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Air Saws • Bevelers • Block Saws • Bolt Tension Calibrator • Bolt Tension Tester • Bulk Bins • Concrete Mixers • Concrete Saws • Concrete Screed • Core Rigs • Diamond Chain Saw • Diaphragm Pumps • Dump Buckets • Effluent Pumps • Fans • Floor Grinders • Generators • Heaters • Hoppers • Hydraulic Shears • Ironworker • Lasers • Levels • Lift Truck Hoppers • Mortar Mixers • Plasma Cutters • Plate Compactors • Portable Compressors • Power Trowels • Pressure Washers • Ring Saws • Rollers • Stationary Bandsaws • Stompers • Submersible Pumps • Sump Pumps • Surveyors Equipment • Torque-Tension Testers • Transits • Trash Pumps • Utility Pumps • Ventilating Blower • Vibrators • Welders • Work Lighting

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- Air Tools
- Anchors – Concrete, Plastic, Screw, Stud, Wedge
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- Anti-Slip Coatings
- Bags – Bolts, Canvas, Tool
- Barrier – Lights, Tapes
- Bars – Crow, Digging, Pinch, Ripping, Stripping
- Belt Repair
- Belt Grinders & Finishing Machine
- Bevel-Mills
- Benders – Conduit, Pipe, Tube
- Bits – Auger, Drill, Masonry, Screwdriver, Tool
- Blades – Band Saw, Chain Saw, Circular Saw, Cut-Off, Hacksaw, Jigsaw, Knife, Masonry, Razor
- Blocks – Crane, Hoist
- Bolt Cutters
- Bolts – grade 2, 5, 8, Carriage, Lag, Stainless Steel, Socket Head Cap Screws
- Boots
- Boxes – Gang, Tool
- Breakers, Pavement
- Brooms & Brushes
- Burrs, Carbide
- C-Clamps
- Cable – Cutters, Hoist
- Cans – Gas, Safety
- Carbide – Burrs, Cutting Tools, Drills, Holecutters, Saws
- Casters
- Caulk – Guns, Sealants
- Chain – Alloy, Binders, Carbon, Coil, Hoists, Machine, Roller, Safety
- Chain Saws
- Chalk Line, Reels
- Chipping Hammers
- Chisels
- Chop Saws
- Clamps – Bar, Beam, C, Hose, Plate, Welding
- Clay Diggers
- CNC's
- Compactors
- Concrete – Anchors, Carts, Tools, Vibrators
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- Cordless Tools
- Couplers, Hose – Air, Hydraulic, Water
- Cutters – Bolt, Cable, Chain, Pipe, Tubing, Wire
- Cutting Tools
- Cleaners
- Coatings
- Contact Sprays
- Core Bits – Carbide & Diamond
- Crane Systems
- Degreasers
- Diamond – Core Bits, Wheels, Blades
- Die Grinders
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- Disc Finishing Machines
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- Drill Presses
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- Ear Protectors
- Epoxies
- Extension Cords
- Extractors, Screw
- Eye Bolts
- Eye Protection
- Face Shields
- Fall Protection
- Fasteners
- Fence Safety
- Files
- Fire Stop Products
- Fire Extinguishers
- First Aid Kits
- Fittings – Air Line, Grease, Hose
- Flashlights, Batteries
- Flex Urethanes
- Gas Detectors
- Gasket Compounds
- Gauges – Hydraulic, Pressure
- Generators
- Glasses, Safety
- Gloves
- Grease – Cartridges, Guns, Hose, Pumps
- Grinders – Air, Electric
- Ground Fault Interrupters
- Guns – Blow, Caulking, Grease, Heat, Spray
- Grout & Floorings
- Hack Saws
- Hammer-Drills
- Hammers, Mallets
- Hand Tools
- Hand Trucks
- Hard Hats
- Hardware
- Hearing Protection
- Heaters – Gas, Kerosene
- Hoists – Air, Electric
- Hole Saws
- Hose – Air, Discharge, Fittings, Hydraulic, Suction, Water, Vacuum
- Hydraulic – Jacks, Pullers, Pumps, Rams, Torque Wrenches
- Hydraulic Hose Made
- Impact Wrenches
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- Jib Cranes
- Jig Saws

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- Knockout Punches
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- Laser Levels
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- Lock-Outs
- Lubricants
- Lubrication Equipment
- Machinery – Metal & Wood Working
- Machine Compounds
- Magnetic Bit Holders
- Magnet Locators
- Markers, Paint
- Masks, Dust
- Masonry – Bits, Wheels
- Metal Deck Fastening
- Needle Scalars
- Never-Seez
- Nuts
- Nylon – Rope, Slings
- Oil Absorber
- Oils & Lubricants
- Padlocks
- Paint, Spray
- Paint Removal Systems
- Pavement Breakers
- Pipe – Cutters, Dies, Taps, Threaders, Vises, Wrenches
- Pipe Repair Kit
- Poly Film
- Pouches, Tool
- Powder Actuated Tools
- Power Tools
- Precision Tools
- Pressure Washers

- Pullers – Bearing, Gear, Hydraulic, Pallet
- Pumps – Hydraulic, Submersible, Trash
- Punches & Chisels
- Radio (Two-Way)
- Raingear
- Reels – Chalk, Cord, Hose
- Respiratory Protection
- Rod, Threaded
- Rope – Manila, Nylon, Polypro
- Routers & Bits
- Rulers
- Sand Blasters
- Sanders/Grinders
- Safety Supplies
- Saws (Gas & Electric)
- Saw Blades – Band, Circular, Hole, Jig, Sabre, Cold
- Scaling Hammers
- Screwdrivers
- Screws – Drywall, TEK, Socket Head, Zip, S/Metal
- Sealants
- Shackles
- Shim Stock
- Shovels, Rakes, Picks
- Signs, Tags
- Silicone – Caulk, Lubricants, Sealers
- Slings – Chain, Nylon, Wire Rope, Twinpath
- Spray Paint
- Sprayers
- Strut
- Studs
- Tampers
- Tap Machines
- Tape – Duct, Masking, Strapping, etc.
- Taps, Dies, Reamers, End Mills
- Thread Repair Kits

- Thread Sealants
- Threaders, Pipe
- Ties, Cable
- Tool Boxes
- Tool Rental
- Tool Repair
- Torque Wrenches
- Traffic Cones
- Trakfast
- Transits & Levels
- Trolleys
- Trouble Lights
- Trowels
- Turnbuckles
- Turrets
- Tyvek Suits
- V-Belts
- Vacuum Cleaners
- Vacuum Systems
- Valves, Ball
- Vests – Safety, Welding
- Vises
- Warning Flags, Lights
- Washers – Flat, Lock
- Welding Supplies, Rods & Wire
- Wearing Compounds
- Welding – Cables, Clamps, Curtains, Leads, Torches, Rods & Wire
- Wheelbarrows
- Winches
- Wire – Brushes, Connectors, Cutters, Music, Nuts, Strippers, Tie
- Wire Rope – Bright, Galvanized, Stainless
- Wrenches – Adjustable, Box, Chain, Hand, Hex, Impact, Pipe, Socket, Structural, Strap, Tap, Torque, etc.

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Actek Mfg. & Eng. Co.
AD Firestop
Ajax Tool Works, Inc.
Akro-Mills
Alemite
American Allsafe Co.
American Clamping Corp.
American Drill Bushing Co.
American Saw & Mfg. Co.
American Tool Co.
American Wire Tie
Ampco Safety Tools
Anderson Brush Co.
Apex Bulk Handlers
ARC Abrasives
ATP
Arkon Safety Equip.
Arrow Fastener Co.
Auburn Mfg. Inc. (AMI)

Baker Scaffold
Band-It Index, Inc.
Baron Mfg. Co., Inc.
Bernzomatic
Bicknell Mfg. Co.
Bil-Jax Inc.
Black & Decker, Inc.
Block Division, Inc.
Bondhus Corp.
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Bright Star Ind.
Buffalo Sling
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Bostik
Burr King Mfg. Co.

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Caldwell Group
Champion Cutting Tool
Channellock
R.E. Chapin Mfg. Works
Cherne Ind., Inc.
Chicago Hardware & Fixture
Chicago Pneumatic Tool
Chilton Metal Prod.
Cleveland City Forge
Cleveland Steel Tool Co.
CMCI Vacuum Lifters
Coffing Hoists
Coleman Cable
Columbus McKinnon
Coopertools
Crosby Group
Crowe Rope
Crown Mats & Matting
Crown North American
CST/Berger

Daloz Fall Protection
E.W. Daniel
Delta of Arkansas
Delta Int'l Machinery
DeWalt
DeWitt Bro. Tool Co.
Diamond Products
Dixon Valve & Coupling

Duct-O-Wire
Duff-Norton
Dynabrade

Eklind Tool
Elco Industries
Elk River Inc.
Emed Co.
Emglo Products Corp.
Empire Level
Ensley Tool
Erico Inc.
ESCO Corp.
ESMET Inc.
Estwing Mfg.
Everett Ind.
Everlast Saw & Carbide Tools

Fein Power Tools
Fiskar
Flexbar Machine
Flexovit
Florida Pneumatic

Garland Mfg.
Garlin Ent.
GB Electrical
General Clamp Ind.
General Tools
Gilmour Mfg.
Great Neck Saw
Green Bull
Greenlee
Griphoist
Guardian
Gunnebo Johnson

H&M Beveling Machine Co., Inc.
C.H. Hanson
Harrington Hoist
Harris Welco
Heck Ind.
Helicoil
Hevi-Haul
Hi-Lo Climbers
Hi-Tech Hoist
Hilman Inc.
Hindley Mfg.
HKK Chain
Hollaender Mfg.
Hooven Allison
Homelite
Hougen Mfg.
Huskie Tools

Igloo Products
Ingersoll-Rand
Ironclad

Jeamar Winches
Jet Equipment
Justrite Mfg.

Kalamazoo Ind.
Keson Ind.
Kett Tool
Kidde
Kiefer Brushes
Kinedyne
Klein Tool

La-Co Ind.
Lawrence Brothers
Leading Edge
Lenox

Level Lite
Lewis Mfg.
Lift-Tech
Little Giant Pump
Loctite Corp.
Lode Rail
Louisville Ladder
Lowell Corp.
LPS Laboratories
Lubrimatic
Lug-All
Lutz File & Tool
Lyon Metal

Macklanburg-Duncan
Magna Prof. Tools
Marshalltown
Master Lock
Mayhew Steel
Merit Abrasives
Met-Track
Metabo
Mi-T-M Corp.
Michigan Hanger
Miller Equipment
Milwaukee Brush
Milwaukee Electric
M.K. Diamond
M.K. Morse
Moldex
Motorola
Morse Cutting Tools
Morse Mfg.
Morse-Starrett
James Morton
Multiquip
Mutual Industries
My-Te Products

Nagata
National Telephone Co.
NCI Prod.
Neese Ind.
Neotronics
Nes
Newco
Nycopress
Nupla
Nordbak

Oil Dri
Oldforge Tools
Oldham Saw
C.S. Osborne

Panasonic
Partner Ind. Prods.
Payson Casters
Pecora
Pelican Rope
Perma Tech
Poly-America Inc.
Porter Cable
Posi-Lock Puller
Powerteam
Powertrack
Precision Brand Prods.
Primark Tool Group

Qualtool
Quantum

Rainfair
Ramset/Redhead (ITW)

Rayovac
RB Manufacturing
Recoil
Reelcraft
Relton
Rescue Systems Inc.
Ridge Tool
Ropemaster
Roper Whitney
Rubbermaid

Safe Waze
Safety Clamps
SAIT (United Abrasives)
Samson
Scheu Prod.
Scotchman Ind.
Service & Materials Co.
Simpson Strong Tie
Sinco
Sioux Tools Inc.
Skidmore-Wilhelm
Slingmax
Spanco
Spec Seal - STI
Specified Technologies Inc.
Stanley-Proto
L.S. Starrett
Steiner Ind.
Stihl
Stone Construction Equip.
Sumner Mfg.
Suncor

Tamco
Teleweld Inc.
Tenax
Thern
3M Abrasives & Safety
Supplies
TPI Corp.
Trelawny Pneumatic
True Temper
Tsurumi (America) Inc.

Unbrako
Union Tools
Uniweld
Urrea Prof. Tools
U.S. Anchor

Versabar Corp.
VSM Abrasives
Vulcan Co.

Wallace Forge Co.
Warrensville File & Knife
Waterloo Ind.
WD-40 Co.
Werner
W.A. Whitney
J.H. Williams
Williamsport Wirerope
(Bethlehem)
Wilson Safety Prod.
Wilton Tool & Machine
Wire Rope Corp. (WRCA)
Woods Wire
Wright Tool
Wyeth-Scott

Yamaha Motor Corp.
Young Brothers
ZRC Products

Credit Application



Buffalo - Headquarters: 716.826.2636 FAX: 716.826.4412
Albany/NE Division: 518.438.0139 FAX: 518.438.5343
Rochester Division: 585.235.0160 FAX: 585.235.0229

Hanes Supply of SC, Inc.
CCISCO: 843.238.1338
FAX: 843.238.8337



CREDIT APPLICATION

Date: _____
Name: _____
Billing Address: _____ Ship To: _____
City/State/Zip: _____
Phone#: _____ Fax#: _____
Person to Contact: _____ (Purchasing)
_____ (Shop/Maintenance)
Type of Business: _____
Sales Tax Exempt#: _____ Send Certificate for Our Files

TRADE REFERENCES

SUPPLIER 1: _____ Account #: _____
Address: _____
Phone: _____ Fax: _____
SUPPLIER 2: _____ Account #: _____
Address: _____
Phone: _____ Fax: _____
SUPPLIER 3: _____ Account #: _____
Address: _____
Phone: _____ Fax: _____
SUPPLIER 4: _____ Account #: _____
Address: _____
Phone: _____ Fax: _____

BANK: _____
Account #: _____
Address: _____
Phone: _____ Fax: _____

OFFICE USE ONLY:	
Approved By: _____	Date: _____
Cust. Class: _____	CR Limit: _____
SLSP/Terr: _____	GEO Code: _____
Terms Code: _____	County: _____

Please Fax Credit Applications for HANES SUPPLY, INC., to: 716.825.2246
Please Fax Credit Applications for CCISCO to: 843.238.8337

Credit Application



CREDIT APPLICATION

The undersigned or each of them, if there are more than one (hereunder collectively referred to as the "undersigned"), certifies the above information to be true and correct and by these presents requests Hanes Supply, Inc./ Coastal Construction Industrial Supply, Inc. to open a credit account. The undersigned, or each of them, accepts as notice in writing of, and consents to the obtaining from any credit reporting agency or any other person of, such information as Hanes Supply, Inc./ Coastal Construction Industrial Supply, Inc. may require at any time in connection with the credit hereby applied for and consents to the disclosure of any information concerning the undersigned to any credit reporting agency, or to any person with whom the undersigned has or may have financial relations. The undersigned agrees to the following conditions:

1. Pay according to the terms of sale in effect at time of purchase.
2. That Hanes Supply, Inc./ Coastal Construction Industrial Supply, Inc. reserves the right to levy a service charge and that such a charge would be 1-1/2% per month on any amounts overdue.
3. Accept that payments are to be imputed firstly on the service charges and then on other amounts owing in their normal chronological order beginning with the oldest.
4. Accept that if at any time the undersigned's financial responsibility appears unsatisfactory to Hanes Supply, Inc./ Coastal Construction Industrial Supply, Inc., or the undersigned fails to comply with the terms of payment, Hanes Supply, Inc./ Coastal Construction Industrial Supply, Inc. may then, without prejudice to any of its other rights, defer any shipment until the undersigned fulfills these obligations. The undersigned also acknowledges that if he has failed to comply with the terms of sale and payment for any purchases made from Hanes Supply, Inc./ Coastal Construction Industrial Supply, Inc. or with any of the conditions hereof, the said Hanes Supply, Inc./ Coastal Construction Industrial Supply, Inc. may cancel this credit account for the future.
5. Accept that if this account is cancelled by Hanes Supply, Inc./ Coastal Construction Industrial Supply, Inc. the then outstanding balance of his account becomes fully due and exigible.
6. Accept that in the event of plurality of signatures, all are jointly and severally liable for the payment of the net unpaid balance of the amounts of all purchases and other proper charges.

GENERAL INFORMATION:

Started In: _____ No. of Employees: _____

Sales Figure: _____ Net Worth: _____

Are Your Statements Available: _____

Type of Business: _____

Description of Your Operation: _____

Signature: _____ Date: _____

Position: _____

Please Fax Credit Applications for HANES SUPPLY, INC. to: 716.825.2246
Please Fax Credit Applications for CCISCO to: 843.238.8337

Terms and Conditions



TERMS AND CONDITIONS

Terms and Conditions of Sales

All sales are expressly conditioned or Buyer's agreement to the terms and conditions set forth below.

Responsibilities/Warranties

It has been our continual policy to represent the finest manufacturers available. The guarantees against defective materials and workmanship as provided by the manufacturers will prevail. We limit our liability to the manufacturers warranties and guarantees. We will use great effort to obtain from each manufacturer (in accordance with manufacturer's warranty or customary practice) the repair or replacement of goods that may prove defective in workmanship or material. The foregoing shall constitute the exclusive remedy or Buyer and only obligation of Seller.

Seller shall not be liable for any special, indirect or consequential damages, including (but not limited to) loss of profits, loss of use of the goods or related goods, damage or injury to the person or property of Buyer or others. Sellers liability or any claim for loss or damage arising out of the sale of goods shall not exceed the price of the product or part on which such liability is based.

Price Information and Quotes

For prices, please call and we will gladly quote you prices.
All quotations are subject to change without notice.

- **Hanes Supply** - Buffalo Headquarters: (716) 826-2636 **TOLL FREE** 888-426-3755
- **Hanes Supply** - Albany/New England Division: (518) 438-0139 **TOLL FREE** 866-426-3725
- **Hanes Supply** - Rochester Division: (585) 235-0160 **TOLL FREE** 800-462-6895
- **Hanes Supply of South Carolina** - DBA Coastal Construction Industrial Supply Co., (**CCISCO**): (843) 238-1338 **TOLL FREE** 888-224-7269

Payment / Terms / Credit

Accounts are due net 30 days from date of invoice. An account becomes delinquent on the 31st day from the invoice date and a finance charge of 1-1/2% per month applies on past due amounts. All orders are subject to approval by our credit department.

F.O.B. Point

All sales are made F.O.B. point of shipment unless otherwise noted. Buyer has risk of loss after delivery at F.O.B. point.

Deliveries

Immediate deliveries are available by Hanes Supply, Inc. and CCISCO, Hanes Supply of South Carolina, DBA Coastal Construction Industrial Supply Co. trucks and vans. We reserve the right to make partial shipments unless order is marked "ship complete". Items not shipped will be back-ordered and sent as quickly as possible. Shipping dates given in advance of actual shipment are estimates based on information provided by manufacturers/suppliers and should not be deemed to represent guaranteed shipping dates.

Returned Goods

We promise to handle returns in a prompt and fair manner. Please do not return goods without prior consent of our office. Your copy of the packing list/sales slip must accompany the returned goods. Goods must be as sold, in unused condition, in original boxes/packaging.

We must reserve the right to charge a 15% restocking charge on returned items. We may not accept as returned goods, material that has been cut or fabricated to customer's specifications.

Special factory orders are subject to return only if the factory will accept them back and these orders are subject to our restocking charge and transportation costs.

Returns must be made within 30 days of date of purchase.

Terms and Conditions

Terms and Conditions of Sale

- 1. ACCEPTANCE** - This purchase acknowledgment ("Purchase Acknowledgment") constitutes Seller's acceptance to Buyer of Buyer's purchase order ("Purchase Order"), conditioned upon assent by Buyer to all terms and conditions contained herein. Buyer's assent to all terms and conditions contained herein will be assumed unless Buyer notifies Seller, in writing, to the contrary within five (5) days after receipt of this Purchase Acknowledgment. No term, condition, amendment or revision stated by Buyer in Buyer's Purchase Order shall be binding upon Seller if it is in conflict with, inconsistent with or in addition to the terms and conditions contained herein unless accepted by Seller in writing.
- 2. PRICE** - Prices specified in this Purchase Acknowledgment shall not be subject to change without the written approval of Seller. To all prices will be added the amount of any tax assessed or to be collected by Seller with respect to sale, delivery or use of the articles furnished under this Purchase Acknowledgment ("Articles").
- 3. DELIVERY** - Seller shall endeavor to deliver the Articles by or on the dates specified in Buyer's Purchase Order, but Seller shall have no liability whatsoever to Buyer or any third party for failure to deliver the Articles on such dates. It is hereby agreed that time is not of the essence unless otherwise agreed to by Seller in writing. Buyer shall excuse Seller and Seller shall not be liable for any delay in delivering or failure to deliver the Articles due to acts of God, strike or other labor troubles, weather, fire, act of government authority, failure of transportation, or any other cause (whether or not similar to the foregoing) beyond Seller's control. To the extent that this Purchase Acknowledgment provides for Seller's manufacturing the Articles without prompt delivery thereof, Buyer must, in any event, accept delivery thereof within Ninety (90) days of Buyer's Purchase Order. In the event Buyer refuses such delivery within said Ninety (90) day period or anticipatorily repudiates thereon by indication or intention to so refuse, Seller can deem Buyer in breach as to the whole of the contract hereunder and immediately sue and recover damages according to the contract price therefor for all of the Articles, without regard to whether or not there is any realistic prospect for resale of the Articles by Seller.
- 4. TERMS** - Net Thirty (30) days.
- 5. SUBCONTRACTING** - Seller may, at its option, subcontract this Purchase Acknowledgment or any portion hereof.
- 6. TITLE AND RISK OF LOSS** - Both title to and risk of loss of the Articles shall pass to Buyer upon Seller's delivery of the Articles to a common carrier.
- 7. SHIPMENT** - Seller shall endeavor to ship the Articles by the mode of transportation specified by Buyer in Buyer's Purchase Order, but Seller shall have no liability whatsoever to Buyer or any third party for failure to ship the Articles by such mode of transportation. Any shipment postponed by Buyer beyond the original date specified in Its Purchase Order shall be billed by Seller and paid for by Buyer as of the original delivery date and title to such Articles shall pass to Buyer upon billing by Seller to Buyer. Upon any such postponement by Buyer, Buyer shall assume any and all risks and shall reimburse and/or pay Seller for any and all expenses incurred by Seller in connection with any storage of the articles.
- 8. INSPECTION** - Buyer acknowledges that Three (3) days provides Buyer with a reasonable amount of time to inspect the Articles. Therefore, the Articles shall be subject to final inspection and acceptance by Buyer within Three (3) days after receipt by Buyer any and all expenses in connection with such inspection shall be borne solely by Buyer. Buyer's failure to inspect within said time shall constitute a waiver of Buyer's rights of inspection and rejection. Upon inspection of the Articles within said Three (3) days, Buyer shall immediately notify Seller in writing as to any Articles that Buyer intends to reject and particularize in detail all defects therein. If, upon inspection, Buyer fails to immediately notify Seller as to which Articles it intends to reject, such failure to notify shall be deemed an acceptance of the Articles by Buyer. Upon Seller's receipt from Buyer of a timely notice to reject, Seller may, at its option, cure within a reasonable amount of time. Any Article properly rejected by Buyer shall be returned to Seller upon written approval of Seller and at Buyer's risk and expense plus applicable transportation charges. All Articles not properly rejected hereunder shall be deemed conforming.
- 9. PAYMENT** - Net payment for the Articles shall be Thirty (30) days following issuance by Buyer of an appropriate invoice. Buyer shall not have the right to set off or recoup any present or future claims which Buyer may have against Seller against amounts due for payment by Buyer to Seller.
- 10. SECURITY** - In the event that Seller determines that Buyer's credit is unsatisfactory, Seller may require payment or security before commencing manufacture, continuing manufacture and/or delivering any shipment hereunder. Buyer's failure to provide such payment or security as demanded by Seller shall cause Buyer to be immediately liable for full payment for the Articles already processed or in the course of processing, as the case may be, and Seller may, at its option, decline to complete manufacture and/or delivery.
- 11. WARRANTY** - Seller represents and warrants that the Articles shall be free from defect of material and workmanship. THE FOREMENTIONED WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A GENERAL OR PARTICULAR PURPOSE OR OTHER WARRANTY OF QUALITY, WHETHER EXPRESS OR IMPLIED, AND ALL SUCH OTHER WARRANTIES ARE EXPRESSLY DISCLAIMED. Buyer's sole and exclusive remedy for the aforementioned warranty shall be the replacement of the Articles proven to be defective or, at Seller's option, refund or credit to Buyer equal to the amount paid by Buyer for the defective Articles. Subject to any generally applicable law, Seller shall in no event be liable to Buyer or to any third party for: (a) indirect, special or consequential damages alleged to have been caused by the Articles, whether claimed under contract, warranty, tort or strict liability theories; or (b) damages in excess of the price of the Articles claimed to be defective.
- 12. CHANGES** - Buyer may not at any time make changes or additions to the general scope of this Purchase Acknowledgment.
- 13. ASSIGNMENT** - The assignment by Buyer of any right, title or interest in this Purchase Acknowledgment without the written consent of Seller shall be wholly void and totally ineffective. Seller may assign claims from money due or to become due hereunder to a bank or other financing institution. Buyer agrees that Buyer shall not delegate any obligation which it has under this Purchase Acknowledgment without the written consent of Seller and any attempted delegation by Buyer without written consent of Seller shall be void.
- 14. LIMITATION OF LIABILITY** - Seller shall not be liable to Buyer for any damages, expenses, liabilities and losses of any kind whatsoever (including, without limitation, attorneys' fees, costs and expenses in connection therewith) on account or by reason of injury to or death of a person whatsoever, or loss of or damage to any property whatsoever caused by, arising from, or related to the performance under this Purchase Acknowledgment of the Seller, its agents, employees or independent contractors, or the act or failure to act, of Seller, its agents, employees or independent contractors. Seller shall not be liable to Buyer for any damages, expenses, liabilities and losses of any kind whatsoever (including, without limitation, attorneys' fees, costs and expenses in connection therewith) on account or by reason of injury to or death of any person whatsoever, or loss of or damage to any property whatsoever caused by, arising from, or related to the Articles.
- 15. CANCELLATION FOR DEFAULT** - Seller may cancel the sale contemplated by this Purchase Acknowledgment (or any part thereof) by written notice to Buyer if: (a) Buyer fails to make payment for the Articles as required hereunder or otherwise fails to comply in any way with this Purchase Acknowledgment; (b) any proceeding is filed by or against Buyer in bankruptcy or insolvency; or (c) any judgment or tax lien or warrant is entered against Buyer.
- 16. TERMINATION FOR CONVENIENCE** - Seller may at any time by written notice to Buyer terminate the sale contemplated by this Purchase Acknowledgment (or any part thereof) at its convenience and for reasons other than default as contemplated by Paragraph 15 hereof. Upon such termination, Seller shall have no liability to Buyer whatsoever.
- 17. MERCHANT** - Buyer hereby acknowledges that it is a merchant as such term is defined in the Uniform Commercial Code.
- 18. CHOICE OF LAW** - This Purchase Acknowledgment shall be governed by and construed in accordance with the laws of the State of New York without reference to principles of conflict of laws, and, with respect to this Purchase Acknowledgment, Buyer consents to the jurisdiction and venue of the Supreme Court of the State of New York, County of Erie, unless such consent is otherwise prohibited.
- 19. STATUTE OF LIMITATIONS** - Any action arising out of or relating to this Purchase Acknowledgment shall be commenced within one (1) year after the cause of action has occurred.
- 20. ARBITRATION** - Any dispute or claim arising out of or pursuant to this Purchase Acknowledgment shall be submitted to binding arbitration in accordance with the expedited (or, if available, super-expedited) rules of the American Arbitration Association. The site of such arbitration proceedings shall be in Buffalo, New York. Except as otherwise expressly provided herein, judgment upon the award may be entered in any court having jurisdiction thereof. This Paragraph shall not limit either party's right to obtain any provisional or equitable remedy, including, without limitation, injunctive relief from any court of competent jurisdiction, as may be necessary in the sole judgment of such party to protect its rights. Neither Buyer nor Seller shall be afforded discovery in any such arbitration and all parties shall be precluded from applying to any court for such discovery.
- 21. EXPENSES** - In the event of any arbitration proceeding or litigation pursuant to this Purchase Acknowledgment, the prevailing party shall be entitled to recover its reasonable costs, expenses and attorney's fees from the nonprevailing party.
- 22. COURSE OF PERFORMANCE, COURSE OF DEALING AND USAGE OF TRADE** - In construing this Purchase Acknowledgment, parol evidence of course of performance, course of dealing or usage of trade shall not be permitted.
- 23. ENTIRE AGREEMENT** - This Purchase Acknowledgment, with such documents as are expressly incorporated herein by reference, is intended by Buyer and Seller as a final expression of their agreement with respect to the subject matter herein and is intended also as a complete and exclusive statement of the parties regarding the subject matter herein, and supersedes all prior and contemporaneous negotiations, undertakings and agreements of the parties, whether written or oral, with respect to the subject matter herein including, without limitation, Buyer's Purchase Order.
- 24. SEVERABILITY** - If any part of this Purchase Acknowledgment is found by an arbitrator or by a court of competent jurisdiction to be void and unenforceable, the remainder of this Purchase Acknowledgment shall remain in full force and effect.
- 25. MODIFICATION** - This Purchase Acknowledgment may not be discharged, abandoned, changed or modified in any manner except by an instrument in writing signed by Buyer and Seller.
- 26. WAIVER** - The failure of Seller to enforce at any time the provisions of this Purchase Acknowledgment shall in no way be construed to be a waiver by Seller of such provision, nor in any way to effect the validity of this Purchase Acknowledgment (or any part hereof) or the right of Seller thereafter to enforce each and every such provision. No waiver by Seller of any breach of this Purchase Acknowledgment shall be held to be a waiver of any other or subsequent breach. All claims of Buyer arising under this Purchase Acknowledgment shall be deemed waived by Buyer unless reported by Buyer to Seller in writing within Thirty (30) days after receipt of the Articles.

Conversion Charts

Drill — Tap Sizes

Decimal Equivalents and Tap Sizes of Fraction, Number, Letter and Metric Sizes

Recommended tap drill sizes for approximately 75% depth of thread

Drill Size	Decimal Inches	Tap Size*	Drill Size	Decimal Inches	Tap Size*	Drill Size	Decimal Inches	Tap Size*	Drill Size	Decimal Inches	Tap Size*	Drill Size	Decimal Inches	Tap Size*
97	.0059		58	.0420		27	.1440		H	.2660		17/32	.5312	5/8 – 11
.15mm	.0059		57	.0430		3.7mm	.1457		6.8mm	.2677		13.5mm	.5315	
96	.0063		1.1mm	.0433		26	.1470		6.9mm	.2717		35/64	.5469	
.16mm	.0063		1.15mm	.0453		3.75mm	.1476	3/16-24NS	I	.2720	5/16-24NF	14mm	.5512	m16x2
95	.0067		56	.0465		25	.1495	#10 – 24	7mm	.2756	m8x1	9/16	.5625	
.17mm	.0067		3/64	.0469	#0 – 80	3.8mm	.1496		J	.2770		14.5mm	.5709	m16x1.5
94	.0071		1.2mm	.0472		24	.1520		7.1mm	.2795		37/64	.5781	3/8-18 ^{NC} 5/8-18NF
.18mm	.0071		1.25mm	.0492	m1.6x0.35	3.9mm	.1535		K	.2810		15mm	.5906	
93	.0075		1.3mm	.0512		23	.1540		9/32	.2812	5/16-32NS	19/32	.5938	3/8-18NPS PIPE
.19mm	.0075		55	.0520		5/32	.1562		7.2mm	.2835		39/64	.6094	
92	.0079		1.35mm	.0531		22	.1570	3/16-32NS	7.25mm	.2854		15.5mm	.6102	m18x2.5
.2mm	.0079		54	.0550		4mm	.1575		7.3mm	.2874		5/8	.6250	11/16-16NS
91	.0083		1.4mm	.0551		21	.1590	#10 – 32	L	.2900		16mm	.6299	m18x2.0
.21mm	.0083		1.45mm	.0571	m1.8x0.35	20	.1610		7.4mm	.2913		41/64	.6406	
90	.0087		1.5mm	.0591		4.1mm	.1614		M	.2950		16.5mm	.6496	
.22mm	.0087		53	.0595	#1 – 64, 72	4.2mm	.1654	m5x0.8	7.5mm	.2953		21/32	.6562	3/4-10NC
89	.0091		1.55mm	.0610		19	.1660		19/64	.2969		17mm	.6693	
.23mm	.0091		1/16	.0625		4.25mm	.1673		7.6mm	.2992		43/64	.6719	
.24mm	.0094		1.6mm	.0630	m2x0.4	4.3mm	.1693		N	.3020		11/16	.6875	3/4-16NF
88	.0095		52	.0635		18	.1695		7.7mm	.3031		17.5mm	.6890	m20x2.5
.25mm	.0098		1.65mm	.0650		11/64	.1719		7.75mm	.3051	m9x1.25	45/64	.7031	
87	.0100		1.7mm	.0669		17	.1730		7.8mm	.3071		18mm	.7087	m20x2.0
.26mm	.0102		51	.0670	#2 – 56	4.4mm	.1732		7.9mm	.3110		23/32	.7188	1/2-14NPT PIPE
86	.0105		1.75mm	.0689	m2.2x0.45	16	.1770	#12 – 24	5/16	.3125	3/8-16NC	18.5	.7283	m20x1.5
.27mm	.0106		50	.0700	#2 – 64	4.5mm	.1772		8mm	.3150		47/64	.7344	1/2-14NPS PIPE
85	.0110		1.8mm	.0709		15	.1800		O	.3160		19mm	.7480	
.28mm	.0110		1.85mm	.0728		4.6mm	.1811		8.1mm	.3189		3/4	.7500	
.29mm	.0114		49	.0730		14	.1820	#12 – 28	8.2mm	.3228		49/64	.7656	7/8-9NC
84	.0115		1.9mm	.0748	m2.3x0.4	13	.1850		P	.3230		19.5mm	.7677	m22x2.5
.3mm	.0118		48	.0760		4.7mm	.1850		8.25mm	.3248		25/32	.7812	
83	.0120		1.95mm	.0768		4.75mm	.1870		8.3mm	.3268		20mm	.7874	m22x2.0
82	.0125		5/64	.0781		3/16	.1875		21/64	.3281		51/64	.7969	
.32mm	.0126		47	.0785	#3 – 48	4.8mm	.1890		8.4mm	.3307		20.5mm	.8071	m22x1.5
81	.0130		2mm	.0787		12	.1890	7/32-32NS	Q	.3320	3/8-24NF	13/16	.8125	7/8-14NF
.34mm	.0134		2.05mm	.0807	m2.5x0.45	11	.1910		8.5mm	.3346	m10x1.5	21mm	.8268	m24x3
80	.0135		46	.0810		4.9mm	.1929		8.6mm	.3386		53/64	.8281	
.35mm	.0138		45	.0820	#3 – 56	10	.1935		R	.3390	1/8-27NPT PIPE	27/32	.8438	
.36mm	.0142		2.1mm	.0827		9	.1960		8.7mm	.3425		21.5mm	.8465	
79	.0145		2.15mm	.0846	m2.6x0.45	5mm	.1969	m6x1	11/32	.3438		55/64	.8594	
.38mm	.0150		44	.0860	#4 – 36	8	.1990		8.75mm	.3445	m10x1.25	22mm	.8661	m24x2
1/64	.0156		2.2mm	.0866		5.1mm	.2008		8.8mm	.3465		7/8	.8750	1-8NC
.4mm	.0157		2.25mm	.0886		7	.2010	1/4 – 20	S	.3480	1/8-27NPS PIPE	22.25mm	.8760	m24x1.50
78	.0160		43	.0890	#4 – 40	13/64	.2031		8.9mm	.3504		22.5mm	.8858	
.42mm	.0165		2.3mm	.0906		6	.2040		9mm	.3543	m10x1.00	57/64	.8906	
.44mm	.0173		2.35mm	.0925		5.2mm	.2047		T	.3580		23mm	.9055	
.45mm	.0177		42	.0935	#4 – 48	5	.2055		9.1mm	.3583		29/32	.9062	
77	.0180		3/32	.0938		5.25mm	.2067	m6x0.75	23/64	.3594		59/64	.9219	3/4-14NPT PIPE
.46mm	.0181		2.4mm	.0945		5.3mm	.2087		9.2mm	.3622		23.5mm	.9252	
.48mm	.0189		41	.0960		4	.2090	1/4 – 24	9.25mm	.3642		15/16	.9375	3/4-14 ^{NC} 1-14NF
.5mm	.0197		2.45mm	.0965		5.4mm	.2126		9.3mm	.3661		24mm	.9449	m27x3
76	.0200		40	.0980		3	.2130	1/4 – 28	U	.3680	7/16-14NC	61/64	.9531	
75	.0210		2.5mm	.0984	m3x0.5	5.5mm	.2165		9.4mm	.3701		24.5mm	.9646	
.55mm	.0217		39	.0995		7/32	.2188		9.5mm	.3740	m11x1.50	31/32	.9688	
.6mm	.0236		38	.1015	#5 – 40	5.6mm	.2205		3/8	.3750		25mm	.9843	m27x2
74	.0225		2.6mm	.1024		2	.2210		V	.3770		63/64	.9844	1-1/8 – 7NC
.7mm	.0240		37	.1040	#5 – 44	5.7mm	.2244		9.6mm	.3780		1	1.0000	
73	.0240		2.7mm	.1063		5.75mm	.2264		9.7mm	.3819		25.5mm	1.0039	
.65mm	.0256		36	.1065	#6 – 32	1	.2280		9.75mm	.3839		1-1/64	1.0156	
71	.0260		2.75mm	.1083		5.8mm	.2283		9.8mm	.3858		26mm	1.0236	
.7mm	.0276		7/64	.1094		5.9mm	.2323		W	.3860		1-1/32	1.0312	
70	.0280		35	.1100		A	.2340		9.9mm	.3898		26.5mm	1.0433	m30x3.5
.69	.0292		2.8mm	.1102		15/64	.2344		25/64	.3906	7/16 – 20	1-3/64	1.0469	1-1/8-12NF
.75mm	.0295		34	.1110		6mm	.2362	m7x1	10mm	.3937	m12x1.75	1-1/16	1.0625	
68	.0310		33	.1130	#6 – 40	B	.2380		X	.3970		27mm	1.0630	
1/32	.0312		2.9mm	.1142	m3.5x0.6	6.1mm	.2402		Y	.4040		1-5/64	1.0781	
.8mm	.0315		32	.1160		C	.2420		13/32	.4062		27.5mm	1.0827	
.67	.0320		3mm	.1181		6.2mm	.2441		Z	.4130		1-3/32	1.0938	
.66	.0330		31	.1200		D	.2460	1/16-27NPT PIPE	10.5mm	.4134	m12x1.25	28mm	1.1024	m30x2.0
.85mm	.0335		3.1mm	.1220		6.25mm	.2461		27/64	.4219	1/2 – 13	1-7/64	1.1094	1-1/4-7NC
.65	.0350		1/8	.1250	5/32-32NS	6.3mm	.2480		11mm	.4331		28.5mm	1.1220	
.9mm	.0354		3.2mm	.1260		E	.2500	1/16-27NPS PIPE	7/16	.4375	1/4-18NPT PIPE	1-1/8	1.1250	
.64	.0360		3.25mm	.1280		1/4	.2500		11.5mm	.4528		1-9/64	1.1406	
.63	.0370		30	.1285	5/32-36NS	6.4mm	.2520		29/64	.4531	1/4-18 ^{NC} 1/2x20	29mm	1.1417	
.95mm	.0374		3.3mm	.1299	m4x0.7	6.5mm	.2559		15/32	.4688		1-5/32	1.1562	1-11/2NPT PIPE
.62	.0380		3.4mm	.1339		F	.2570	5/16-18NC	12mm	.4724	m14x2	29.5mm	1.1614	
.61	.0390		29	.1360	#8 – 32	6.6mm	.2598		31/64	.4844	9/16 – 12	1-11/64	1.1719	1-1/4-12NF
1mm	.0394		3.5mm	.1378		G	.2610		12.5mm	.4921	m14x1.5			
.60	.0400		28	.1405		6.7mm	.2638		1/2	.5000				
.59	.0410		9/64	.1406		17/64	.2656		13mm	.5118	m14x1.25			
1.05mm	.0413		3.6mm	.1417		6.75mm	.2657	m8x1.25	33/64	.5156	9/16 – 18			

*To be used with drills as indicated

Conversion Charts

Metric – Fraction Conversion Chart

Conversion Chart Showing Millimeter Sizes, Fractional and Decimal Inch Sizes

Milli-Meter	Dec. Equiv.	Frac-tional	Milli-Meter	Dec. Equiv.	Frac-tional	Milli-Meter	Dec. Equiv.	Frac-tional	Milli-Meter	Dec. Equiv.	Frac-tional	Milli-Meter	Dec. Equiv.	Frac-tional
.1	.0039		1.8	.0709		4.1	.1614		—	.2770		12.0	.4724	
.15	.0059		1.85	.0728		4.2	.1654		7.1	.2795		12.30	.4843	31/64
.2	.0079		—	.0730		—	.1660		—	.2811		12.5	.4921	
.25	.0098		1.9	.0748		4.25	.1673		7.14	.2812	9/32	12.7	.5000	1/2
.3	.0118		—	.0760		4.3	.1693		7.2	.2835		13.0	.5118	
—	.0135		1.95	.0767		—	.1695		7.25	.2854		13.10	.5156	33/64
.35	.0138		1.98	.0781	5/64	4.37	.1719	11/64	7.3	.2874		13.49	.5312	17/32
—	.0145		—	.0785		—	.1730		—	.2900		13.5	.5315	
.39	.0156	1/64	2.0	.0787		4.4	.1732		7.4	.2913		13.89	.5469	35/64
.4	.0157		2.05	.0807		—	.1770		—	.2950		14.0	.5512	
—	.0160		—	.0810		4.5	.1771		7.5	.2953		14.29	.5625	9/16
.45	.0177		—	.0820		—	.1800		7.54	.2968	19/64	14.5	.5709	
—	.0180		2.1	.0827		4.6	.1811		7.6	.2992		14.68	.5781	37/64
.5	.0197		2.15	.0846		—	.1820		—	.3020		15.0	.5906	
—	.0200		—	.0860		4.7	.1850		7.7	.3031		15.08	.5937	19/32
—	.0210		2.2	.0866		4.75	.1870		7.75	.3051		15.48	.6094	39/64
.55	.0217		2.25	.0885		4.76	.1875	3/16	7.8	.3071		15.5	.6102	
—	.0225		—	.0890		4.8	.1890		7.9	.3110		15.88	.6250	5/8
.6	.0236		2.3	.0905		—	.1910		7.94	.3125	5/16	16.0	.6299	
—	.0240		2.35	.0925		4.9	.1929		8.0	.3150		16.27	.6406	41/64
—	.0250		—	.0935		—	.1935		—	.3160		16.5	.6496	
.65	.0256		2.38	.0937	3/32	—	.1960		8.1	.3189		16.67	.6562	21/32
—	.0260		2.4	.0945		5.0	.1968		8.2	.3228		17.0	.6693	
—	.0280		—	.0960		—	.1990		—	.3230		16.06	.6719	43/64
.7	.0276		2.45	.0964		5.1	.2008		8.25	.3248		16.46	.6875	11/16
—	.0292		—	.0980		—	.2010		8.3	.3268		17.5	.6890	
.75	.0295		2.5	.0984		5.16	.2031	13/64	8.33	.3281	21/64	17.86	.7031	45/64
—	.0310		—	.0995		—	.2040		8.4	.3307		18.0	.7087	
.79	.0312	1/32	—	.1015		5.1	.2047		—	.3320		18.26	.7187	23/32
.8	.0315		2.6	.1024		—	.2055		8.5	.3346		18.5	.7283	
—	.0320		—	.1040		5.25	.2067		8.6	.3386		18.65	.7344	47/64
—	.0330		2.7	.1063		5.3	.2086		—	.3390		19.0	.7480	
.85	.0335		—	.1065		—	.2090		8.7	.3425		19.05	.7500	3/4
—	.0350		2.75	.1082		5.4	.2126		8.73	.3437	11/32	19.45	.7656	49/64
.9	.0354		2.78	.1094	7/64	—	.2130		8.75	.3445		19.5	.7677	
—	.0360		—	.1100		5.5	.2165		8.8	.3465		19.84	.7812	25/32
—	.0370		2.8	.1102		5.56	.2187	7/32	—	.3480		20.0	.7874	
.95	.0374		—	.1110		5.6	.2205		8.9	.3504		20.24	.7969	51/64
—	.0380		—	.1130		—	.2210		9.0	.3543		20.5	.8071	
—	.0390		2.9	.1141		5.7	.2244		—	.3580		20.64	.8125	13/16
1.0	.0394		—	.1160		5.75	.2263		9.1	.3583		21.0	.8268	
—	.0400		3.0	.1181		—	.2280		9.13	.3594	23/64	21.03	.8281	53/64
—	.0410		—	.1200		5.8	.2283		9.2	.3622		21.43	.8437	27/32
1.05	.0413		3.1	.1220		5.9	.2323		9.25	.3641		21.5	.8465	
—	.0420		3.18	.1250	1/8	—	.2340		9.3	.3661		21.83	.8594	55/64
—	.0430		3.2	.1260		5.95	.2344	15/64	—	.3680		22.0	.8661	
1.1	.0433		3.25	.1279		6.0	.2362		9.4	.3701		22.23	.8750	7/8
1.15	.0452		—	.1285		—	.2380		9.5	.3740		22.5	.8858	
—	.0465		3.3	.1299		6.1	.2401		9.53	.3750	3/8	22.62	.8906	57/64
1.19	.0469	3/64	3.4	.1338		—	.2420		—	.3770		23.0	.9055	
1.2	.0472		—	.1360		6.2	.2441		9.6	.3780		23.02	.9062	29/32
1.25	.0492		3.5	.1378		6.25	.2460		9.7	.3819		23.42	.9219	59/64
1.3	.0512		—	.1405		6.3	.2480		9.75	.3838		23.5	.9252	
—	.0520		3.57	.1406	9/64	6.35	.2500	1/4	9.8	.3858		23.81	.9375	15/16
1.35	.0531		3.6	.1417		6.4	.2520		—	.3860		24.0	.9449	
—	.0550		—	.1440		6.5	.2559		9.9	.3898		24.21	.9531	61/64
1.4	.0551		3.7	.1457		—	.2570		9.92	.3906	25/64	24.5	.9646	
1.45	.0570		—	.1470		6.6	.2598		10.0	.3937		24.61	.9687	31/32
1.5	.0591		3.75	.1476		—	.2570		—	.3970		25.0	.9843	
—	.0595		—	.1495		6.6	.2598		—	.4040		25.03	.9844	63/64
1.55	.0610		3.8	.1496		—	.2610		10.32	.4062	13/32	25.4	1.000	1
1.59	.0625	1/16	—	.1520		6.7	.2638		—	.4130		—	—	—
1.6	.0629		3.9	.1535		6.75	.2656	17/64	10.5	.4134		—	—	—
—	.0635		—	.1540		6.75	.2657		10.72	.4219	27/64	—	—	—
1.65	.0649		3.97	.1562	5/32	—	.2660		11.0	.4330		—	—	—
1.7	.0669		—	.1570		6.8	.2677		11.11	.4375	7/16	—	—	—
—	.0670		4.0	.1575		6.9	.2716		11.5	.4528		—	—	—
1.75	.0689		—	.1590		—	.2720		11.51	.4531	29/64	—	—	—
—	.0700		—	.1610		7.0	.2756		11.91	.4687	15/32	—	—	—

Conversion Charts

Bolt Sizing Chart Nominal Opening Sizes of Wrenches or Sockets in Inches to Fit Standard Bolt Heads, Nuts and Screw Heads

Locate thread diameter of bolt, nut or screw in extreme left or right column. Then move across to box which has proper identification of bolt, nut or screw at top of vertical column. The size in this particular box is the nominal opening size in inches of the wrenches and sockets that will fit.

NUTS					BOLTS AND SCREWS				
Thread Dia. of Nut	Finished Series and Finished Thick Nuts	Reg. Series Hex and Square Nuts	Heavy Series Hex and Square Nuts	Machine Screw Nuts and Stove Bolt Nuts	Regular and Finished Series Hex and Square Head Bolts	Heavy Series Hex and Square Head Bolts	Lag Screws	Square Head Set Screws	Thread Dia. of Bolt or Screw
Use wrench or socket size shown below					Use wrench or socket size shown below				
#0 & 1				5/32					#0 & 1
#2 & 3				3/16					#2 & 3
#4				1/4					#4
#5 & 6				5/16					#5 & 6
#8				11/32					#8
#10				3/8			5/16	3/16	#10
#12				7/16				7/32	#12
1/4	7/16	7/16	1/2	7/16	3/8-7/16		3/8	1/4	1/4
5/16	1/2	9/16	9/16	9/16	1/2		1/2	5/16	5/16
3/8	9/16	5/8	11/16	5/8	9/16		9/16	3/8	3/8
7/16	11/16	3/4	3/4		5/8		5/8	7/16	7/16
1/2	3/4	13/16	7/8		3/4	7/8	3/4	1/2	1/2
9/16	7/8	7/8	15/16		13/16			9/16	9/16
5/8	15/16	1	1-1/16		15/16	1-1/16	15/16	5/8	5/8
3/4	1-1/8	1-1/8	1-1/4		1-1/8	1-1/4	1-1/8	3/4	3/4
7/8	1-5/16	1-5/16	1-7/16		1-15/16	1-7/16	1-5/16	7/8	7/8
1	1-1/2	1-1/2	1-5/8		1-1/2	1-5/8	1-1/2	1	1
1-1/8	1-11/16	1-11/16	1-13/16		1-11/16	1-13/16	1-11/16	1-1/8	1-1/8
1-1/4	1-7/8	1-7/8	2		1-7/8	2	1-7/8	1-1/4	1-1/4
1-3/8	2-1/16	2-1/16	2-3/16		2-1/16	2-3/16	2-1/16	1-3/8	1-3/8
1-1/2	2-1/4	2-1/4	2-3/8		2-1/4	2-3/8	2-1/4	1-1/2	1-1/2
1-5/8	2-7/16	2-7/16	2-9/16		2-7/16	2-9/16	2-7/16	1-5/8	1-5/8
1-3/4	2-5/8	2-5/8	2-3/4		2-5/8	2-3/4	2-5/8	1-3/4	1-3/4
1-7/8	2-13/16	2-13/16	2-15/16		2-13/16	2-15/16	2-13/16	1-7/8	1-7/8
2	3	3	3-1/8			3	3-1/8	2	2
2-1/4	3-3/8	3-3/8	3-1/2		3-3/8	3-1/2	3-3/8	2-1/4	2-1/4
2-1/2	3-3/4	3-3/4	3-7/8		3-3/4	3-7/8	3-3/4	2-1/2	2-1/2
2-3/4	4-1/8	4-1/8	4-1/4		4-1/8	4-1/4	4-1/8	2-3/4	2-3/4
3	4-1/2	4-1/2	4-5/8		4-1/2	4-5/8	4-1/2	3	3
3-1/4			5		4-7/8		4-7/8	3-1/4	3-1/4
3-1/2			5-3/8		5-1/4		5-1/4	3-1/2	3-1/2
3-3/4			5-3/4		5-5/8		5-5/8	3-3/4	3-3/4
4			6-1/8		6		6	4	4

* Regular Square Bolts Only

Table of Multiples

Circumference of Circle = Diameter x 3.1416

Area of Circle = $\begin{cases} \text{Square of Diameter} \times 0.7854, \text{ or} \\ \text{Square of Radius} \times 3.1416, \text{ or} \\ \text{Square of Circumference} \times 0.07958 \end{cases}$

Area of Triangle = Base x one-half altitude

Surface of Sphere = $\begin{cases} \text{Circumference} \times \text{diameter, or} \\ \text{Square of Diameter} \times 3.1416 \end{cases}$

Volume of Sphere = $\begin{cases} \text{Surface} \times \text{one-sixth diameter, or} \\ \text{Cube of Diameter} \times 0.5236 \end{cases}$

Area of Hexagon = Square of Diameter of Inscribed Circle x 0.866

Area of Octagon = Square of Diameter of Inscribed Circle x 0.828

Engineering Units

1 Horsepower = 33,000 foot pounds per minute
550 foot pounds per second
746 watts
.746 kilowatts

1 Horsepower Hour = .746 kilowatt hours
1,980,000 foot pounds
2,545 heat units (B.T.U.)

1 Kilowatt = 1,000 watts
1.34 horsepower
737.3 foot pounds per second
44,240 foot pounds per minute
56.9 heat units (B.T.U.) per minute

1 Kilowatt Hour = 1,000 watt hours
1.34 horsepower hours
2,654,200 foot pounds
3,412 heat units (B.T.U.)

1 British Thermal Unit = 1,055 watt seconds
778 foot pounds
.000293 kilowatt hour
.000393 horsepower hour

1 Watt = 1 joule per second
.00134 horsepower
3,412 heat units (B.T.U.) per hour
.7373 foot pounds per second
44.24 foot pounds per second

Conversion Charts

Measurements and Weights

Linear Measure

1000 mils	=	1 inch
12 inches	=	1 foot
3 feet	=	1 yard
2 yards	=	$\begin{cases} 1 \text{ fathom} \\ 6 \text{ feet} \end{cases}$
5-1/2 yards	=	$\begin{cases} 1 \text{ rod} \\ 16-1/2 \text{ feet} \end{cases}$
40 rods	=	$\begin{cases} 1 \text{ furlong} \\ 660 \text{ feet} \end{cases}$
8 furlongs	=	$\begin{cases} 1 \text{ mile} \\ 5280 \text{ feet} \end{cases}$
1.15156 miles	=	$\begin{cases} 1 \text{ nautical mile, or knot} \\ 6080.26 \text{ feet} \end{cases}$
3 nautical miles	=	$\begin{cases} 1 \text{ league} \\ 18,240.78 \text{ feet} \end{cases}$

Square Measure

144 square inches	=	1 square foot
9 square feet	=	1 square yard
30-1/4 square yds	=	$\begin{cases} 1 \text{ square rod} \\ 272-1/4 \text{ square feet} \end{cases}$
160 square rods	=	$\begin{cases} 1 \text{ acre} \\ 43,560 \text{ square feet} \end{cases}$
640 acres	=	$\begin{cases} 1 \text{ square mile} \\ 27,878,400 \text{ square feet} \end{cases}$

A circular mil is the area of a circle 1 mil, or 0.001 inch in diameter.

1 square inch = 1,273,239 circular mils

A circular inch is the area of a circle 1 inch in diameter = 0.7854 square inches.

1 square inch = 1.2732 circular inches

Cubic Measure

1728 cubic inches	=	$\begin{cases} 1 \text{ cubic foot} \\ 7.4805 \text{ gallons} \end{cases}$
27 cubic feet	=	1 cubic yard
128 cubic feet	=	1 cord

Liquid Measure

4 gills	=	1 pint
2 pints	=	1 quart
4 quarts	=	$\begin{cases} 1 \text{ gallon} \\ 231 \text{ cubic inches} \\ .134 \text{ cubic feet} \end{cases}$
31-1/2 gallons	=	1 barrel
2 barrels	=	1 hogshead

Dry Measure

2 pints	=	1 quarts
8 quarts	=	1 peck
4 pecks	=	$\begin{cases} 1 \text{ bushel} \\ 2150.42 \text{ cubic inches} \\ 1.2445 \text{ cubic feet} \end{cases}$

Weight—Avoirdupois or Commercial

437.5 grains	=	1 ounce
16 ounces	=	1 pound
112 pounds	=	1 hundredweight
20 hundredweight	=	$\begin{cases} 1 \text{ gross, or long ton} \\ 2240 \text{ pounds} \end{cases}$
2000 pounds	=	1 net, or short ton
2204.6 pounds	=	1 metric ton

Conversion Charts

Metric System of Measures and Weights

Linear Measure

1 millimeter	=	0.03937 inches
1 centimeter	=	0.3937 inches
1 decimeter	=	3.937 inches
1 meter	=	$\begin{cases} 39.37 \text{ inches} \\ 3.28083 \text{ feet} \\ 1.09361 \text{ yards} \end{cases}$
1 kilometer	=	$\begin{cases} 3280.83 \text{ feet} \\ 1093.61 \text{ yards} \\ 0.62137 \text{ miles} \end{cases}$
1 inch	=	25.4 millimeters
1 inch	=	2.54 centimeters
1 inch	=	.254 decimeters
1 inch	=	.0254 meters
1 foot	=	.3048 meters
1 yard	=	.9144 meters
1 mile	=	1.60935 kilometers

Square Measure

1 square millimeter	=	$\begin{cases} 0.00155 \text{ square inches} \\ 1973.5 \text{ circular mils} \end{cases}$
1 square centimeter	=	0.155 square inches
1 square decimeter	=	15.5 square inches
1 square meter	=	$\begin{cases} 1550 \text{ square inches} \\ 10.7639 \text{ square feet} \\ 1.196 \text{ square yards} \end{cases}$
1 square kilometer	=	$\begin{cases} 0.386109 \text{ square miles} \\ 247.11 \text{ acres} \end{cases}$
1 square myriameter	=	38.6109 square miles
1 square inch	=	645.2 square millimeters
1 square inch	=	6.452 square centimeters
1 square inch	=	0.06452 square decimeters
1 square foot	=	0.0929 square meters
1 square yard	=	0.836 meters

Cubic Measure

1 cubic centimeter	=	0.061 cubic inches
1 cubic decimeter	=	$\begin{cases} 61.0234 \text{ cubic inches} \\ 0.035314 \text{ cubic feet} \end{cases}$
1 cubic meter	=	$\begin{cases} 35.314 \text{ cubic feet} \\ 1.308 \text{ cubic yards} \end{cases}$

Weight

1 gram	=	15.432 grains
1 kilogram	=	2.204622 pounds
1 metric ton	=	$\begin{cases} 2204.6 \text{ pounds} \\ 0.9842 \text{ gross tons} \\ 1.1023 \text{ net tons} \end{cases}$
1000 kilograms	=	
1 grain	=	0.0648 gram
1 pound	=	0.4536 kilogram

Capacity

1 Liter	=	$\begin{cases} 61.0234 \text{ cubic inches} \\ 0.03531 \text{ cubic feet} \\ 0.2642 \text{ gallons} \end{cases}$
1 cubic foot	=	28.317 liters
1 gallon	=	3.785 liters

Compound Units

1 gram per square millimeter	=	1.422 pounds per square inch
1 kilogram per square millimeter	=	1422.32 pounds per square inch
1 kilogram per square centimeter	=	14.2232 pounds per square inch
1 kilogram per square meter	=	$\begin{cases} 0.2048 \text{ pounds per square foot} \\ 1.8433 \text{ pounds per square yard} \end{cases}$
1 kilogram meter	=	7.2330 foot pounds
1 kilogram per meter	=	0.6720 pounds per foot
1 pound per square inch	=	0.07031 kilogram per square centimeter
1 pound per square foot	=	0.0004882 kilogram per square centimeter
1 pound per square foot	=	0.006944 pounds per square inch
1 pound per cubic inch	=	27679.7 kilograms per cubic meter
1 pound per cubic foot	=	16.0184 kilograms per cubic meter
1 kilogram per cubic meter	=	0.06243 pounds per cubic foot
1 foot per second	=	0.30480 meters per second
1 meter per second	=	3.28083 feet per second
1 meter per second	=	2.23693 miles per hour

