 * 0.25 * (L1 + L2 + L3) * 4 * 0.0487$

$= 0.1461 * (L1 + L2 + L3)$

Total WT = WT of BC + WT TL + WT Stress Skin

Conduit Size (in)	Stress Skin W3 (lbs)	Total WT (lbs)
0.75	3.33	13.1
1.00	3.33	11.6
1.50	3.33	8.9
2.00	3.42	8.2
3.00	4.46	19.4
4.00	5.53	29.7
5.00	–	–

NOTE: Use column labeled Total WT for design.

REV	BY	DATE	CHECKED	DATE
0	RKE	9-9-92	PD	9-9-92

ABB ENVIRONMENTAL SERVICES, INC.

JOB NO 0218

CALC NO 0218-CO-0H29

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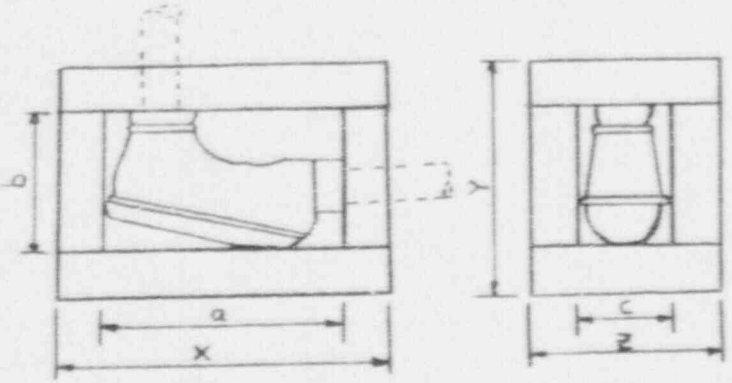
Thermo-lag Weight for LBD



Formulas

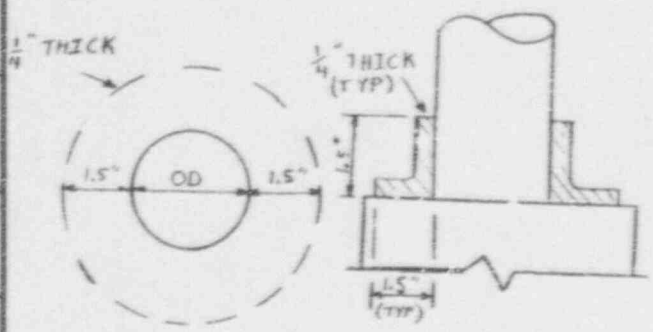
x = a + 1.5
y = b + 1.5
z = c + 1.5
V1 = a * b * c
V2 = x * y * z
V3 = 3.14159 * (OD) ^ 2 * 0.75 / 2
W1 = (V2 − V1 − V3) * 0.0487
W2 = (L1 + L2) * (Unit WT)
W = W1 − W2
L1 + L2 = LBD dimensions

Conduit Size (in)	TL wt/ft (lb)	Conduit (1) O.D. (in)	LBD(2) wt (lbs)	a (3) (in)	b (3) (in)	c (3) (in)	x (in)	y (in)	z (in)	V1 (in^3)	V2 (in^3)	V3 (in^3)	W1 (lbs)	L1+L2 (ft)	W2 (lbs)	W (lbs)	TL + LBD (LBS)
0.75	5.34	1.050	11.00	12.4375	5.4375	4.63	13.9375	6.9375	6.1250	312.8	592.2	1.30	13.55	1.125	6.01	7.54	18.5
1.00	6.34	1.315	11.00	12.4375	5.4375	4.63	13.9375	6.9375	6.1250	312.8	592.2	2.04	13.51	1.125	7.13	6.38	17.4
1.56	7.67	1.900	9.00	12.4375	5.4375	4.63	13.9375	6.9375	6.1250	312.8	592.2	4.25	13.40	1.125	8.63	4.77	13.8
2.00	8.60	2.375	9.00	12.4375	5.4375	4.63	13.9375	6.9375	6.1250	312.8	592.2	6.65	13.29	1.125	9.68	3.61	12.6
3.00	5.94	3.500	22.00	19.6875	9.5625	5.63	21.1875	11.0625	7.1250	1059.0	1670.0	14.43	29.05	1.792	10.64	18.41	40.4
4.00	7.27	4.500	51.00	27.8125	11.8750	7.13	29.3125	13.3750	8.6250	2353.2	3381.5	23.86	48.92	2.583	13.78	30.14	81.1
5.00	8.67	5.563	62.00	32.4375	12.50	8.625	33.9375	14.0000	10.1250	3497.2	4810.6	36.46	62.19	2.875	24.93	37.26	99.3

NOTES:

1. Ref. 5 page 1-102
2. Ref. 4 SH. PESD-2-2 Rev CP-3
3. Ref. 7 Attachment B

Thermo–lag Weight for LBD



Formulas

W3 = 3.0 * 0.25 * 0.0487 * (2 * X + 2 * Y + Z) [along box edges]

W4 = 3.14159 * 0.25 * 0.25 * 0.0487 * ((OD + 3) ^ 2 – OD ^ 2) * 2 [around conduit]

W5 = 3.14159 * OD * 0.25 * 1.25 * 0.0487 * 2 [around conduit]

Total Stress Skin = W3 + W4 + W5

Total WT = LBD WT + TL WT + Total Stress Skin WT

Conduit Size (in)	Stress Skin W3 (lbs)	Stress Skin W4 (lbs)	Stress Skin W5 (lbs)	Total Stress Skin (lbs)	Total WT (lbs)
0.75	1.75	0.29	0.10	2.14	20.7
1.00	1.75	0.32	0.13	2.20	19.6
1.50	1.75	0.39	0.18	2.32	16.1
2.00	1.75	0.44	0.23	2.42	15.0
3.00	2.62	0.57	0.33	3.52	43.9
4.00	3.43	0.69	0.43	4.55	85.7
5.00	3.87	0.81	0.53	5.21	104.5

NOTE: Use column labeled Total WT for design.

REV	BY	DATE	CHECKED	DATE
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ABB COMBUSTION ENGINEERING NUCLEAR POWER

JOB NO 0218

CALC NO 0218-CO-0429

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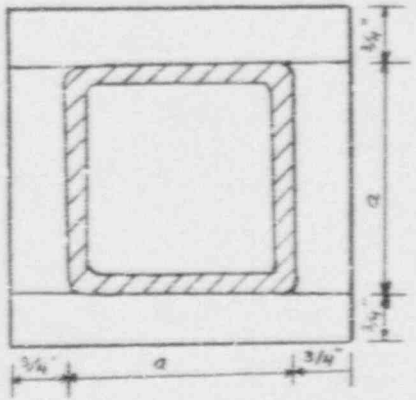
Thermo–Lag Weight for Tube Steel (9" RULE)



Formulas
A1 = (a + 2 * 0.75) * (a + 2 * 0.75)
A2 = a x a
A3 = A1 – A2
WT TL = A3 x 12 x 0.0487

TS Size	A1 (in ^ 2)	A2 (in ^ 2)	A3 (in ^ 2)	WT TL (lbs/ft)
2x2	12.25	4.00	8.25	4.82
3x3	20.25	9.00	11.25	6.57
4x4	30.25	16.00	14.25	8.33
5x5	42.25	25.00	17.25	10.08
6x6	56.25	36.00	20.25	11.83
7x7	72.25	49.00	23.25	13.59
8x8	90.25	64.00	26.25	15.34

REV: 0 | BY: RSC | DATE: 9-9-92 | CHECKED: PD | DATE: 9-9-92
ABB IMPELL CORPORATION
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Thermo-lag Weights on Junction Boxes

L (in)	W (in)	D (in)	TL Weight (#)	Stress Skin (#)	Total Weight (#)
60	48	30	462.31	20.82	483.13
60	48	18	366.32	19.07	385.39
60	42	30	422.21	19.94	442.15
60	36	24	339.37	18.19	357.56
60	30	24	301.89	17.31	319.21
60	30	20	275.16	16.73	291.88
60	30	10	208.32	15.27	223.58
60	24	24	264.42	16.44	280.85
60	24	18	226.94	15.56	242.50
60	24	12	189.47	14.68	204.15
60	24	10	176.98	14.39	191.37
60	18	15	174.68	14.24	188.92
60	18	12	157.25	13.81	171.06
60	12	12	125.04	12.93	137.97
54	36	12	232.20	15.56	247.76
48	42	24	317.67	17.31	334.98
48	42	18	277.57	16.44	294.00
48	36	36	360.41	18.19	378.60
48	36	24	285.46	16.44	301.89
48	30	24	253.24	15.56	268.80
48	30	12	183.55	13.81	197.36
48	24	24	221.03	14.68	235.71
48	18	18	159.23	12.93	172.16
48	18	12	129.64	12.05	141.69
48	18	10	119.78	11.76	131.54
48	12	12	102.69	11.18	113.86
48	12	10	93.70	10.88	104.58
48	8	8	67.91	10.01	77.92
42	18	18	142.79	12.05	154.84
42	18	15	129.31	11.61	140.93
40	24	18	163.39	12.64	176.03
36	36	24	231.55	14.68	246.23
36	30	30	234.18	14.68	248.86
36	30	12	145.42	12.05	157.47
36	30	10	135.56	11.76	147.32
36	24	24	177.83	12.93	190.56
36	24	8	105.75	10.59	116.35
36	21	12	112.88	10.74	123.61
36	18	12	102.03	10.30	112.33
36	12	12	80.33	9.42	89.76

NOTE: For design use total weight plus JB weight from Ref 4 SH PESD-4-5.

FORMULAS

TL WT = [(L + 0.75)*(W + 0.75) * 0.75 * 2 + (L + 0.75) * (D + 0.75) * 0.75 * 2 + (W + 0.75) * (D + 0.75) * 0.75 * 2] * 0.0487

Struss Skin = 3 * 0.25 * (L + W + D + 1.5 * 3) * 4 * 0.0487

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Thermo-lag Weights on Junction Boxes

L (in)	W (in)	D (in)	TL Weight (#)	Stress Skin (#)	Total Weight (#)
36	12	8	65.87	8.84	74.71
36	12	6	58.64	8.55	67.18
36	6	6	39.57	7.67	47.24
30	30	24	180.26	12.93	193.19
30	24	24	155.94	12.05	167.99
30	24	10	99.18	10.01	109.19
30	24	8	91.07	9.72	100.79
30	18	18	109.92	10.30	120.22
30	18	6	66.53	8.55	75.07
30	12	12	69.16	8.55	77.70
30	12	8	56.44	7.96	64.41
30	6	6	33.65	6.79	40.45
24	24	18	112.55	10.30	122.85
24	24	12	90.85	9.42	100.27
24	18	12	74.42	8.55	82.96
24	18	6	55.35	7.67	63.02
24	12	12	57.98	7.67	65.65
24	10	10	47.31	7.09	54.40
24	6	4	23.13	5.62	28.76
18	18	18	77.04	8.55	35.59
18	18	12	60.61	7.67	68.28
18	18	8	49.65	7.09	56.74
18	18	6	44.17	6.79	50.97
18	16	8	45.63	6.79	52.43
18	12	12	46.80	6.79	53.60
18	12	8	37.60	6.21	43.81
18	12	6	33.00	5.92	38.91
18	8	8	29.56	5.62	35.19
18	6	4	18.09	4.75	22.84
12	12	12	35.63	5.92	41.54
12	12	10	31.90	5.62	37.52
12	12	8	28.17	5.33	33.51
12	12	6	24.45	5.04	29.49
12	12	4	20.72	4.75	25.47
12	6	6	15.90	4.16	20.07
12	4	4	10.50	3.58	14.08
10	8	8	19.34	4.46	23.79
8	8	6	14.22	3.87	18.09
8	8	4	11.67	3.58	15.24
6	6	4	8.01	3.00	11.01

NOTE: For design use total weight plus JB weight from Ref 4 SH PESD-4-5.

FORMULAS

TL WT = [(L + 0.75)*(W + 0.75) * 0.75 * 2 + (L + 0.75) * (D + 0.75) * 0.75 * 2 + (W + 0.75) * (D + 0.75) * 0.75 * 2] * 0.0487

Stress Skin = 3 * 0.25 * (L + W + D + 1.5 * 3) * 4 * 0.0487

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8.0 Conclusion

The weights derived in this calculation can be used for the design validation of conduit systems covered with thermo-lag.

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