

ALP Lighting Components, Inc.

12/15/05 - Revision

Cold rolled, Low-Carbon Steel Coil and Sheet Procurement Specifications

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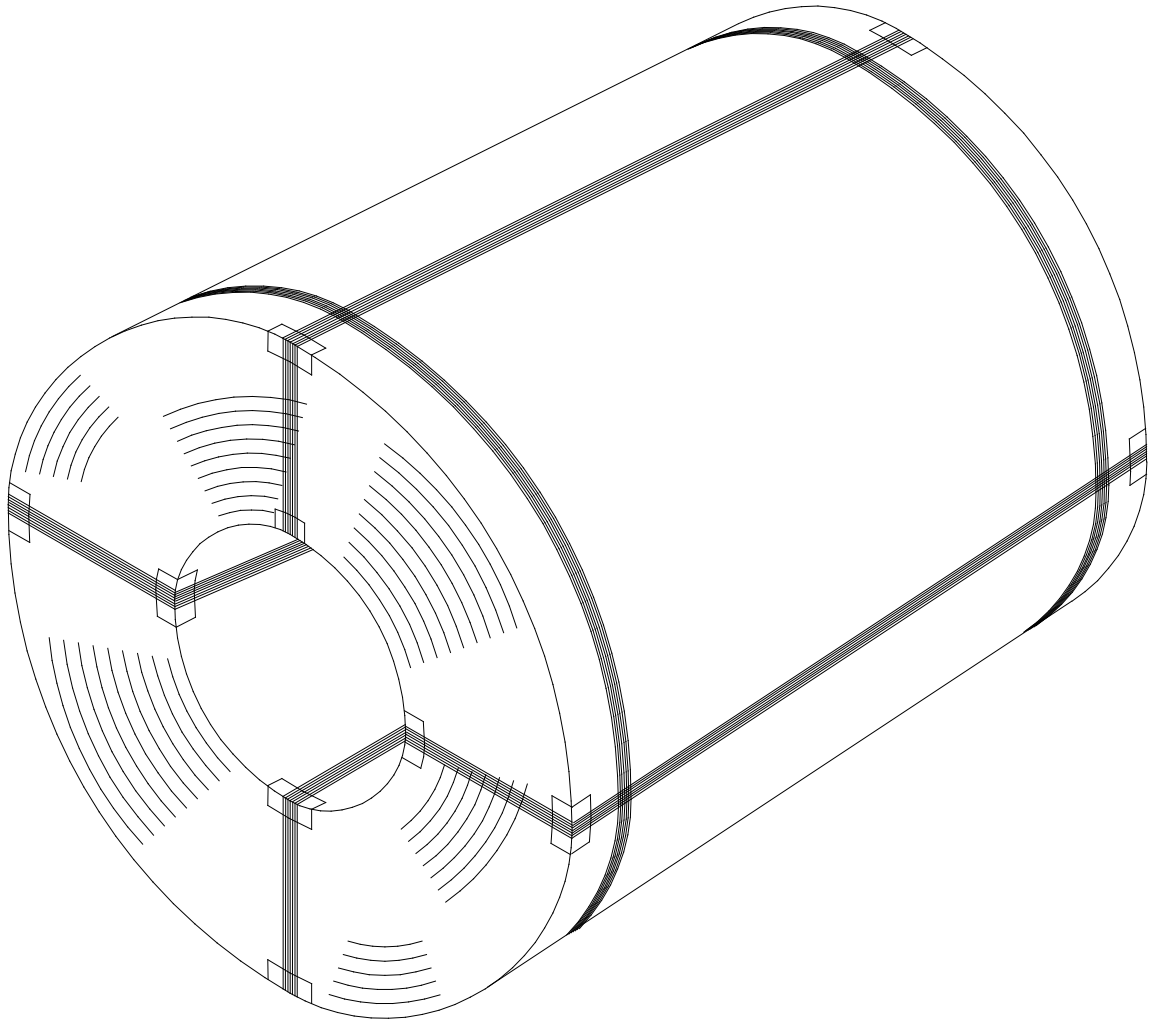
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COLD ROLLED STEEL SPECIFICATION

THE FOLLOWING PROCUREMENT SPECIFICATION SETS FORTH ALP LIGHTING'S STANDARD REQUIREMENTS FOR COLD ROLLED STEEL. THESE GRADES OF COLD ROLLED STEEL ARE INTENDED TO BE EITHER ROLL FORMED OR FABRICATED USING PROGRESSIVE DIE PUNCHING AND FORMING. SPECIFIC REQUIREMENTS FOR FLAT STEEL SHEET UTILIZED ON ALP'S FMS SYSTEM ARE ALSO INCORPORATED INTO THIS SPECIFICATION.

SPECIAL REQUIREMENTS AND EXCEPTIONS/DEVIATIONS SHALL BE SPECIFICALLY NEGOTIATED AND DOCUMENTED ON THE ALP LIGHTING PURCHASE ORDER.



SPECIFICATION

1.0 SCOPE

1.1 GENERAL OVERVIEW

ALP LIGHTING REQUIRES COMMERCIAL QUALITY LOW - CARBON STEEL FOR USE IN THE MANUFACTURE OF THE VAST MAJORITY OF OUR LIGHT FIXTURES FOR BOTH INDUSTRIAL/COMMERCIAL AND CONSUMER GOODS.

THESE APPLICATIONS REQUIRE MATERIALS THAT ARE SERVICEABLE UNDER A WIDE VARIETY OF CONDITIONS AND THAT ARE ESPECIALLY ADAPTABLE TO LOW COST TECHNIQUES OF MASS PRODUCTION (TYPICALLY ROLL FORMING AND PROGRESSIVE DIE OPERATIONS) INTO ARTICLES HAVING GOOD APPEARANCE. IN LIMITED APPLICATIONS, MATERIAL WITH UNIQUE MECHANICAL AND PHYSICAL PROPERTIES MAY BE SPECIFIED IN ORDER TO ATTAIN PERFORMANCE, APPEARANCE, OR DIMENSIONAL RESULTS WHICH ARE BEYOND THE SCOPE OF TRADITIONAL COMMERCIAL QUALITY MATERIAL.

THEREFORE, ALL PRODUCTS MUST INCORPORATE, IN VARIOUS DEGREES AND COMBINATIONS, EASE OF FABRICATION, ADEQUATE STRENGTH, EXCELLENT FINISHING CHARACTERISTICS (TO PROVIDE ATTRACTIVE APPEARANCE AFTER FABRICATION), AND COMPATIBILITY WITH VARIOUS COATINGS, LAMINATES AND FINISHING PROCESSES.

THE FOLLOWING SPECIFICATION IS INTENDED TO BE USED IN CONJUNCTION WITH THE RELEVANT PURCHASE ORDER AND ALP LIGHTING'S PART NUMBER SYSTEM, FOR STEEL AND ALUMINUM, TO DEFINE MATERIAL GAGE, COIL WIDTH, MATERIAL TYPE, FINISH, AND ANY ADDITIONAL CRITERIA REQUIRED.

2.0 STEEL CLASSIFICATION

2.1 STEEL TYPE

(I.) COMMERCIAL QUALITY (CQ)

THIS IS THE PRIMARY COLD ROLLED STEEL (CRS) USED BY ALP LIGHTING. COMMERCIAL QUALITY LOW - CARBON STEEL SHEET IS SUITABLE FOR MODERATE FORMING; MATERIAL OF THIS QUALITY HAS SUFFICIENT DUCTILITY TO BE BENT FLAT ON ITSELF IN ANY DIRECTION IN A STANDARD ROOM-TEMPERATURE BEND TEST.

(II.) DRAWING QUALITY SPECIAL KILLED (DQSK)

THIS GRADE OF LOW - CARBON STEEL IS UTILIZED BY ALP LIGHTING FOR PRODUCTS WHICH REQUIRE PARTICULARLY SEVERE DEFORMATIONS OR RESISTANCE TO STRETCHER STRAINS. THIS WILL ONLY BE USED IN VERY RARE OCCASIONS.

(III.) REPHOSPHORIZED STEEL - ENHANCED STRUCTURAL STRENGTH

LOW - CARBON STEEL PRIMARILY USED BY ALP LIGHTING TO ATTAIN GREATER STRENGTH ON COMPRESSION TESTS DUE TO ENHANCED MECHANICAL PROPERTIES (TENSILE STRENGTH, YIELD STRENGTH, AND HARDNESS).

2.2 TYPICAL MECHANICAL PROPERTIES OF LOW - CARBON STEEL

ALTHOUGH MECHANICAL PROPERTIES TYPICAL OF COMMERCIAL QUALITY (CQ), AND DRAWING QUALITY SPECIAL KILLED (DQSK), ARE NOT NORMALLY SPECIFIED THE DESIRED RANGE UTILIZED BY ALP LIGHTING IS AS FOLLOWS.

STEEL TYPE	TENSILE STRENGTH	YIELD STRENGTH	PERCENT ELONGATION IN 2 INCHES	ROCKWELL B HARDNESS
COMMERCIAL QUALITY (CQ)	40 - 50 KSI	24 - 35 KSI	35% - 42%	40 - 60
DRAWING QUALITY SPECIAL KILLED (DQSK)	36 - 46 KSI	23 - 30 KSI	39% - 49%	35 - 50
REPHOSPHORIZED	50 - 65 KSI	30 - 45 KSI	25% - 40%	50 - 70

2.3 CHEMICAL COMPOSITION OF LOW - CARBON STEEL

THE FOLLOWING IS AN OUTLINE FOR THE ACCEPTABLE RANGE OF CHEMICAL COMPOSITION OF STEEL MATERIAL FOR COMMERCIAL QUALITY, DRAWING QUALITY, DRAWING QUALITY SPECIAL KILLED. REFERENCE ASTM STANDARDS A568, A568M-03, A1008, A1008-03.

STEEL TYPE	MAT'L TYPE	CARBON (C)	MANGANESE (Mn)	PHOSPHOROUS (P)	SULFUR (S)
CRCQ	COIL / SHEET	0.03% - 0.10%	0.15%-0.50%	0.03% MAX.	0.03% MAX.
CRDQSK	COIL / SHEET	0.03% - 0.06%	0.15% - 0.25%	0.02% MAX.	0.02% MAX
REPHOS (ALA) ^{NOTE 1}	COIL / SHEET	0.03% - 0.07%	0.15% - 0.45%	0.07% - 0.09%	0.02% MAX
REPHOS (ALR) ^{NOTE 2}	COIL / SHEET	0.03% - 0.07%	0.15% - 0.45%	0.04% - 0.05%	0.02% MAX

NOTE 3: HEAT ANALYSIS OF CARBON IN DECARBURIZED STEEL IS NOT APPROPRIATE. COMPOSITION IS BASED ON SHEET ANALYSIS.

2.4 SURFACE QUALITY REQUIREMENTS

ALL COLD ROLLED STEEL SHEET AND COIL IS INTENDED FOR APPLICATIONS WHERE SURFACE FINISH IS IMPORTANT.

ALL COLD ROLLED STEEL WILL HAVE A REGULAR MATTE SURFACE FINISH. REGULAR MATTE FINISH IS UNIFORM IN APPEARANCE, WITH A DULL TEXTURE FINISH HAVING A PROFILOMETER READING BETWEEN 25 AND 65 MICRO-INCHES.

2.5 GENERAL REQUIREMENTS

WELDED JOINTS

ONLY PICKLE LINE WELDS ARE ACCEPTABLE AND THE MATERIAL MUST REMAIN WITHIN DIMENSIONAL AND PHYSICAL PROPERTY LIMITS.

3.0 COIL DIMENSIONAL REQUIREMENTS

3.1 COIL THICKNESS AND TOLERANCES

IT IS ALP LIGHTING'S BUSINESS PRACTICE TO SPECIFY MINIMUM ALLOWABLE MATERIAL THICKNESS. MATERIAL THICKNESS MAY BE DETERMINED AT ANY POINT ACROSS THE WIDTH OF THE COIL BUT NOT LESS THAN ONE INCH FROM EITHER EDGE. REFER TO ATTACHMENT G FOR REFERENCE OF MATERIAL GAGE TO DECIMAL THICKNESS.

THICKNESS MINIMUM ^{NOTE 1}	MATERIAL WIDTH (INCHES)		
	OVER 12 TO 15	OVER 15 TO 72	OVER 72
	MAXIMUM THICKNESS TOLERANCES (INCHES)		
UP TO 0.019	+0.002, -0.000	+0.002, -0.000	N/A
0.020 TO 0.039	+0.003, -0.000	+0.003, -0.000	+0.003, -0.000
0.040 TO 0.057	+0.004, -0.000	+0.004, -0.000	+0.004, -0.000
0.058 TO 0.071	+0.005, -0.000	+0.005, -0.000	+0.005, -0.000
0.072 TO 0.098	+0.005, -0.000	+0.005, -0.000	+0.006, -0.000
0.099 TO 0.140	+0.005, -0.000	+0.006, -0.000	+0.007, -0.000

NOTE 1. ALL THICKNESS INFORMATION PERTAINS TO RAW MATERIAL PRIOR TO COATING.

3.2 COIL WIDTHS AND TOLERANCES

(I.) RAW COILS DIRECTLY FROM STEEL MILL

SPECIFIED WIDTH	TOLERANCE
OVER 12 INCHES TO 30 INCHES INCL.	- 0.000 / + 0.125 INCHES
OVER 30 INCHES TO 48 INCHES INCL.	- 0.000 / + 0.188 INCHES
OVER 48 INCHES TO 60 INCHES INCL.	- 0.000 / + 0.250 INCHES

(II.) TOLERANCE FOR ALL COILS SLIT BY AN OUTSIDE PROCESSOR

- ALL WIDTH DIMENSIONS FOR CUT TO SLIT COILS WILL BE SPECIFIED ON THE RELEVANT ALP LIGHTING PURCHASE ORDER.
- ALL SLIT COIL WIDTH TOLERANCES MUST BE +/- **0.005** INCHES.

3.3 COIL FLATNESS TOLERANCES

FLATNESS IS DEFINED FOR ROLLED PRODUCTS AS DISTORTION IN THE COIL / SHEET SUCH AS A BULGE OR A WAVE, USUALLY TRANSVERSE TO THE DIRECTION OF ROLLING.

FLATNESS TOLERANCES FOR COLD ROLLED STEEL (CUT LENGTHS OVER 12 INCHES WIDE, NOT TENSION LEVELED)

SPECIFIED MINIMUM THICKNESS (INCHES)	SPECIFIED WIDTH RANGE (INCHES)	FLATNESS TOLERANCE (INCHES) ^{NOTE 1, 2, 3, 4}
UP TO 0.048 INCLUSIVE	UP TO 36 INCLUSIVE	0.375
	OVER 36 TO 60 INCLUSIVE	0.625
	OVER 60 TO 72 INCLUSIVE	0.875
OVER 0.048	UP TO 36 INCLUSIVE	0.250
	OVER 36 TO 60 INCLUSIVE	0.375
	OVER 60 TO 72 INCLUSIVE	0.625

NOTES: 1. MAXIMUM DEVIATION FROM A HORIZONTAL FLAT SURFACE.

2. THIS TABLE DOES NOT APPLY WHEN PRODUCT IS ORDERED TO A SPECIFIED HARDNESS RANGE OR "ANNEALED LAST" (DEAD SOFT).
3. THIS TABLE APPLIES TO LENGTHS CUT FROM COILS BY THE CONSUMER AFTER ADEQUATE FLATTENING MEASURES ARE PERFORMED.
4. TOLERANCES FOR STEEL WITH SPECIFIED MINIMUM YIELD STRENGTH UNDER 45 KSI.

**FLATNESS TOLERANCES FOR COLD ROLLED STEEL
(CUT LENGTHS OVER 12 INCHES WIDE, TENSION LEVELED)**

THE "I UNIT" IS A UNIT OF MEASURE WHICH TAKES INTO ACCOUNT BOTH THE WAVE HEIGHT AND WAVE LENGTH OF THE STEEL. FOR TENSION LEVELED, COILED COLD ROLLED STEEL, ALP EXPECTS THE STRIP SHAPE TO BE 15 I UNITS OR LESS. STRIP SHAPE IS CALCULATED WITH THE FOLLOWING EQUATION.

$$Strip\ Shape = 246,700 \times \left(\frac{(Wave\ Height)^2}{(Wave\ Length)^2} \right)$$

THE FOLLOWING TABLE GIVES A FEW EXAMPLES OF THE COMBINATION OF HEIGHTS AND LENGTHS THAT MEET A 15 I UNIT VALUE.

STRIP SHAPE	WAVE HEIGHT (INCHES)	WAVE LENGTH (INCHES)
15 I UNITS	0.125	16
	0.188	24
	0.250	32
	0.375	48

3.4 COIL CAMBER AND TOLERANCE

CAMBER IS DEFINED AS THE MAXIMUM ACCEPTABLE DEVIATION FROM STRAIGHT OF A SIDE EDGE OF A COIL. THE MEASUREMENT MUST BE TAKEN FROM THE CONCAVE SIDE USING A STRAIGHT EDGE AND GAGE PIN.

ASTM STANDARD CAMBER TOLERANCE FOR ANY CUT LENGTH FROM 6 FEET TO 8 FEET IS 0.250 INCHES. THE ASTM TOLERANCE FOR COILS IS ONE INCH IN 20 FEET.

- ALP SPECIFICATION FOR CAMBER IS 0.125" IN AN 8' STRIP.

4.0 FLAT SHEET DIMENSIONAL REQUIREMENTS

ALL STEEL PURCHASED FOR FMS (FLEXIBLE MANUFACTURING SYSTEM) EQUIPMENT MUST COMPLY WITH THE FOLLOWING DIMENSIONAL REQUIREMENTS:

4.1 SHEET THICKNESS AND TOLERANCES

IT IS ALP LIGHTING'S BUSINESS PRACTICE TO SPECIFY MINIMUM ALLOWABLE MATERIAL THICKNESS. MATERIAL THICKNESS MAY BE DETERMINED AT ANY POINT ACROSS THE WIDTH OF THE COIL BUT NOT LESS THAN 1/2 INCH FROM EITHER EDGE.

THICKNESS MINIMUM ^{NOTE 1}	MATERIAL WIDTH (INCHES)		
	OVER 12 TO 15	OVER 15 TO 72	OVER 72
	MAXIMUM THICKNESS TOLERANCES (INCHES)		
UP TO 0.019	+0.002, -0.000	+0.002, -0.000	N/A
0.020 TO 0.039	+0.003, -0.000	+0.003, -0.000	+0.003, -0.000
0.040 TO 0.057	+0.004, -0.000	+0.004, -0.000	+0.004, -0.000
0.058 TO 0.071	+0.005, -0.000	+0.005, -0.000	+0.005, -0.000
0.072 TO 0.098	+0.005, -0.000	+0.005, -0.000	+0.006, -0.000
0.099 TO 0.140	+0.005, -0.000	+0.006, -0.000	+0.007, -0.000

NOTE 1. ALL THICKNESS INFORMATION PERTAINS TO RAW MATERIAL PRIOR TO COATING.

4.2 SHEET WIDTHS AND TOLERANCES

THE WIDTH IS DEFINED AS THE SLIT CROSS-SECTION OF THE SHEET. THE ALLOWABLE TOLERANCE IS +0.187/-0.000.

THE METHOD OF MEASUREMENT IS TO PLACE THE STEEL SHEET ON A FLAT SURFACE AND MEASURE THE WIDTH AT BOTH THE TOP AND BOTTOM OF THE SHEET USING APPROPRIATE LAYOUT EQUIPMENT. (LINEAR GAGE, CALIPERS , OR STRAIGHT EDGE.

4.3 SHEET FLATNESS TOLERANCE

FLATNESS IS DEFINED FOR ROLLED PRODUCTS AS DISTORTION OF THE COIL / SHEET SUCH AS A BULGE OR A WAVE, USUALLY TRANSVERSE TO THE DIRECTION OF ROLLING. FOR COLD ROLLED SHEET STEEL, ALP EXPECTS THE STRIP SHAPE TO BE 7.5 I UNITS OR LESS. SEE SECTION 3.3 FOR FURTHER EXPLANATION ON THE "I UNIT" AND STRIP SHAPE CALCULATION. THE TABLE AT THE TOP OF THE FOLLOWING PAGE GIVES A FEW EXAMPLES OF THE COMBINATION OF HEIGHTS AND LENGTHS THAT MEET A 7.5 I UNIT VALUE.

STRIP SHAPE	WAVE HEIGHT (INCHES)	WAVE LENGTH (INCHES)
7.5 I UNITS	0.125	23

	0.188	34
	0.250	45
	0.375	68

4.4 SHEET LENGTH TOLERANCE

THE SHEARED LENGTH TOLERANCE IS +/- 0.031.

TO MEASURE, PLACE THE FLAT SHEET ON A FLAT SURFACE AND USING A LINEAR GAGE , STRAIGHT EDGE OR TAPE (1/32 INCH ACCURACY MINIMUM) MEASURE THE LENGTH APPROXIMATELY 1/2 INCH FROM THE EDGE OF THE SHEET ON BOTH SIDES.

4.5 SHEET SQUARENESS TOLERANCE.

SQUARENESS IS DEFINED AS A FLAT SHEET CHARACTERISTIC OF HAVING ADJACENT SIDES OR EDGES MEETING AT 90 DEGREES AND MAY BE DETERMINED VIA CALCULATING THE DIFFERENCE IN LENGTH OF THE DIAGONALS.

THE MAXIMUM ALLOWABLE DIFFERENCE IN THE LENGTH OF BOTH DIAGONALS IS 0.0625 INCHES.

THE METHOD OF MEASUREMENT IS TO PLACE THE SHEET ON A FLAT SURFACE AND MEASURE BOTH DIAGONALS USING A STEEL TAPE (WITH 1/32 INCH GRADUATIONS). SUBTRACT THE LOWER DIAGONAL MEASUREMENT FROM THE HIGHER AND DIVIDE BY 2. THE RESULTANT CANNOT EXCEED THE SPECIFIED LIMIT ABOVE.

4.6 SHEET WEIGHT REQUIREMENTS (INCLUDES STEEL AND PALLET)

(I.) 3000 LBS MAXIMUM ON 50 INCH X 50 INCH FLAT SHEETS.

(II.) 4000 LBS MAXIMUM ON ALL ADDITIONAL SIZE SHEETS.

5.0 FINISH REQUIREMENTS

5.1 COILS REQUIRING SECONDARY FINISH

REFERENCE THE APPROPRIATE ALP LIGHTING SPECIFICATION FOR ALL SECONDARY FINISH PRODUCTS SUCH AS PRE-PAINT, LAMINATE, AND PORCELAIN COATED STEEL.

5.2 RAW COILS

ALL UNFINISHED STEEL COILS MUST HAVE LIGHTWEIGHT RUST PREVENTATIVE OIL APPLIED. THE OIL MUST NOT RUN OR DRIP THROUGH LAYERS AND ACCUMULATE ON THE FLOOR.

APPROVED OILS AND RELEVANT SUPPLIER INFORMATION.

PRODUCT NAME	MANUFACTURER
1. FERROCOTE 5684	QUAKER CHEMICAL CORPORATION
2. SHELL MVI 100 NEUTRAL	SHELL OIL COMPANY

6.0 PACKAGING REQUIREMENTS

ALL PACKAGING OF STEEL COILS SHALL BE IN ACCORDANCE WITH THE FOLLOWING PROVISIONS UNLESS SPECIFIED IN WRITING BY THE INDIVIDUAL RECEIVING PLANT.

6.1 COIL PACKAGING REQUIREMENTS

(A.) GENERAL REQUIREMENTS FOR ALL COILS

(I.) COIL INSIDE DIAMETER AND OUTSIDE DIAMETER SPECIFICATIONS ARE AS FOLLOWS:

COIL WIDTH	INSIDE DIAMETER		OUTSIDE DIAMETER		PACKAGING METHOD	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	EYE HORZ.	EYE TO SKY
0"-9"	16.25	21.25	48"	60"		X
9"-30"	16.25	21.25	48"	60"		X
30"-48"	16.25	21.25	48"	60"	X	

**NOTE: ANY CHANGES TO THIS REQUIREMENT WILL BE SPECIFIED ON THE PURCHASE ORDER

(II.) ALL COILS MUST HAVE INDIVIDUAL IDENTIFICATION TAGS WHICH SPECIFY THE FOLLOWING:

- COIL NUMBER
- NET COIL WEIGHT
- PURCHASE ORDER
- SUPPLIER NAME
- MILL COIL NUMBER
- QC RELATED INFORMATION
- TAG INSIDE COIL WITH PART NUMBER AND WEIGHT

(III.) NO ADHESIVE TAPE OR MATERIAL SHALL BE IN DIRECT CONTACT WITH THE STEEL COIL. THE RESIDUAL ADHESIVE FREQUENTLY RESULTS IN EQUIPMENT AND DIE RELATED PROBLEMS.

(IV.) ALL COILS MUST BE PALLETIZED AND SHIPPED EYE TO THE SKY. ONLY COILS 12 INCHES WIDE OR LESS ARE ALLOWED TO BE STACKED AND SHIPPED ON A MULTIPLE COIL PALLET, EYE TO THE SKY.

(V.) ALL METAL BANDS THROUGH THE COIL EYE SHALL HAVE APPROPRIATE EDGE PROTECTORS BETWEEN THE BANDS AND STEEL COIL TO PREVENT DAMAGE TO THE COILS DURING SHIPMENT AND HANDLING. CIRCUMFERENTIAL COIL BANDS SHALL HAVE BAND SEAL PROTECTION PADS TO PREVENT COIL DAMAGE.

(VI.) MAXIMUM PALLET WEIGHTS

- 9,800 LBS FOR FLAT BED TRUCK OR RAIL CAR SHIPMENTS
- 5,000 LBS WHEN SHIPPED ON STANDARD VAN OR TRAILER

(VII.) ALL COILS MUST HAVE 5/8 INCH MINIMUM FIBER CORE EQUAL TO THE SLIT WIDTH OF COIL.

(B.) COILS SHIPPED EYE TO THE SKY

(I.) ALL EYE TO THE SKY COILS

(a.) EACH COIL MUST HAVE FOUR (4) EQUALLY SPACED 5/8 INCH EYE METAL BANDS WITH THE NECESSARY PROTECTORS APPROPRIATELY POSITIONED.

(b.) EACH COIL MUST HAVE ONE (1) 5/8 INCH METAL CIRCUMFERENCE BAND WITH BAND SEAL PROTECTOR PAD IN THE 12 O'CLOCK POSITION.

(c.) A PROTECTIVE MOISTURE BARRIER (20 MIL THICK MINIMUM) MUST BE POSITIONED BETWEEN THE BOTTOM OF THE COIL AND THE TOP OF THE PALLET AS SHOWN IN ATTACHMENTS PK-CS02 AND PK-CS03.

(d.) COILS SHALL BE COMPLETELY OUTER WRAPPED WITH MOISTURE PROOF PAPER (VPI OR VCI TREATED) TO PROTECT THEM FROM OUTSIDE MOISTURE AND SECURED TO THE PALLET WITH A MINIMUM OF TWO (2) 1-1/4 INCH METAL BANDS THROUGH THE EYE OF THE COIL(S). THE METAL BANDS MAY GO THROUGH THE EYE OF THE COIL(S), AS SHOWN IN PK-CS02, OR COMPLETELY AROUND THE COIL(S), AS SHOWN IN PK-CS03.

(e.) PALLET SIZE MUST EXCEED THE COIL DIAMETER BY A MINIMUM OF 1/2 INCH ON ALL SIDES. ALL COILS MUST BE CENTERED ON THE PALLET AND SHALL NOT OVERHANG THE EDGE OF THE PALLET.

(f.) THE PALLET MUST BE CONSTRUCTED TO SUPPORT THE COIL WEIGHT, AS WELL AS PREVENT DECK BOARD STRAPPING DAMAGE, DURING TRANSPORTATION AND HANDLING.

(II.) ADDITIONAL REQUIREMENTS FOR MULTIPLE COIL PALLETS

(a.) EACH COIL INTERFACE MUST BE PROTECTED WITH A MINIMUM OF FOUR (4) SPACERS SUITABLE FOR MAINTAINING A 2 INCH MINIMUM SPACE BETWEEN COILS TO ACCOMMODATE DE-STACKING BY FORKLIFT TRUCK. SPACERS SHALL RUN FROM ID TO OD IN DIAMETRICAL ALIGNMENT AND WILL BE ALIGNED VERTICALLY FROM ONE COIL TO THE NEXT COIL.

(NOTE: SPACERS CANNOT BE MADE OF WOOD, UNLESS SEPARATED FROM STEEL COILS WITH VPI OR VCI TREATED WATER PROOF PAPER.)

(b.) ALL COILS MUST BE OF THE SAME OUTSIDE DIAMETER. BAND COILS TOGETHER AS A SINGLE PACKAGE WITH A MINIMUM OF TWO (2) 1-1/4 INCH METAL BANDS. REFER TO ATTACHMENT PK-CS03.

(C.) COILS SHIPPED EYE HORIZONTAL

(I.) COILS MUST HAVE A MINIMUM OF FOUR (4) EQUALLY SPACED 3/4 INCH METAL EYE BANDS AND TWO (2) CIRCUMFERENTIAL METAL BANDS WITHIN 2 INCHES OF EACH COIL EDGE.

(II.) COILS SHALL BE COMPLETELY OUTER WRAPPED WITH MOISTURE PROOF PAPER (VPI OR VCI TREATED) TO PROTECT THEM FROM OUTSIDE MOISTURE.

(III.) MAXIMUM WEIGHTS FOR ALL COILS:

COIL TYPE	USAGE	MAXIMUM WEIGHT (LBS.)
ALL COILS	ALL PLANTS	9,800

(D.) PACKAGING DIAGRAMS

THE FOLLOWING ATTACHMENTS ILLUSTRATE APPROPRIATE BANKING AND PALLET CONFIGURATIONS FOR THE VARIOUS COIL OPTIONS.

- PK-CS01 - INDIVIDUAL COATED COIL (FINISHED MATERIAL) - EYE HORIZONTAL
- PK-CS02 - MULTIPLE COATED COILS (FINISHED MATERIAL) - EYE TO THE SKY
- PK-CS03 - INDIVIDUAL COATED COIL (FINISHED MATERIAL) - EYE TO THE SKY

6.2 SHEET PACKAGING REQUIREMENTS

THE PALLETIZATION AND PACKAGING REQUIREMENTS FOR SHEET STEEL IS OUTLINED BELOW:

1. TOP PROTECTION

THE TOP PROTECTION IS TO BE 1 INCH X 6 INCHES X 1 INCH PROTECTOR UNDER BANDS.

2. EDGE PROTECTION/ BANDING

SUFFICIENT BANDING IS REQUIRED TO SECURE THE SHEETS TO THE PALLET. BANDING MUST BE PLACED OUTSIDE THE EDGE PROTECTORS. EDGE PROTECTORS ARE REQUIRED ON ALL FOUR SIDES.

3. STRINGERS/ RUNNERS

MOUNT 4 X 4 INCH STRINGERS ON 10 INCH CENTERLINE SPACING. STRINGERS MUST BE FLUSH WITH DECK BOARDS.(MAXIMUM DEVIATION FROM DECK BOARDS +/- 0.25 INCHES)

4. DECK BOARDS

ONLY 3/4 INCH THICK SOLID PLYWOOD DECK BOARDS MAY BE USED. THE CLEARANCE BETWEEN DECK BOARDS AND SHEET STEEL MUST BE 1.00 INCH MINIMUM ALL AROUND.

5. FORKLIFT PROVISION

FORKLIFT ACCESS MUST BE PROVIDED ALONG THE LENGTH OF THE PALLET.

6. ATTACHMENT PK-SS01 & PK-SS02 DEPICTS THE PACKAGING REQUIREMENTS OUTLINED IN ITEMS 1 - 5, FOR ALL SHEET STEEL INTENDED FOR FMS USE.

7.0 GENERAL TRUCKING SPECIFICATIONS

ALL TRUCK LOADS OF COILS MUST COMPLY WITH THE FOLLOWING GENERAL GUIDELINES. FAILURE OF THE DRIVER TO COMPLY WILL RESULT IN ALP'S REFUSAL TO LOAD OR UNLOAD THE VEHICLE. IF VIOLATIONS ARE IDENTIFIED AFTER LOADING, THE VEHICLE WILL BE UNLOADED AND SENT OUT EMPTY. COMPLIANCE WITH ALL GENERAL LOADING REQUIREMENTS IS MANDATORY AND A MAJOR CONSIDERATION WHEN EVALUATING A CARRIER'S SERVICE PERFORMANCE.

1. ALL TRUCKS MUST BE EQUIPPED WITH THE FOLLOWING (SEE ATTACHMENT CS-LD01):

- **COIL RACKS** FOR SECURE ATTACHMENT DURING HAULING.

- MINIMUM 4 INCH X 4 INCH BEVELED BLOCKING (1.5 INCH BEVEL) OF SUFFICIENT SIZE , QUANTITY AND QUALITY TO PREVENT MOVEMENT OF COILS IN TRANSIT. **CAUTION - NO SQUARE CUT 4 X 4 PERMITTED.**

- **STEEL CHAIN PROTECTORS** OF SUFFICIENT QUALITY TO PREVENT CHAIN DAMAGE TO STEEL.

- **CHAINS** OF SUFFICIENT NUMBER AND STRENGTH TO SECURE LOAD MUST BE USED.

- **TARPS** MUST BE CLEAN , FREE OF HOLES, AND OF SUFFICIENT SIZE TO COMPLETELY COVER MATERIAL **INCLUDING INTERFACE WITH TRUCK BED.**

- **TRAILER FLOORS MUST BE IN GOOD CONDITION** , FREE OF HOLES AND LOOSE DEBRIS.

- **RUBBER BELTING** MUST BE 3/8 INCH THICK MINIMUM X 12 INCH MINIMUM WIDTH. STRIPS MUST BE SUFFICIENT IN QUANTITY TO PROTECT ALL COILS FROM TRANSIT DAMAGE.

-ALL COILS (BARE OR WRAPPED) MUST BE SHROUDED. (SEE PAPER SHROUDING PROCEDURE - PAPER FURNISHED UPON REQUEST.)

2. ALL TRUCKS MUST COMPLY WITH GOVERNMENT REGULATIONS APPLICABLE TO WEIGHT LAWS, LOAD SECUREMENT AND APPLICABLE MOTOR CARRIER SAFETY REGULATIONS, AND PLACARDING.

3. PLACEMENT OF CHAINS OVER THE TOP OF COILS IS NOT ACCEPTABLE. NYLON STRAPS ARE ACCEPTABLE. SEE ATTACHED DIAGRAM OUTLINING CHAIN REQUIREMENTS AND LOCATION.

8.0 AREAS OF RESPONSIBILITY

8.1 DESIGNATION OF RESPONSIBILITY

THE FOLLOWING CHART OUTLINES WHICH SECTIONS OF THIS SPECIFICATION ARE RELEVANT TO THE SUPPLIERS INVOLVED.

ACTIVITY	SUBSTRATE SUPPLIER	SLITTER OUTSIDE PROCESSOR	COIL COATING APPLICATION	ALP LIGHTING
1.0 SCOPE	X			
1.1 GENERAL OVERVIEW	X	X	X	X
2.0 STEEL CLASSIFICATION				
2.1 STEEL TYPE	X			
2.2 MECHANICAL PROPERTIES	X			
2.3 CHEMICAL COMPOSITION	X			
2.4 SURFACE QUALITY	X			
2.5 GENERAL REQUIREMENTS	X			
3.0 COIL DIMENSIONAL REQMTS.				
3.1 COIL THICKNESS	X	X		
3.2 COIL WIDTH	X	X		
3.3 COIL FLATNESS	X	X		
3.4 COIL CAMBER	X	X		
4.0 FLAT SHEET DIMENSIONAL REQUIREMENTS.				
4.1 SHEET THICKNESS & TOL.	X			
4.2 SHEET WIDTH & TOL.	X			
4.3 SHEET FLATNESS & TOL.	X			
4.4 SHEET LENGTH & TOL.	X			
4.5 SHEET SQUARENESS & TOL	X			
4.6 SHEET COIL WEIGHT	X			
5.0 SECONDARY FINISHING				
5.1 FINISHED COILS	X		X	
5.2 RAW COILS	X			
6.0 PACKAGING				
6.1 COIL PACKAGING	X	X	X	
6.2 SHEET PACKAGING	X			
7.0 GENERAL TRUCKING REQTS.	X	X	X	
8.0 AREAS OF RESPONSIBILITY	X	X	X	X

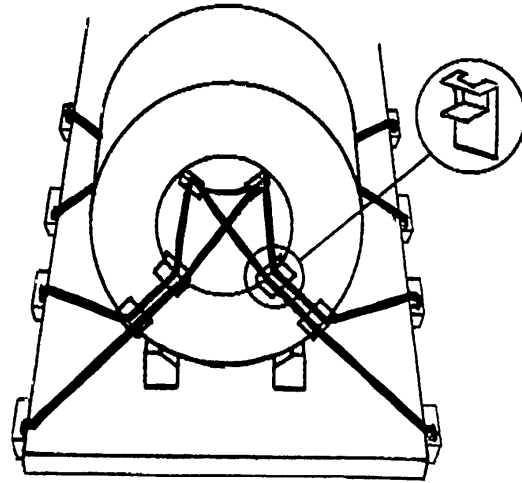
ATTACHMENT G - GAGE THICKNESS FOR COLD ROLLED STEEL

THIS TABLE IS PROVIDED FOR REFERENCE. THE PREFERRED METHOD FOR SPECIFYING STEEL IS WITH THE DECIMAL THICKNESS DESIRED. USING GAGE DESIGNATIONS CAN LEAD TO CONFUSION FOR DIFFERENT SUPPLIERS IN DIFFERENT AREAS THAT DO NOT HAVE THE SAME INTERPRETATION OF GAGE DESIGNATION.

GAGE	MINIMUM MATERIAL THICKNESS <small>NOTE 1</small>
14 GA	0.0700 INCHES
16 GA	0.0560 INCHES
18 GA	0.0430 INCHES
20 GA	0.0310 INCHES
22 GA	0.0260 INCHES
23 GA	0.0239 INCHES
24 GA	0.0210 INCHES
25 GA	0.0179 INCHES
26 GA	0.0160 INCHES

NOTE 1. ALL DIMENSIONAL INFORMATION PERTAINING TO RAW MATERIAL PRIOR TO COATING.

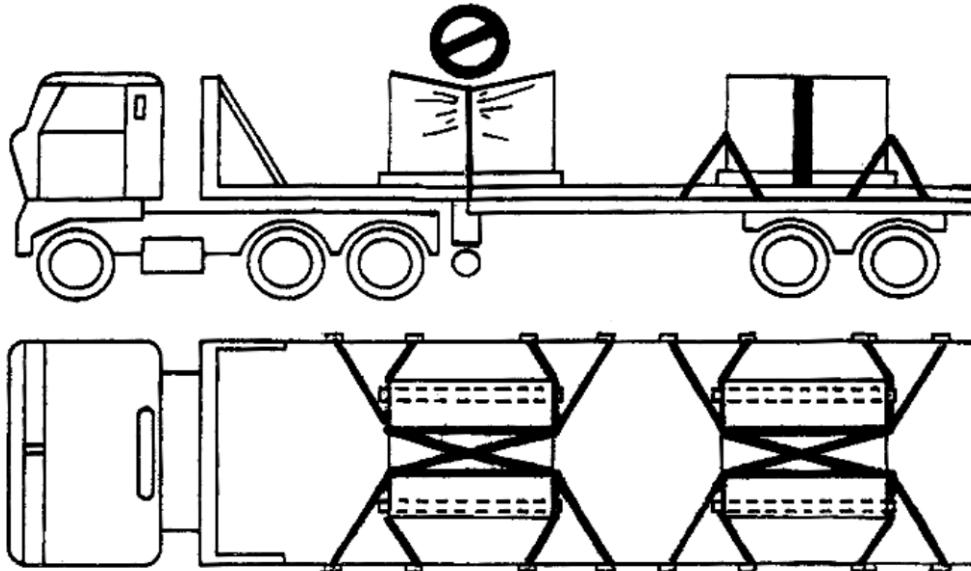
ATTACHMENT CS-LD01 - TRUCKING REQUIREMENTS



STEEL CHAIN PROTECTORS MANDATORY AT ALL POINTS

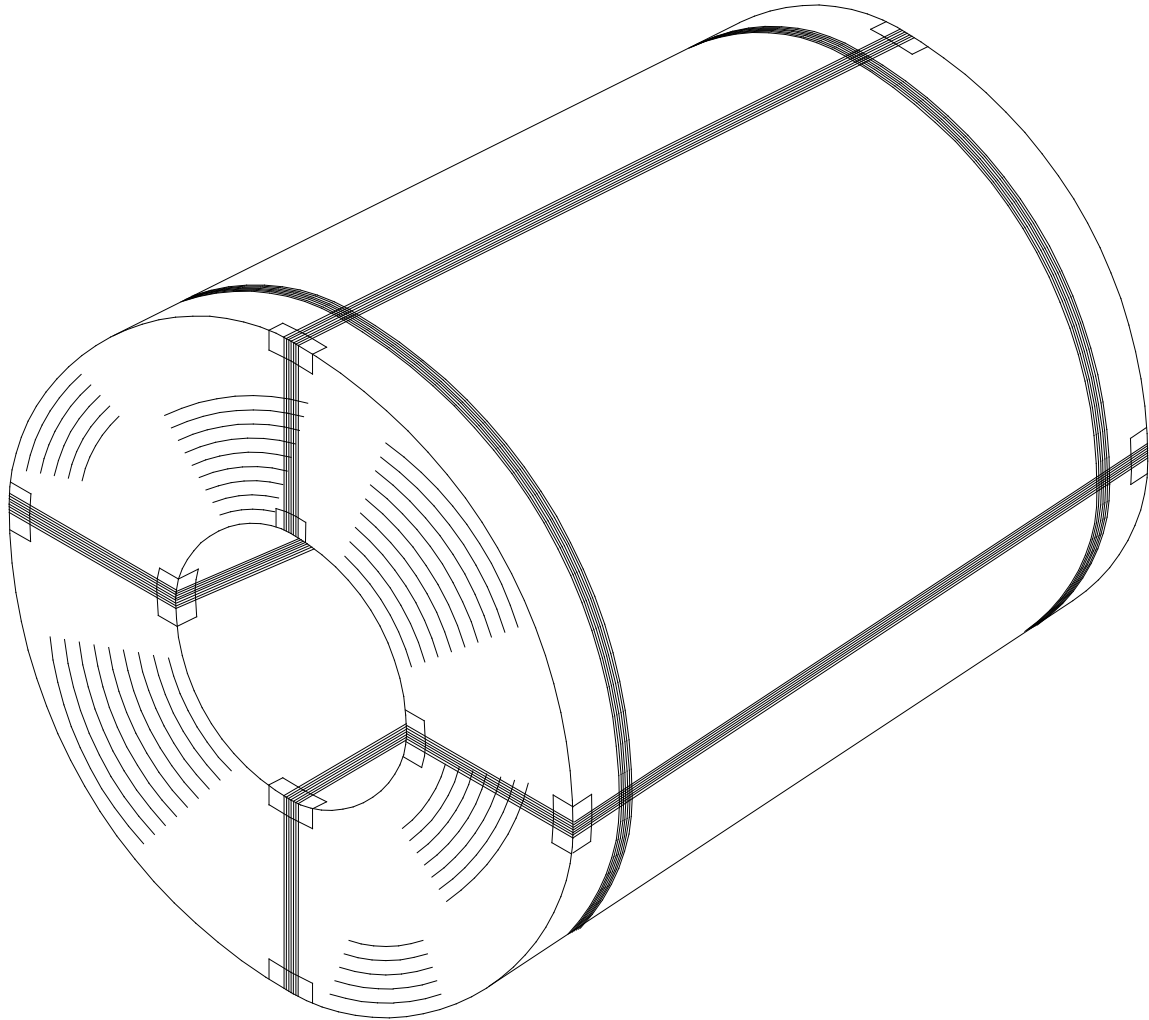
NO CHAINS

NYLON STRAP OPTIONAL



**CHAINING METHOD - COILS EYE LENGTHWISE WHEN VIEWED FROM ABOVE TRUCK
(COILS MOUNTED EYE TO THE SIDE MUST ALSO COMPLY WITH MINIMUM NUMBER OF CHAINS FOR COIL WEIGHT.)**

ATTACHMENT PK-CS01



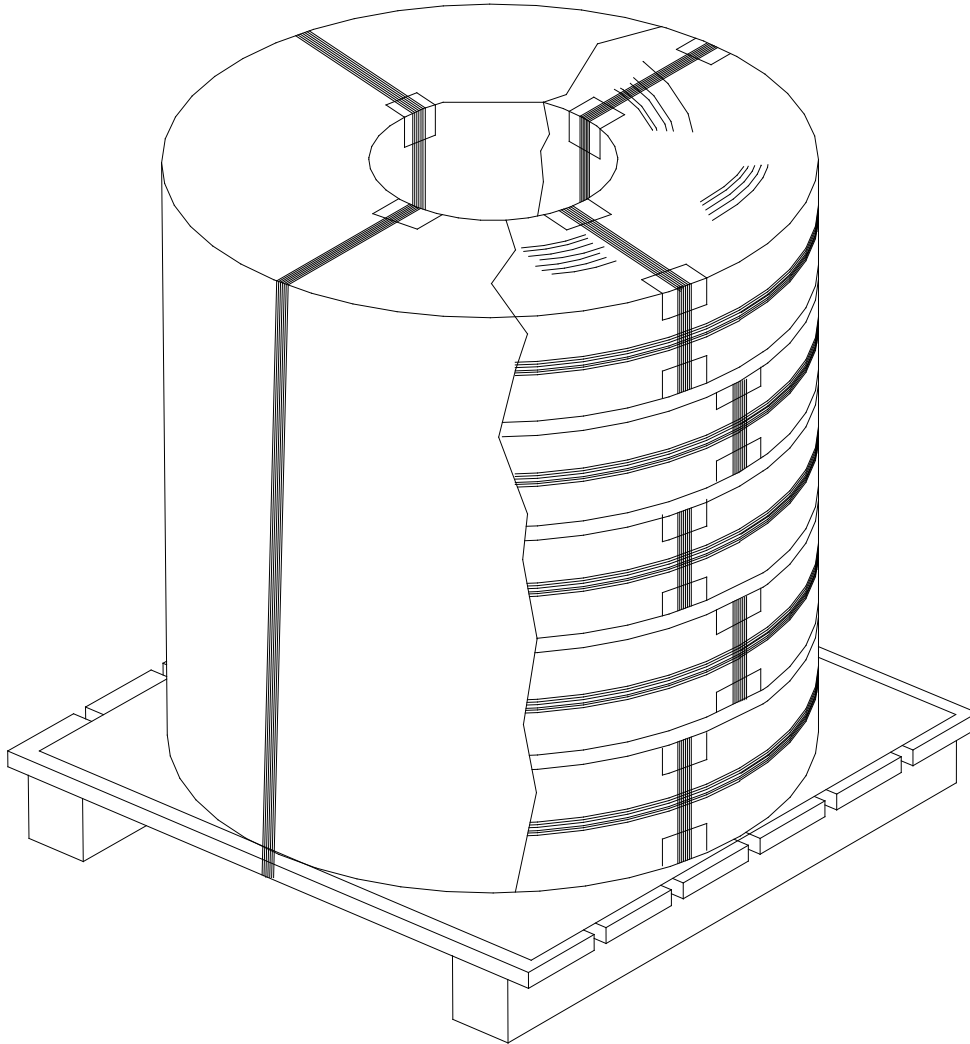
**INDIVIDUAL COIL
EYE HORIZONTAL**

Four (4) equally spaced 3/4" metal bands through the eye of the coil. Two (2) circumferential 3/4" metal bands located within 2 inches of each edge of the coil.

WARNING

The handling of waxed coils is potentially hazardous unless appropriate care is used with crane hooks, fork lifts, etc. The extreme lubricity of the coating allows intra-wrap slippage much more easily than on normal painted coil. All waxed coils will be well marked to the customer's attention to prevent any accidents.

ATTACHMENT PK-CS02



**MULTIPLE COILS
EYE to the SKY**

Four (4) equally spaced 5/8" metal bands through the eye of the coil.

One (1) 5/8" circumferential metal band on each coil.

Four (4) spacers 2"x2" spanning coil ID to OD equally spaced around diameter of coil. Spacers shall not be wood unless separated from steel with waterproof paper.

Two (2) 1 1/4" metal bands to secure the coils to the pallet.

20 mil minimum thickness VPI or VCI treated moisture proof paper between the bottom coil and the pallet.

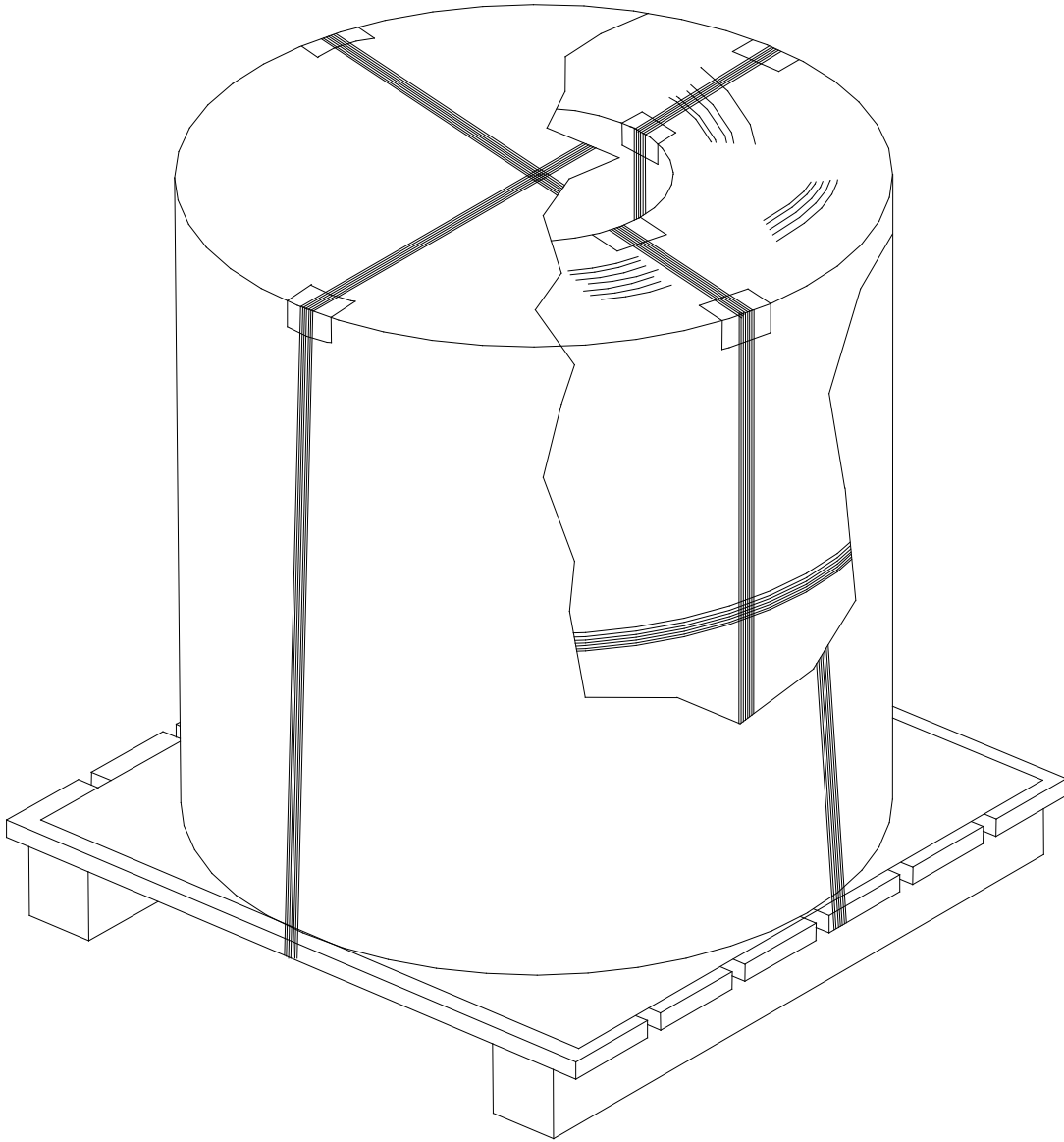
4" x 4" skids

2" x 4" or 2" x 6" braces nailed to skids.

WARNING

The handling of waxed coils is potentially hazardous unless appropriate care is used with crane hooks, fork lifts, etc. The extreme lubricity of the coating allows intra-wrap slippage much more easily than on normal painted coil. All waxed coils will be well marked to the customer's attention to prevent any accidents.

ATTACHMENT PK-CS03



**SINGLE COIL
EYE to the SKY**

Four (4) equally spaced 5/8" metal bands through the eye of the coil. One (1) 5/8" circumferential metal band on each coil. Two (2) 1 1/4" metal bands to secure the coils to the pallet.

20 mil minimum thickness VPI or VCI treated moisture proof paper between the bottom coil and the pallet.

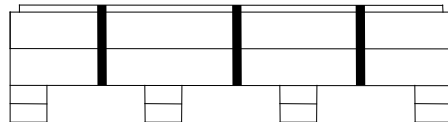
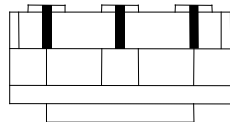
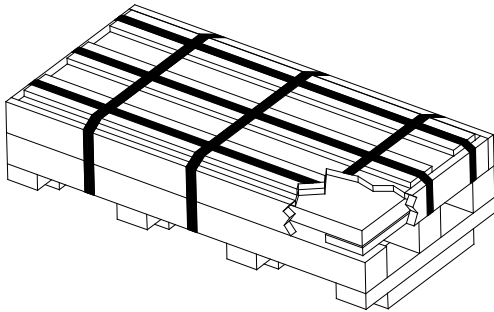
4" x 4" skids

2" x 4" or 2" x 6" braces nailed to skids.

WARNING

The handling of waxed coils is potentially hazardous unless appropriate care is used with crane hooks, fork lifts, etc. The extreme lubricity of the coating allows intra-wrap slippage much more easily than on normal painted coil. All waxed coils will be well marked to the customer's attention to prevent any accidents.

ATTACHMENT PK-SS01



FLAT SHEET

Top protection 1"x 6"x 1" under banding.
Edge protectors are required for all banding.
Mount 4"x 4" stringers on 10" centerline.
Deck boards must be 3/4 inch plywood.
Forklift access must be provided along the length of the pallet.