Service Locations

Rocky Mountain Region

PDM Spanish Fork
1100 N. 300 W.
P.O. Box 280
Spanish Fork, UT 84660
(801) 798-8676
(800) 444-7361
(801) 798-3605 Fax

PDM Denver
4755 N. Washington Street
Denver, CO 80216
(303) 297-1456
(800) 736-4277
(303) 295-3538 Fax

Nevada

PDM Las Vegas
4475 Alto Avenue
Las Vegas, NV 89115
(702) 413-0067
(888) 413-4736
(702) 413-0006 Fax

PDM Sparks
1250 Kleppe Lane
Sparks, NV 89431
(775) 358-1441
(800) 736-1400
(775) 355-1443 Fax

Pacific Northwest

PDM Woodland
1785 Schurman Way
Woodland, WA 98674
(360) 225-1133
(800) 451-9581
(360) 225-0204 Fax

California

PDM Corporate
9245 Laguna Springs Dr.,
Suite 350
Elk Grove, CA 95758
(916) 513-4548

PDM Santa Clara
3500 Bassett Street
Santa Clara, CA 95054
(408) 988-3000
(800) 672-8801
(408) 988-6966 Fax

PDM Plate Processing Center
4005 E. Church Avenue
Fresno, CA 93725
(559) 442-1410
(800) 222-3235
(559) 442-1409 Fax

PDM Stockton
3535 E. Myrtle Street
Stockton, CA 95205
(209) 943-0513
(800) 800-4736
(209) 466-8420 Fax

Feralloy PDM Steel Service
936 Performance Dr.
Stockton, CA 95206
(209) 234-0548
(800) 972-5986
(209) 234-0549 Fax

Service Locations

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A Brief History Of PDM

PDM entered the steel service center industry in 1954 with the acquisition of the Proctor-James Steel Company in San Jose, California. In 1955, Kyle & Company was purchased, with facilities in Fresno, Stockton, and Sacramento. With four service centers, PDM was able to provide outstanding service throughout central and northern California.

In 1962, a new facility was constructed in Fresno, California. In 1968, the existing operations were greatly augmented by the completion of a large, state of the art service center in Stockton, California. The facility utilized the most modern material handling equipment of the time.

In 1974, a new warehouse was built in Reno, Nevada to improve service in central and northern Nevada as well as the Eastern Sierras in California.

To provide the greatest possible service and selection to customers, the "Common Inventory Concept" was adopted which provided customers throughout the company, access to uncommon, hard to find, slow moving items, without the burden of carrying duplicate inventories in each location. Under the Common Inventory Concept, the new Stockton facility became the geographical hub of the service wheel with spokes running east to Reno, south to Fresno and west to Santa Clara. The "Interplant Transfer System" was developed to quickly move this common inventory between service centers, providing short lead-time delivery of most items regardless of the inventory location. This concept proved to be so successful that future PDM operations were either built or expanded to provide other "hub" type distribution facilities.

In 1977, a new service center was established in Spanish Fork, (close to Provo) Utah. Over the years, this location was expanded numerous times to meet the market demands. It is now a full line distribution and processing facility acting as the "hub" for the Intermountain Region providing service for customers in Utah, Idaho, Wyoming, and Colorado.

In January 1997, PDM purchased General Steel, a carbon steel service center in Vancouver, Washington. In April of 1999 this operation moved into a newly designed and built facility in Woodland, Washington and became the next "hub" in the Great Northwest. The Woodland service center serves Washington, and Oregon. In July 2001, the Reliance Steel & Aluminum Co. of Los Angeles, California purchased PDM Steel Service Centers. Today PDM Steel operates as a wholly-owned subsidiary now named: PDM Steel Service Centers, Inc.

PDM entered the Las Vegas market in late 2003 working from a remote office with delivery supplemented through both the Fresno and Spanish Fork locations. By early 2005, the company moved into a small full-service warehouse with delivery throughout Southern Nevada, Southern Utah, and Northern Arizona.

In May of 2008, PDM acquired Engbar Pipe and Steel in Denver, Colorado. With the support of regular delivery and a vast inventory from the Spanish Fork operation, PDM Denver expanded their service and product offering to the greater Colorado market and parts of Wyoming.

PDM built and moved into a new, state of the art facility in Las Vegas in August 2008. This operation now houses a complete product offering with multiple processing capabilities.

As demand for "pre-production processing" material grew, the company responded by also investing in new processing equipment installed at all facilities. State of the art automatic saws with controlled feed-in and feed-out tables and enhanced plate cutting equipment have been upgraded in almost all locations.

In 2008, the company purchased its first multifunction precision plate processing center and located it in Fresno. In 2010 a second center was located in Spanish Fork. These processing centers provided improved thermal cutting capabilities and multifunction processes, like drilling, punching, tapping, scribing, marking, and a variety of machining options all on one machine. In that same year, PDM installed a 120 ton iron worker in Fresno augmenting the production of plate and small structural parts. The company has since continued to expand its plate processing capabilities with the installations of a 1,000-ton 24' press brake, multi-axis beveling tables, laser cutting machines and another cutting edge machining center.

In June of 2013, PDM acquired the Stockton location of Feralloy, another Reliance subsidiary. Now known as Feralloy PDM Steel Service (FPSS), this operation specializes in flat roll steel product distribution, coil slitting, cut-to-length and services a vast array of customers in the Western US.

In 2016 PDM relocated its corporate headquarters from Stockton to a commercial building in Elk Grove, California and the Stockton service center is now a standalone facility.

Over the last few years, PDM has put an even greater focus on quality and continuous improvement and has 4 locations that are ISO 9001:2015 Certified. PPC (2017), FPSS (recertified 2018), Stockton (2018), Spanish Fork (2019).

The most recent change occurred in 2019 when the company introduced new laser cutting capabilities with the introduction of a new tube laser. PDM is now able to offer customers 360-degree processing on large scale structural products in virtually any shape or profile. This added tremendous service capacity to our customer base across industries by offering them a simplified, single solution that decreases the need for welding by creating "smart parts" with tabs and features on processed material to facilitate quicker assembly.

PDM Steel is continuously evaluating opportunities to improve service, inventories, and delivery for our diversified customer base. Our pledge to you in the future, as in the past, will always be to provide you with the finest...

Service
When And Where You Need It!

This catalog is published for general information. It is not a stock list. Call to confirm the availability of particular sizes and grades. Specific application of the information or products listed herein may require professional assistance or interpretation. Information on product specifications is highly abridged. The latest ASTM (www.astm.org) documents should be consulted for full and accurate information on product specifications. Technical information on any questions as to structural design, weldability, formability, allowable stress, heat treating, material properties or characteristics, etc. should be referred to the appropriate professional consultant.

PDM Steel Service Centers, Inc.

TERMS AND CONDITIONS OF SALE

PDM Steel Service Centers, Inc. ("Seller") and the party purchasing goods and/or materials ("Customer") hereby agree to the following Terms and Conditions of Sale ("Terms and Conditions"):

1. Customer's Acceptance of Terms. These Terms and Conditions of Sale constitute the final and entire understanding and agreement between Seller and Customer relating to the goods and/or materials ("Products") sold by Seller to Customer. Customer's acceptance of the Products is expressly conditioned on Customer's acceptance of these Terms and Conditions. Customer's acceptance is limited to these Terms and Conditions, and no different, inconsistent and/or additional terms and conditions submitted by Customer in acknowledging or accepting these Terms and Conditions or in issuing any purchase orders, releases, shipping instructions or other documents in connection with the Products, whether prior or subsequent, shall modify or amend these Terms and Conditions or be valid or binding against Seller, unless specifically accepted by Seller in writing. In the event of any conflict, discrepancy or inconsistency between these Terms and Conditions and the terms and conditions contained in any document submitted by Customer, these Terms and Conditions shall govern even if Customer's document expressly limits acceptance to Customer's terms and conditions. No course or pattern of dealings or conduct between Seller and Customer and no usage of trade shall be relevant to determine the meaning or intent of these Terms and Conditions even though the accepting or acquiescing party has knowledge of the nature of the performance and an opportunity for objection.

2. Open Credit Account. Seller reserves the right in its sole discretion to approve, conditionally approve or disapprove any request by Customer for credit. The amount of credit Seller extends to Customer will be determined by Seller in its discretion and may vary from time to time. Customer shall notify Seller, in writing, of any error in any

invoice within ten (10) days after the Customer's receipt of such invoice, and, if no such notice from Customer is received by Seller, the invoice shall be deemed to be correct and payable as delivered to Customer.

3. Open Account Payment Terms. **TIME FOR CUSTOMER'S PAYMENT OF THE PURCHASE PRICE FOR THE PRODUCTS SHALL BE OF THE ESSENCE.** All sums owing Seller by Customer shall be paid in accordance with the provisions of Seller's invoice or any written quotation issued by Seller and signed by Customer. In the absence of such express provisions, Seller's terms will be net thirty (30) days from the date of invoice. All sums past due and owing to Seller shall bear interest at the rate of the lesser of one and one-half percent (1.5%) per month or the maximum rate permitted by applicable law from the invoice date until paid in full. All payments made by Customer to Seller shall be applied in the following priority: (a) first to the amounts, if any, due to Seller for attorneys' fees and court costs, (b) second to the amounts, if any, due to Seller in the event of Customer's default, (c) third to the amount, if any, of interest due to Seller as a result of Customer's late payment and (d) finally to the balance of the purchase price due to Seller for the Products.

4. Customer's Representations and Warranties. Upon Seller's request from time to time, Customer will provide Seller with current financial information. Customer represents and warrants that any financial information provided to Seller will be true and correct in all material respects and shall fairly and accurately present the financial condition of Customer as of the date of such financial statements. Customer hereby authorizes Seller to review and evaluate Customer's credit background from time to time.

5. Security Interest. To secure Customer's full and prompt payment of the purchase price for the Products, Customer hereby grants to Seller a first priority, purchase money security interest in and to the Products and all products and proceeds therefrom. Customer authorizes Seller to file a UCC financing statement to perfect this security interest at any time.

6. Cancellation and Returns. Customer may not cancel any order of Products for Customer's convenience without Seller's prior written consent. Seller may, in its sole opinion, authorize Customer in writing to cancel Products normally carried in Seller's inventory. Any cancellation so authorized shall be subject to a cancellation charge of 15% of the purchase price. Customer may not cancel any processed Products, specially manufactured Products, or Products not normally carried in Seller's inventory.

7. Approval of Sale; Prior Sale. No sale shall be final until approved by the corporate office of Seller. All quotations for Products normally carried in Seller's inventory are subject to prior sale, unless otherwise specified in writing by Seller. All quotations for specially

manufactured Products and Products not normally carried in Seller's inventory are subject to mill availability.

8. Price; Basis of Invoices. Seller's price is subject to and contingent upon Customer purchasing the entire quantity of Products identified in Seller's quotation. If Customer purchases less than the entire quantity of Products identified therein, prices may vary. Seller shall invoice all Products in accordance with Seller's published schedule of weights, areas, sizes and lengths. All weights shall be theoretical and shall be determined in accordance with ASTM standards.

9. Force Majeure. Neither Customer nor Seller shall be liable for any delay, breach or nonperformance of these Terms and Conditions (other than the payment of money) wholly or partly due to any cause beyond such party's control ("Force Majeure") including, without limitation, acts of God; war; civil disturbances; acts of any foreign, federal, state, local or other governmental authority; non-availability, delay or diversion of shipping or other transport; lock outs, strikes or trade disputes; break down or interruption of any plant, machinery, equipment or utilities; shortage, non-availability or allocation of raw materials or commodities; any combination of the foregoing, or any other cause outside of such party's control whether similar to or different from those stated herein. On the happening of Force Majeure, the affected party shall advise the other party in writing with reasonable promptness and the affected party may suspend its performance during such Force Majeure without liability to the other party.

10. Title; Risk of Loss. All prices quoted by Seller are Ex Works Seller's loading dock. Risk of loss shall pass to Customer at the time of delivery. Title shall pass to Customer upon loading on the transportation facility (i.e. truck or railcar), irrespective of any freight allowance, prepayment of freight or delivery terms.

11. Inspection; Claims. Customer shall carefully inspect all Products and shipping documents promptly upon delivery. No claim for shortages or Products damaged during delivery will be valid or enforceable against Seller unless (a) Customer notifies Seller in writing specifying in detail the shortage or damage within five (5) days from the date of delivery; (b) Customer returns the damaged Products to Seller within ten (10) days following delivery; (c) upon return, Seller confirms such damage; and (d) Customer has fulfilled all of the payment terms. Customer's notice must be accompanied by the original freight bill, with notation on the face thereof by an authorized agent for the carrier as to the Products claimed to be short or damaged during transit. Customer shall be deemed to have waived any claim for shortages or Products damaged in transit if Customer fails to so notify Seller within five (5) days following delivery. Any processing or use of the Products by Customer, other than return to Seller, shall be conclusive as to Customer's acceptance of the Products as being satisfactory and in accordance with these Terms and Conditions.

12. Limited Warranty. Seller warrants to Customer for a period of twelve (12) months following delivery only that (a) the Products shall conform to the description and specifications, subject to industry standard tolerances and variations; and (b) Seller has good title to the Products free and clear of liens, security interests or encumbrances by any party claiming by, through or under Seller. **SELLER HEREBY DISCLAIMS AND CUSTOMER HEREBY WAIVES ANY AND ALL OTHER ORAL OR WRITTEN WARRANTIES IN RESPECT OF THE PRODUCTS, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SELLER EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES UNLESS EXPRESSLY MADE IN WRITING AND SIGNED BY AN OFFICER OF SELLER.**

Seller's liability shall be limited, at Seller's option, to repair or replacement of non-conforming Products or refund of the purchase price. The foregoing sets forth Seller's entire obligation and liability to Customer in respect of the Products, and Customer accepts the same as its entire right and sole remedy in relation to any breach by Seller of these Terms and Conditions. **IN NO EVENT OR CIRCUMSTANCE WHATSOEVER SHALL SELLER BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY, PUNITIVE OR SPECIAL DAMAGES OF ANY TYPE OR NATURE EVEN IF SELLER HAS REASON TO KNOW OF THE POSSIBILITY OF SUCH DAMAGES. SELLER'S TOTAL LIABILITY ARISING OUT OF OR IN ANY WAY RELATED TO THE PRODUCTS, WHETHER BASED IN CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND/OR GROSS NEGLIGENCE), STRICT LIABILITY, OR ANY OTHER CAUSE OF ACTION, SHALL IN NO EVENT EXCEED THE PURCHASE PRICE ACTUALLY PAID BY CUSTOMER FOR THE PRODUCTS TO WHICH SUCH LIABILITY RELATES.**

13. Unofficial Communications. No agents, employees, or representatives of Seller have any authority to bind Seller to any affirmation, representation, guaranty or warranty other than those expressly set forth in these Terms and Conditions. Any technical advice furnished by Seller with respect to the selection or use of Products is given without charge, and Seller assumes no obligation or liability whatsoever for the advice given or the results obtained, all such advice being given and accepted at Customer's sole risk.

14. Taxes. All prices quoted by Seller are exclusive of all taxes. In addition to the purchase price, Customer shall pay or reimburse Seller the amount of all sales, use and ad valorem taxes, excises, duties and/or other governmental charges that Seller may be required to pay with respect to the Products.

15. Indemnification. Customer shall indemnify, defend, and hold harmless Seller, its affiliates, and the shareholders, directors, officers,

employees, agents, successors and assigns of all of them (collectively, the "Seller Indemnified Parties") from and against any and all losses, claims, damages, injuries, liabilities, taxes, fines, penalties, costs or expenses (including attorneys' fees and court costs) incurred or suffered by any of the Seller Indemnified Parties to the extent directly or indirectly arising out of, relating to or resulting from (a) Customer's unloading, storing, handling, packaging, processing, fabrication, or use of the Products; or (b) any negligence, act, or omission of Customer, its employees, agents and anyone for whom Customer may be legally liable.

16. Default; Bankruptcy. Upon failure of Customer to make any payment required hereunder, without deduction, setoff or counterclaim, within ten (10) days after the same becomes due, or if Customer defaults in the performance of any other obligation, term, or condition, or if Customer shall make an assignment for the benefit of creditors, or in the event of a commencement of proceedings by or against Customer involving bankruptcy, insolvency, reorganization or arrangement, or in the case of other significant financial instability of Customer, Seller, without demand or notice of any kind and without prejudice to any other right or remedy of Seller, may (a) terminate the sale of all or any of the Products; (b) suspend the release of any Products on consignment to Customer and defer further deliveries; (c) require Customer to return or allow Seller to reclaim and/or pick-up any unpaid Products; (d) require Customer to pay the purchase price for any or all the Products not yet paid for in full (whether such Products are on-hand, in process or on-order, and whether or not delivered) and any other sums due from Customer to Seller, which Customer shall pay on Seller's first demand notwithstanding any credit period or other forbearance; (e) place any Products identified to Customer in storage at the cost and risk of Customer; (f) apply any payments made by Customer as Seller may elect without regard to any appropriation by Customer; (g) sell any or all of the Products at such price as may be available but without having any duty to Customer to do so at the best or any particular price, and collect any shortage in price from Customer; and/or (h) exercise any other right or remedy that Seller may have at law or in equity in the event of Customer's default. Seller is entitled to immediate relief from the automatic stay should Customer file for protection under the bankruptcy code. Customer agrees not to oppose relief from the automatic stay if sought by Seller.

17. Waiver. Any waiver of these Terms and Conditions, to be valid or binding, must be in writing and signed by the party against which such waiver is to be enforced, and shall not constitute a continuing waiver of any other breach or default, and acceptance by Seller of any payments with knowledge of any breach or default shall not constitute such waiver. No omission or delay by either party in exercising any right, power or privilege shall operate as a waiver thereof, nor

shall any single or partial exercise of any such right, power or privilege preclude any other or further exercise thereof or exercise of any other right, power, or privilege.

18. Governing Law and Venue. **THESE TERMS AND CONDITIONS SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE IN WHICH SELLER IS LOCATED WITHOUT REGARD TO ITS CHOICE OF LAW OR CONFLICTS OF LAWS PROVISIONS. ANY CLAIM, DISPUTE OR CONTROVERSY ARISING OUT OF OR RELATING TO THESE TERMS AND CONDITIONS OR THE PRODUCTS SHALL BE RESOLVED BY LITIGATION BROUGHT EXCLUSIVELY IN THE FEDERAL OR STATE COURTS HAVING JURISDICTION OVER SELLER'S LOCATION AND SELLER AND CUSTOMER IRREVOCABLY CONSENT TO THE JURISDICTION OF SAID COURTS.**

19. Prevailing Party. In the event of any claim, dispute or controversy arising out of or relating to these Terms and Conditions, the prevailing party shall be entitled to recover it attorneys' fees and court costs from the non-prevailing party.

20. Assignment and Third Party Rights. Neither party may delegate or assign its rights or obligations without the other party's prior written consent, except that Seller may assign its rights and obligations to an affiliate upon prior written notice to Customer. Any delegation or assignment without such written consent shall be null and void, and without any legal force or effect. Notwithstanding Seller's consent to any assignment or delegation by Customer, these Terms and Conditions shall be fully binding on Customer, its successors and permitted assigns. These Terms and Conditions shall not be deemed or construed as granting or conferring any rights in or providing any basis for claims by third parties.

21. Severability. If any provision contained in these Terms and Conditions or the application thereof to the parties shall be finally determined by a court of competent jurisdiction to be invalid, illegal or unenforceable in any respect, such provision shall be deemed severed and deleted from these Terms and Conditions and replaced with a provision that is valid, legal and enforceable to the fullest extent permitted by applicable law and the validity, legality and enforceability of the remaining provisions of these Terms and Conditions and any other application thereof to the parties shall not in any way be affected or impaired thereby.

22. Acceptance/Enforceability of Copies. Seller may, at Seller's sole discretion, accept a facsimile copy, electronic copy, or photocopy of any order between Seller and Customer in lieu of an original document. Customer consents to Seller's use of such copy and waives any right to object to the use of a copy in place of the original and any right to require Seller to subsequently produce an original document.

23. Entire Agreement. These Terms and Conditions contain the final and entire agreement of the parties hereto with respect to the sale and purchase of the Products and all other transactions contemplated herein, and supersede all prior or contemporaneous discussions, negotiations, agreements or understandings, whether written or oral, between the parties relating to the subject matter hereof. These Terms and Conditions may be changed, amended, modified, revised or supplemented only by a written instrument signed by an authorized manager or officer of Seller.

Processing Services

Sawing to Length

Nearly all band saws throughout PDM are fed with state of the art conveyor systems that greatly increase productivity and overall tolerances. With CNC controlled indexing and automated miter cutting, these operations are efficient and very accurate.

Capacities: Jaw openings up to 40" x 48"
Miter cutting capacity up to 25" x 25" and 45 degrees
CNC indexing, accurate bundle cutting
Cost saving nesting capabilities

Plate Shearing

Driven by large hydraulic rams, high carbon blades come together like a large pair of scissors to cut steel plates. Plate shears provide fast and accurate square and rectangular part production in a wide variety of thicknesses.

Capacities: Cuts up to ¼' thick mild steel plate
Cuts up to 13'-0" wide

Thermal Shape Cutting

Thermal cutting employs the processes of oxy fuel or high definition plasma cutting. Oxy fuel cutting is utilized to handle thicker plate cutting (up to 8") while high definition plasma cuts much faster in thickness ranging from 10 ga. up to 2" thick.

Capacities: Cuts up to 120" wide
Cuts up to 60' long

** See Shape Chart on page 18.*

Punching, Drilling, Tapping, Marking, Scribing, and Milling

Our precision plate processing machines can cut, punch, drill, tap, mark, scribe, and mill parts in a multitude of thicknesses and grades with improved accuracy. Due to a method of stationary gantry for fixed points of operation, this provides greater accuracy in cutting and the other processes.

Capacities: Milling both face and end
Drilling up to 3" in diameter in 3" plate
Punching up to 1-1/2" in diameter
Tapping up to 1-1/2" in diameter
Scribing layout lines and customized lettering
Marking letter and number size: 2/3" wide x 5/8" tall
High definition plasma up to 3" thick

Steel Forming Services

A 1,000 ton x 24' Cincinnati Press Brake provides a wide variety of forming shapes including angles, channels, zee's and more complex shapes.

Capacities: 1,000 ton downward force
24' forming bed
1/2" thick mild steel plate up to 24' long
1" thick mild steel plate up to 14" long

** See Forming Chart on page 17-20.*

Multiple Angle Beveling

Chamfering and plate edge preparation using a full range of multiple axis beveling machines allows full beveling capabilities. From beveling on the fly, including radius beveling, these machines provide a vast array of beveling and edge preparation needs.

Capacities: Radius Beveling
Multiple angle beveling on the fly
Multiple axis beveling

Iron Worker

With 120 tons of cutting power, the multi-function iron worker can bend and shear or punch flat bars, plates rounds and angles making connection plates, imbed plates, connecting rods and a multitude of small parts.

Capacities: Cuts angel up to 6 x 6 x 5/8”
Cuts mild steel rounds up to 2” in diameter
Cuts mild steel plate up to 3/4” thick x 18” wide
Punching up to 1 ½ diameter in 1” thick plate
Bends up to 120 tons max
Copes and Notches up to L6 x 4 x 3/8

Steel Beam Cambering Services

Cambering is a technique where the straightness of a structural steel beam is altered to provide additional strength and resistance to deflection. PDM Steel cambers structural steel beams using a heavy duty lateral hydraulic press to gently alter the steel beam into its desired shape.

Capacities: Beams up to 36” x 262 lbs./ft.
Material over 60ft Long
Camber standard and miscellaneous channels, beams, and tubing

Steel Beam Splitting Services

PDM splits steel beams into Tee’s using a rotary beam shear. This process, results in less stress relieving during the splitting process. Additionally, Tee’s are straightened through the cambering machine producing a clean, straight finished product.

Capacities: 6” to 40” depth
Up to 1/2” web thickness
Up to 65’ lengths
Wide Flange, Standard Beams and Channels
Miscellaneous channels into custom angles

Coil Sheet & Plate Services:
Leveling, & Cut-to-Length

Leveling is the process where large steel coils are straightened and then cut-to-length for a specific requirement. This meets customer's needs to purchase exact length of material eliminating drop that would result from using stock size sheet or plate.

Capacities: 28 ga. to ½" thick
36" to 96" in width
17" to 480" in length

Laser Cutting

Laser cutting employs a highly concentrated laser beam to cut steel plate and sheet to precise tolerances without excessive heat in the cutting process.

Capacities: Up to ¼" thick
Up to 60" wide
Up to 120" long

** See Typical Burning Shapes on page 18.*

Slitting

Slitting is the process of cutting a master coil into multiple narrower coils in one continuous pass. The finished narrower coils are rewound and packaged for shipment. Slit coils are often used in roll forming lines or continuous stamping operations. Very tight width tolerances (+/- .005") are possible.

Capacities: Thickness .018 Min to .135 Max
Slit Coil Widths: 1" to 60"

1,000 ton Cincinnati Press Brake with 24' bed

360° Tube Laser Cutting

PDM Steel offers a single system capable of combining multiple manual operations into a single cycle, dramatically reducing your wait time and cost. Additionally, this process can decrease the amount of welding by developing "smart parts" including tabs and features on the processed material for quicker assembly.

Capacities: Standard Materials: Mild Steel, Stainless Steel, Aluminum (Other materials may be available upon request)
Tube length for loading/unloading: 20'-40' infeed, up to 40' outfeed
Maximum tube weight: 67 lbs./ft.
Drilling & Tapping Min .125- 5/8" max
Cutting Tolerance +/- .004

Round
Min Dia: 1"
Max Dia: 14"

Square
Min: 1" Max: 10"
Rectangle
Min: 1 x 1.25" Max: 12" x 8"

Angle
Min: 1.5"
Max: 10"

Channel
Min: 1.125" x 1.25"
Max: 12" x 4"

Flat Bar
Min: 5/16" x 2"
Max: 3/4" x 14"

I-Beam
Min: 4" Max: 12"
H-Beam
Min: 4" Max: 12"

*Other open profiles upon request.
*You are not limited to just round, square or rectangular. Special shaped tubes or open sections can be programmed and cut without problems.

Typical Burn Shapes

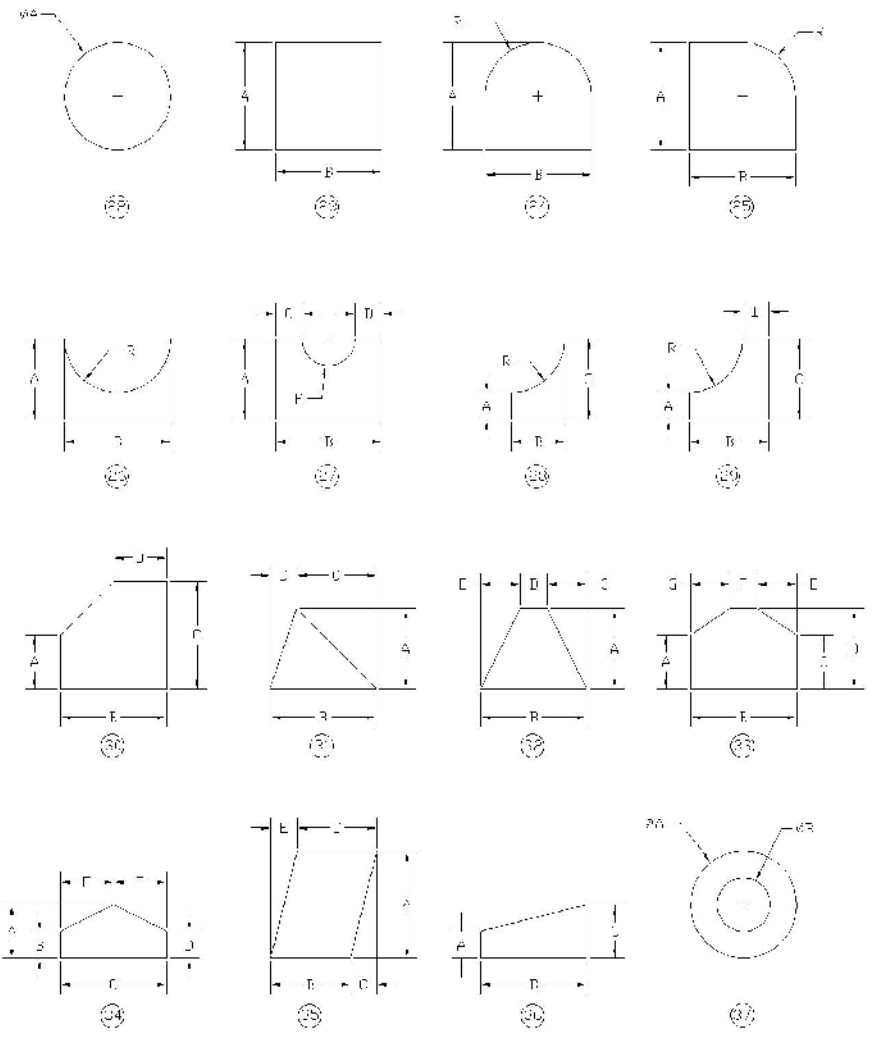
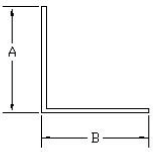


Table 1

Forming Chart

Information Required
1. Shape #
2. Material Type & Thickness
3. Quantity
4. Length of Part
5. Outside or Inside Dimensions Provided
6. Tolerances & Critical Dimensions



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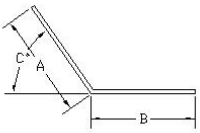

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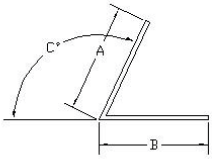

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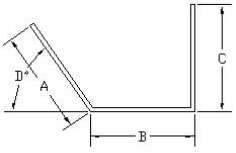

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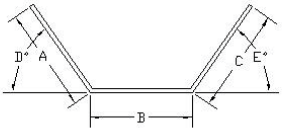

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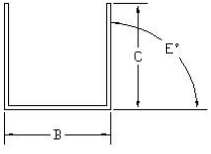

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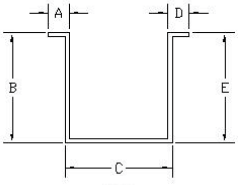
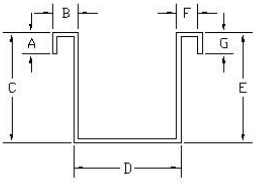


7



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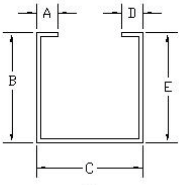

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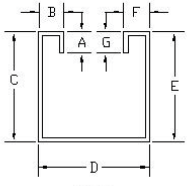

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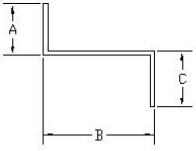

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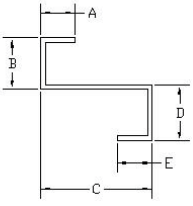
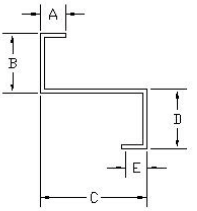


12

Forming Chart

Information Required
1. Shape #
2. Material Type & Thickness
3. Quantity
4. Length of Part
5. Outside or Inside Dimensions Provided
6. Tolerances & Critical Dimensions



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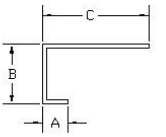

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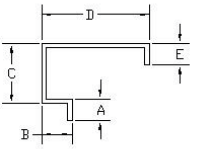

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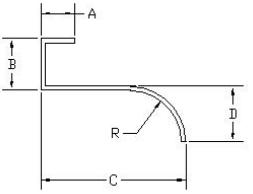

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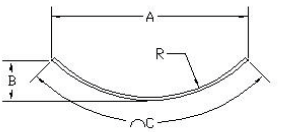

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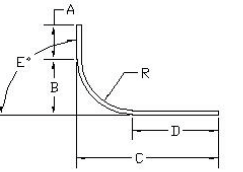

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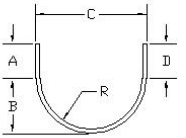

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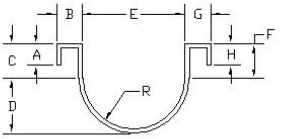

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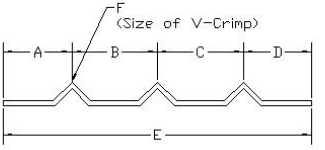

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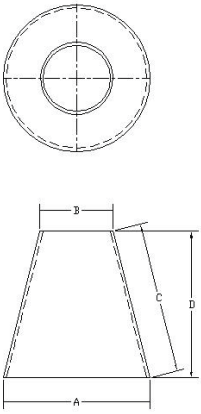
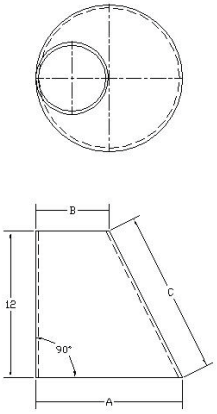
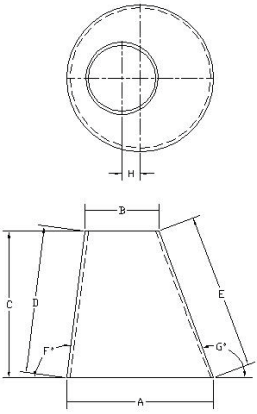


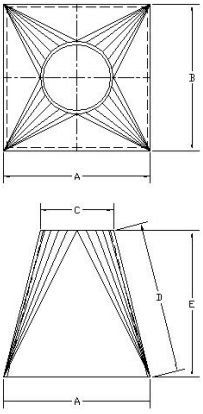
Concentric Reducer



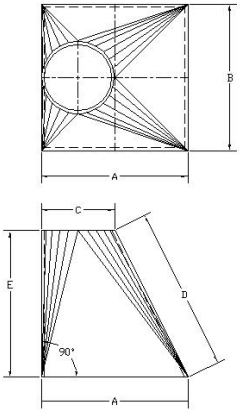
Eccentric Reducer



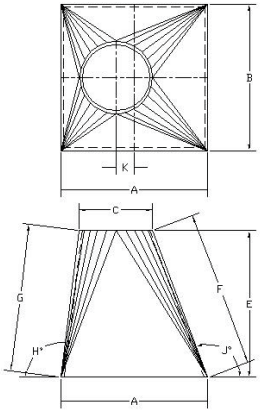
Offset Reducer



Concentric Square or
Rectangle to Round Transition



Eccentric Square or
Rectangle to Round Transition



Offset Square or
Rectangle to Round Transition

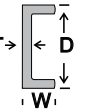
Note: Reducers and Transitions must be Formed in the Pressbrake and must be made in halves or more peices dependent on size and material thickness. Press brake marks will be noticeable.

Hot Rolled Bars

Bar Size Shapes

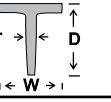
Hot Rolled Bar size shapes (i.e. less than 3") are typically available in a multigrade product that meets the specifications of the following grades: A36, A529Gr50, and CSA44W/50W.

Bar Sized Channels



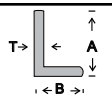
Size					Weight	Weight
D		W		T	Per Foot	Per 20' Bar
3/4	X	3/8	X	1/8	.56	11.20
1	X	3/8	X	1/8	.68	13.60
1	X	1/2	X	1/8	.82	16.40
1 1/4	X	1/2	X	1/8	1.01	20.20
1 1/2	X	1/2	X	1/8	1.12	22.40
1 1/2	X	9/16	X	3/16	1.44	28.80
1 1/2	X	3/4	X	1/8	1.17	23.40
2	X	1/2	X	1/8	1.43	28.60
2	X	9/16	X	3/16	1.86	37.20
2	X	1	X	1/8	1.59	31.80
2	X	1	X	3/16	2.32	46.40
2 1/2	X	5/8	X	3/16	2.27	45.40

Bar Sized Tees



Size					Weight	Weight
D		W		T	Per Foot	Per 20' Bar
3/4	X	3/4	X	1/8	.620	12.24
1	X	1	X	1/8	.851	17.02
1 1/4	X	1 1/4	X	1/8	1.091	21.82
				3/16	1.551	31.02
1 1/2	X	1 1/2	X	3/16	1.902	38.04
				1/4	2.432	48.64
1 3/4	X	1 3/4	X	3/16	2.262	45.24
2	X	2	X	1/4	3.563	71.26
				5/16	4.304	86.08
2 1/2	X	2 1/2	X	1/4	4.604	92.08
				5/16	5.505	110.10
				3/8	6.406	128.12

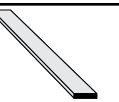
Bar Sized Angles



Size					Weight	Weight
A		B		T	Per Foot	Per 20' Bar
1/2	X	1/2	X	1/8	.380	7.60
5/8	X	5/8	X	1/8	.480	9.60
3/4	X	3/4	X	1/8	.591	11.82
7/8	X	7/8	X	1/8	.701	14.02
1	X	1	X	1/8	.801	16.02
				3/16	1.161	23.22
				1/4	1.491	29.82
1 1/4	X	1 1/4	X	1/8	1.011	20.22
				3/16	1.481	29.62
				1/4	1.922	38.44
1 1/2	X	1 1/2	X	1/8	1.231	24.62
				3/16	1.802	36.04
				1/4	2.342	46.84
				5/16	2.863	57.26
				3/8	3.353	67.06
1 3/4	X	1 3/4	X	1/8	1.441	28.82
				3/16	2.122	42.44
				1/4	2.773	55.46
2	X	1 1/2	X	1/8	1.441	28.82
				3/16	2.122	42.44
				1/4	2.773	55.46
2	X	2	X	1/8	1.652	33.04
				3/16	2.442	48.84
				1/4	3.193	63.86
				5/16	3.924	78.48
				3/8	4.704	94.08
2 1/2	X	1 1/2	X	3/16	2.442	48.84
				1/4	3.193	63.86
2 1/2	X	2	X	3/16	2.753	55.06
				1/4	3.623	72.46
				5/16	4.504	90.08
				3/8	5.305	106.10
2 1/2	X	2 1/2	X	3/16	3.073	61.46
				1/4	4.104	82.08
				5/16	5.005	100.10
				3/8	5.906	118.12
				1/2	7.707	154.14

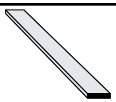
Many bar sized shapes are also available in 30' & 40' lengths.

Hot Rolled Flats



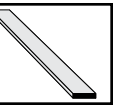
Size In Inches		Weight Per Foot	Weight Per 20'
1/4 x	1/2	.425	8.50
	5/8	.531	10.62
	3/4	.639	12.78
	7/8	.745	14.90
	1	.851	17.02
	1 1/4	1.064	21.28
	1 1/2	1.276	25.52
	1 3/4	1.489	29.78
	2	1.702	34.04
	2 1/4	1.915	38.30
	2 1/2	2.127	42.54
	2 3/4	2.340	46.80
	3	2.552	51.04
	3 1/4	2.766	55.32
	3 1/2	2.978	59.56
	4	3.403	68.06
	4 1/2	3.829	76.58
	5	4.254	85.08
	5 1/2	4.679	93.58
	6	5.105	102.10
	7	5.956	119.12
	8	6.806	136.12
5/16 x	1/2	.531	10.62
	5/8	.665	13.30
	3/4	.798	15.96
	7/8	.931	18.62
	1	1.064	21.28
	1 1/4	1.329	26.58
	1 1/2	1.594	31.88
	1 3/4	1.861	37.22
	2	2.127	42.54
	2 1/4	2.393	47.86
	2 1/2	2.658	53.16
5/16 x	2 3/4	2.925	58.50
	3	3.191	63.82
	3 1/2	3.723	74.46
	4	4.254	85.08
	4 1/2	4.785	95.70
	5	5.318	106.36
	5 1/2	5.850	117.00
	6	6.381	127.62
	7	7.445	148.90
	8	8.508	170.16
3/8x	1/2	.639	12.78
	5/8	.798	15.96
	3/4	.957	19.14
	7/8	1.117	22.34
	1	1.276	25.52
	1 1/4	1.596	31.92
	1 1/2	1.915	38.30
	1 3/4	2.233	44.66
	2	2.552	51.04
	2 1/4	2.872	57.44
	2 1/2	3.191	63.82
	2 3/4	3.509	70.18
	3	3.829	76.58
	3 1/4	4.148	82.96
	3 1/2	4.467	89.34
	4	5.105	102.10
	4 1/2	5.743	114.86
	5	6.381	127.62
	5 1/2	7.020	140.40
	6	7.657	153.14
	7	8.933	178.66
	8	10.210	204.20

Hot Rolled Flats (Continued)



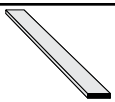
Size In Inches		Weight Per Foot	Weight Per 20'
1/2 x	3/4	1.276	25.52
	7/8	1.489	29.78
	1	1.702	34.04
	1 1/4	2.127	42.54
	1 1/2	2.552	51.04
	1 3/4	2.978	59.56
	2	3.403	68.06
	2 1/4	3.829	76.58
	2 1/2	4.254	85.08
	2 3/4	4.679	93.58
	3	5.105	102.10
	3 1/4	5.530	110.60
	3 1/2	5.956	119.12
	4	6.806	136.12
	4 1/2	7.657	153.14
	5	8.508	170.16
	5 1/2	9.359	187.18
	6	10.210	204.20
	7	11.911	238.22
	8	13.613	272.26
5/8 x	1	2.127	42.54
	1 1/4	2.658	53.16
	1 1/2	3.191	63.82
	1 3/4	3.723	74.46
	2	4.254	85.08
	2 1/4	4.785	95.70
	2 1/2	5.318	106.36
	2 3/4	5.850	117.00
	3	6.381	127.62
	3 1/4	6.913	138.26
	3 1/2	7.445	148.90
	4	8.508	170.16
	4 1/2	9.572	191.44
	5	10.640	212.80
5/8 x	5 1/2	11.699	233.98
	6	12.762	255.24
	7	14.894	297.88
	8	17.016	340.32
3/4 x	1	2.552	51.04
	1 1/4	3.191	63.82
	1 1/2	3.829	76.58
	1 3/4	4.467	89.34
	2	5.105	102.10
	2 1/4	5.743	114.86
	2 1/2	6.381	127.62
	2 3/4	7.020	140.40
	3	7.657	153.14
	3 1/2	8.933	178.66
	4	10.210	204.20
	4 1/2	11.491	229.82
	5	12.762	255.24
	5 1/2	14.038	280.76
	6	15.314	306.28
	7	17.867	357.34
	8	20.419	408.38
7/8 x	1	2.978	59.56
	1 1/4	3.723	74.46
	1 1/2	4.467	89.34
	2	5.956	119.12
	2 1/2	7.445	148.90
	3	8.933	178.66
	3 1/2	10.420	208.40
	4	11.911	238.22
	4 1/2	13.403	268.06
	5	14.894	297.88
	6	17.867	357.34
	7	20.830	416.60
	8	23.822	476.44

Hot Rolled Flats (Continued)



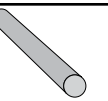
Size In Inches	Weight Per Foot	Weight Per 20'
1 x 1 1/4	4.254	85.08
1 1/2	5.105	102.10
1 3/4	5.956	119.12
2	6.806	136.12
2 1/4	7.657	153.14
2 1/2	8.508	170.16
2 3/4	9.359	187.18
3	10.210	204.20
3 1/4	11.060	221.20
3 1/2	11.911	238.22
4	13.613	272.26
4 1/2	15.314	306.28
5	17.016	340.32
5 1/2	18.718	374.36
6	20.419	408.38
7	23.822	476.44
8	27.226	544.52
1 1/4 x 1 1/2	6.381	127.62
1 3/4	7.445	148.90
2	8.508	170.16
2 1/4	9.572	191.44
2 1/2	10.640	212.80
3	12.762	255.24
3 1/2	14.894	297.88
4	17.816	340.32
1 1/4 x 4 1/2	19.148	382.96
5	21.270	425.40
6	25.524	510.48
7	29.778	595.56
8	34.032	680.64
1 1/2 x 2	10.210	204.20
2 1/2	12.762	255.24
3	15.314	306.28
3 1/2	17.867	357.34
4	20.419	408.38
4 1/2	22.972	459.44
5	25.524	510.48
6	30.629	612.58
7	35.734	714.68
8	40.834	816.76
2 x 2 1/2	17.016	340.32
3	20.419	408.38
3 1/2	23.822	476.44
4	27.226	544.52
4 1/2	30.629	612.58
5	34.032	680.64
6	40.838	816.76
7	47.600	952.00
8	54.451	1089.02

Weights For UM Plates



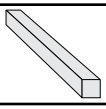
Size In Inches			Wt. Per Foot	Wt. Per 20 Ft.
1/4	x	9	7.66	153.1
		10	8.51	170.2
		11	9.36	187.2
		12	10.21	204.2
		14	11.91	238.2
5/16	x	9	9.57	191.4
		10	10.64	212.8
		12	12.76	255.2
		14	14.89	297.7
3/8	x	9	11.49	229.8
		10	12.76	255.2
		11	14.03	280.6
		12	15.31	306.3
		14	17.86	357.2
1/2	x	9	15.31	306.3
		10	17.02	340.4
1/2	x	11	18.72	374.4
		12	20.42	408.4
		14	23.82	476.5
5/8	x	9	19.15	383.0
		10	21.27	425.4
		12	25.52	510.5
		14	29.77	595.5
3/4	x	9	22.97	459.4
		10	25.52	510.5
		12	30.63	612.6
		14	35.74	714.7
1	x	9	30.63	612.6
		10	34.03	680.6
		12	40.84	816.8
		14	47.65	952.9

Hot Rolled Rounds



Size In Inches	Wt. Per Foot	Wt. Per 20 Ft.	Size In Inches	Wt. Per Foot	Wt. Per 20 Ft.
3/16	.094	1.88	3 3/8	30.449	608.98
1/4	.167	3.34	3 1/2	32.741	654.82
5/16	.261	5.22	3 5/8	35.123	702.46
3/8	.376	7.52	3 3/4	37.585	751.70
7/16	.511	10.22	3 7/8	40.138	802.76
1/2	.669	13.38	4	42.770	855.40
9/16	.846	16.92	4 1/4	48.275	965.50
5/8	1.044	20.88	4 1/2	54.131	1082.62
3/4	1.503	30.06	4 3/4	60.307	1206.14
7/8	2.046	40.92	5	66.823	1336.46
1	2.673	53.46	5 1/4	73.669	1473.38
1 1/8	3.382	67.64	5 1/2	80.856	1617.12
1 1/4	4.177	83.54	5 3/4	88.373	1767.46
1 3/8	5.054	101.08	6	96.221	1924.42
1 1/2	6.014	120.28	6 1/4	104.398	2087.96
1 5/8	7.058	141.16	6 1/2	112.926	2258.52
1 3/4	8.186	163.72	6 3/4	121.785	2435.70
1 7/8	9.397	187.94	7	130.973	2619.46
2	10.690	213.80	7 1/4	140.492	2809.84
2 1/8	12.071	241.42	7 1/2	150.352	3007.04
2 1/4	13.533	270.66	7 3/4	160.541	3210.82
2 5/16	14.293	285.86	8	171.061	3421.22
2 3/8	15.074	301.48	8 1/4	181.921	3638.42
2 1/2	16.706	334.12	8 1/2	193.112	3862.24
2 5/8	18.417	368.34	8 3/4	204.643	4092.86
2 3/4	20.219	404.38	9	216.504	4330.08
2 7/8	22.091	441.82	9 1/4	228.695	4573.90
3	24.053	481.06	9 1/2	241.227	4824.54
3 1/4	28.237	564.74	10	267.342	5346.84

Hot Rolled Squares



Size In Inches	Wt. Per Foot	Wt. Per 20 Ft.	Size In Inches	Wt. Per Foot	Wt. Per 20 Ft.
1/4	.213	4.26	1 5/8	8.986	179.72
5/16	.332	6.64	1 3/4	10.423	208.46
3/8	.478	9.56	2	13.310	266.20
7/16	.652	13.04	2 1/8	15.367	307.34
1/2	.851	17.02	2 1/4	17.229	344.58
5/8	1.329	26.58	2 1/2	21.270	425.40
3/4	1.915	38.30	2 3/4	25.737	514.74
7/8	2.605	52.10	3	30.629	612.58
1	3.403	68.06	3 1/4	35.944	718.88
1 1/8	4.307	86.14	3 1/2	41.689	833.78
1 1/4	5.318	106.36	4	54.451	1089.02
1 3/8	6.434	128.68	4 1/2	68.915	1378.30
1 1/2	7.567	153.14	5	85.080	1701.60

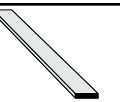
Commercial Quality

Commercial Quality bars are typically produced in grades C1008, C1020, to chemical specifications. Commercial Quality bars are not subject to mechanical property tests. Typical properties are given for reference only. Mill size tolerances apply to all Commercial Quality bars.

Applications

Commercial Quality bars are used in many applications. Among them are structural uses involving moderate cold bending or hot forming, welding, punching, and the production of non-critical parts of buildings, bridges, railway equipment, road building equipment, agricultural equipment and implements, and general machinery.

Hot Rolled Strips



Size In Inches	Weight Per Foot	Weight Per 20'	Size In Inches	Weight Per Foot	Weight Per 20'
1/8 x 1/2	0.213	4.26	3/16 x 1/2	0.319	6.38
5/8	0.266	5.32	5/8	0.398	7.96
3/4	0.319	6.38	3/4	0.478	9.56
7/8	0.372	7.44	7/8	0.559	11.18
1	0.425	8.50	1	0.639	12.78
1 1/8	0.478	9.56	1 1/8	0.718	14.36
1 1/4	0.531	10.62	1 1/4	0.798	15.96
1 1/2	0.639	12.78	1 1/2	0.957	19.14
1 3/4	0.745	14.90	1 3/4	1.117	22.34
2	0.851	17.02	2	1.276	25.52
2 1/4	0.957	19.14	2 1/4	1.435	28.70
2 1/2	1.064	21.28	2 1/2	1.596	31.92
2 3/4	1.170	23.40	2 3/4	1.755	35.10
3	1.276	25.52	3	1.915	38.30
3 1/2	1.489	29.78	3 1/2	2.233	44.66
4	1.702	34.04	4	2.552	51.04
4 1/2	1.915	38.30	4 1/2	2.872	57.44
5	2.127	42.54	5	3.191	63.82
6	2.552	51.04	6	3.829	76.58
8	3.403	68.06	8	5.105	102.10
10	4.254	85.08	10	6.381	127.62
12	5.105	102.10	12	7.657	153.14

Structural Shapes

Structural shapes are those whose greatest dimension, not including length, is three inches or greater.

Structural Quality products (i.e. 3" and larger) are typically available in a multigrade product that will meet the specifications of the following grades: A36, A529Gr50 & 55, A572Gr50 & 55, A709Gr36 & 50, CAN 44W 50W & 55W, CSA44, 50W, AASHTO M270, M270M-10gr36 Gr50, ASME SA36M-07.

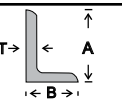
Weldability

When any grade of steel is used in welded construction, procedures must be suitable for the steel and the intended service.

ASTM A36 steel presents no welding problems when using all welding processes. The quality of the welds is generally extremely high for both welds and joints. Welding rod specifications are dependent on welding conditions such as the thickness of the sections to be welded, service requirements and design.

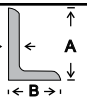
High Strength, Low Alloy grades such as A572 Grade 50 and A992 are weldable with welding techniques suitable for the grade and intended service application.

Structural Angles



Size					Weight	Weight
A		B		T	Per Foot	Per 40' Bar
3	X	2	X	3/16	3.073	122.92
				1/4	4.104	164.16
				5/16	5.005	200.20
				3/8	5.906	236.24
				1/2	7.707	308.28
3	X	2 1/2	X	3/16	3.393	135.72
				1/4	4.504	180.16
				5/16	5.605	224.20
				3/8	6.606	264.24
				1/2	8.508	340.32
3	X	3	X	3/16	3.714	148.56
				1/4	4.905	196.20
				5/16	6.106	244.24
				3/8	7.207	288.28
				1/2	9.409	376.36
3 1/2	X	2 1/2	X	3/16	3.393	135.72
				1/4	4.905	196.20
				5/16	6.106	244.24
				3/8	7.207	288.28
				1/2	9.409	376.36
3 1/2	X	3	X	1/4	5.405	216.20
				5/16	6.606	264.24
				3/8	7.907	316.28
				1/2	10.210	408.40
3 1/2	X	3 1/2	X	1/4	5.805	232.20
				5/16	7.207	288.28
				3/8	8.508	340.32
				1/2	11.110	444.40
4	X	3	X	1/4	5.805	232.20
				5/16	7.207	288.28
				3/8	8.508	340.32
				1/2	11.110	444.40
				5/8	13.613	544.52
4	X	3 1/2	X	1/4	6.206	248.24
				5/16	7.707	308.28

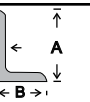
Structural Angles (Continued)



Size					Weight	Weight
D		W		T	Per Foot	Per 40' Bar
4	X	3 1/2	X	3/8	9.109	364.36
				1/2	11.911	476.44
4	X	4	X	1/4	6.606	264.24
				5/16	8.208	328.32
				3/8	9.809	392.36
				1/2	12.812	512.48
				5/8	15.715	628.60
				3/4	18.517	740.68
5	X	3	X	1/4	6.606	264.24
				5/16	8.208	328.32
				3/8	9.809	392.36
				1/2	12.812	512.48
				5/8	15.715	628.60
5	X	3 1/2	X	1/4	7.007	280.28
				5/16	8.708	348.32
				3/8	10.410	416.40
				1/2	13.613	544.52
				5/8	16.816	672.64
				3/4	19.810	792.76
5	X	5	X	5/16	10.310	412.40
				3/8	12.312	492.48
				7/16	14.313	572.52
				1/2	16.215	648.60
				5/8	20.019	800.76
				3/4	23.622	944.88
6	X	3 1/2	X	1/4	7.907	316.28
				5/16	9.809	392.36
				3/8	11.711	468.44
				1/2	15.314	612.56
				5/8	19.018	760.72
6	X	4	X	5/16	10.310	412.40
				3/8	12.312	492.48
				7/16	14.313	572.52

Please Note: Most Structural Angles are stocked in 20', 30', and 40' lengths.

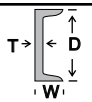
Structural Angles (Continued)



Size					Weight	Weight
D		W		T	Per Foot	Per 40' Bar
6	X	4	X	1/2	16.215	648.60
				5/8	20.019	800.76
				3/4	23.622	944.88
6	X	6	X	1/4	9.989	399.56
				5/16	12.400	500.48
				3/8	14.914	596.56
				7/16	17.216	688.64
				1/2	19.618	784.72
				5/8	24.223	968.92
				3/4	28.727	1149.08
				1	37.435	1497.40
7	X	4	X	3/8	13.613	544.52
				7/16	15.700	632.60
				1/2	17.917	716.68
				5/8	22.121	884.84
				3/4	26.225	1049.00
8	X	4	X	1/2	19.618	784.72
				5/8	24.200	968.00
				3/4	28.727	1149.08
				1	37.435	1497.40
8	X	6	X	1/2	23.022	920.88
				5/8	28.527	1141.08
				3/4	33.832	1353.28
				1	44.242	1769.68
8	X	8	X	1/2	26.425	1057.00
				5/8	32.731	1309.24
				3/4	38.937	1557.48
				1	51.048	2041.92
9	X	4	X	1/2	21.320	852.80
				3/4	31.300	1252.00

Please Note: Most Structural Angles are stocked in 20', 30', and 40' lengths.

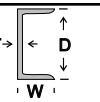
Structural Channels



Size				Weight
D	Lbs. / Foot	W	T	Per 40' Bar
3	3.5	1.372	.132	140
	4.1	1.410	.170	164
	5.0	1.498	.258	200
	6.0	1.596	.356	240
4	4.5	1.584	.125	180
	5.4	1.584	.184	216
	6.25	1.647	.247	250
	7.25	1.721	.321	290
5	6.7	1.750	.190	268
	9.0	1.885	.325	360
6	8.2	1.920	.200	328
	10.5	2.034	.314	420
	13.0	2.157	.437	520
7	9.8	2.090	.210	392
	12.25	2.194	.314	490
	14.75	2.299	.419	590
8	11.50	2.260	.220	460
	13.75	2.343	.303	550
	18.75	2.527	.487	750
9	13.4	2.433	.233	536
	15.0	2.485	.285	600
	20.0	2.648	.448	800
10	15.3	2.600	.240	612
	20.0	2.739	.379	800
	25.0	2.886	.526	1000
	30.0	3.033	.673	1200
12	20.7	2.942	.282	828
	25.0	3.047	.387	1000
	30.0	3.170	.510	1200
15	33.9	3.400	.400	1356
	40.0	3.520	.520	1600
	50.0	3.716	.716	2000

Please Note: Most Structural Channels are available in 20', 30', 40', 50', and 60' lengths.

Misc. Structural Channels



Size				Weight
D	Lbs. / Foot	W	T	Per 40' Bar
3	7.1	1.938	.312	284
4	13.8	2.500	.500	552
6	6.5	1.850	.155	260
	7.0	1.875	.179	280
	12.0	2.497	.310	480
	15.1	2.941	.316	604
	15.3	3.500	.340	612
	16.3	3.000	.375	652
	18.0	3.504	.379	720
7	19.1	3.452	.352	764
	22.7	3.603	.503	908
8	8.5	1.874	.179	340
	18.7	2.978	.353	748
	20.0	3.025	.400	800
	21.4	3.450	.375	856
	22.8	3.502	.427	912
9	23.9	3.450	.400	956
	25.4	3.500	.450	1016
10	6.5	1.170	.152	260
	8.4	1.500	.170	336
	22.0	3.315	.290	880
	25.0	3.405	.380	1000
	28.5	3.950	.425	1140
	33.6	4.100	.575	1244
	41.1	4.321	.796	1644
12	10.6	1.500	.190	424
	14.3	2.125	.250	572
	31.0	3.670	.370	1240
	35.0	3.765	.465	1400
	40.0	3.890	.590	1600
	45.0	4.010	.710	1800
	50.0	4.135	.835	2000
13	31.8	4.000	.375	1272
	35.0	4.072	.447	1360
	40.0	4.185	.560	1600
	50.0	4.412	.787	2000
18	42.7	3.950	.450	1708
	45.8	4.000	.500	1832
	51.9	4.100	.600	2076
	58.0	4.200	.700	2320

Wide Flange Beams

Size				
	Lbs/Ft	D	W	T
4 x	13	4.16	4.060	.280
5 x	16	5.01	5.000	.240
	19	5.15	5.030	.270
6 x	8.5	5.83	3.940	.170
	9	5.90	3.940	.170
	12	6.03	4.000	.230
	16	6.28	4.030	.260
6 x	15	5.99	5.990	.230
	20	6.20	6.020	.260
	25	6.38	6.080	.320
8 x	10	7.89	3.940	.170
	13	7.99	4.000	.230
	15	8.11	4.015	.245
8 x	18	8.14	5.250	.230
	21	8.28	5.270	.250
8 x	24	7.93	6.495	.245
	28	8.06	6.535	.285
8 x	31	8.00	7.995	.285
	35	8.12	8.020	.310
	40	8.25	8.070	.360
	48	8.50	8.110	.400
	58	8.75	8.220	.510
	67	9.00	8.280	.570
10 x	12	9.87	3.960	.190
	15	9.99	4.000	.230
	17	10.11	4.010	.240
	19	10.24	4.020	.250
10 x	22	10.17	5.750	.240
	26	10.33	5.770	.260
	30	10.47	5.810	.300

Size				
	Lbs/Ft	D	W	T
10 x	33	9.73	7.960	.290
	39	9.92	7.985	.315
	45	10.10	8.020	.350
10 x	49	9.98	10.000	.340
	54	10.09	10.030	.370
	60	10.22	10.080	.420
	68	10.40	10.130	.470
	77	10.60	10.190	.530
	88	10.84	10.265	.605
	100	11.10	10.340	.680
	112	11.36	10.415	.755
12 x	14	11.91	3.970	.200
	16	11.99	3.990	.220
	19	12.16	4.005	.235
	22	12.31	4.030	.260
12 x	26	12.22	6.490	.230
	30	12.34	6.520	.260
	35	12.50	6.560	.300
12 x	40	11.94	8.005	.295
	45	12.06	8.045	.335
	50	12.19	8.080	.370
12 x	53	12.06	9.995	.345
	58	12.19	10.010	.360
12 x	65	12.12	12.000	.390
	72	12.25	12.040	.430
	79	12.38	12.080	.470
	87	12.53	12.125	.515
	96	12.71	12.160	.550
	106	12.89	12.220	.610
	120	13.12	12.320	.710
	136	13.41	12.400	.790
	152	13.71	12.480	.870
	170	14.03	12.570	.960
	190	14.38	12.670	1.060
	210	14.71	12.790	1.180

Wide Flange Beams (Continued)

Size				
	Lbs/Ft	D	W	T
	230	15.05	12.895	1.285
	252	15.41	13.005	1.395
	279	15.85	13.140	1.530
	305	16.32	13.235	1.625
	336	16.82	13.385	1.775
14 x	22	13.74	5.000	.230
	26	13.91	5.025	.255
14 x	30	13.84	6.730	.270
	34	13.98	6.745	.285
	38	14.10	6.770	.310
14 x	43	13.66	7.995	.305
	48	13.79	8.030	.340
	53	13.92	8.060	.370
14 x	61	13.89	9.995	.375
	68	14.04	10.035	.415
	74	14.17	10.070	.450
	82	14.31	10.130	.510
14 x	90	14.02	14.520	.440
	99	14.16	14.565	.485
	109	14.32	14.605	.525
	120	14.48	14.670	.590
	132	14.66	14.725	.645
14 x	145	14.78	15.500	.680
	159	14.98	15.565	.745
	176	15.22	15.650	.830
	193	15.48	15.710	.890
	211	15.72	15.800	.980
	233	16.04	15.890	1.070
	257	16.38	15.995	1.175
	283	16.74	16.110	1.290
	311	17.12	16.230	1.410
	342	17.54	16.360	1.540
	370	17.92	16.475	1.655

Size				
	Lbs/Ft	D	W	T
	398	18.29	16.590	1.770
14 x	426	18.67	16.695	1.875
	455	19.02	16.835	2.015
	500	19.60	17.010	2.190
	550	20.24	17.200	2.380
	605	20.92	17.415	2.595
	665	21.64	17.650	2.830
	730	22.42	17.890	3.070
16 x	26	15.69	5.500	.250
	31	15.88	5.525	.275
16 x	36	15.86	6.985	.295
	40	16.01	6.995	.305
	45	16.13	7.035	.345
	50	16.26	7.070	.380
	57	16.43	7.120	.430
16 x	67	16.33	10.235	.395
	77	16.52	10.295	.455
	89	16.75	10.365	.525
	100	16.97	10.425	.585
18 x	35	17.70	6.000	.300
	40	17.90	6.015	.315
	46	18.06	6.060	.360
18 x	50	17.99	7.495	.355
	55	18.11	7.530	.390
	60	18.24	7.555	.415
	65	18.35	7.590	.450
	71	18.47	7.635	.495
18 x	76	18.21	11.035	.425
	86	18.39	11.090	.480
	97	18.59	11.145	.535
	106	18.73	11.200	.590
	119	18.97	11.265	.655

Wide Flange Beams (Continued)

Size				
	Lbs/Ft	D	W	T
	130	19.25	11.160	.670
	143	19.49	11.220	.730
	158	19.72	11.300	.810
	175	20.04	11.375	.890
	192	20.35	11.455	.960
	211	20.67	11.555	1.060
	234	21.06	11.650	1.160
	258	21.46	11.770	1.280
	283	21.85	11.890	1.400
	311	22.32	12.005	1.520
21 x	44	20.66	6.500	.350
	50	20.83	6.530	.380
	57	21.06	6.555	.405
21 x	48	20.62	8.140	.350
	55	20.80	8.220	.375
	62	20.99	8.240	.400
	68	21.13	8.270	.430
	73	21.24	8.295	.455
	83	21.43	8.355	.515
	93	21.62	8.420	.580
21 x	101	21.36	12.290	.500
	111	21.51	12.340	.550
	122	21.68	12.390	.600
	132	21.83	12.440	.650
	147	22.06	12.510	.720
	166	22.48	12.420	.750
	182	22.72	12.500	.830
	201	23.03	12.575	.910
24 x	55	23.57	7.005	.395
	62	23.74	7.040	.430
24 x	68	23.73	8.965	.415
	76	23.92	8.990	.440
	84	24.10	9.020	.470
	94	24.31	9.065	.515
	103	24.53	9.000	.550

Size				
	Lbs/Ft	D	W	T
24 x	104	24.06	12.750	.500
	117	24.26	12.800	.550
	131	24.48	12.855	.605
	146	24.74	12.900	.650
	162	25.00	12.955	.705
	176	25.24	12.890	.750
	192	25.47	12.950	.810
	207	25.71	13.010	.870
	229	26.02	13.110	.960
	250	26.34	13.185	1.040
	279	26.73	13.305	1.160
	306	27.13	13.405	1.260
	335	27.52	13.520	1.380
	370	27.99	13.660	1.520
27 x	84	26.71	9.960	.460
	94	26.92	9.990	.490
	102	27.09	10.015	.515
	114	27.29	10.070	.570
	129	27.63	10.010	.610
27 x	146	27.38	13.965	.605
	161	27.59	14.020	.660
	178	27.81	14.085	.725
	194	28.11	14.035	.750
	217	28.43	14.115	.830
	235	28.66	14.190	.910
	258	28.98	14.270	.980
	281	29.29	14.350	1.060
	307	29.61	14.445	1.160
	336	30.00	14.550	1.260
	368	30.39	14.665	1.380
30 x	90	29.53	10.400	.470
	99	29.65	10.450	.520
	108	29.83	10.475	.545
	116	30.01	10.495	.565
	124	30.17	10.515	.585

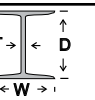
Wide Flange Beams (Continued)

Size				
	Lbs/Ft	D	W	T
	132	30.31	10.545	.615
	148	30.67	10.480	.650
30 x	173	30.44	14.985	.655
	191	30.68	15.040	.710
	211	30.94	15.105	.755
	235	31.30	15.055	.830
	261	31.61	15.155	.930
	292	32.01	15.255	1.020
	326	32.40	15.370	1.140
	357	32.80	15.470	1.240
	391	33.19	15.590	1.360
33 x	118	32.86	11.480	.550
	130	33.09	11.510	.580
	141	33.30	11.535	.605
	152	33.49	11.565	.635
	169	33.82	11.500	.670
33 x	201	33.68	15.745	.715
	221	33.93	15.805	.775
	241	34.18	15.860	.830
	263	34.53	15.805	.870
	291	34.84	15.905	.960
	318	35.16	15.985	1.040
	354	35.55	16.100	1.160
	387	35.95	16.200	1.260
36 x	135	35.55	11.950	.600
	150	35.85	11.975	.625
	160	36.01	12.000	.650
	170	36.17	12.030	.680
	182	36.33	12.075	.725
	194	36.49	12.115	.765
	210	36.69	12.180	.830
	232	37.12	12.120	.870
	256	37.43	12.215	.960
36 x	231	36.49	16.470	.760
	247	36.67	16.510	.800
	262	36.85	16.550	.840
	282	37.11	16.595	.885
	302	37.33	16.655	.945
	330	37.67	16.630	1.020
	361	37.99	16.730	1.120
	395	38.37	16.830	1.220
	441	38.85	16.965	1.360
	487	39.33	17.105	1.500
	529	39.79	17.220	1.610
	652	41.05	17.575	1.970
40 x	149	38.20	11.810	.630
	167	38.59	11.810	.650
	183	38.98	11.810	.650
	211	39.37	11.810	.750
	235	39.69	11.890	.830
	264	40.00	11.930	.960
	278	40.16	11.970	1.025
	294	40.39	12.010	1.060
	327	40.79	12.130	1.180
	331	40.79	12.165	1.220
	392	41.57	12.360	1.415
40 x	199	38.67	15.750	.650
	215	38.98	15.750	.650
	249	39.38	15.750	.750
	277	39.69	15.830	.830
	297	39.84	15.825	.930
	324	40.16	15.910	1.000
	362	40.55	16.020	1.120
	372	40.63	16.065	1.160
	397	40.95	16.120	1.220
	431	41.26	16.220	1.340
	503	42.05	16.415	1.535
	593	42.99	16.690	1.790
44 x	230	42.91	15.750	.710
	262	43.31	15.750	.785
	290	43.62	15.825	.865
	335	44.02	15.945	1.025

Standard (I) Beams

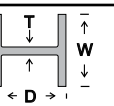
Size				Weight
D	Lbs. / Foot	W	T	Per 40' Bar
3	5.70	2.330	.170	228
	7.50	2.509	.349	300
4	7.70	2.663	.193	308
	9.50	2.796	.326	380
5	10.00	3.004	.214	400
6	12.50	3.332	.232	500
	17.25	3.565	.465	690
8	18.40	4.001	.271	736
	23.00	4.171	.441	920
10	25.40	4.661	.311	1016
	35.00	4.944	.594	1400
12	31.80	5.000	.350	1272
	35.00	5.078	.428	1400
	40.80	5.252	.462	1632
	50.00	5.477	.687	2000
15	42.90	5.501	.411	1716
	50.00	5.640	.550	2000
18	54.70	6.001	.461	2188
	70.00	6.251	.711	2800
20	66.00	6.255	.505	2640
	75.00	6.385	.635	3000
	86.00	7.060	.660	3440
	96.00	7.200	.800	3840
24	80.00	7.000	.500	3200
	90.00	7.125	.625	3600
	100.00	7.245	.745	4000
	106.00	7.870	.620	4240
	121.00	8.050	.800	4840

Miscellaneous Beams



	Size			Weight
D	Lbs. / Foot	W	T	Per 40' Bar
3	2.9	2.250	.090	116
4	3.2	2.250	.092	128
4	3.45	2.250	.092	138
4	4.08	2.250	.115	163
4	6.0	3.800	.130	240
5	18.9	5.003	.316	756
6	3.7	2.000	.098	148
6	4.4	1.844	.114	176
8	6.2	2.281	.129	248
8	6.5	2.281	.135	260
10	7.5	2.688	.130	300
10	8.0	2.690	.141	320
10	9.0	2.690	.157	360
12	10.0	3.250	.149	400
12	10.8	3.065	.160	432
12	11.8	3.065	.177	472
12.5	11.6	3.500	.155	464
12.5	12.4	3.750	.155	496

H Pilings



	Size			Weight
D	Lbs. / Foot	W	T	Per 40' Bar
8	36.0	8.155	.445	1440
10	42.0	10.075	.415	1680
10	57.0	10.225	.565	2280
12	53.0	12.045	.435	2120
12	63.0	12.125	.515	2520
12	74.0	12.215	.605	2960
12	84.0	12.295	.685	3360
14	73.0	14.585	.505	2920
14	89.0	14.695	.615	3560
14	102.0	14.785	.705	4080
14	117.0	14.885	.805	4680

Tubing Products

The steel for square, rectangular and round structural tubing is produced to a flat strip that is cold formed into the final shape and electric resistance welded. Structural tubing is manufactured to the chemical and mechanical requirements of ASTM A-500 Grade A, ASTM A-500 Grade B, A-500 Grade C, and A1085. Some ornamental sizes of square, rectangular and round tubing are made to the chemical requirements of ASTM A-513.

Applications

Hollow Structural Tubing offers maximum strength and compactness with low cost design features for general building construction. These carbon steel square and rectangular sections can be used as columns, posts or spandrel beams, and in complete load bearing panels, window walls, and entry structures.

A500/A1085 Comparison

	A500 Grade B	A500 Grade C	A1085
Manufacture Process	Cold Formed Welded	Cold Formed Welded	Cold Formed Welded
Max Perimeter	88"	88"	88"
Thickness Range	less than .875"	less than .875"	.148"-/875"
Yield			
Rounds	42k min	46k min	50k min 70k max
Shapes	46k min	50k min	50k min 70k max
Tensile			
Rounds	58k min	62k min	65k min
Shapes	58k min	62k min	65k min
Wall Thickness	plus or minus 10%	plus or minus 10%	minus 5% to plus 10%
Mass Tolerance	N/A	N/A	-3.50%
Corner Radius	no more than 3T max	no more than 3T max	t= to or less than .40" 1.6t to 3.0t t greater than .40" 1.8t to 3.0t
CVN	N/A	N/A	25 ft lbs @ 40 Deg F
Elongation min 2"	23%	21%	21%

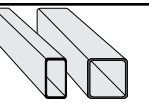
Workability and Weldability

Hollow Structural Tubing can be subjected to the usual fabricating operations. The ductility of tubing products is good. It bends well, flattens, cuts, punches, flares and flanges easily and can be welded by the commonly employed techniques and practices.

Availability of Lengths

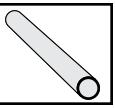
Ornamental Tubing is generally available in 20' and 24' lengths. Structural Tubing is generally available in 20', 24', 30', 32', 34', 40', 48', 56' and 60' lengths. Call for availability of particular sizes and lengths.

Square & Rectangular Mechanical Tubing



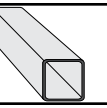
Outside Dims.	Wall Thickness	Wt. / Foot
1/2 x 1/2 x	.048	.301
	.060	.362
5/8 x 5/8 x	.048	.367
	.060	.442
3/4 x 3/4 x	.048	.457
	.060	.552
	.075	.690
	.083	.753
	.090	.800
	.120	1.029
1 x 1 x	.048	.629
	.060	.763
	.075	.945
	.083	1.036
	.090	1.115
	.120	1.437
1 1/4 x1 1/4 x	.048	.807
	.060	.981
	.075	1.200
	.083	1.318
	.090	1.443
	.120	1.846
1 1/2 x1 1/2 x	.048	.956
	.060	1.163
	.075	1.455
	.083	1.602
	.090	1.716
	.120	2.254
1 3/4 x1 3/4 x	.060	1.370
	.083	1.884
	.090	2.011
	.120	2.663
1 x 1/2 x	.060	.552
	.075	.679
1 1/2 x 1/2 x	.060	.763
1 1/2 x 3/4 x	.060	.879
	.075	1.072
	.083	1.176
	.120	1.640
1 1/2 x 1 x	.048	.800
	.060	.981
	.075	1.200
	.083	1.318
	.090	1.443
	.120	1.846
2 x 1 x	.060	1.163
	.075	1.455
	.083	1.602
	.090	1.716
	.120	2.254
2 x1 1/2 x	.060	1.370
	.075	1.694
	.090	2.011
	.120	2.663
2 1/2 x 1 x	.120	2.663
2 1/2 x1 1/2 x	.060	1.564
	.075	1.945
	.090	2.316
	.120	2.940
2 x 2 x	.060	1.564
	.075	1.966
	.083	2.143
	.090	2.316
	.120	3.050
3 x 1 x	.060	1.564
	.075	1.945
	.083	2.166
	.090	2.316
	.120	2.940
3 x1 1/2 x	.060	1.779
	.083	2.448
	.120	3.479
3 x 2 x	.083	2.756
	.120	3.890
4 x1 1/2 x	.120	4.292
4 x 2 x	.083	3.296
	.090	3.518
	.120	4.700

Round Mechanical Tubing



Outside Dims.		Wt. / Foot	Wt. / 20'
1/2	x.048	.236	4.72
	.060	.282	5.64
5/8	x.048	.301	6.02
	.060	.362	7.24
	.083	.481	9.62
3/4	x.049	.367	7.34
	.060	.442	8.84
	.083	.591	11.82
	.090	.634	12.68
7/8	x.048	.432	8.64
	.060	.552	11.04
	.083	.702	14.04
1	x.049	.498	9.96
	.060	.602	12.04
	.075	.741	14.82
	.083	.813	16.26
	.090	.875	17.50
	.120	1.128	22.56
1 1/4	x.048	.629	12.58
	.060	.763	15.26
	.083	1.034	20.68
1 1/4	x.090	1.115	22.30
	.120	1.448	28.96
1 1/2	x.060	.923	18.46
	.083	1.256	25.12
	.090	1.355	27.10
	.120	1.769	35.38
1 3/4	x.060	1.083	21.66
	.083	1.478	29.56
	.090	1.596	31.92
	.120	2.100	42.00
2	x.060	1.243	24.86
	.083	1.699	33.98
	.090	1.836	36.72
	.120	2.409	48.18
2 1/2	x.048	1.283	25.66
	.060	1.564	31.28
	.083	2.143	42.86
	.120	3.050	61.00
3	x.060	1.884	37.68
	.090	2.797	55.94
	.120	3.619	73.82

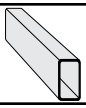
Square Structural Tubing



Outside Dims.	Wall Thickness	Wt. / Foot
1 1/4 x 1 1/4 x	.188	2.40
1 1/4 x 1 1/4 x	.188	3.23
	.250	3.70
2 x 2 x	.188	4.32
	.250	5.41
	.313	6.32
2 1/2 x 2 1/2 x	.090	2.979
	.120	3.89
	.188	5.59
	.250	7.11
	.313	8.45
3 x 3 x	.120	4.70
	.188	6.87
	.250	8.81
	.313	10.58
	.375	11.75
3 1/2 x 3 1/2 x	.120	5.52
	.188	8.15
	.250	10.51
	.313	12.70
	.375	14.71
4 x 4 x	.120	6.34
	.188	9.42
	.250	12.21
	.313	14.83
	.375	17.27
	.500	21.63
4 1/2 x 4 1/2 x	.120	7.31
	.188	10.70
	.250	13.91
	.313	16.98
	.375	19.82
5 x 5 x	.120	7.84
	.188	11.97
	.250	15.62
	.313	19.08
	.375	22.37
	.500	28.43
5 1/2 x 5 1/2 x	.125	9.01
	.165	11.74
	.188	13.30
	.250	17.32
	.313	21.22
	.375	24.93
	.500	31.84
6 x 6 x	.188	14.53
	.250	19.02
	.313	23.34
	.375	27.48

Outside Dims.	Wall Thickness	Wt. / Foot
6 x 6 x	.500	35.24
	.625	42.30
7 x 7 x	.188	17.08
	.250	22.42
	.313	27.59
	.375	32.58
	.500	42.05
	.625	50.76
8 x 8 x	.188	19.63
	.250	25.82
	.313	31.84
	.375	37.69
	.500	48.85
	.625	59.32
9 x 9 x	.250	29.23
	.313	36.10
	.375	42.79
	.500	55.66
	.625	67.82
10 x 10 x	.188	24.75
	.250	32.63
	.313	40.35
	.375	47.90
	.500	62.46
	.625	76.33
12 x 12 x	.250	39.43
	.313	48.86
	.375	58.10
	.500	76.07
	.625	93.34
14 x 14 x	.313	57.36
	.375	68.31
	.500	89.68
	.625	110.23
16 x 16 x	.313	65.87
	.375	78.52
	.500	103.30
	.625	127.34
18 x 18 x	.500	116.91
	.625	144.39
	.750	171.16
	.870	197.24
20 x 20 x	.500	130.52
	.625	161.40
	.750	191.58
	.875	221.06
22 x 22 x	.750	212.00
	.875	244.88

Rectangular Structural Tubing



Outside Dims.	Wall Thickness	Wt. / Foot
2 1/2 x 1 1/2 x	.188	4.32
	.250	5.41
3 x 1 1/2 x	.188	4.96
3 x 2 x	.188	5.59
	.250	7.11
	.313	8.45
3 1/2 x 1 1/2 x	.188	5.59
3 1/2 x 2 1/2 x	.188	7.05
	.250	8.81
4 x 1 1/2 x	.188	6.21
4 x 2 x	.188	6.87
	.250	8.81
	.313	10.58
4 x 2 1/2 x	.120	5.11
4 x 3 x	.120	5.52
	.188	8.15
	.250	10.51
	.313	12.70
	.375	14.71
5 x 2 x	.120	5.52
	.188	8.15
	.250	10.51
	.313	12.70
5 x 3 x	.120	6.34
	.188	9.42
	.250	12.21
	.313	14.83
	.375	17.27
	.500	21.63
5 x 4 x	.120	7.15
	.188	10.70
	.250	13.91
	.313	16.96
	.375	19.82
6 x 2 x	.120	6.34
	.188	9.42
	.250	12.21
	.313	14.83
	.375	17.27
6 x 3 x	.120	7.16
	.188	10.70
	.250	13.91
	.313	16.96
	.375	19.82
	.500	25.00
6 x 4 x	.120	7.97
	.188	11.97
	.250	15.62
	.313	19.08
	.375	22.37
	.500	28.43
7 x 3 x	.188	11.97
	.250	15.62
	.313	19.08
	.375	22.37
7 x 4 x	.188	13.25
	.250	17.32
	.313	21.21
	.375	24.93
	.500	31.83
7 x 5 x	.188	14.53
	.250	19.02
	.313	23.34
	.375	27.48
	.500	35.24
8 x 2 x	.188	11.97
	.250	15.62
	.313	19.08
	.375	22.37
8 x 3 x	.188	13.25
	.250	17.32
	.313	21.21
	.375	24.93
	.500	31.84
8 x 4 x	.188	14.53
	.250	19.02
	.313	23.34
	.375	27.48
	.500	35.24
8 x 6 x	.188	17.08
	.250	22.42
	.313	27.59
	.375	32.58
	.500	42.05
	.625	50.81
10 x 2 x	.188	14.53
	.250	19.02
	.313	23.34
10 x 3 x	.188	15.80
	.250	20.72
10 x 4 x	.188	17.08
	.250	22.42

Rectangular Structural Tubing (Continued)

Outside Dims.	Wall Thickness	Wt. / Foot
	.313	27.59
	.375	32.58
	.500	42.05
	.625	50.77
10 x 5 x	.188	18.35
	.250	24.12
	.313	29.72
	.375	35.14
	.500	45.40
10 x 6 x	.188	19.62
	.250	25.82
	.313	31.84
	.375	37.69
	.500	48.85
	.625	59.32
10 x 8 x	.188	22.18
	.250	29.23
	.313	36.10
	.375	42.79
	.500	55.66
12 x 2 x	.188	17.08
	.250	22.42
12 x 3 x	.188	18.35
	.250	24.12
	.313	29.72
12 x 4 x	.188	19.63
	.250	25.82
	.313	31.84
	.375	37.69
	.500	48.85
	.625	59.32
12 x 6 x	.188	22.18
	.250	29.23
	.313	36.10
	.375	42.79
	.500	55.66
12 x 8 x	.250	32.63
	.313	40.35
	.375	47.90
	.500	63.97
	.625	76.33
12 x 10 x	.250	36.03
	.313	44.60
12 x 10 x	.375	53.00
	.500	69.27
14 x 4 x	.250	29.23
	.313	36.10
	.375	42.79
	.500	55.66
14 x 6 x	.250	32.63
	.313	40.35
	.375	47.90
	.500	62.46
14 x 10 x	.313	48.86
	.375	58.10
	.500	76.07
	.625	93.25
16 x 4 x	.313	40.35
	.375	47.90
	.500	62.46
16 x 8 x	.250	40.84
	.313	48.86
	.375	58.10
	.500	76.07
	.625	93.30
16 x 12 x	.313	57.36
	.375	68.31
	.500	89.68
18 x 6 x	.250	39.43
	.313	48.86
	.375	58.10
	.500	76.07
	.625	93.34
20 x 4 x	.313	48.86
	.375	58.10
	.500	76.07
	.625	97.72
20 x 8 x	.313	57.36
	.375	68.31
	.500	89.68
	.625	110.23
20 x 12 x	.313	65.87
	.375	78.52
	.500	103.30
	.625	127.00
	.750	150.75
24 x 12 x	.500	116.91
	.625	144.39
	.750	171.16

Round Structural Tubing

OD	Pipe Sized	Schedule	Wall	WPF
3			0.188	3.87
			0.125	5.64
			0.250	7.34
			0.313	8.98
3.5	3	10	0.120	4.33
			0.188	6.65
		40	0.216	7.58
			0.250	8.68
		80	0.300	10.25
			0.313	10.64
4	3.5	10	0.120	4.97
			0.188	7.66
		40	0.226	9.11
			0.250	10.02
			0.313	12.33
		80	0.318	12.51
			0.375	14.53
4.5	4	10	0.120	5.61
			0.188	8.66
		40	0.237	10.79
			0.250	11.35
			0.313	13.96
		80	0.337	14.98
			0.375	16.52
5			0.125	6.51
			0.188	9.67
			0.250	12.68
			0.313	15.67
			0.375	18.52
5.5			0.125	7.18
			0.188	10.67
			0.250	14.02
			0.313	17.34
			0.375	20.53
5.563	5	10	0.125	7.26
			0.188	10.79
			0.250	14.19
		40	0.258	14.62
			0.313	17.55
		80	0.375	20.78
			0.500	27.06
6			0.125	7.85
			0.188	11.68
			0.250	15.35
			0.313	19.02
			0.375	22.53

OD	Pipe Sized	Schedule	Wall	WPF
6.625	6		0.156	10.79
			0.188	12.92
			0.250	17.02
		40	0.280	18.99
			0.313	21.04
			0.375	25.03
		80	0.432	28.57
			0.500	32.71
		120	0.562	36.42
7			0.188	13.68
			0.250	18.04
			0.313	22.35
			0.375	26.56
			0.500	34.74
8.625	8		0.188	16.94
		20	0.250	22.36
			0.313	27.79
		40	0.322	28.58
			0.375	33.07
		80	0.500	43.43
9.625	9		0.188	18.95
			0.250	25.06
			0.313	31.13
		40	0.342	33.94
			0.375	37.08
		XH	0.500	48.77
			0.625	60.13
10			0.250	26.032
10.75	10		0.188	21.21
		20	0.250	28.06
			0.313	34.89
		40	0.365	40.52
			0.375	41.59
		XH	0.500	54.79
		80	0.593	64.33
			0.625	67.65
11.75	11		0.250	30.73
			0.313	38.23
		40	0.375	45.56
		XH	0.500	60.08
			0.625	74.33
12.75	12	20	0.250	33.41
			0.313	41.61
		STD	0.375	49.61
		40	0.406	53.58
		XH	0.500	65.48

Round Structural Tubing (Continued)

OD	Pipe Sized	Schedule	Wall	WPF
12.75	12	60	0.562	73.22
		80	0.687	88.51
			0.625	81.01
13.375			0.250	35.04
			0.313	43.67
			0.375	52.07
			0.500	68.76
			0.625	85.11
14	14	10	0.250	36.71
			0.313	45.75
			0.375	54.62
		STD	0.437	63.36
		40	0.500	72.16
		XH	0.625	89.36
16	16	10	0.219	36.91
			0.250	42.09
			0.313	52.44
		STD	0.375	62.64
		XH	0.500	82.85
			0.625	102.72
18	18		0.250	47.44
			0.313	59.02
			0.375	70.65
		XH	0.500	93.54
			0.562	104.76
			0.625	116.09
20	20		0.250	52.78
			0.313	65.87
			0.375	78.67
			0.406	85.04
		XH	0.500	104.23
			0.625	129.45

Note: Many Structural Sizes are available in 21', 24', 30' 34', & 40' Lengths. All weights and dimensions are nominal. Permissible variation in weight is 5% above or below.

Pipe Products

Standard, Continuous Weld, Electric Weld or Seamless

Pipe is generally available with **Plain Ends** which are square cut, **Threaded and Coupled** Ends and with **Beveled Ends**.

Scope

The term "pipe" covers black and hot dipped galvanized, welded and seamless in nominal pipe sizes $^{1}/_{8}$ through 26 inches with average nominal wall thickness as given in the following pages. Pipe ordered to this specification is intended for mechanical and pressure applications and is also acceptable for ordinary uses in steam, water, gas and air lines. It is suitable for welding and suitable for some forming operations.

Manufacture

The weld seam of electric-resistance welded pipe in Grade B shall be heat treated after welding to a minimum of 1000° (540°C) so that no untempered martensite remains, or otherwise processed in such a manner that no untempered martensite remains. All pipe sold under this specification must meet ASTM testing requirements to assure proper application.

Strength Requirements

Seamless Or Electric Weld	Tensile Strength (P.S.I.)	Yield Strength (P.S.I.)
A53 Grade A	48,000 Min.	30,000 Min.
A53 Grade B	60,000 Min.	35,000 Min.
A500 Grade A	45,000 Min.	33,000 Min.
A500 Grade B	58,000 Min.	46,000 Min.

Note: Many Structural Sizes are available in 21', 24', 30', 34', & 40' Lengths. All weights and dimensions are nominal. Permissible variation in weight is 5 % above or below.

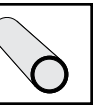
Gauge Pipe

Pipe Size	O.D. WT/FT	14GA	12GA	10GA	7GA	3GA
4-OD	4.00	.079	.109	.134	.188	
		3.308	**4.530**	**5.532**	**7.654**	
4		.079	.109	.134	.188	
		3.730	**5.112**	**6.248**	**8.658**	
5-OD	5.00	.079	.109	.134	.188	
		4.152	**5.694**	**6.694**	**9.662**	
6-OD	6.00	.079	.109	.134	.188	
		4.996	**6.858**	**8.395**	**11.67**	
6	6.625		.109	.134	.188	.250
			7.585	**9.289**	**12.92**	**17.02**
7-OD	7.00		.109	.134	.188	
			7.840	**9.826**	**13.67**	
8-OD	8.00	.079	.109	.134	.188	
		6.684	**9.186**	**11.25**	**15.68**	
8	8.625		.109	.134	.188	.250
			9.194	**12.15**	**16.94**	**22.36**
10-OD	10.00		.109	.134	.188	.250
			11.57	**14.12**	**19.70**	**26.03**
10	10.75		.109	.134	.188	.250
			12.28	**15.19**	**21.20**	**28.04**
12-OD	12.00		.109	.134	.188	.250
			13.84	**16.98**	**23.71**	**31.37**
12	12.75		.109	.134	.188	.250
			14.71	**18.05**	**25.22**	**33.38**
14	14.00		.109	.134	.188	.250
			16.17	**19.84**	**27.73**	**36.71**
16	16.00		.109	.134	.188	.250
			18.49	**22.70**	**31.78**	**42.05**
18	18.00		.109	.134	.188	.250
			20.82	**25.56**	**35.76**	**47.39**
20	20.00			.134	.188	.250
				28.43	**39.78**	**52.73**
22	22.0			.134	.188	.250
				31.29	**43.79**	**58.07**
24	24.00			.134	.188	.250
				34.15	**47.81**	**63.41**
26	26.00			.134	.188	.250
				37.01	**51.82**	**68.75**
30	30.00			.134	.188	.250
				42.74	**59.85**	**79.43**
36	36.00				.188	.250
					71.90	**95.45**
42	42.00				.188	.250
					83.95	**111.5**
48	48.00				.188	.250
					96.00	**127.5**

Pipe Dimensions & Weights

Pipe Size	O.D. WT/FT	5	10	20	30	40	Std.	60
1/8	.405	.035 .14	.049 .19			.068 .24	.068 .24	
1/4	.540	.049 .26	.065 .33			.088 .42	.088 .42	
3/8	.675	.049 .33	.065 .42			.091 .56	.091 .56	
1/2	.840	.065 .54	.083 .67			.109 .85	.109 .85	
3/4	1.050	.065 .68	.083 .86			.113 1.13	.113 1.13	
1	1.315	.065 .87	.109 1.40			.133 1.68	.133 1.68	
1-1/4	1.660	.065 1.11	.109 1.81			.140 2.27	.140 2.27	
1-1/2	1.900	.065 1.27	.109 2.09			.145 2.72	.145 2.72	
2	2.375	.065 1.60	.109 2.64			.154 3.65	.154 3.65	
2-1/2	2.875	.083 2.48	.120 3.53			.203 5.79	.203 5.79	
3	3.500	.083 3.03	.120 4.33			.216 7.58	.216 7.58	
3-1/2	4.000	.083 3.47	.120 4.97			.226 9.11	.226 9.11	
4	4.500	.083 3.92	.120 5.61			.237 10.79	.237 10.79	.281 12.66
4-1/2	5.000						.247 12.53	

Pipe Dimensions & Weights

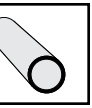


Pipe Size	O.D. WT/FT	80	E.H.	100	120	140	160	Dble. E.H.
1/8	.405	095 .31	.095 .31					
1/4	.540	.119 .53	.119 .53					
3/8	.675	.126 .73	.126 .73					
1/2	.840	.147 1.09	.147 1.09				.187 1.30	.294 1.71
3/4	1.050	.154 1.47	.154 1.47				.218 1.94	.308 2.44
1	1.315	.179 2.17	.179 2.17				.250 2.84	.358 3.66
1-1/4	1.660	.191 3.00	.191 3.00				.250 3.77	.382 5.21
1-1/2	1.900	.200 3.63	.200 3.63				.281 4.86	.400 6.41
2	2.375	.218 5.02	.218 5.02				.343 7.46	.436 9.03
2-1/2	2.875	.276 7.66	.276 7.66				.375 10.01	.552 13.70
3	3.500	.300 310.25	.300 10.25				.437 14.32	.600 18.58
3-1/2	4.000	.318 12.51	.318 12.51					.636 22.85
4	4.500	.337 14.98	.337. 14.98		437 19.01		.531 22.51	.674 27.54
4-1/2	5.000		.355 17.61					.710 32.53

Pipe Dimensions & Weights

Pipe Size	O.D. WT/FT	5	10	20	30	40	Std.	60
5	5.563	.109 6.35	.134 7.77			.258 14.62	.258 14.62	
6	6.625	.109 7.59	.134 9.29			.280 18.97	.280 18.97	
7	7.625						.301 23.57	
8	8.625	.109 9.91	.148 13.40	.250 22.36	.277 24.70	.322 28.55	.322 28.55	.406 35.64
9	9.625						.342 33.90	
10	10.750	.134 15.19	.165 18.70	.250 28.04	.307 34.24	.365 40.48	.365 40.48	.500 54.74
11	11.750						.375 45.55	
12	12.750	.165 22.18	.180 24.20	.250 33.38	.330 43.77	.406 53.53	.375 49.56	.562 73.16
14	14.000		.250 36.71	.312 45.68	.375 54.57	.437 63.37	.375 54.57	.594 85.05
16	16.000		.250 42.05	.312 52.36	.375 62.58	.500 82.77	.375 62.58	.656 107.5
18	18.000		.250 47.39	.312 59.03	.437 82.06	.562 104.7	.375 70.59	.750 138.2
20	20.000		.250 52.73	.375 78.60	.500 104.1	.594 123.1	.375 78.60	.812 166.4
24	24.000		.250 63.41	.375 94.62	.562 140.8	.688 171.3	.375 94.62	.969 238.4

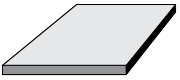
Pipe Dimensions & Weights



Pipe Size	O.D. WT/FT	80	E.H.	100	120	140	160	Dble. E.H.
5	5.563	.375 20.78	.375 20.78		.500 27.04		.625 32.96	.750 38.55
6	6.625	.432 28.57	.432 28.57		.562 36.39		.718 45.30	.864 53.16
7	7.625		.500 38.05					.875 63.08
8	8.625	.500 43.39	.500 43.39	.593 50.87	.718 60.93	.812 67.76	.906 74.69	.875 72.42
9	9.625		.500 48.72					
10	10.750	.594 64.43	.500 54.74	.719 77.03	.844 89.29	1.000 104.1	1.125 115.6	
11	11.750		.500 60.07					
12	12.750	.688 88.63	.500 65.42	.844 107.3	1.000 125.5	1.125 139.7	1.312 160.3	
14	14.000	.750 106.1	.500 72.09	.938 130.9	1.094 150.8	1.250 170.2	1.406 189.1	
16	16.000	.844 136.6	.500 82.77	1.031 164.8	1.219 192.4	1.438 223.6	1.594 245.3	
18	18.000	.938 170.9	.500 93.45	1.156 208.0	1.375 244.1	1.562 274.2	1.781 308.5	
20	20.000	1.031 208.9	500 104.1	1.280 256.1	1.500 296.4	1.750 341.1	1.968 379.0	
24	24.000	1.218 296.4	.500 125.5	1.531 367.4	1.812 429.4	2.062 483.1	2.343 541.9	

Plate Products

Hot Rolled ASTM-A36



Hot rolled plates made to ASTM-A36 are intended for use in structural applications. Plates 1/2" and under are normally sheared: while heavier plates are flame cut. Flame cutting is necessary when plate thickness exceeds mill shearing limits.

Analysis

Thickness	Carbon	Manganese	Phosphorus	Sulphur	Silicon
3/16 To 3/4"	.25 Max	.80 / 1.20	.04 Max	.05 Max	.40 Max
3/4 - 1 1/2"	.25 Max	.80 / 1.20	.04 Max	.05 Max	.40 Max
1 1/2 - 2 1/2"	.26 Max	.80 / 1.20	.04 Max	.05 Max	.15 / .40
2 1/2 - 4"	.27 Max	.85 / 1.20	.04 Max	.05 Max	.15 / .40
4" & Up	.29 Max	.85 / 1.20	.04 Max	.05 Max	.15 / .40

Applications

Carbon steel plates have so many and such varied uses that a comprehensive list of plate applications would be impossible in these pages, however a few uses are: tanks, tubes, truck frames, railroad cars, and many structural uses, such as: base plates, girders, etc.

PLATE

Mechanical Properties

Tensile Strength (P.S.I.)	Yield Point (P.S.I.)	Elongation In 8 Inches
58,000 - 80,000	36,000 Minimum*	20%

* Yield Point 32,000 P.S.I. for plates over 8 inches thick.

Machinability

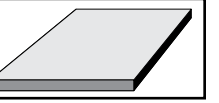
This grade is satisfactory for ordinary machining or drilling but it is not considered a free machining grade.

Weldability

These grades present no problems when using all welding processes. The quality is generally high for both welds and joints. Welding rod specifications are dependent on conditions such as the thickness of the sections to be welded, service requirements and design.

High Tensile Plates

ASTM A572 Grade 50



High Tensile Plates are low alloy steel, which produce high strength and are intended primarily for weight reduction, or longer life, by means of greater strength.

Analysis (Typical)

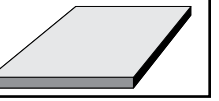
	Carbon	Mn	P	Sulphur	Silicon	Cb
Gr. 50	.23 Max	1.35 Max	.04 Max	.05 Max	.40 Max	.01 Min

Mechanical Properties (Typical)

	Tensile Strength (P.S.I.)	Yield Point (P.S.I.)	Elongation In 2"
Gr. 50	65,000 Min.	50,000	Min. 21%

Pressure Vessel Quality Plate

A516 Grade 70



Applications

A516/70 is a carbon steel plate for boilers for stationary service and other pressure vessels. The maximum thickness under this specification is 6".

Analysis (Typical)

	Carbon	Mn	Phosphorus	Sulphur	Silicon
A516 Gr. 70	.28 Max	1.2 Max	.035 Max	.04 Max.	.15-.40

Mechanical Properties

	Tensile Strength (P.S.I.)	Yield Point (P.S.I.)	Elongation In 8"
A516 Gr. 70	70,000 - 90,000	38,000 Min.	17%

Weldability

These grades present no problems when using all welding processes. Welding rod specifications depend on conditions such as thickness of section, service requirements and design.

Corrosion Resistant Plate A588

This specification covers high strength low alloy steel which is made to reduce weight without sacrificing strength and is primarily used in structural applications. Additionally, this grade is more resistant to atmospheric corrosion in most environments than carbon steel and when properly exposed to the atmosphere this steel is suitable for many applications in the bare or unpainted/ uncoated condition.

Applications

A588 steel is intended to be used in structural applications demanding higher strength in a low alloy product for enhance weld ability like bridges. However it is also made to a fine grain standard making it ideal for manufactured goods like tubing. This material performs well in structural applications where corrosion resistance is desired with or without painting or coating the finished product. A prime example again is bridges. In uncoated applications the material will allow surface rust to a point where the corrosion is halted or retarded depending on the corrosive nature of the surrounding atmosphere.

Analysis (Typical)

	C	Mn	P	Sulphur	Silicon	Ni	Cr	Cu
A588 Gr. A	.19	.80-1.25	.04 Max	.05 Max	.30-.065	.40 Max	.04-.65	.25-.40
A588 Gr. B	.20 Max	.75-1.35	.04 Max	.05 Max	.15-.50	.50 Max	.04-.70	.20-.040

Mechanical Properties (Typical)

	Tensile Strength (P.S.I.)	Yield Point (P.S.I.)	Elongation In 2"
A588 Gr. A&B	70,000 Min.	50,000	18%

Weldability

Welding this grade of steel presents no problems when using the welding specification outlines in the A6 guidelines of the ASTM manuals. Welding wire or rod specifications depend on thickness of section, service requirements and design. Some heating before and after welding may be necessary.

High Brinell Plate

High Brinell or Wear Plates are made from heat treated, high strength, abrasion resisting steels.

Analysis

Because these plates are made to a specific hardness range rather than to a specific ASTM grade, there is a wide range of chemistries found in these steels depending on the mill of origin.

Applications

This steel is used in applications requiring high strength and high wear resistance. Good candidates for these steels are mining, earth moving equipment, loader buckets, cutting edges, chutes, slurry pipe, ore bins, and similar uses.

Typical Mechanical Properties

Grade	Tensile Strength (P.S.I.)	Yield Point (P.S.I.)	Elongation Percent In 2"	Brinell Hardness
AR400	180,000	145,000	14	400
AR500	230,000	190,000	14	500

Fabrication

Due to the proprietary nature of High Brinell plate, procedures for welding, drilling and forming are specific to each mill's product and can be provided upon request.

Constructional Alloy A514

Heat treated constructional alloy steels are low-carbon alloy steel with a level of strength substantially higher than that of the high-strength low alloy grades. This higher strength is obtained by heat treating, water quenching and tempering. The alloying elements and amount of the alloy content vary among the grades depending upon the section thickness and desired properties. Their general weldability is improved by the lower carbon content.

The range of hardness for ASTM A-514 is Brinell 235 - 293. This range is sometimes referred to as "Regular Quality." If you have specific hardness requirements, please contact our sales office.

Typical Analysis of A514

Carbon	Manganese	Phosphorus	Sulphur	Silicon
.12 - .21	.70 - 1.00	.035 Max.	.035 Max.	.20 - .35

Chromium	Molybdenum	Vanadium	Titanium	Boron
.40 - .0065	.15 - .25	.03 - .08	.01 - .03	.0005 - .005

Mechanical Properties For Regular Quality

			Reduction of Area (Min. %)	
Tensile Strength (P.S.I.)	Yield Point (P.S.I.)	Elongation In 2"	3/4 Inch And Under	Over 3/4 Inch
110 to 130,000	100,000 Min.	18% Min.	40%	50%

Applications

Regular Quality is used in general structural applications where its greater strength permits reduction in weight by using smaller cross-sectional areas. It is for welded construction where procedures are suitable to maintain the properties of the plate.

321 and 360 Minimum Brinell Quality are for applications where higher hardness and strength in conjunction with increased resistance to impact abrasion are important.

Forming

Regular Quality can be cold-formed readily, provided sufficient power is available and allowance is made for greater spring back than with mild steel.

Thickness Of Material	Minimum Radius
Up to 1" inclusive	Two Times Thickness
Over 1 inch to 2" inclusive	Three Times Thickness

Warm forming may be done at temperatures below 1100°F. without destroying the mechanical properties or toughness. Hot forming may be done at 1600-1800°F, but the formed part must be heat-treated to restore its original properties. To insure proper safety and the structural integrity of the finished product we will assist you with heat number and source-mill information so that you can obtain accurate information from the producing mill prior to any attempt to form this material.

Machinability

The cutting speed of Regular Quality is 65 surface feet per minute or approximately 40% of 1212.

Weldability

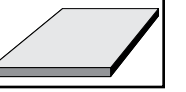
Similar techniques to those used in structural carbon steels apply but precautions must be used. Hydrogen must be kept out of the welding operation. Large sections or those under high restraint should be preheated to temperatures not exceeding 400°F.

Heat Treating

Stress relieving may be performed by heating at temperatures up to 1100°F. If Regular Quality material is heated over 1100°F, it must be heat treated again to restore the original strength.

Austinize	Quench	Temper
1650°F to 1700°F	Agitated Water	1150°F to 1250°F

Weights For Plate Products

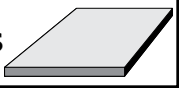


	Weight Per Plate
3/16 Inch	
7.66 Lbs. / Sq. Ft.	
48 x 96	245.1
120	306.4
144	367.7
240	612.8
288	735.4
60 x 96	306.4
120	383.0
144	459.6
240	766.0
288	919.2
72 x 120	459.6
144	551.5
240	919.2
288	1103.0
360	1378.8
84 x 240	1072.4
360	1608.6

	Weight Per Plate
3/16 Inch (Cont.)	
96 x 120	612.8
144	735.4
240	1225.6
288	1470.7
360	1838.4
120 x 240	1532.0
360	2298.0
1/4 Inch	
10.21 Lbs. / Sq. Ft.	
48 x 96	326.7
120	408.4
144	490.1
240	816.8
288	980.2
60 x 96	408.4
120	510.5
144	612.6
240	1021.0

	Weight Per Plate
1/4 Inch (Cont.)	
288	1225.2
72 x 96	490.1
120	612.6
72 x 144	735.1
240	1225.2
288	1470.2
360	1837.6
84 x 240	1429.4
360	2144.1
96 x 96	653.4
120	816.8
144	980.2
240	1633.6
288	1960.3
360	2450.4
120 x 240	2042.0
360	3063.0

Weights For Plate Products



	Weight Per Plate
5/16 Inch	
12.76 Lbs. / Sq. Ft.	
48 x 96	408.3
120	510.4
144	612.5
240	1020.8
60 x 96	510.4
120	638.0
144	756.6
240	1276.0
288	1531.2
72 x 120	756.6
144	918.7
240	1531.2
288	1837.4
360	2296.8
84 x 240	1786.4
360	2679.6
96 x 120	1020.8
144	1225.0
240	2041.6
288	2449.9
360	3062.4
120 x 240	2552.0
360	3828.0
3/8 Inch	
15.31 Lbs. / Sq. Ft.	
48 x 96	489.9
120	612.4
144	734.9
240	1224.8
288	1469.8
60 x 96	612.4
120	765.5
144	918.6

	Weight Per Plate
3/8 Inch (Cont.)	
240	1531.0
288	1837.2
72 x 120	918.6
144	1102.5
240	1837.2
288	2204.6
360	2755.8
84 x 240	2143.4
360	3215.1
96 x 120	1224.8
144	1469.8
240	2449.6
288	2939.5
360	3674.4
120 x 240	3062.0
360	4593.0
7/16 Inch	
17.87 Lbs. / Sq. Ft.	
96 x 240	2859.2
1/2 Inch	
20.42 Lbs. / Sq. Ft.	
48 x 96	653.4
120	816.8
144	980.2
240	1633.6
288	1960.3
60 x 96	816.8
120	1021.0
144	1225.2
240	2042.0
60 x 288	2450.4
72 x 120	1225.2
144	1470.2
240	2450.4
288	2940.5

	Weight Per Plate
1/2 Inch (Cont.)	
360	3675.6
84 x 240	2858.8
288	3430.6
360	4288.2
96 x 120	1633.6
144	1960.3
240	3267.2
288	3920.6
360	4900.8
120 x 240	4084.0
360	6126.0
5/8 Inch	
25.52 Lbs. / Sq. Ft.	
48 x 96	816.6
120	1020.8
144	1225.0
240	2041.6
288	2449.9
60 x 96	1020.8
144	1531.2
240	2552.0
288	3062.4
72 x 120	1531.2
144	1837.4
240	3062.4
288	3674.9
360	4593.6
84 x 240	3572.8
360	5359.2
96 x 120	2041.6
144	2449.9
240	4083.2
288	4899.8
360	6124.8

Weights For Plate Products (Continued)

	Weight Per Plate
5/8 Inch (Cont.)	
120 x 240	5104.0
360	7656.0
3/4 Inch	
30.63 Lbs. / Sq. Ft.	
48 x 96	980.2
120	1225.2
144	1470.2
240	2450.4
60 x 96	1225.2
120	1531.5
144	1837.8
240	3063.0
288	3675.6
72 x 120	1837.8
144	2205.4
240	3675.6
288	4410.7
360	7351.2
84 x 240	4288.2
360	6432.2
96 x 120	2450.4
144	2940.5
240	4900.8
288	5881.0
360	7351.2
120 x 240	6126.0
360	9189.0
7/8 Inch	
35.73 Lbs. / Sq. Ft.	
48 x 96	1143.4
120	1429.2
144	1715.0
240	2858.4

	Weight Per Plate
7/8 Inch (Cont.)	
60 x 96	1429.2
120	1786.5
144	2143.8
240	3573.0
288	4287.6
360	5395.5
72 x 120	2143.8
144	2572.6
240	4287.6
288	5145.1
360	6431.4
84 x 240	5002.2
360	7503.3
96 x 120	2858.4
144	3430.1
240	5716.8
288	6860.2
360	8575.2
120 x 240	7146.0
360	10719.0
1 Inch	
40.84 Lbs. / Sq. Ft.	
48 x 96	1306.9
120	1633.6
144	1960.3
240	3267.2
288	3920.6
60 x 96	1633.6
120	2042.0
144	2940.5
240	4084.0
288	4900.8
72 x 120	2450.4

	Weight Per Plate
1 Inch (Cont.)	
144	2940.5
240	4900.8
288	5881.0
360	7351.2
84 x 240	5717.6
360	8576.4
96 x 120	3267.2
144	3920.6
240	6534.4
288	7841.3
360	9801.6
120 x 240	8168.0
120 x 360	12252.0
1 1/8 Inch	
45.95 Lbs. / Sq. Ft.	
96 x 240	7352.0
1 1/4 Inch	
51.05 Lbs. / Sq. Ft.	
48 x 96	1633.6
120	2042.0
144	2450.4
192	3267.2
240	4084.0
60 x 96	2042.0
120	2552.5
144	3063.0
192	4084.0
240	5105.0
72 x 120	3063.0
144	3675.6
192	4900.8
240	6126.0
360	9189.0

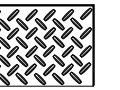
Weights For Plate Products (Continued)

	Weight Per Plate
1 1/4 Inch (Cont.)	
84 x 240	7147.0
360	10720.5
96 x 120	4084.0
144	4900.8
192	6534.4
240	8168.0
360	12252.0
1 3/8 Inch	
56.15 Lbs. / Sq. Ft.	
96 x 240	8984.0
1 1/2 Inch	
61.26 Lbs. / Sq. Ft.	
48 x 96	1960.3
120	2450.4
144	2940.5
192	3920.6
240	4900.8
60 x 96	2450.4
60 x 120	3063.0
144	3675.6
192	4900.8
240	6126.0
72 x 120	3675.6
144	4410.7
192	5881.0
240	7351.2
360	11026.8
84 x 240	8576.4
360	12864.6
96 x 120	4900.8
144	5881.0
192	7841.3
240	9801.6

	Weight Per Plate
1 5/8 Inch	
66.36 Lbs. / Sq. Ft.	
96 x 240	10617.6
1 3/4 Inch	
71.47 Lbs. / Sq. Ft.	
48 x 96	2287.0
120	2858.8
144	3430.6
192	4574.1
240	5717.6
60 x 96	2858.8
120	3573.5
144	4288.2
192	5717.6
240	7147.0
72 x 120	4288.2
144	5145.8
192	6861.1
240	8576.4
360	12864.6
84 x 240	10005.8
360	15008.7
96 x 120	5717.6
144	6861.1
96 x 192	9148.2
240	11435.2
1 7/8 Inch	
76.57 Lbs. / Sq. Ft.	
96 x 240	12251.2
2 Inch	
81.68 Lbs. / Sq. Ft.	
60 x 240	8168.0
72 x 240	9801.6

	Weight Per Plate
2 Inch (Cont.)	
84 x 240	11435.2
96 x 240	13068.8
2 1/4 Inch	
91.89 Lbs. / Sq. Ft.	
60 x 240	9189.0
72 x 240	11026.8
84 x 240	12864.6
96 x 240	14702.4
2 1/2 Inch	
102.1 Lbs. / Sq. Ft.	
60 x 240	10210.0
72 x 240	12252.0
96 x 240	16336.0
2 3/4 Inch	
112.3 Lbs. / Sq. Ft.	
3 Inch	
122.5 Lbs. / Sq. Ft.	
3 1/2 Inch	
142.9 Lbs. / Sq. Ft.	
4 Inch	
163.36 Lbs./ Sq. Ft.	
4 1/2 Inch	
183.8 Lbs. / Sq. Ft.	
5 Inch	
204.2 Lbs. / Sq. Ft.	
6 Inch	
245.0 Lbs. / Sq. Ft.	
8 Inch	
326.7 Lbs. / Sq. Ft.	

Floor Plate
A786 Commercial Quality



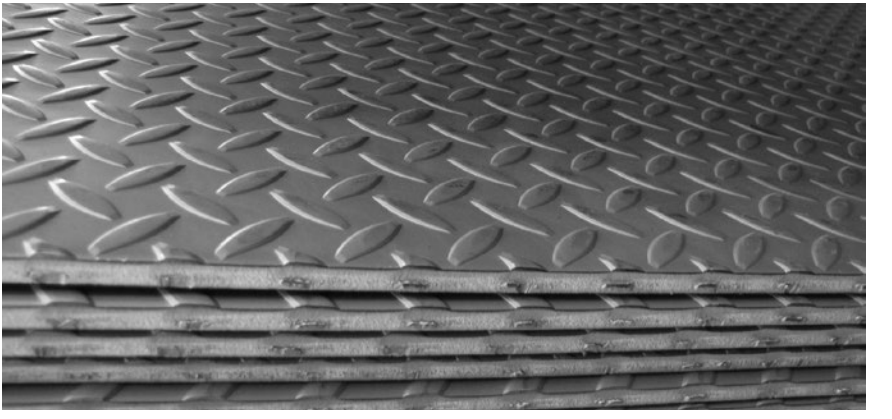
Diamond Floor Plate is made of rolled carbon steel that has great structural strength and long wearing qualities. The practical safety tread pattern provides 4-way traction, easy cleaning and drainage.

Applications

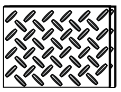
Diamond Floor Plate is extensively used in safety floors, step treads, walkways, truck beds, truck bumpers, conveyors, cover plates, running boards, cab floors, and truck tail gates.

Weldability

This material presents no welding problems when using all welding processes. The quality of the welds is generally extremely high for both welds and joints. Welding rod specifications are dependent on welding conditions such as the thickness of the sections to be welded, service requirements and design.



Floor Plate



	Weight Per Plate
16 Ga.	
3.00 Lbs. / Sq. Ft.	
36 x 96	72.0
120	90.0
144	108.0
48 x 96	96.0
120	120.0
192	192.0
240	240.0
14 Ga.	
3.75 Lbs. / Sq. Ft.	
48 x 96	120.0
120	150.0
192	240.0
240	300.0
12 Ga.	
5.25 Lbs. / Sq. Ft.	
48 x 96	168.0
120	210.0
192	336.0
240	420.0
60 x 120	262.5
240	525.0
1/8 Inch	
6.15 Lbs. / Sq. Ft.	
36 x 120	184.5
48 x 96	196.8
120	246.0
240	492.0
288	590.4
60 x 120	307.5
240	615.0
288	710.4
72 x 240	738.0
288	885.6
3/16 Inch	
8.71 Lbs. / Sq. Ft.	
48 x 96	278.7

	Weight Per Plate
3/16 Inch (Cont.)	
120	348.4
240	696.8
60 x 96	348.4
120	435.5
240	871.0
288	1045.2
72 x 240	1045.2
288	1254.2
84 x 240	1219.4
288	1463.3
1/4 Inch	
11.26 Lbs. / Sq. Ft.	
48 x 96	360.3
120	450.4
240	900.8
288	1081.0
60 x 120	563.0
240	1126.0
288	1351.2
72 x 240	1351.2
288	1621.4
96 x 240	1801.6
288	2161.9
5/16 Inch	
13.81 Lbs. / Sq. Ft.	
48 x 96	441.9
120	552.4
240	1104.8
288	1325.8
60 x 120	690.5
240	1381.0
288	1657.2
72 x 240	1657.2
288	1988.6
96 x 240	2209.6
288	2651.5

	Weight Per Plate
3/8 Inch	
16.37 Lbs. / Sq. Ft.	
48 x 96	523.8
120	654.8
240	1309.6
48 x 288	1571.5
60 x 240	1637.0
288	1964.4
72 x 240	1964.4
288	2357.3
96 x 240	2619.2
288	3143.0
1/2 Inch	
21.47 Lbs. / Sq. Ft.	
48 x 96	687.0
120	858.8
240	1717.6
288	2061.1
60 x 240	2147.0
288	2576.4
72 x 240	2576.4
288	3091.7
96 x 240	3435.2
288	4122.2
5/8 Inch	
26.58 Lbs. / Sq. Ft.	
48 x 240	2126.4
60 x 240	2658.0
72 x 240	3189.6
96 x 240	4252.8
3/4 Inch	
31.68 Lbs. / Sq. Ft.	
48 x 240	2534.4
60 x 240	3168.0
72 x 240	3801.6
96 x 240	5068.8
96 x 288	6082.6

Sheet Products

Hot Rolled ASTM-A1011

Commercial Quality is suitable for all ordinary purposes where the presence of oxide on the surface is not objectionable. Sheets of this quality may be suitable for bending and moderate forming; however, they are not guaranteed against breakage except that caused by piped steel (material with tubular voids). Commercial Quality sheets should be capable of withstanding standard test bends, i.e., being bent flat on itself in any direction at room temperature.

Analysis

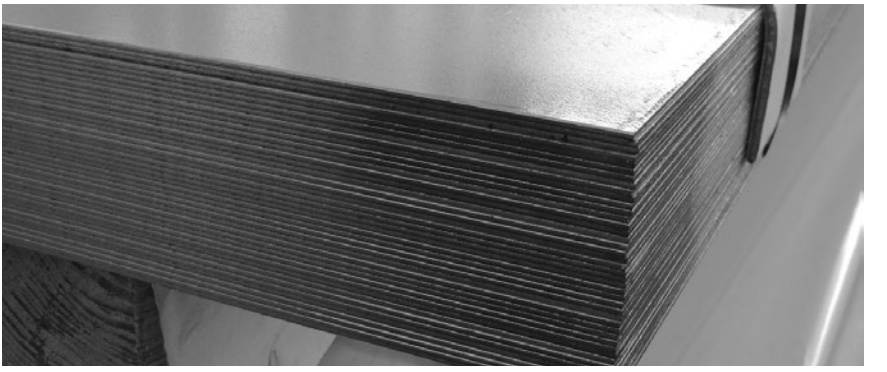
Carbon	Manganese	Phosphorus	Sulphur
.15 Max.	.30 - .60	.04 Max.	.05 Max.

Applications

Commercial Quality sheets have good ductility. They are easy to fabricate and are used for a wide variety of purposes, such as barrels and drums, lockers, cabinets, doors, blower and ventilating systems, bins, partitions, chutes, steel jackets, and agricultural equipment.

Weldability

This quality of sheet presents no welding problems, when using all welding processes. Welding quality is generally extremely high for welds and joints. Welding rod specifications are dependent on welding conditions such as thickness of section, service requirements and design to name a few of the probable welding conditions.



High Tensile Sheet ASTM A1011 Grade 50

High Strength / Low Alloy sheets (sometimes referred to as High Tensile sheets) are rolled and generally stocked in Grade 50.

Analysis

Carbon	Manganese	Phosphorus	Sulphur	Columbium	Vanadium
.23 Max	1.35 Max	.04 Max	.05 Max	.01 Min	.01 Min

Applications

This material is extensively used in industrial and domestic air conditioning equipment, farm buildings, farm elevators, farm wagons, fertilizer wagons, hay balers, potato planter hoppers, tractors, bins, blowers, booms, concrete forms, conveyors, filing cabinet parts, floor plates, door frames, furnace parts, material handling equipment, pole line hardware, lamp and sign posts, pump parts, scraper parts, tanks, trailers, transformer shells, trucks, wheelbarrows and, worm gears.

Mechanical Properties

	Tensile Strength (P.S.I.)	Yield Strength (P.S.I.)	Elongation In 2"
All Gauges - Gr 50	65,000 Min.	50,000 Min.	22% Min.

Forming

High Tensile Sheet may be hot or cold formed. To insure proper safety and the structural integrity of the finished product we will assist you with heat number and source-mill information so that you can obtain accurate information from the producing mill prior to any attempt to form this material.

For cold forming, a greater force is required to produce a permanent set because of the higher yield point than carbon steel. It is suggested for cold forming that the inside radius of the bend should be at least equal to the thickness of the material for sheet and strip up to $^1/_{16}$" inclusive; at least twice the thickness of the material over $^1/_{16}$" to $^1/_4$", inclusive; and three times the thickness for material over $^1/_4$" to $^1/_2$" inclusive.

Punching and Shearing

Shearing may require tighter and more secure clamping if a clamp hold down is used because the metal tends to pull more than structural carbon steel. Punching requires up to 20% greater force than for equal thicknesses of ASTM-A569 material.

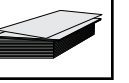
Gas Cutting

No special precautions need be taken beyond those required for structural steel, and the heat effects and cutting speeds are similar for both grades. This material can be plasma-cut with minimal warpage.

Weldability

High Tensile is readily welded by all the usual methods, i.e., shielded metal arc, submerged arc, and electrical resistance, including spot welding. An important advantage in welded structures is the fact that this material experiences an increase in the yield and tensile strength with practically no decrease in elongation when stress-relieved.

Cold Rolled Sheet ASTM A1008



Specification: Commercial Quality

Sheets of this quality should be suitable for bending and moderate forming; however, they are not guaranteed against breakage except that caused by piped steel (material with tubular voids). Sheets of Commercial Quality should be capable of withstanding a standard bend test, i.e., being bent flat on itself in any direction at room temperature.

Cold Rolled Sheets are from continuous mill production from low-carbon open-hearth rimmed, texture or capped steel with a carbon maximum of 0.15.

Applications

The dull surface texture is suitable for paints, lacquers and enamels. Cabinets, appliances, auto body parts, furniture, file cases and desks, partitions, and doors are some applications for cold rolled sheets.

Weights For H.R. & C.R. Sheets

Size In Inches	Weight Per Sheet
26 Ga. (.0179)	
36 x 96	18.02
120	22.53
48 x 96	24.03
120	30.04
24 Ga. (.0239)	
36 x 96	24.02
120	30.03
48 x 96	32.03
120	40.04
22 Ga. (.0299)	
36 x 96	30.02
120	37.53
48 x 96	40.03
120	50.04
20 Ga. (.0359)	
36 x 96	36.02
120	45.03
48 x 96	48.03
120	60.04
18 Ga. (.0478)	
36 x 96	48.29
120	60.36
48 x 96	64.38
120	80.48
16 Ga. (.0598)	
36 x 96	60.00
120	75.00
48 x 96	80.06
120	100.00
144	120.01
240	200.02
60 x 96	100.00
120	125.01
144	150.01

Size In Inches	Weight Per Sheet
14 Ga. (.0747)	
36 x 96	75.07
120	93.84
48 x 96	100.10
120	125.12
144	150.14
240	250.24
60 x 96	125.12
120	156.40
240	312.80
72 x 120	187.68
144	225.22
240	375.36
12 Ga.(.1046)	
36 x 96	105.10
120	131.37
48 x 96	140.13
120	175.16
144	210.19
240	350.32
60 x 96	175.16
120	218.95
144	262.74
72 x 120	262.74
144	315.29
11 Ga. (.1196)	
36 x 96	120.12
120	150.15
48 x 96	160.16
120	200.20
144	240.24
240	400.40
60 x 96	200.20
120	250.25
144	300.30
240	500.50

Size In Inches	Weight Per Sheet
11 Ga. (Cont.)	
72 x 96	240.24
120	300.30
144	360.36
240	600.60
10 Ga. (.1345)	
36 x 96	135.12
120	168.90
48 x 96	180.16
120	225.20
144	270.24
240	450.40
60 x 96	225.20
120	281.50
144	337.80
192	450.40
240	563.00
72 x 96	270.24
120	337.80
144	405.36
192	540.48
240	675.60
7 Ga (.1793)	
36 x 96	180.17
120	225.21
48 x 96	240.22
120	300.28
144	360.34
240	600.56
60 x 96	300.28
120	375.35
144	450.42
240	750.70
72 x 120	450.42
144	540.50

AISI Thickness Tolerance H.R. & C.R. Sheet

	Thickness In Inches			
Gage Number	Decimal Equivalent	Tol. Range H.R. & P.&O.	Tol Range C.R. Sheet	Pounds Per Sq. Foot
7	.1793	.1873 .1713	.0883 .1703	7.507
10	.1345	.1425 .1265	.1405 .1285	5.630
11	.1196	.1276 .1116	.1256 .1136	5.005
12	.1046	.1126 .0966	.1106 .0986	4.379
13	.0897	.0967 .0827	.0947 .0847	3.75
14	.0747	.0817 .0677	.0797 .0697	3.128
16	.0598	.0658 .0538	.0648 .0548	2.502
18	.0478	.0528 .0428	.0518 .0438	2.102
20	.0359	-----	.0389 .0329	1.501
22	.0299	-----	.0329 .0269	1.261
24	.0239	-----	.0269 .0209	1.001
26	.0179	-----	.0199 .0159	.751

Galvanized Sheet ASTM-A653, G-90

Commercial Quality

Flat galvanized sheets are flat, have closely guarded shearing tolerances, and are ductile and soft.

These sheets are produced by passing the base sheets through a bath of molten zinc which, after controlled cooling, gives a clean, bright, uniform spangle.

Stamping, cold drawing, double seaming and brake or roll forming will not impair the protective quality of these sheets.

Applications

Flat galvanized sheets are used as the prime general sheet metal for heating, cooling, joist hangers, and for sign work if the sheets are primed before painting.

Paintable Galvanized Sheet ASTM-A653, A-40/A-60

Paintable Galvanized Sheet, sometimes called Paint Bond, Jetkote or Wiped Galvanized, has a surface coating that makes priming unnecessary.

Applications

Paintable galvanized sheets are used in applications where paint, enamels and lacquers will be used or where flat, stretcher-leveled sheets are needed. These sheets can be drawn, stamped, formed, and sheared without cracking, peeling or flaking.

Office furniture, cabinets of all types, appliance shells, truck and trailer bodies, lighting fixtures, signs, air conditioning and refrigeration equipment are some applications for Paintable Galvanized sheet.

Chemical Composition (Typical)

Carbon	Manganese	Phosphorus	Sulphur
.15 Max.	.30 - .60	.05 Max.	.05 Max.

AISI Thickness Tolerance For Galv. Sheet

Ga. No.	Dec. Equiv.	Tolerance Range			Ga. No.	Dec. Equiv.	Tolerance Range		
10	.1382	.1472	To	.1292	20	.0396	.0436	To	.0356
11	.1233	.1323	To	.1143	22	.0336	.0376	To	.0296
12	.1084	.1174	To	.0994	24	.0276	.0316	To	.0236
14	.0785	.0865	To	.0705	26	.0217	.0247	To	.0187
16	.0635	.0695	To	.0575	28	.0187	.0217	To	.0157
18	.0516	.0566	To	.1466	30	.0157	.0187	To	.0127

Weights For Galvanized Sheets

Size In Inches	Weight Per Sheet	Size In Inches	Weight Per Sheet	Size In Inches	Weight Per Sheet
10 Ga. (.138)		**18 Ga. (.052)**		**26 Ga. (.022)**	
Wt. / Sq. Ft.	**5.786**	**Wt. / Sq. Ft.**	**2.158**	**Wt. / Sq. Ft.**	**.907**
48 X 96	185.15	48 X 96	69.06	48 X 96	29.02
120	231.44	120	86.32	120	36.28
12 Ga. (.109)		**20 Ga. (.040)**		**28 Ga. (.019)**	
Wt. / Sq. Ft.	**4.535**	**Wt. / Sq. Ft.**	**1.658**	**Wt. / Sq. Ft.**	**.782**
48 X 96	145.12	48 X 96	53.06	36 X 96	18.77
120	181.40	120	66.32	120	23.46
14 Ga. (.079)		**22 Ga. (.034)**		**30 Ga. (.016)**	
Wt. / Sq. Ft.	**3.284**	**Wt. / Sq. Ft.**	**1.407**	**Wt. / Sq. Ft.**	**.657**
48 X 96	105.09	48 X 96	45.02	36 X 96	15.77
120	131.36	120	56.28		
16 Ga. (.064)		**24 Ga. (.028)**			
Wt. / Sq. Ft.	**2.658**	**Wt. / Sq. Ft.**	**1.157**		
48 X 96	85.06	48 X 96	37.02		
120	106.32	120	46.28		

Expanded Metal & Grating Products

Expanded Metal, Expanded Metal Grating, Bar Grating, and Diamond Grip are all products that have openings in their horizontal surfaces which increase friction for safer climbing and standing, and allow dirt, oil, etc. to fall through. This provides a certain amount of self-cleaning.

Stock sizes are generally 48 x 96 sheets. However, 48 x 120, 48 x 144 and custom sizes are available upon request.

Expanded Metal - Raised

Style Designation	Center To Center Of Bonds		Thickness Of Strand	Weight In Pounds Per Square Foot	
	Width	Length		Plain	Galv.
1/4 - No. 18	.255	1.00	.048	1.14	1.71
1/2 - No. 18	.500	1.20	.048	.70	.85
1/2 - No. 16	.500	1.20	.060	.86	.97
1/2 - No. 13	.500	1.20	.092	1.47	1.73
3/4 - No. 16	.923	2.00	.060	.54	.65
3/4 - No. 13	.923	2.00	.092	.80	.92
3/4 - No. 10	.923	2.00	.092	1.20	1.36
3/4 - No. 9	.923	2.00	.134	1.80	1.95
1- No. 16	1.090	2.40	.060	.44	.51
1 1/2 - No. 16	1.330	3.00	.060	.40	.48
1 1/2 - No. 13	1.330	3.00	.092	.60	.68
1 1/2 - No. 10	1.330	3.00	.092	.79	.89
1 1/2 - No. 9	1.330	3.00	.134	1.20	1.31
1 1/2 - No. 6	1.330	3.00	.198	2.50	2.73
2 - No. 9	1.850	4.00	.134	.90	1.02

Expanded Metal - Flattened

Style Designation	Center To Center Of Bonds Width	Length	Strand Thickness	Weight Per Square Foot Plain	Galv
1/4 - No. 20	.255	1.03	.030	.83	1.24
1/4 - No. 18	.255	1.03	.040	1.11	1.65
1/2 - No. 20	.500	1.26	.029	.40	.51
1/2 - No. 18	.500	1.26	.039	.66	.88
1/2 - No. 16	.500	1.26	.050	.82	1.00
1/2 - No. 13	.500	1.26	.070	1.40	1.62
3/4 - No. 16	.923	2.10	.048	.51	.61
3/4 - No. 14	.923	2.12	.061	.63	.75
3/4 - No. 13	.923	2.10	.070	.76	.86
3/4 - No. 9	.923	2.12	.120	1.71	1.86
1 - No. 16	1.090	2.56	.048	.41	.50
1 1/2 - No. 13	1.330	3.20	.070	.57	.68
1 1/2 - No. 9	1.330	3.20	.110	1.11	1.28

Expanded Metal - Grating

Style Designation	Center To Center Of Bonds Width	Length	Weight Per Square Foot Plain	Galv
3.0 Lb. Grating	1.33	5.33	3.00	3.20
3.14 Lb Skywalk	2.00	6.00	3.14	3.34
4.0 Lb. Grating	1.33	5.33	4.00	4.30
4.27 Lb Walkway	1.41	4.00	4.27	4.57
5.0 Lb. Grating	1.33	5.33	5.00	5.50
6.25 Lb Grating	1.41	5.33	6.25	6.85

Expanded Metal Terminology

Material Terminology

Expanded Metal (also called raised or regular expanded metal) is metal sheet that is simultaneously slit and stretched into a rigid, open mesh. It is available in carbon, stainless and galvanized steel, and in aluminum.

Flattened Expanded Metal is made by passing expanded metal through a rolling mill to flatten it. This process reduces the thickness slightly and provides a smooth, flat surface.

Expanded Metal Grating is made from thicker sheet or plate, by a process similar to that which produces expanded metal. Expanded metal grating is often used for catwalks and platform applications where self cleaning and good footing are required.

Decorative Expanded Metal is manufactured so that the open areas have unique, decorative shapes.

Expanded Metal Stair Treads use expanded metal grating for the horizontal surfaces, flat bar for the vertical surfaces and angles at the corners.

The ***Bond*** is the point where adjacent *Strands* intersect. The bond is always twice the width of the *Strand*.

C.S.F. (100 Square Feet) is the unit of measure that is used to weigh and price expanded metal.

Camber is a slight bow which can occur during manufacturing and results in an out-of-square condition.

Deburring is a process whereby most expanded metal is passed through rotary steel brushes to remove burrs and rough edges. Expanded metal grating and very light expanded metal are generally not deburred.

The ***Diamond*** is the diamond-shaped open area formed by the *Strands* and bonds (also referred to as the ***Opening)***.

F.X.M. is the commonly used abbreviation for Flattened Expanded Metal.

L.W.D. or ***L.W.O.*** refers to the Long Way of the Diamond or Long Way of the Opening. This is used to make it clear that you are measuring in a direction that is parallel to the largest dimension of the diamond. Expanded Metal and Expanded Metal Grating is manufactured with the LWD running the width of the sheet or the length of the sheet.

Mesh is the nominal distance, expressed in inches, from the center of one bond to the center of an adjacent bond measured across the *S.W.D.*

The ***Opening Size*** is the area enclosed by the *Strands* and bonds.

The ***Overall Thickness*** is the finished thickness of the sheet which often determines the selection of framing components.

The ***Percent of Open Area*** is used by designers to calculate the degree to which light and air can pass through a piece of expanded metal.

The ***Pitch*** is the measurement from a point on one diamond to the same point on an adjacent diamond.

R.X.M. is the commonly used abbreviation for Raised Expanded Metal.

S.W.D. or ***S.W.O.*** refers to the Short Way of the Diamond or the Short Way of the Opening. This is used to make it clear that you are measuring in a direction that is parallel to the smallest dimension of the diamond. Expanded Metal and Expanded Metal Grating is manufactured with the SWD running the width of the sheet or the length of the sheet.

The ***Strand*** is the single metal strip that forms the border of the diamond, or opening. The strand has thickness (the thickness of the sheet) and width.

Diamond Grip

Diamond-Grip, made by ISG Safety Products, Ltd., is a light weight, high friction product which is used to provide a nonskid, self cleaning surface for stair treads, walkways, work platforms, and mezzanines. This material comes in galvanized channels of various gauges, widths and depths. It is most often stocked in 12 & 14 Gauge.

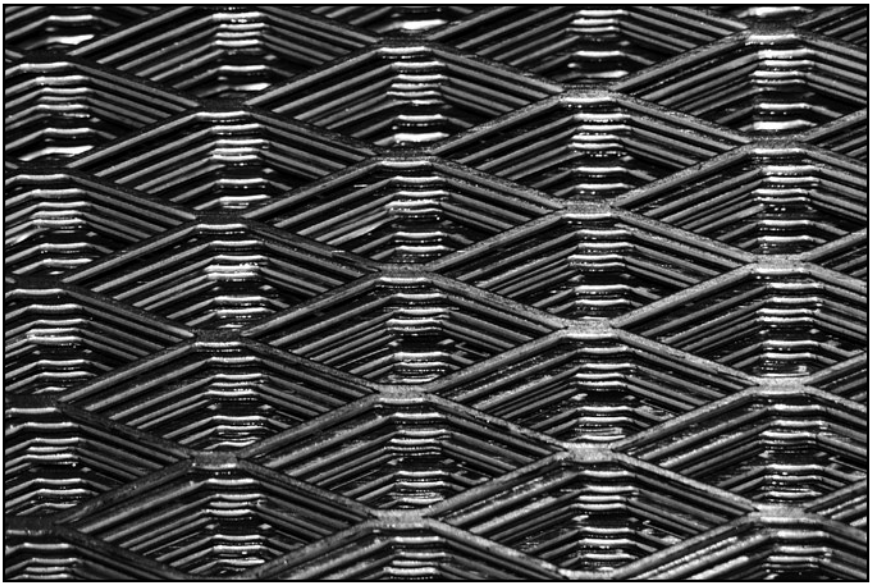
Size	Channel Height			
	1 1/2" High	2" High	2 1/2" High	3" High
4 3/4" Wide X 144" Long	X	X	X	
7" Wide X 144" Long	X	X	X	X
9 1/2" Wide X 144" Long	X	X	X	X
11 3/4" Wide X 144" Long	X	X	X	X
18 3/4" Wide X 144" Long	X	X	X	X

Diamond Grip Stair Treads

14 Ga. X 24" Long X 9 1/2" Wide X 1 1/2" Deep

14 Ga. X 30" Long X 9 1/2" Wide X 1 1/2" Deep

12 Ga. X 36" Long X 9 1/2" Wide X 1 1/2" Deep



Bar Grating Products

Welded Bar Grating is a manufactured product which has a multitude of uses. For instance, it is used to cover trenches in pavement, to make self-cleaning stair treads and to construct platforms around equipment.

There are a number of questions that you will need to answer when ordering Welded Bar Grating:

1. What material? Most Welded Bar Grating is made from carbon steel but it is also available in Stainless Steel and Aluminum. A similar product is made from fiberglass for use in highly corrosive applications.

2. Which way do the bearing bars run? For greatest strength the bearing bars will usually run the short way of the span. (If you had a trench that was 10" X 120" the bearing bars would normally span the 10" dimension of your trench. See the illustration of bearing and cross bars on the next page)

3. What is the size of the area that you need to cover? Give the size in inches and remember to allow for clearance. If you are putting grating into a 10" wide trench, a 10" wide piece of grating will not fit. You would want to order your grating somewhat narrower, say 9 $^{3}/_{4}$" or 9 $^{7}/_{8}$" in width in order to clear.

4. Are the pieces to be banded? Banding is used to close the spaces between the bearing bars. This makes for a more finished look, keeps the ends from being bent out of shape and reduces the chance of injury from the exposed ends of the bearing bars when the pieces have to be handled.

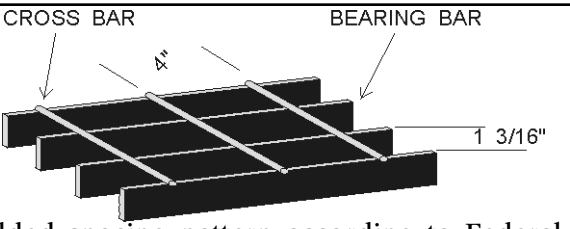
5. Are the pieces to be painted or galvanized? When special ordering you may specify that the grating be painted or galvanized by the manufacturer.

6. Are the bearing bars to be serrated or smooth? When special ordering you may specify that the top edge of the bearing bars be cut in such a manner that a series of bumps will provide greater friction.

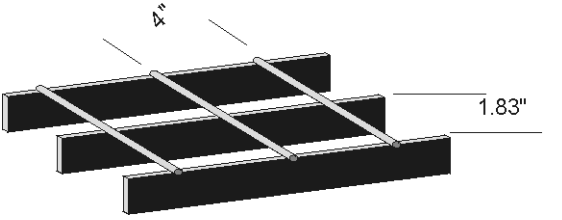
Remember that while Welded Bar Grating is available in custom sizes, you will want to work from standard 3' X 24' panels whenever possible. (4' wide panels may be special ordered) This means that in the example of a 10" X 120" trench used above it would take 3 pieces 10" by 36" and 1 piece 10" X 12" to cover the trench with bearing bars running the short way of the span.

While it might seem easier to cover the area with one piece, you would have to run the bearing bars the 10' way to cover the trench with one piece. The 10' span would be very weak. Remember also, that you may occasionally have to remove the grating to clean your trench and one man can handle three-foot long pieces more easily than he can handle a ten foot long piece.

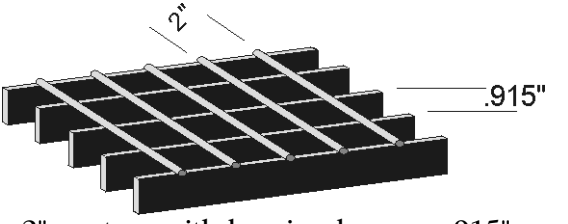
Types & Spacings Of Welded Bar Grating



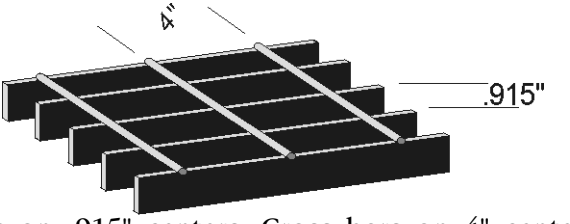
Standard welded spacing pattern according to Federal specification RRG-661c. Bearing bars on 1 $^{3}/_{16}$" centers. Cross bars on 4" centers. Most commonly used pattern.



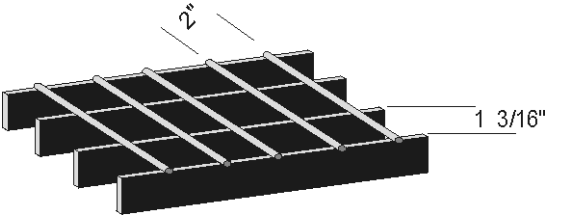
Cross bars on 4" centers. Bearing bar spacing opened up to 1.83" centers. This grating is used for maximum light and air circulation.



Cross bars on 2" centers with bearing bars on .915" centers. Ideal for sidewalks. Accommodates bicycle traffic.



Bearing bars on .915" centers. Cross bars on 4" centers. Used where heavy loads are applied and depth is restricted.



Cross bar spacing narrowed to 2" centers. Bearing bars on 1 $^{3}/_{16}$" centers. Increased surface contact for long life under heavy traffic.

Bar Grating Load Table

U= Uniform Load D = Deflection C=Concentrated Load

Bearing Bar Size In Inches		Span				
		2'0"	2'6"	3'0"	3'6"	4'0"
3/16 X 3/4	U	575	370	259	186	144
	D	.093	.152	.218	.294	.373
	C	579	463	388	330	289
	D	.077	.120	.173	.235	.310
1/8 X 1	U	688	440	304	225	172
	D	.073	.110	.160	.219	.286
	C	688	549	459	391	343
	D	.059	.091	.129	.175	.232
3/16 X 1	U	1030	659	460	335	256
	D	.073	.112	.160	.219	.287
	C	1029	822	687	588	513
	D	.058	.090	.129	.176	.230
1/8 X 1 1/4	U	1072	688	475	351	269
	D	.059	.090	.175	.233	.290
	C	1074	859	714	610	538
	D	.048	.073	.104	.142	.180
3/16 X 1 1/4	U	1610	1029	714	528	401
	D	.059	.090	.128	.174	.230
	C	1610	1283	1074	919	801
	D	.048	.073	.105	.141	.180
1/8 X 1 1/2	U	1541	988	687	501	387
	D	.045	.074	.106	.148	.193
	C	1542	1237	1030	884	723
	D	.038	.058	.086	.116	.155
3/16 X 1 1/2	U	2320	1484	1032	758	580
	D	.047	.076	.107	.148	.193
	C	2320	1858	1548	1325	1160
	D	.038	.060	.088	.116	.154
3/16 X 1 3/4	U	3140	2018	1401	1030	788
	D	.041	.062	.093	.126	.164
	C	3150	2522	2100	1803	1573
	D	.031	.053	.075	.100	.134
3/16 X 2	U	4118	2633	1830	1346	1029
	D	.038	.058	.080	.112	.140
	C	4118	3293	2748	2350	2059
	D	.029	.047	.062	.089	.116
3/16 X 2 1/4	U	5210	3330	2310	1670	1301
	D	.033	.050	.073	.099	.128
	C	5210	4169	3475	2913	2604
	D	.028	.040	.058	.080	.103

Cold Finished Bar Products ASTM A108

A low carbon steel of "machine" grade without "brittleness" when formed or bent. The manganese content is high, making it a good steel for carburized parts, since it produces a harder and more uniform case.

Rounds of 4" diameter and smaller are cold drawn and rounds over 4" are turned and polished having a high degree of accuracy, concentricity, straightness and a highly polished surface.

Analysis

Carbon	Manganese	Phosphorus	Sulphur
.15 - .20	.60 - .90	.04 Max.	.05 Max.

Applications

Suitable for general shafting purposes and other uses not requiring the greater strength of alloy or high carbon steel. Extensively used for parts to be case hardened, where requirements are not too high or too severe, such as worms, pinions, gears, ratchets, dogs, chain pins and king pins.

Typical Mechanical Properties

The following data is from mill lab tests. It is only a guide and cannot be used as a basis for the acceptance or rejection of material.

Cold Drawn Bars

Tensile Strength (P.S.I.)	Yield Point (P.S.I.)	Elongation in 2 Inches	% Reduction Of Area
70,000 - 80,000	55,000 - 70,000	18 - 25%	45 - 57

Brinell Hardness	Rockwell Hardness	Percent Machinability	Surface Feet Per Minute
160 - 180	B-87	65	108

Weldability

This steel presents no welding problems when using all welding processes. Welding quality is generally high. Welding rod specifications are dependent on welding conditions such as thickness of section, service requirements and design.

Hardening

This steel will respond to any of the standard carburizing methods. The following heat treatment is suggested for a hard case and tough core: Carburize at 1650° /1700° F for approximately eight hours, cool in box and reheat to 1400/1450° F.

Weights For Cold Drawn Round Bars

Size In Inches	Wt. Per Ft.	Wt. Per 12'	Size In Inches	Wt. Per Ft.	Wt. Per 12'
1/8	.042	.50	2 3/4	20.219	242.63
3/16	.094	1.13	2 7/8	22.091	265.09
1/4	.167	2.00	2 15/16	23.062	276.74
5/16	.261	3.13	3	24.053	288.64
3/8	.376	4.51	3 1/16	25.074	300.89
7/16	.511	6.13	3 1/8	26.105	313.26
1/2	.669	8.03	3 3/16	27.156	325.87
9/16	.846	10.15	3 1/4	28.237	338.84
5/8	1.044	12.53	3 5/16	29.328	351.94
11/16	1.263	15.16	3 3/8	30.449	365.39
3/4	1.503	18.04	3 7/16	31.580	378.96
13/16	1.765	21.18	3 1/2	32.741	392.89
7/8	2.046	24.55	3 5/8	35.123	421.48
15/16	2.349	28.19	3 3/4	37.585	451.02
1	2.673	32.08	3 7/8	40.138	481.66
1 1/16	3.017	36.20	3 15/16	41.439	497.27
1 1/8	3.382	40.58	4	42.770	513.24
1 3/16	3.770	45.24	4 1/8	45.483	545.80
1 1/4	4.177	50.12	4 1/4	48.275	579.30
1 5/16	4.604	55.25	4 7/16	52.630	631.56
1 3/8	5.054	60.65	4 1/2	54.31	649.57
1 7/16	5.523	66.28	4 3/4	60.307	723.68
1 1/2	6.014	72.17	4 15/16	65.161	781.93
1 9/16	6.525	78.30	5	66.823	801.88
1 5/8	7.058	84.70	5 1/4	73.669	884.03
1 11/16	7.611	91.33	5 1/2	80.856	970.27
1 3/4	8.186	98.23	5 3/4	88.373	1060.48
1 13/16	8.781	105.37	6	96.221	1154.65
1 7/8	9.397	112.76	6 1/4	104.398	1252.78
1 15/16	10.033	120.40	6 1/2	112.926	1355.11
2	10.690	128.28	6 3/4	121.785	1461.42
2 1/16	11.371	136.45	7	130.973	1571.68
2 1/8	12.071	144.85	7 1/4	140.492	1685.90
2 3/16	12.790	153.48	7 1/2	150.352	1804.22
2 1/4	13.533	162.40	7 3/4	160.541	1926.49
2 5/16	14.293	171.52	8	171.061	2052.73
2 3/8	15.074	180.89	8 1/4	181.921	2183.05
2 7/16	15.885	190.62	8 1/2	193.112	2317.34
2 1/2	16.706	200.47	8 3/4	204.643	2455.72
2 5/8	18.417	221.00	9	216.504	2598.05
2 11/16	19.308	231.70	9 1/4	228.695	2744.34

Weights For Cold Drawn Flat Bars

Size In Inches			Wt. Per Ft.	Wt. Per 12'
1/8	x	1/4	.106	1.27
		5/16	.133	1.60
		3/8	.159	1.91
		1/2	.213	2.56
		5/8	.266	3.19
		3/4	.319	3.83
		7/8	.372	4.46
		1	.425	5.10
		1 1/8	.478	5.74
		1 1/4	.531	6.37
		1 1/2	.639	7.67
		1 3/4	.745	8.94
		2	.851	10.21
		2 1/4	.957	11.48
		2 1/2	1.064	12.77
		2 3/4	1.170	14.04
		3	1.276	15.31
		3 1/2	1.489	17.87
		4	1.702	20.42
		4 1/2	1.915	22.98
		5	2.127	25.52
		6	2.552	30.62
3/16	x	1/4	.159	1.91
		5/16	.199	2.39
		3/8	.239	2.87
		1/2	.319	3.83
		5/8	.398	4.78
		3/4	.478	5.74
		7/8	.559	6.71
		1	.639	7.67
		1 1/8	.718	18.62
		1 1/4	.798	19.58
		1 1/2	.957	11.48
		1 3/4	1.117	13.40
		2	1.276	15.31
		2 1/4	1.435	17.22
		2 1/2	1.596	19.15
		2 3/4	1.755	21.06
		3	1.915	22.98
		3 1/2	2.233	26.80
		4	2.552	30.62
		4 1/2	2.872	34.46
3/16	x	5	3.191	38.29
		6	3.829	45.95
		8	5.105	61.26
		10	6.381	76.57
1/4	x	5/16	.266	3.19
		3/8	.319	3.83
		1/2	.425	5.10
		5/8	.531	6.37
		3/4	.639	7.67
		7/8	.745	8.94
		1	.851	10.21
		1 1/8	.957	11.48
		1 1/4	1.064	12.77
		1 3/8	1.170	14.04
		1 1/2	1.276	15.31
		1 3/4	1.489	17.87
		2	1.702	20.42
		2 1/4	1.915	22.98
		2 1/2	2.127	25.52
		2 3/4	2.340	28.08
		3	2.552	30.62
		3 1/2	2.978	35.74
		4	3.403	40.84
		4 1/2	3.829	45.95
		5	4.254	51.05
		5 1/2	4.679	56.15
		6	5.105	61.26
		7	5.956	71.47
		8	6.806	81.67
		10	8.508	102.10
5/16	x	3/8	.398	4.78
		1/2	.531	6.37
		5/8	.665	7.98
		3/4	.798	9.58
		7/8	.931	11.17
		1	1.064	12.77
		1 1/8	1.196	14.35
		1 1/4	1.329	15.95
		1 1/2	1.596	19.15
		1 3/4	1.861	22.33
		2	2.127	25.52
		2 1/4	2.393	28.72

Weights For Cold Drawn Flat Bars (Cont.)

Size In Inches			Wt. Per Ft.	Wt. Per 12'
5/16	x	2 1/2	2.658	31.90
		2 3/4	2.925	35.10
		3	3.151	38.29
		3 1/2	3.723	44.68
		4	4.254	51.05
		4 1/2	4.785	57.42
		5	5.318	63.82
		5 1/2	5.850	70.20
		6	6.302	75.62
		8	8.508	102.10
		10	10.635	127.62
3/8	x	1/2	.639	7.67
		5/8	.798	9.58
		3/4	.957	11.48
		7/8	1.117	13.40
		1	1.276	15.31
		1 1/8	1.435	17.22
		1 1/4	1.596	19.15
		1 1/2	1.915	22.98
		1 3/4	2.233	26.80
		2	2.552	30.62
		2 1/4	2.872	34.46
		2 1/2	3.191	38.29
		2 3/4	3.509	42.11
		3	3.829	45.95
		3 1/4	4.148	49.78
		3 1/2	4.467	53.60
		4	5.105	61.26
		4 1/2	5.743	68.92
		5	6.381	76.57
		5 1/2	7.020	84.24
		6	7.657	91.88
		7	8.933	107.20
		8	10.210	122.52
		10	12.762	153.14
7/16	x	1/2	.745	8.94
		3/4	1.117	13.40
		1	1.489	17.87
		1 1/4	1.861	22.33
		1 1/2	2.233	26.80
		1 3/4	2.605	31.26
		2	2.979	35.75
7/16	x	2 1/4	3.350	40.20
		2 1/2	3.721	44.65
		3	4.467	53.60
		4	5.956	71.47
1/2	x	5/8	1.064	12.77
		3/4	1.276	15.31
		7/8	1.489	17.87
		1	1.702	20.42
		1 1/8	1.915	22.98
		1 1/4	2.127	25.52
		1 1/2	2.552	30.62
		2	3.403	40.84
		2 1/4	3.829	45.95
		2 1/2	4.254	51.05
		2 3/4	4.679	56.15
		3	5.105	61.26
		3 1/4	5.530	66.36
		3 1/2	5.956	71.47
		4	6.806	81.67
		4 1/2	7.657	91.88
		5	8.508	102.10
		5 1/2	9.359	112.31
		6	10.210	122.52
		7	11.911	142.93
		8	13.613	163.96
		9	15.314	183.77
		10	17.016	204.19
5/8	x	3/4	1.596	19.15
		7/8	1.861	22.33
		1	2.127	25.52
		1 1/8	2.393	28.72
		1 1/4	2.658	31.90
		1 1/2	3.191	38.29
		1 3/4	3.723	44.68
		2	4.254	51.05
		2 1/4	4.785	57.42
		2 1/2	5.318	63.82
		2 3/4	5.850	70.20
		3	6.381	76.57
		3 1/2	7.445	89.34
		4	8.508	102.10
		4 1/2	9.572	114.86

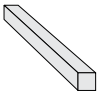
Weights For Cold Drawn Flat Bars (Cont.)

Size In Inches			Wt. Per Ft.	Wt. Per 12'
5/8	x	5	10.640	127.68
		5 1/2	11.699	140.39
		6	12.762	153.14
		7	14.894	178.73
		8	17.015	204.29
		10	21.280	255.36
		12	25.524	306.29
3/4	x	7/8	2.233	26.80
		1	2.552	30.62
		1 1/8	2.872	34.46
		1 1/4	3.191	38.29
		1 1/2	3.829	45.95
		1 3/4	4.467	53.60
		2	5.105	61.26
		2 1/4	5.743	68.92
		2 1/2	6.381	76.57
		2 3/4	7.020	84.24
		3	7.857	91.88
		3 1/4	8.295	99.54
		3 1/2	8.933	107.20
		4	10.210	122.52
		4 1/2	11.491	137.89
		5	12.762	153.14
		5 1/2	14.038	168.46
		6	15.314	183.77
		7	17.887	214.40
		8	20.419	245.03
		10	25.524	306.29
		12	30.629	367.55
7/8	x	1	2.978	35.74
		1 1/8	3.350	40.20
		1 1/4	3.723	44.68
		1 3/8	4.059	49.14
		1 1/2	4.467	53.60
		1 3/4	5.211	62.53
		2	5.956	71.47
		2 1/4	6.700	80.40
		2 1/2	7.445	89.34
		2 3/4	8.189	98.27
		3	8.933	107.20
		3 1/2	10.420	125.04
		4	11.911	142.93
7/8	x	5	14.894	178.73
		6	17.867	214.40
		8	23.822	285.86
		12	35.734	428.81
1	x	1 1/4	4.254	51.05
		1 1/2	5.105	61.26
		1 3/4	5.956	71.47
		2	6.806	81.67
		2 1/4	7.657	91.88
		2 1/2	8.508	102.10
		2 3/4	9.359	112.31
		3	10.210	122.52
		3 1/4	11.060	132.72
		3 1/2	11.911	142.93
		4	13.613	163.36
		4 1/2	15.314	183.77
		5	17.016	204.19
		5 1/2	18.718	224.62
		6	20.419	245.03
		7	23.822	285.86
		8	27.226	326.71
		10	34.032	408.38
		12	40.838	490.06
1 1/4	x	1 1/2	6.381	76.57
		1 3/4	7.445	89.34
		2	8.508	102.10
		2 1/4	9.572	114.86
		2 1/2	10.640	127.68
		2 3/4	11.701	140.41
		3	12.762	153.14
		3 1/2	14.894	178.73
		4	17.016	204.19
		4 1/2	19.148	229.78
		5	21.270	255.24
		6	25.524	306.29
		8	34.032	408.38
		10	42.540	410.48
		12	51.048	612.58
1 1/2	x	1 3/4	8.933	107.20
		2	10.210	122.52
		2 1/4	11.486	137.83
		2 1/2	12.762	153.14

Weights For Cold Drawn Flat Bars (Cont.)

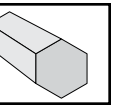
Size In Inches	Wt. Per Ft.	Wt. Per 12'
1 1/2 x 2 3/4	14.038	168.46
3	15.314	183.77
3 1/4	16.590	199.10
3 1/2	17.867	214.40
4	20.419	245.03
4 1/2	22.972	275.66
5	25.524	306.29
6	30.629	367.55
8	40.838	490.06
10	51.048	612.58
12	61.258	735.10
1 3/4 x 2	11.911	142.93
2 1/4	13.401	160.81
2 1/2	14.889	178.67
2 3/4	16.375	196.50
3	17.867	214.40
3 1/2	20.845	350.14
4	23.822	285.86
5	29.778	357.34
6	35.734	428.81
8	47.645	571.74
2 x 2 1/4	15.310	183.72
2 1/2	17.016	204.19
2 3/4	18.718	224.62
3	20.419	245.03
3 1/2	23.822	285.86
4	27.226	326.71
4 1/2	30.625	367.55
5	34.032	408.38
6	40.838	490.06
8	54.451	653.41
10	68.064	816.77
12	81.677	980.12
2 1/2 x 3	25.524	306.29
3 1/2	29.778	357.34
4	34.032	408.38
5	42.540	510.48
6	51.048	612.58
8	68.064	816.77
3 X 3 1/2	35.734	428.81
4	40.838	490.06
4 1/2	45.943	551.32
5	51.048	612.58
6	61.258	735.10

Cold Drawn Square Bars



Size In Inches	Wt. Per Ft.	Wt. Per 12'
1/8	.053	.64
3/16	.120	1.44
1/4	.213	2.56
5/16	.332	3.98
3/8	.478	5.74
7/16	.652	7.82
1/2	.851	10.21
9/16	1.077	12.92
5/8	1.329	15.95
11/16	1.609	19.31
3/4	1.915	22.98
13/16	2.247	26.96
7/8	2.605	31.26
15/16	2.991	35.89
1	3.403	40.84
1 1/16	3.842	46.10
1 1/4	5.318	63.82
1 3/8	6.434	77.21
1 1/2	7.657	91.88
1 5/8	8.986	107.83
1 3/4	10.423	125.08
1 7/8	11.964	143.57
2	13.613	163.36
2 1/4	17.229	206.75
2 1/2	21.270	255.24
2 3/4	25.737	308.84
3	30.629	367.55
3 1/4	35.944	431.33
3 1/2	41.689	500.27
4	54.400	652.80

Cold Drawn Hexagon Bars



Size In Inches	Wt. Per Ft.	Wt. Per 12'	Size In Inches	Wt. Per Ft.	Wt. Per 12'
3/16	.104	1.25	1 7/16	6.091	73.09
1/4	.184	2.21	1 1/2	6.631	79.57
5/16	.288	3.46	1 5/8	7.782	93.38
3/8	.414	4.97	1 3/4	9.026	108.31
7/16	.565	6.78	1 7/8	10.360	124.32
1/2	.737	8.84	2	11.791	141.49
9/16	.933	11.20	2 1/8	13.313	159.76
5/8	1.151	13.81	2 1/4	14.556	174.67
11/16	1.393	16.72	2 3/8	16.626	199.51
3/4	1.658	19.90	2 1/2	18.417	221.00
13/16	1.946	23.35	2 5/8	20.309	243.71
7/8	2.256	27.07	2 3/4	22.291	267.49
15/16	2.590	31.08	3	26.525	318.30
1	2.947	35.36	3 1/8	28.787	345.44
1 1/8	3.731	44.77	3 1/4	31.101	373.20
1 3/16	4.156	49.87	3 1/2	36.104	433.25
1 1/4	4.605	55.26	4	47.154	565.85
1 1/8	5.572	66.86			

Stressproof® Cold Finished Shafting

This is a heavily cold worked, strain relieved carbon killed steel bar. It is available as a Cold Drawn Bar in 12 foot lengths. Some locations stock an ASTM-1144 bar with similar properties.

Analysis

Carbon	Manganese	Sulphur	Silicon
.40 - .48	1.35 - 1.65	.24 - .33	.15 - .30

Applications

Ideal for general maintenance and repair, as all properties are "built in" the bar. Production parts include axles, collets, gears, spline shafts, spindles, pump shafts, feed and lead screws to all kinds, worms, studs, etc.

Machinability

Stressproof machines well for its strength, with excellent tool life and a smooth finish. Cutting speeds of about 125 surface feet per minute are recommended.

Mechanical Properties

Size In Inches	Min. Yield Point	Average Tensile Strength
1/2" To 2"	100,000 p.s.i.	125,000 p.s.i.
Over 2" To 3 1/4"	90,000 p.s.i.	120,000 p.s.i.

Tolerances

Size In Inches	Cold Drawn (Plus)	Cold Drawn (Minus)
5/16 to 1 1/2" Inc.	0.000	0.004
1 1/2 to 2 1/2" Inc.	0.000	0.005
2 1/4 to 4"	0.000	0.006

Warpage

Almost completely free from strains, it may be splined, key seated, broached, drilled, reamed, milled or threaded. Expensive straightening operations are eliminated.

Wearability

Although easily machined, wear resistant properties are unusually high. Many heat treated or carburized parts have been successfully replaced by unhardened Stressproof in spite of its relative softness.

Reduced Costs

By eliminating hardening and straightening operations, reducing machining time, lowering steel costs when replacing alloy steels, and by improving the quality of the finished part, STRESSPROOF will give you reductions in costs on many parts. While the price is slightly higher than ordinary carbon bars, its increased strength, wearability and service life make it the most economical steel to use in many applications.

Precision C-1045 Shafting

Precision Shafting represents the highest degree of straightness, accuracy, concentricity and surface perfection obtainable in commercial practice. These bars are turned and centerless ground to close limits over their entire length, and burnished to a high finish after grinding. It is important to note that turning does not alter the physical properties of the bar.

Analysis

Specification	Carbon	Manganese	Phosphorus	Sulphur
C-1045	.43 - .50	.60 - .90	.04 Max	.05 Max.

Application

This steel is often called pump rod or pump shafting due to its high degree of straightness (important in high speed shafting). The special straightness serves to prevent vibrations and wear on packings and bearings which must be avoided in deep well pump work. Other uses include motor shafts and other applications where high speed work necessitates straightness and accuracy along with the ability to be machined unsymmetrically with practically no danger of warpage.

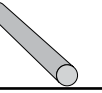
Typical Mechanical Properties

Spec.	Tensile (P.S.I.)	Yield (P.S.I.)	Elongation In 2 Inches	% Reduction of Area
C-1045	110,000	78,000	20%	55

Tolerances

Diameter Of Bar	Plus Tolerance	Minus Tolerance
Less Than 1 1/2"	0	.001”
1 1/2" To Under 2 1/2"	0	.0015”
2 1/2" To 3" Inclusive	0	.002”
Over 3" To 4" Inclusive	0	.003”

Screw Machine Stock



C-12L14 Cold Finished Rounds

These special quality CF rounds have a machinability rating on automatic screw machines of 300 surface feet per minute. These rounds are of screw stock quality used for instruments, electronic parts, and machine shafts. They are also suitable for nickel plating.

Analysis

Spec.	*Carbon*	*Manganese*	*Phosphorus*	*Sulphur*	*Lead*
C-12L14	.15 Max.	.085 - 1.15	.04 - .09	.26 - .35	.15 - .35

Concrete Reinforcing Bars ASTM-A615

The ASTM-A615 Specification pertains to deformed and plain billet-steel concrete reinforcement bars in cut lengths or coils. A deformed bar is defined as a bar whose surface is provided with lugs or protrusions (referred to as deformations) which inhibit longitudinal movement of the bar relative to the concrete which surrounds the bar in such construction. The standard sizes and their number designations are listed below.

Bars are of 3 minimum yields: namely, 40,000 psi, 60,000 psi, and 75,000 psi; designated as Gr. 40, Gr. 60, and Gr. 75, respectively.

Mechanical Properties

	Gr. 40	Gr. 60	Gr. 75
Tensile Strength, Min. P.S.I.	60,000	90,000	100,000
Yield Strength, Min. P.S.I.	40,000	60,000	75,000
Bar Number	Minimum % of elongation in 8 in.		
3	11%	9%	7%
4,5,6	12%	9%	7%
7,8		8%	7%
9,10		7%	6%
11, 14, 18		7%	6%

Bend Test Requirements

(Minimum Diameter for Bend Tests = 180°, d = Nominal Diameter of Bar)

Bars are capable of being bent around a pin without cracking on the outside diameter as follows: (Number 14 & 18 are bent 90°).

Bar Number	Grade 40	Grade 60	Grade 75
3,4,5	3 $^1/_2$ X d	3 $^1/_2$ X d	5 X d
6	5 X d	5 X d	5 X d
7,8		5 X d	5 X d
9,10		7 X d	7 X d
11		7 X d	7 X d
14,18		9 X d	9 X d

ASTM-A706 Specification pertains to low-alloy steel deformed bars in cut lengths or coils for concrete reinforcement, intended for applications where welding and/or bending, are of importance.

Mechanical Properties

Tensile Strength, Min. P.S.I.	80,000
Yield Strength, Min. P.S.I.	60,000
Yield Strength, Max. P.S.I.	78,000
Tensile Strength shall not be less than 1.25 times the actual yield strength.	

Concrete Reinforcing Bars ASTM-A706

Bar Number	Minimum % of elongation in 8 in.
3, 4, 5, 6	14%
7, 8, 9, 10, 11	12%
14, 18	10%

Bend Test Requirements

(Minimum Diameter for Bend Tests = 180°, d = Nominal Diameter of Bar)

Bars are capable of being bent around a pin without cracking on the outside diameter as follows:

Bar Number	Diameter of Pin
3, 4, 5	3 X d
6, 7, 8	4 X d
9, 10, 11	6 X d
14, 18	8 X d

Concrete Reinforcing Bars Weights & Dimensions

Bar Number	Weight Per Ft.	Nominal Diameter	Nominal Dec. Diam.	Cross Section Area (In^2)	Perimeter In Inches
3	.376	3/8	0.375	0.11	1.178
4	.669	1/2	0.500	0.20	1.571
5	1.044	5/8	0.625	0.31	1.963
6	1.503	3/4	0.750	0.44	2.356
7	2.046	7/8	0.875	0.60	2.749
8	2.673	1	1.000	0.79	3.142
9	3.403	1 1/8	1.128	1.00	3.544
10	4.307	1 1/4	1.270	1.27	3.990
11	5.318	1 3/8	1.410	1.56	4.430
14	7.650	1 5/8	1.693	2.25	5.320
18	13.600	2 1/4	2.257	4.00	7.090

Color Codes

To assist you in the identification of steel products purchased from PDM Steel Service Centers, please refer to the following Color Codes. The color code list which follows is arranged according to product category and description:

Hot Rolled Strip & Bars	Structural Shapes	Pipe & Round Tubing
Cold Rolled Strip & Bars	Sq. & Rectangular Tubing	Expanded Metal
Alloy Rounds	Sheet	Expanded Met. Grating
Rebar	Plate	

Hot Rolled Strip & Bars

HR Strip

Thickness	Specification	Color
1/8"	Comm.Qual.	Yellow
3/16"	Comm. Qual.	Green

HR Flats, Rounds, and Squares

Thickness	Specification	Color
1/8"	A36	Yellow
3/16"	A36	Green
1/4"	A36	Red
5/16"	A36	White
3/8"	A36	Blue
7/16"	A36	Gold
1/2"	A36	Orange
9/16"	A36	Copper
5/8"	A36	Yellow
3/4"	A36	Green
7/8"	A36	Pink
1"	A36	Black
1 1/8"	A36	Yellow
1 1/4"	A36	Red
1 3/8"	A36	Blue
1 1/2"	A36	Orange
2"	A36	Black

Description	Specification	Color
HR Flat and Round (Min. 50 ksi)	A529	Blue and White
HR Flat	A572 Gr. 50	Green and White
HR Flat	C1008	Blue and Green
HR Flat and Round	C1018	Black & Blue
HR Flat, Round, and Square	C1040/1045	Green and Red
HR Flat	C1055	Green and Orange
HR Flat, Hollow, and Solid Tul Bar	C1070	Red and Orange
HR Flat, Round, Square	C1095	Silver
B.E. Weedcutter	C1055	Green
B.E. Weedcutter	C1070	Orange

Hot Rolled Bar Shapes

Bar Angles, Channels & Tees

Thickness	Specification	Color
1/8"	A36	Yellow
3/16"	A36	Green
Bar Tees	A36	Blue

Alloy Bars

Description	Specification	Color
HR HT Stress Relieved Round	4140	Blue and Purple
CF HT Stress Relieved Round	4140	Green and Purple
CF HT Stress Relieved Square	4130	White and Purple
CF HT Sq. (NOT Stress Relieved)	4130	White and Orange
CF Round	ETD 150®	Purple

Rebar

Description	Specification	Color
Rebar GR 40	A615	Blue
Rebar GR 60	A615	Red
Rebar GR 60 (Weldable)	A706	Yellow

Cold Finished Bars

Description	Specification	Color
CF Flat	C1018	Black
CF Round	C1018	Black
CF Rd-Drawn G.&P./T.G.&P.	C1018	Black and White
CF Round	C1045	Red
CF Round	C1215	White
CF Round-Leaded	12L14	Orange
CF Round	1117	Gold
CF Rd. Stressproof®	1144	Yellow
CF Rd. Stress Relieved	1144	Green
Fatigue Proof®	1137	Brown
Precision Ground Shaft	C1045	Pink
xx Undersize **Over 1" stored in cardboard tubes.		
CF Square	C1018	Black
CF Square (Round Corners)	C1018	Pink
CF Hex	C1018	Black
CF Hex - Leaded	12L14	Orange

Structural Shapes

Structural Angles

Thickness	Specification	Color
1/8"	A36	Yellow
3/16"	A36	Green
1/4"	A36	Red
5/16"	A36	White
3/8"	A36	Blue
7/16"	A36	Gold
1/2"	A36	Orange
5/8"	A36	Yellow
3/4"	A36	Green
7/8"	A36	Pink
1"	A36	Black

Description	Specification	Color
Wide Flange	A36	Blue
Hi Tensile	A572 Gr.50	Green & Yellow
Dual Grade	A992	
M Beams (Misc.)	A36	Blue
S Beams (Std. I)	A36	Blue
H Pilings (Domestic)	A36	Blue and Red
H Pilings (Import)	A36	Blue and White
Channels	A529	Blue and White
Channels, Standard	A36	
1st wt.		Blue
2nd wt.		Blue and Red
3rd wt.		Blue and Green
4th wt.		Blue and Yellow
Channels, Misc.	A36	Blue

Tube, Square & Rectangular

Wall Thickness	Specification	Color
.049	A500 A / A513	Black
.060, .063, .065	A500 A / B / C / A513	White
.072, .073, .075	A500 A / A513	Copper
.083	A500 A / B / C / A513	Pink
.090, .095	A500 A / A513	Blue
.109	A500 A / A513	Purple
.120, .125	A500 A / B / C	Yellow
.180, .188	A500 B / C	Green
.238, .250	A500 B / C	Red
.313	A500 B	White
.375	A500 B	Blue
.500	A500 B	Orange
.625	A500 B	Yellow

Tube, Pre-Primed

Wall Thickness	Specification	Color
Under 2" Sq. & 3" X 1" Rect.	A513	As Above
Over 2" Sq. & 3" X 1 1/2" Rect.	A500 B	As Above

Tube, Flashout

2.53 X 2.53 X 0.250	Red and Gold

Tube, Round HREW & CREW

Wall Thickness	*Specification*	*Color*
Mech Tube-HREW & CREW	A513-T1 & T2	Same as Square Tube

Pipe

Description	*Specification*	*Color*
Pipe Std (Sch 40)	A53A	Green
X Heavy (Sch 80)	A53A	White
Pipe Std (Sch 40)	A53B	Blue
X Heavy (Sch 80)	A53B	Red
Pre-Primed (KleenKote®) Pipe	No Grade	N/C
Uncoated Pipe	A53A	Orange
Uncoated Pipe	A53B	Pink
Uncoated Pipe (Sched. 10)	A53A	Gold

Plate

Plate products are marked with the color code for the grade on the corners of the plate. The color code for the thickness of the plate is marked as a stripe of color on the ends of the plate. (Example: $^5/_8$" A572 Gr 50 would have Green & Yellow on all four corners to denote the grade and a stripe of Blue on both ends to denote the thickness.)

Description	*Specification*	*Color Code For Grade (On all Corners)*
Hot Rolled	A36	Blue
Floor Plate	Comm. Q	No Color
Abrasion Resistant	AR235	Yellow
Brinell	321	Purple and Yellow
Brinell	360	Red and Yellow
Brinell	400	Copper and Yellow
Brinell	500	Black and Yellow
Brinell, Formable	400	White and Yellow
Brinell, Formable	440	Pink and Yellow
Brinell, Formable	500	Pink, Black and Yellow
Constructional Alloy (Tl® Type)	A514	Pink
High Strength, Low Alloy	A656 Gr 80	Pink and White
High Tensile	A572 Gr 42	Green and White
High Tensile	A572 Gr 50	Green and Yellow
High Tensile	A572 Gr 60	Green and Gray
ABS Certified	A283 Gr C	Green and Blue
Weathering	A588	Blue and Yellow
HR Corten®	A242	Blue and White
HR Pressure Vessel Quality	A516 Gr 70	White
HR Low Carbon	C1010	Copper
HR Low Carbon	C1015	Copper and Blue
HR Low Carbon (Robinson Proc.)	C1010	Copper and Purple
HR (Robinson Proc.)	A36	Blue and Purple
HR Stress Free Plate	A36	Blue and Orange
HR Stress Free Plate	C1008	Yellow and Orange
HR Stress Free Plate	A570	Red and Orange
HR Med Carbon	C1035	Orange

HR Med Carbon	C1040/1045	Green
HR Med Carbon	C1055	Green and Orange
HR UM	A36	Blue
HR UM (Min. 50 ksi)	A529	Blue and White
33 Max. Carbon	33 Max. Carbon	Gold

Plate

Thickness	*Color Code/Thickness (Marked on both ends)*
3/16"	Green
1/4"	Red
5/16"	White
3/8"	Blue
7/16"	Gold
1/2"	Orange
5/8"	Yellow
3/4"	Green
7/8"	Pink
1"	Black
1 1/8"	Yellow
1 3/16"	Green
1 1/4"	Red
1 3/8"	Blue
1 1/2"	Orange
1 5/8"	Yellow
1 3/4"	Green
1 7/8"	Pink
2"	Black
2 1/8"	Yellow
2 1/4"	Red
2 1/2"	Orange
2 3/4"	Green
3"	Black
3 1/2"	Orange
4"	Black
4 1/2"	Orange

Sheet, Hot Rolled and Gauge Floor Plate

Thickness		*Specification*	*Color*
7 Ga	(.1793)	A-1011	Orange
10 Ga	(.1345)	A-1011	Gold
11 Ga	(.1196)	A-1011	Black
12 Ga	(.1046)	A-1011	Yellow
13 Ga	(.0847)	A-1011	Orange
14 Ga	(.0747)	A-1011	Red
16 Ga	(.0598)	A-1011	Green

Sheet Miscellaneous

Description	*Specification*	*Color*
Sheet (Calwell®)	PQ55	Red and Black
Sheet (Robinson Process)	C1010	Copper and Purple
Sheet (High Tensile)	A-1011 (Gr 45)	White
Sheet (High Tensile)	A-1011 (Gr 50)	Green and Yellow

Sheet, Cold Rolled

Thickness		*Spec.*	*Color*
10 Ga	(.1345)	A366	Gold
11 Ga	(.1196)	A366	Black
12 Ga	(.1046)	A366	Yellow
13 Ga	(.0847)	A366	Orange
14 Ga	(.0745)	A366	Red
16 Ga	(.0598)	A366	Green
18 Ga	(.0478)	A366	Pink
20 Ga	(.0359)	A366	Gold
22 Ga	(.0299)	A366	Yellow
24 Ga	(.0239)	A366	Red
26 Ga	(.0179)	A366	Green

Sheet, Flat Galvanized

Thickness		*Spec.*	*Color*
10 Ga	(.138)	A653 CQ, CTD	Gold
12 Ga	(.109)	A653 CQ, CTD	Yellow
14 Ga	(.079)	A653 CQ, CTD	Red
16 Ga	(.064)	A653 LFQ, CTD	Green
18 Ga	(.052)	A653 LFQ, CTD	Pink
20 Ga	(.040)	A653 LFQ, CTD	Gold
22 Ga	(.034)	A653 LFQ, CTD	Yellow
24 Ga	(.028)	A653 LFQ, CTD	Red
26 Ga	(.022)	A653 LFQ, CTD	Green
28 Ga	(.019)	A653 LFQ, CTD	Pink
30 Ga	(.016)	A653 LFQ, CTD	Gold
PQS Electro Galvanized (Chromated)		A653 Class C	As Above
PQS Wiped Galvanized (A40)		A653 LFQ	As Above
Aluzinc Plus (Steel sheet with aluminum/zinc coating)			As Above

Expanded Metal

Width of opening (color end). Thickness of strand (color side)

Opening	*Thickness*	*Color*
1/4"	# 6	Black
1/2"	# 9	Red
1/2"	# 10	Gold
3/4"	# 13	Green
1"	# 14	White
1"	# 16	Orange
1 1/2"	# 18	Blue
2"	# 20	Yellow

Example: 1/4" #20—Black end, yellow side.

Expanded Metal Grating

Weight	*Spec.*	*Color*
3.00 Lb.	Comm Q	White
3.14	Comm Q	Orange
4.00	Comm Q	Yellow
4.27	Comm Q	Green
5.00	Comm Q	Blue
6.25	Comm Q	Gold
7.00	Comm Q	Red
All Other Products		No Color

Notes

Notes