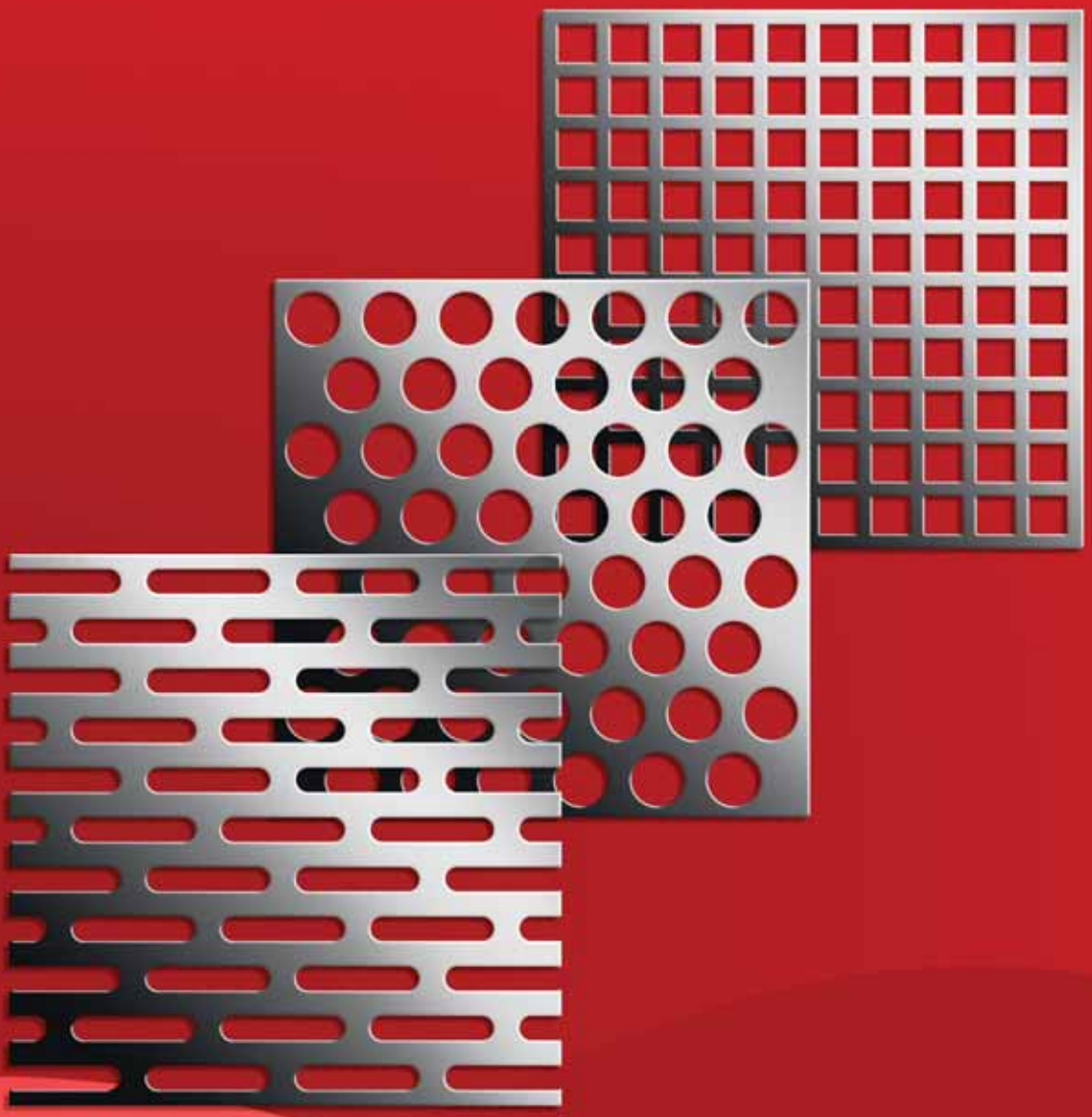
PERFORATED METAL



NEW METALS INC.

MESSAGE FROM THE DIRECTOR

NEW METALS INC., division of LAMINA DESPLEGADA, S.A. DE C.V., has the great satisfaction of presenting to you, our customer, our new perforated metal catalog. This edition has been put together keeping in mind both those users with experience in this industry as well as those that may require the technical support of a specialized perforator.

In the pages to follow, the reader will embark on a journey through the fascinating world of perforated metal. This journey will begin with the basic concepts of form, design and the perforated production process. This section will be followed by a description of the enormous potential of the uses and applications that the diversity of perforated metals has to offer all over the world in a wide range of styles and materials. A section on technical aspects to be considered when specifying a perforated metal product is also presented, which includes the International Standards accepted by the IPA (Industrial Perforators Association) and EUROPERF (European Perforators Association).

You will also find in our catalog a list of additional value added services that we can offer to our current and potential customers, such as design, precision leveling, shearing, forming, fabricating, painting, degreasing and more. With our customers in mind, we also include a simple and practical guide on how to order perforated metal that consists of a useful tool for selecting the ideal design and material for the user's specific application. Last, but not least, we will offer a sampling of the wide range of standard products, shown to scale for a better visualization of the product being considered, which will include an extensive group of technical information tables most common to the industry.

This catalog presents our perforated metal program with a primarily commercial emphasis. For a greater degree of technical information, we recommend that you refer to The Designers, Specifiers and Buyers Handbook of Perforated Metals published by the IPA (Industrial Perforators Association) and developed in part by our parent company, LAMINA DESPLEGADA, S.A. de C.V.

This catalog has been carefully prepared as a reference, both technical and commercial, for current and future users of perforated metal. However, because we understand the enormous challenges (both technical and economic) presented when selecting the ideal product for your application, we offer you the experience and technical expertise of our entire organization. We hope our customers and friends will feel free to call on us to assist them when designing and selecting perforated metal to meet their requirements.

Sincerely,

Gerardo Ruiz

CONTACT INFORMATION:

For quotations, orders and further information regarding perforated metal, please contact our customer service representatives by phone, fax or e-mail.

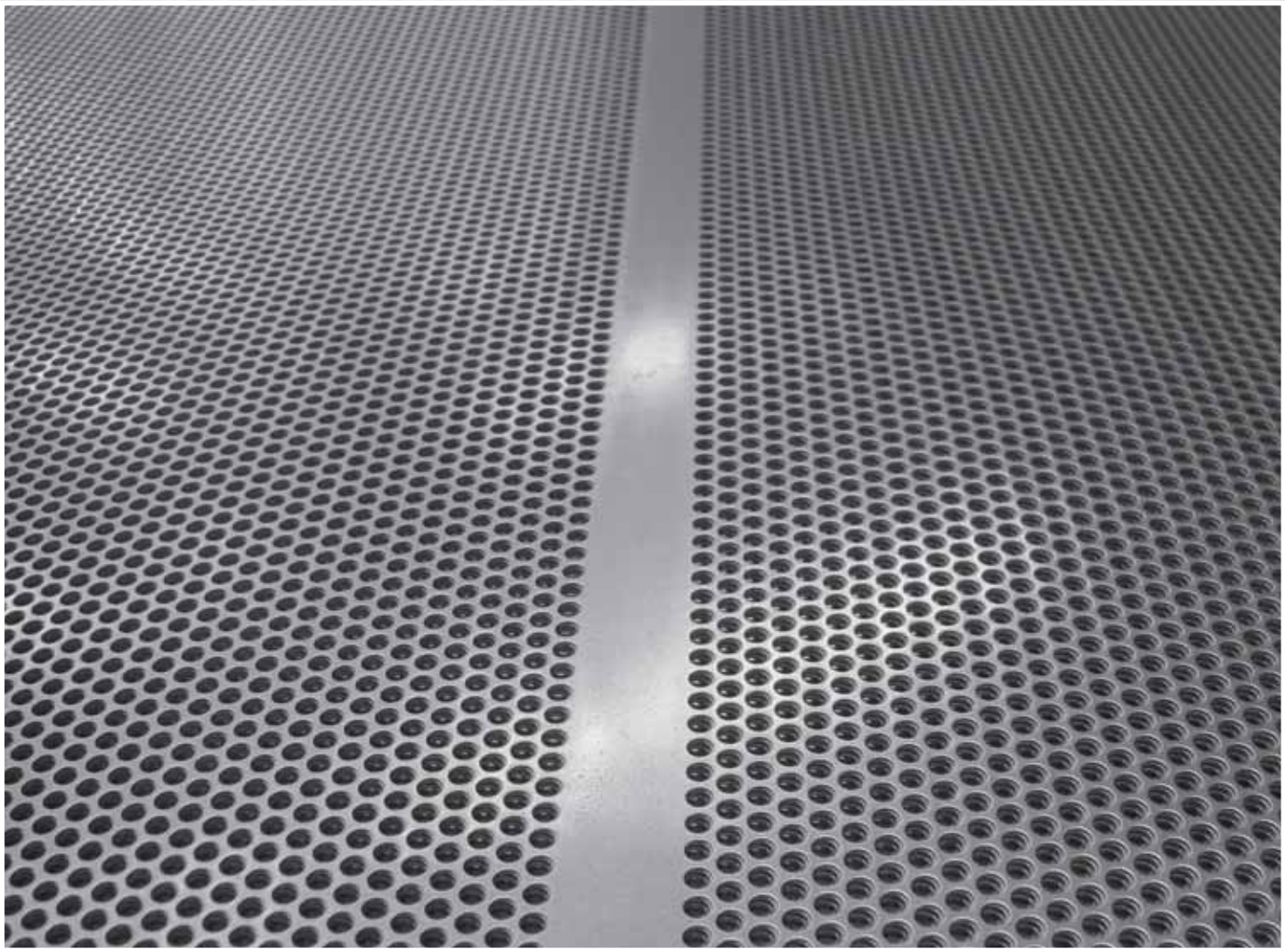
Phone: 1.888.639.6382 or 1.210.804.2200
Fax: 1.888.813.4275 or 1.210.822.2999

E-mail: perforated@newmetals.com
Website: http://www.newmetals.com

New Metals, Inc.
1777 N.E. Loop 410, Suite 1225
San Antonio, TX 78217

QUALITY POLICY

Through the process of continuous improvement and implementation of ISO 9001, it is the quality policy of NEW METALS, INC. to achieve total customer satisfaction by offering products and services of excellent quality.



CORPORATE PROFILE

Holding Company:	*Lámina Desplegada, S.A. de C.V. (Established 1954)* *Av. Cuauhtémoc # 103* *Santa Catarina, N.L. 66150* *MEXICO*
Market Coverage:	*United States of America, Canada, Mexico, The Caribbean Islands, Central America and South America.*
Product Lines:	*Perforated metal, expanded metal, gratings, deco mesh, micro mesh, metal floorplate, ornamental metal parts and parts fabrication.*
Finishing Capabilities:	*Precision roller leveling, shearing, forming, die-cutting, bending, slitting, stamping, welding, hot-dip galvanizing, powder coating, custom packing, bar coding, laser and plasma cutting.*
Production Capacity:	*Over 75,000 Metric Tons per year.*
Production Facilities:	*Total Building Area = 150,500 Sq.Ft.*
Personnel:	*400 Employees (300 hourly; 100 management and sales)*
Quality Program:	*ISO – 9001:2000. Certified since April 1996.*

THE BEST ALTERNATIVE IN PERFORATED

Whichever the case, if you are looking for a standard or made to order perforation, New Metals, Inc. can provide you with a solution to meet your needs. With state of the art production equipment and highly trained personnel, we can offer an enormous range of standard perforated products, along with the technical support to assist you in designing made to order perforated metal parts.

The extraordinary potential that the wide world of perforated metals offers to designers and engineers allows for great versatility for all sorts of industries with the only limit being the imagination of the user. Applications for perforated metal can be found in the construction industry, furniture manufacturing, agricultural equipment, electronics, food processing, automotive industry, mining, sugar refining, distilling and hundreds of more uses.

Perforated metal offers technical advantages over other mesh materials such as woven wire, welded wire and expanded metal. The functional capacity of perforated metal compared to these other materials is superior when considering such characteristics as ventilation, filtration, sorting and selection of minerals or grains, sound absorption, radiation protections and others.

One of the greatest advantages of perforated metal when compared to other materials is its versatility in allowing for a variety of combinations of open areas (holes) and solid areas within a single sheet.

COMPETITIVE ADVANTAGES

In addition to having 40 years of perforated metal manufacturing experience, NEW METALS, INC. also offers many competitive advantages that make it an excellent choice as a supplier-partner for perforated metals.

- *Low cost alternative.*
- *Personalized attention in the design and manufacturing of perforated metals.*
- *Fast and effective response.*
- *Many additional value-added services.*
- *Administrative and financial services, such as long-term contracts, Just in Time deliveries, KAN-BAN programs, indexed pricing agreements, etc.*
- *International Business Experience.*
- *Positioning close to raw material sources.*
- *Guaranteed Quality. ISO 9001:2008 Certified.*
- *Customer Oriented.*
- *Capability of perforating light and heavy gauge materials.*
- *State of the art equipment.*
- *Immediate delivery from stock.*


ABS Quality Evaluations
CERTIFICATE OF CONFORMANCE
New Metals Inc.
ISO 9001:2008

FUNCTIONS OF PERFORATED METAL

The functional capabilities of Perforated Metal are many, including:

- *Filtration*
- *Sound suppression*
- *EMI / RFI Radiation containment*
- *Purification of gases and liquids*
- *Sorting and selection of minerals or grains*
- *Architectural elements*
- *Combining open areas with solid areas*
- *Protective grilles for moving parts*
- *Aeration for hot or humid areas*
- *Visability of enclosed areas*
- *Drying of oven-baked parts (grains, bread, brick, ceramics, etc.)*

DON'T IMPROVISE!
CALL YOUR PERFORATED METAL EXPERT…

No matter what your perforated metal requirement is, don't improvise. Call your specialized manufacturer for help resolving your problem.

Call us, we'll perforate for you!
Telephones: 1.888.639.6382 or 1.210.804.2200

SECTION II. APPLICATIONS AND ADVANTAGES OF PERFORATED METAL

AGRICULTURAL INDUSTRY
- Silo Ventilation Systems
- Sifters and Tumblers
- Grain Separators

AUTOMOTIVE INDUSTRY
- Air and Oil Filters
- Radiator Grilles
- Mufflers
- Exhaust Pipes

ELECTRONICS INDUSTRY
- Decorative Grilles
- Speakers
- Conductor Panels
- Radios and Radar Equipment
- Lamp Screens

MINING INDUSTRY
- Conveyors
- Dust Extractors
- Vibrating Sieves
- Protective Guards
- Carbon Washers

FOOD PROCESSING INDUSTRY
- Shredders
- Coffee Bean Toasters
- Tea Separators
- Fruit Dryers and Presses
- Centrifuges

AERATION INDUSTRY
- Air Conditioners
- Ventilation Ducts
- Fan Guards
- Return Air Grilles

ACOUSTICS INDUSTRY
- Wall and Ceiling Panels
- Sound Deadening Equipment

INDUSTRIES WHICH TAKE ADVANTAGE OF THE FUNCIONALITY OF PERFORATED METAL

Industry	Design	EMI Shielding	Liquid Control	Gas Control	Filtration	Acoustics	Heat Dissipation
Aerospace		X		X		X	X
Agriculture				X	X		X
Domestic Appliances	X	X	X	X	X		X
Architectural	X			X		X	X
Automotive	X			X			X
IT	X	X					X
Construction	X			X		X	X
Electronics		X		X			X
Food Processing			X		X		X
Furniture	X					X	
HVAC				X			X
Lighting	X						
Marine			X	X	X		X
Medical		X		X			X
Mining					X		
Petrochemical			X	X			
POP Displays	X						
Security	X	X			X		
Telecommunications		X				X	

OTHER USES

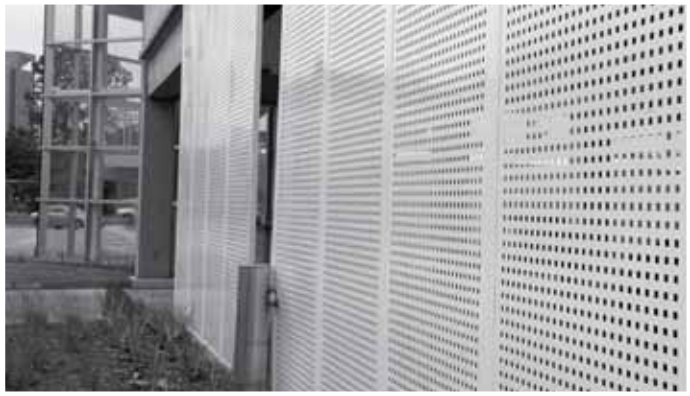
- *Baskets and Waste Receptacles*
- *Lockers*
- *Indoor and Outdoor Furniture*
- *Staircases*
- *Microwave Ovens*
- *Flooring*
- *Stage Scenery*
- *Washers & Dryers*
- *Computers*
- *Architectural Elements*
- *Refrigerators*

ADVANTAGES OF PERFORATED METAL

Perforated metal is superior in many applications where holes are required. Perforated allows for precise control of open areas that regulate the passage of sound, air, gases, liquids and solid particles.

Some of perforated metals' main advantages over other materials are:

- *Uniformity in hole size and spacing.*
- *Smooth, clean surface.*
- *Perforated metal is strong, resistant and does not stretch.*
- *Versatility of hole design: round, square, slots and decorative shapes.*
- *Controlled passage of sound, air, gas and liquids*
- *Radiation containment*
- *Filtration and classification*
- *Esthetic quality*
- *Structural strength*



SECTION III. THE PERFORATED PROCESS: BASIC CONCEPTS

The process of perforating metals can be performed with a variety of different types of presses (turret, all-across, sectional, CNC, etc.), each of which apply pressure with repetitive blows with punches that can create a variety of holes: rounds, squares, slots and decorative.

State of the art technology allows for continuous perforations with great precision. All-across or full-width perforating presses are the quickest and most efficient for producing continuous perforations in larger quantities. These presses can operate at variable speeds from 100 to 800 strokes per minute, punching hundreds of thousands of holes per minute with great precision and extremely tight tolerances. These presses can also be computer controlled to allow for solid margins on both sides of the sheet.

Turret and sectional presses, though they operate at slower speeds, offer some advantages as they permit versatility in allowing for perforating heavier gauge metals, short runs and special design perforated shapes, all with a lower tooling cost.

The most popular perforation design is by far the round hole: however, square, rectangular, slot and special design holes such as clovers, triangles, hexagons and combinations of these special shapes allow for a multitude of decorative patterns in the material.

The distribution of perforations can also vary according to the needs of the user. An infinite number of combinations of perforations, distribution of the perforated area and the distance between perforations can be designed. However, there are many industry standard patterns that offer the advantage of being readily available at an accessible cost. The most common distribution patterns are staggered (60° and 45°), diagonal and rectangular, as will be seen in greater detail later in this catalog.

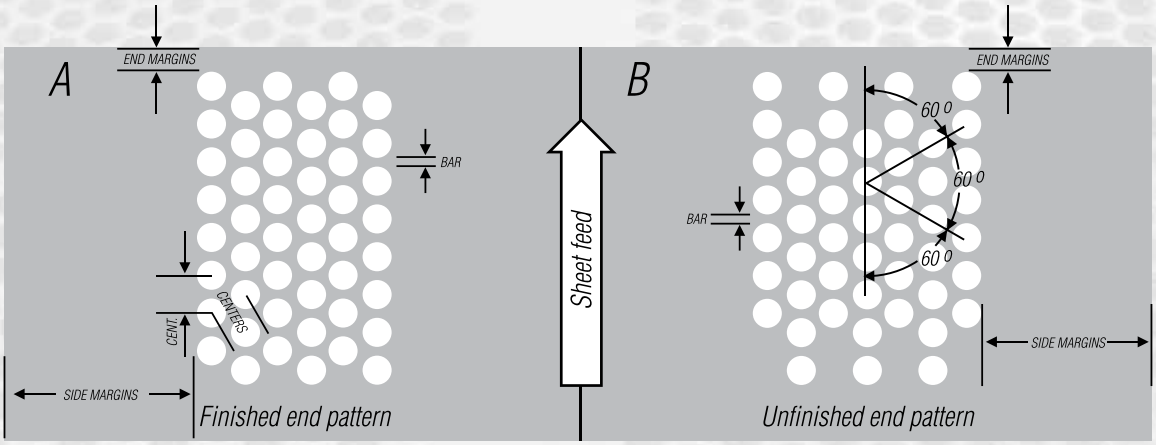
The spacing of perforations constitutes an additional parameter that must also be considered. The space left between perforations is known as the bar.

The open area that perforated metal offers is the result of the combination of the design of the perforation, the dimensions of the perforation (the diameter; or in the case of slots and squares, the length and width, etc.) and the distribution of the perforation.

The direction of pattern is yet another variable to consider when designing with perforated metal, something that is particularly critical when dealing with slots or rectangular perforations. Even though the straight row of holes is normally parallel to the long dimension of the sheet, that might not always be the case or meet the needs of the designer.

A final element for consideration is whether or not the perforated sheet is to have side and end margins. Several options are available, as shown in the following illustration:

PERFORATION END PATTERNS



SECTION IV. THE PERFORATED PROCESS II: TECHNICAL FACTORS

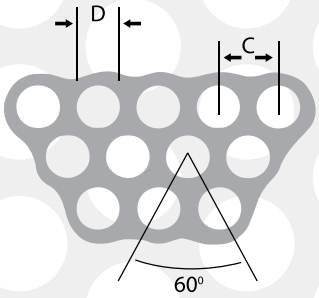
STANDARDS AND PRACTICES OF THE PERFORATED METAL INDUSTRY

ROUND PERFORATIONS

Round holes are the most popular shape in the perforated metal industry, representing 80% of products in the market. They are produced with the greatest efficiency, at a lower cost, with less expensive and more durable tooling and represent the strongest and most versatile of all perforation patterns.

There are three types of industry standard distribution patterns. 60° Staggered, 45° staggered and rectangular (90°) are shown below.

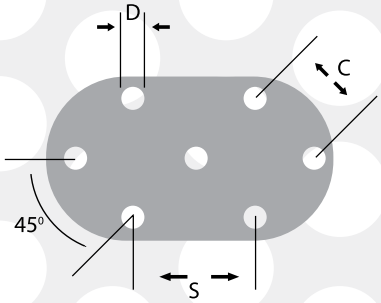
Round Hole 60° Staggered



% Open area calculation

$$\frac{D^2 \times 90.69}{C^2} = \%$$

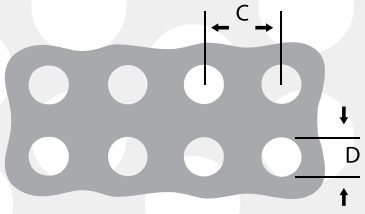
Round Hole 45° Staggered



% Open area calculation

$$\frac{157.08\ D^2}{S^2} = \%$$

Round Hole Rectangular Distribution



% Open area calculation

$$\frac{D^2 \times 78.54}{C^2} = \%$$

The 60° staggered pattern is the most popular distribution as it offers greater structural strength and has the most versatile range of open area.

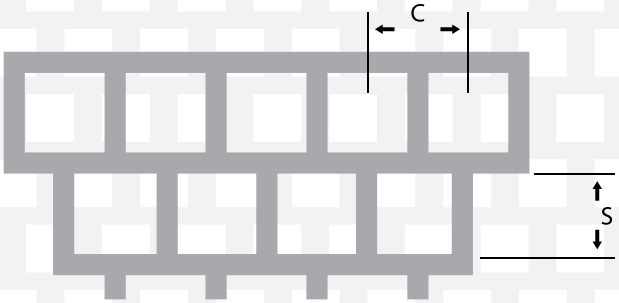
The distance between perforations is measured from center to center, as shown in the illustrations above.

SQUARE PERFORATIONS

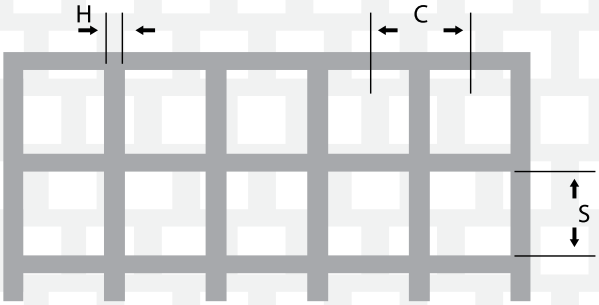
Squares are the simplest of all decorative design perforations. The advantages that square holes offer are excellent visibility, maximum open area for ventilation and excellent protection. Its most common use is in ventilation and protective guards. Square holes are offered in both staggered and square distributions.

Square perforations are weaker than rounds. The pronounced corners expose the punches to a greater degree of wear and breakage, causing production to be generally slower and more costly than for rounds.

Staggered Square Perforations



Rectangular Square Perforations



% Open area calculation

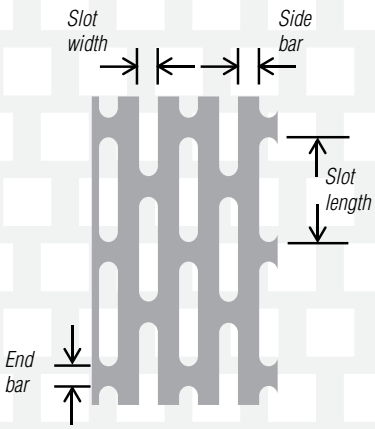
$$\frac{S^2 \times 100}{C^2} = \%$$

SLOTTED PERFORATIONS

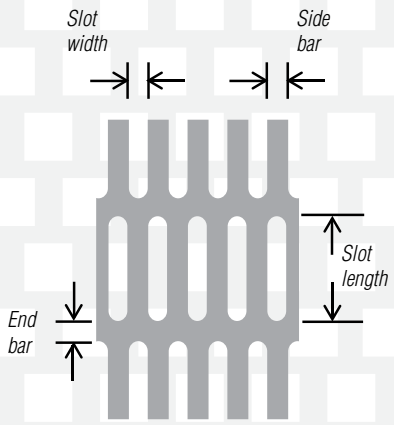
Slot perforations are also an industry standard design that is very useful in sorting and grading of solid objects, such as grains or minerals.

Slots are available as round end or square end. Either option is available in three possible distributions (Side Stagger, End Stagger or Rectangular (straight lines)), each of which can affect the application.

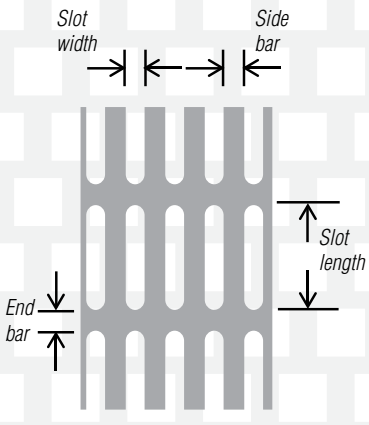
SLOTS
SIDE STAGGER



SLOTS
END STAGGER



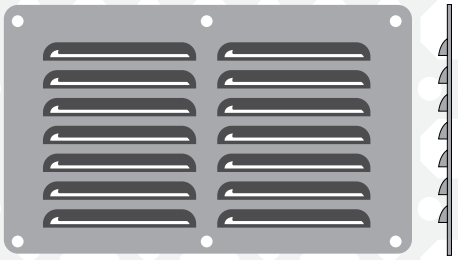
SLOTS
STRAIGHT LINES



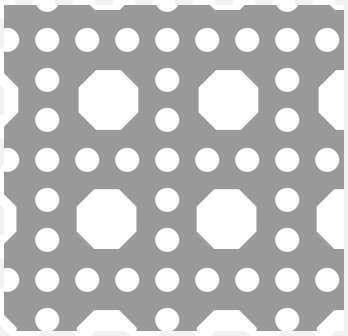
OTHER PERFORATED DESIGNS

Though some designs are not standard, a wide variety of hole shapes and decorative patterns are common among perforated metal consumers (see illustration below). As many of these patterns are made to order, please contact our Customer Service Department to discuss the best alternative for your particular requirement.

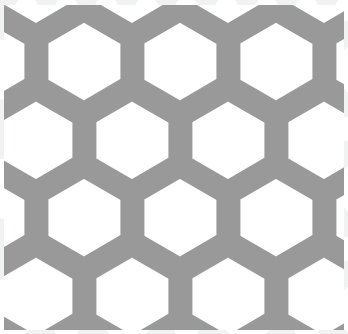
Louver



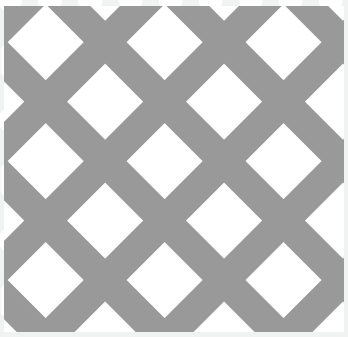
Cane



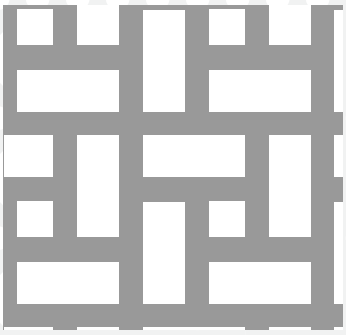
Hexagonal



Diagonal



Windmill



OPEN AREA

The percentage of open area is the most important characteristic of perforated metals and is the reason behind using perforated over a solid metal. Perforating is primarily to create open area in very specific forms and arrangements that permit the controlled flow of air, liquids, solids and sound. The percentage of open area is particularly important in applications that involve fluid flow, pressure drop, heat dissipation, acoustical absorption and reduction in component weight. The amout of open area can be precisely controlled to range from under 2% to 80%.

Another consideration is the fact that the removal of material in achieving open area necessarily reduces the strength and rigidity of the original sheet. The perforating process at the same time work hardens the remaining material. These factors should be considered when selecting the appropriate open area, along with the design, distribution and ideal dimension of the perforations for the specific application.

Don't improvise. For a greater assurance when designing a use for perforated metal, call our Customer Service Department. We will be happy to assist you determine which perforated product meets your requirements.

FACTORS THAT AFFECT QUALITY, COST AND DELIVERY

There are many factors that affect the perforated metal production process which can determine the quality, cost and lead-time of the finished product. The following is a list of the most important factors to consider when selecting a perforated metal product:

- *Type of material*
- *Material thickness*
- *Perforation design*
- *Dimensions of the perforation*
- *Distribution of the perforation*
- *Space between perforations*
- *Open Area*
- *Side and/or end margins*
- *Areas without perforations*
- *Tolerances*
- *Surface finish*
- *Degreasing requirements*
- *Packaging and labeling specifications*

It is worth mentioning again that there are industry standards for most of the above listed parameters that can save time and money. These standards should be adhered to whenever possible in order to best optimize the selection process. However, there always exists the option of made to order perforated designs.

CRITICAL FACTORS IN THE PERFORATED PROCESS

MINIMUM HOLE SIZE

The smallest hole size that is practical to be perforated depends on the thickness and type of material to be used. As a general rule for carbon steel and aluminum, the diameter of the hole should not be smaller than the thickness of the material. As the hole size approaches the thickness of the metal (1:1), the process becomes critical and tooling breakage and quality failures become more and more probable. In these situations, further production process precautions become necessary and as a result, the costs are increased.

MINIMUM BAR SIZE

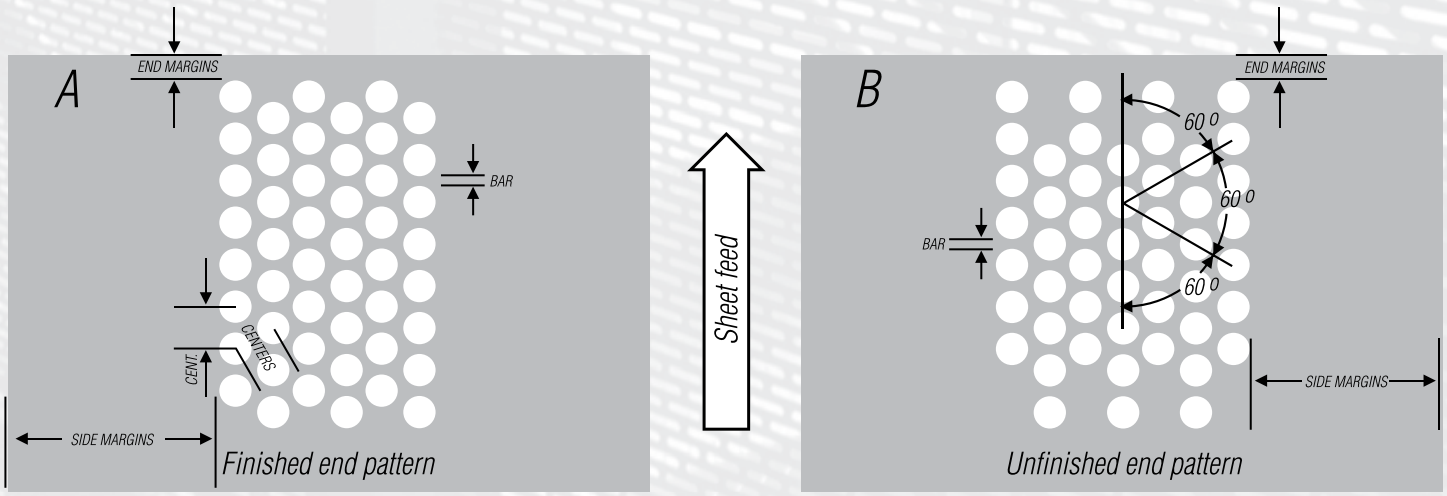
The same relationship exists between size of the bar or solid areas between holes and the thickness of the material being perforated. As this relationship reaches 1:1, the level of difficulty in producing a high quality product increases, as does the cost to do so. In order to avoid unnecessary additional cost and probable quality concerns, it is always best to maintain a bar size which is greater than the thickness of the material

DIRECTION OF PATTERN

For staggered perforations, both round and square, the direction of the stagger will normally be the short dimension of the sheet. The direction of the straight row of holes will run parallel to the long dimension of the sheet. For slotted perforations, in most cases the long dimension of the slots can be furnished parallel with either the width or length of the sheet.

MARGINS

While it is considered industry standard practice to produce perforated areas with unfinished ends when enclosed within margins, finished ends can be produced provided that the tool is capable of doing so. See diagram below:



SIDE MARGINS

Side margins are determined by the distance between the last perforation and the edge of the sheet. This margin creates a limit to the amount of stress caused by the perforation process that can be relieved from the finished sheet causing distortion in the metal. The greater the width of the margin, the greater the distortion there will be in the flatness of the sheet. For that reason, minimum side margins are always recommended.

Standard stock size sheets will be supplied with minimum or no end margins and minimum side margins.

STANDARDS AND TOLERANCES

As with any manufacturing process, the exact measurement of any of the parameters that determine specifications and quality of a sheet of perforated metal are subject to generally accepted industry standards and tolerances. The two international organizations that establish these standards and tolerances are the IPA (Industrial Perforators Association) for North America and EUROPERF (European Perforators Association) for Europe. Unless otherwise specified, all perforated metal products by NEW METALS, INC. adhere to IPA dimensions and tolerances.

The primary areas of concern in regards to tolerances as they relate to the manufacturing of perforated metal are listed below. For reasons of space, full tables are not shown here. For a greater degree of technical information, we recommend that you refer to The Designers, Specifiers and Buyers Handbook of Perforated Metals published by the IPA (Industrial Perforators Association) and developed in part by LAMINA DESPLEGADA, S. A. DE C. V., among others.

PARAMETERS WHERE TOLERANCES APPLY:

- *Standard Gauges*
- *Sheet Size (width and length)*
- *Squareness*
- *Size of the perforation*
- *Size of the bar*
- *Flatness*
- *Camber*
- *Margins*
- *Blank non-perforated areas*
- *Stretch*
- *Surface Distortion*
- *Burrs*

It should be noted that general tolerances apply only in the event that a specific criteria or tolerance is omitted in part or in full for a particular tolerance. It is always preferable to have a print approved by the customer that specifically states the tolerances critical to the customer. General tolerances are then only referred to when not included in the print.

SECTION V.
ADDITIONAL PROCESSES

Each day, customers are requiring more and more additional value-added finish work be performed by the perforated metal manufacturer. The majority of perforated metal parts being produced are being used as furniture, appliance or other types of components, all of which require further finishing for their final application.

Some of the additional processes offered by our company include:

- *Precision Leveling*
- *Shearing*
- *Slitting*
- *Resquaring*
- *Stamping*
- *Circle Shearing*
- *Painting*
- *Anodizing*
- *Chroming*
- *Forming*
- *Corrugating*
- *Rolling*
- *Welding*
- *Coating*
- *Bending*
- *Special Packaging*
- *Bar Coding*

SECTION VI.
HOW TO ORDER PERFORATED METAL

When ordering or quoting perforated metals, it is important to supply the manufacturer with a certain minimum of information. The following is intended to be a suggested checklist to minimize any possibility of mistakes that could create misunderstandings:

MATERIAL: The most commonly available materials include carbon steel, pre-galvanized steel, aluminum and stainless steel.

MATERIAL SPECIFICATION: Type or grade of steel (commercial, drawing or deep drawing quality). For pre-galvanized steel, state the minimum coating requirement (G90, G60, G40, etc.). For aluminum and stainless steel, the desired alloy must be provided.

GAUGE OR THICKNESS OF MATERIAL. At the end of this catalog you will find a table of standard gauge thickness equivalents.

DIMENSIONS OF THE SHEET OR COIL. It is important to include the dimensions of the product along with dimensional tolerances required.

SHAPE OF HOLE. Rounds, Squares, Slots, etc.

PATTERN OF PERFORATIONS: Staggered (60° or 45°) or Straight Line; For slots, Side Stagger or End Stagger.

SIZE OF THE HOLE. Specify size in inches or mm.

DISTANCE BETWEEN CENTERS. Specify spacing in inches or mm.

MARGINS. State side and end margin requirements.

DIRECTION OF THE PATTERN. This is of particular importance for slot perforations.

Open Area and/or Number of Perforations per Square Foot. In some cases this information is extremely relevent and must be included.

It is best to work with an approved print, which can be supplied by our design department if supplied with the complete information from the above checklist. It is important to include any and all critical tolerances that, if not specifically stated on the print, will conform to standard IPA tolerances.

NEW METALS INC.

QUOTATION REQUEST FORM

Date:	
Company:	
Requested by:	
Address:	
Telephone:	
e-mail:	
Destination:	
Intended use or application:	

Material:		
Gauge:		
Thickness:		
Dimentions:		Tolerances:
Width:		
Length:		
Type of perforation*:		

Hole characteristics and dimensions:

ROUND:

Distribution of perforations:	Staggered	Straight
Diameter of hole :		
Distance between centers:		
Open area:		
Holes per square inch :		

Margins:			Tolerances:
End:			
Side:			

Special instructions:

Oil/degrease:	
Packaging:	
Leveling:	
Resquared:	
Other:	

Note: All perforated metal products will be quoted per a preliminary drawing that clearly defines detailed specifications of the sheet.

COMMONLY USED TERMS

BAR: Solid area between perforations.

DISTANCE BETWEEN PERFORATIONS: The distance measured from the center of one hole to the center of the next hole.

OPEN AREA: Percentage of perforated area that allows for the passage of air, light, liquid or solids.

STAGGERED: Distribution of perforations in a triangular pattern, forming a 45° or 60° angle when joining three adjacent holes with a straight line.

END STAGGERED: Distribution of perforations (rectangular or slots) that alternate the ends of the perforated pattern in the form of a triangle.

SIDE STAGGERED: Distribution of perforations (rectangular or slots) that alternate the sides of the perforated pattern in the form of a triangle.

PERFORATIONS PER SQUARE INCH (PPSI) (Holes per Square Inch = HPSI): Total number of holes per square inch of surface area.

DIRECTION OF PATTERN: Orientation of the straight rows of holes in a perforated sheet in relation to length or width of the sheet.

END MARGINS: Non-perforated areas at the ends or short way of the sheet.

SIDE MARGINS: Non-perforated areas along the sides or long way of the sheet.

RE-SQUARING: Reshearing to eliminate camber, thereby improving squareness.

BLANK NON-PERFORATED AREAS: Areas without any holes that can be anywhere in the sheet.

FLATNESS: Degree of deviation that the perforated sheet has from a horizontal plane, measured at the highest point.

STRETCH: Degree of increase in length of the finished perforated part in relation to the length of the original blank sheet. Whether metal will stretch or not and to what extent as a result of the perforation process depends on the properties of the metal, its thickness, die design and hole size and spacing.

DISTORTION: Distortion of metals during the perforation process can take the form of loss of flatness, edge waviness, edge nonparallelism or oil canning of perforated areas surrounded by blank margins.

CAMBER: The lack of straightness of sides of the perforated metal sheet. Being most pronounced in coiled and long pieces, in most cases camber can be corrected during roller leveling or by slitting.

BURR: Burrs are the natural result of any metal punching operation. Eliminating burrs would require permanently sharp punches and perfect clearance between punches and holes in the female die.

TRADE PRACTICES

1. DESCRIPTION OF GOODS SOLD.
Perforated materials provided under this contract shall be in accordance with Seller's quoted specifications and/or drawings (specifications). The industry Perforating Standards and Practices provided for in "Designers, Specifiers and Buyers Handbook for Perforated Metals" © 1993 shall prevail unless specifically excluded or modified.

No changes may be made in the specifications after the acceptance date unless agreed to by Seller in writing. In the event any such changes are made, Seller may revise its price and delivery schedule accordingly.

2. UNITS OF WEIGHT AND MEASURE.
Any reference to units of weight or measure for perforated material shall apply after perforating.

3. PRE-PRODUCTION SAMPLES.
Prices stated shall not apply to any pre-production samples.

4. INSPECTION PROCEDURES.
Seller's prices are based on normal inspection and testing procedures as determined and performed by Seller.

5. PACKING.
Seller will pack all shipments in accordance with normal industry standard. Upon request, Seller will provide special packaging, but reserves the right to change its price and delivery schedules if such packaging requires additional risk, expense or time.

6. SALES, USE AND OTHER TAXES.
Buyer shall pay or reimburse Seller for any sales, use, excise, occupational, or other tax arising directly or indirectly from this sale transaction or the performance thereof, or from the use by any person of the perforated material sold, which Seller may be required to pay or collect, and any legal fees or other expenses incurred by Seller in connection therewith. Such taxes are not included in the quoted price.

7. OVER-RUNS AND UNDER-RUNS.
Where mill quantity is involved, the permissible mill quantity variation applies. In the case of coil, unless otherwise agreed upon, the quantity expressed in pounds or footage will be subject to published mill variations.

Where an exact quantity must be delivered this agreement must contain an explicit statement that the order is for an exact quantity and that mill and industry standards for variation do not apply.

8. TRANSPORTATION.
All prices and deliveries are F.O.B. Shipping Point and risk of loss shall pass to Buyer upon delivery to the carrier. Buyer shall specify type of carrier and routing. In the absence of such specifications, Seller will use its best judgment in selecting a carrier and shipping the goods, but shall not be liable for any delays or charges resulting from its selection.

9. ESCALATOR.
The purchase price specified shall be adjusted to include any net increases in Seller's material and labor costs occurring between the date of acceptance of this contract and the date of shipment. Seller shall maintain records of the material and labor costs for manufacturing the perforated materials and shall compute such costs upon the date of acceptance of this contract and the date of shipment in order to arrive at such adjustment to the purchase price.

10. PAYMENT TERMS.
Terms for payment and discount are specified in the sale documents. Any discount allowed applies only to the invoice value of the perforated material and not to any part of the transportation charges, taxes and/or other charges.

11. QUOTATIONS – ACCEPTANCES.
Quotations are effective for thirty days only from date of issuance and acceptance must be received by Seller in writing at its main office and no other acceptance, oral

or written, will be binding on Seller. Acceptance of this quotation is expressly limited to the Terms and Conditions of this quotation and the rights of the parties shall be governed exclusively by the Terms and Conditions hereof. If this quotation is accepted and Buyer's order form is used for the purpose, it is expressly understood and agreed that the Terms and Conditions herein shall prevail as the same may in any way conflict with the provisions set forth in such forms of the Buyer, and the issuance of such order form by Buyer shall be deemed to be Buyer's assent to the foregoing.

12. QUOTATIONS ON BUYER'S SPECIFICATIONS.
If quotation, or any part thereof, is made pursuant to drawings or blueprints furnished by the Buyer, Seller reserves the right to recheck quotation before accepting order at the quoted prices and to adjust prices in the case of any error.

13. BUYER'S CREDIT ON DEFAULT.
If, in the judgment of Seller, the financial condition of Buyer at any time does not justify initiation of continuance of production or shipment on the terms specified, Seller may require full or partial payment in advance.

14. DELAYS.
Seller shall not be liable for loss or damage due to delay in manufacture or delivery resulting from any cause beyond Seller's reasonable control, including, but not limited to, compliance with any regulations, order or instructions of any Federal, State or Municipal Government or any department or agency thereof, acts of God, acts or omissions of the Buyer, acts of civil or military authority, fires, strikes, factory shutdowns or alterations, embargoes, war, riot, delays in transportation or inability due to causes beyond the Seller's reasonable control to obtain necessary labor, manufacturing facilities or materials form the Seller's usual sources and any delays resulting from any such cause extends the delivery date accordingly. IN NO EVENT SHALL THE SELLER BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES FOR ANY DELAY FOR ANY CAUSE.

15. ERRORS IN WEIGHT OR NUMBER DELIVERED.
Seller shall have no liability for errors in weight or quantity delivered unless claim is made by Buyer within ten (10) days after receipt of shipment. If such timely claim is made by Buyer, Seller may either ship the quantity necessary to make good the deficiency or, at Seller's option, credit Buyer with the invoice price of the deficiency. This shall be Buyer's exclusive remedy for such errors.

16. PATENT INFRINGEMENT.
Buyer shall save the Seller harmless from all loss, damage or liability, including attorneys' fees, arising out of the manufacture by Seller for the Buyer of any patented device or a part thereof or on account of the use of such articles by Buyer, the patents for which Seller does not own or control.

17. GOVERNMENT PRICE CONTROLS.
Seller reserves the right to cancel orders in the event selling prices are established by government regulations which are lower than prices quoted.

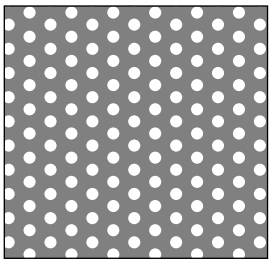
18. CORRECTION OF ERRORS.
Seller reserves the right to correct all typographical or clerical errors which may be present in the prices or specifications.

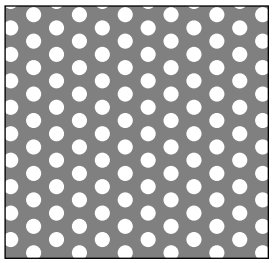
NEW METALS' PERFORATED PRODUCTS

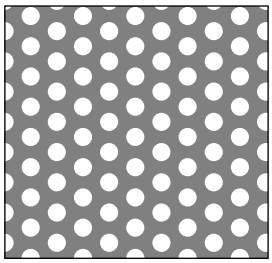
PERFORATED METAL SPECIFICATIONS

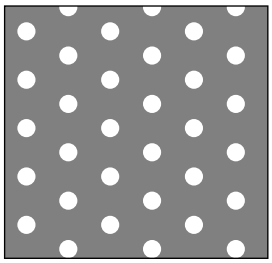
Catalog number	Perforation diameter		Distance between centers		Perforations per square inch	Open area %
	mm.	In.	mm.	In.		
E062/125	1.6	.062	3.2	.125	74	22
E078/137	2.0	.078	3.5	.137	62	29
E078/157	2.0	.078	4.0	.157	47	22
E093/157	2.4	.093	4.0	.157	47	32
E093/250	2.4	.093	6.4	.250	18	13
E098/157	2.5	.098	4.0	.157	47	35
E118/196	3.0	.118	5.0	.196	30	33
E125/187	3.2	.125	4.7	.187	33	41
E125/250	3.2	.125	6.4	.250	18	23
E157/187	4.0	.157	4.7	.187	23	64
E157/250	4.0	.157	6.4	.250	18	36
E187/250	4.7	.187	6.4	.250	18	51
E196/275	5.0	.196	7.0	.275	15	46
E196/314	5.0	.196	8.0	.314	12	35
E236/314	6.0	.236	8.0	.314	12	51
E236/354	6.0	.236	9.0	.354	9	40
E275/393	7.0	.275	10.0	.393	7	44
E314/393	8.0	.314	10.0	.393	7	58
E354/472	9.0	.354	12.0	.472	5	51
E375/500	9.5	.375	12.7	.500	5	51
E393/511	10.0	.393	13.0	.511	4	54
E472/629	12.0	.472	16.0	.629	3	51
E500/687	12.7	.500	17.4	.687	2	48
E750/1000	19.1	.750	25.4	1.000	1	51
E1000/1500	25.4	1.000	38.1	1.500	0.5	40

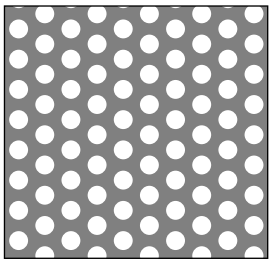
ROUND HOLES

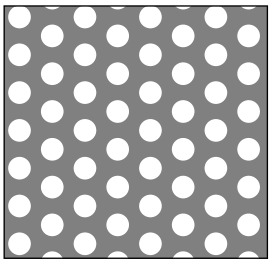

E062/125 22% open area

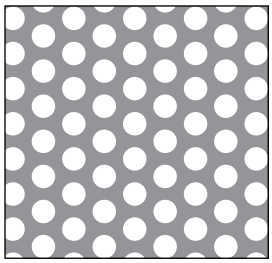

E078/137 29% open area

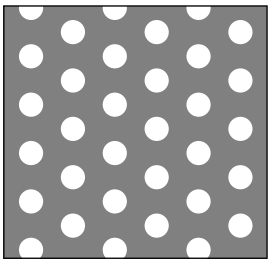

E093/157 32% open area

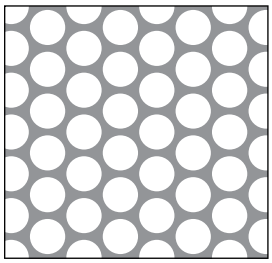

E093/250 13% open area

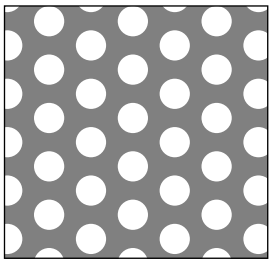

E098/157 35% open area

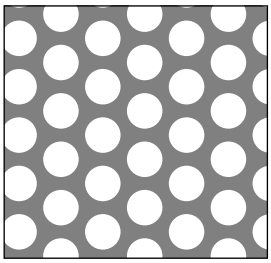

E118/196 33% open area

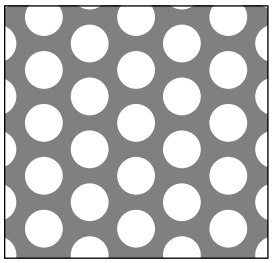

E125/187 41% open area

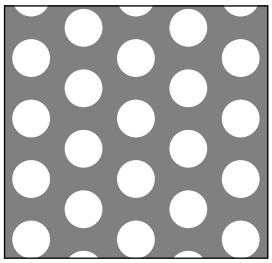

E125/250 23% open area

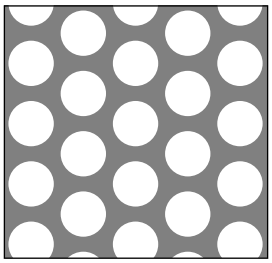

E157/187 64% open area

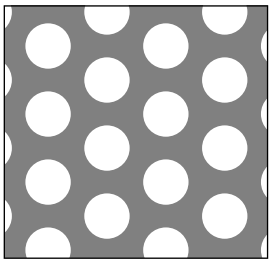

E157/250 36% open area

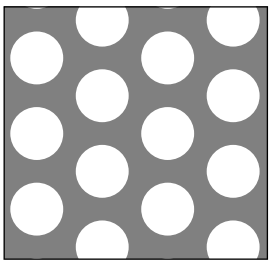

E187/250 51% open area

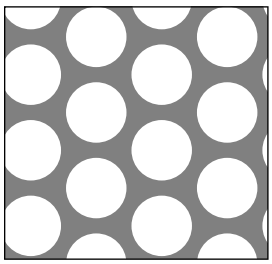

E196/275 46% open area

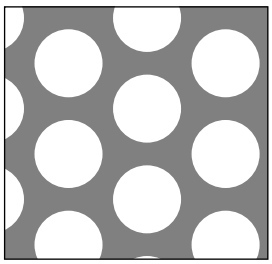

E196/314 35% open area

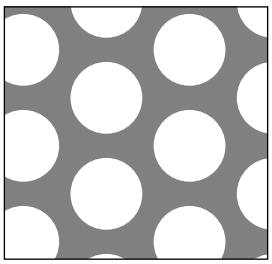

E236/314 51% open area

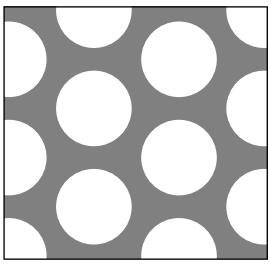

E236/354 40% open area

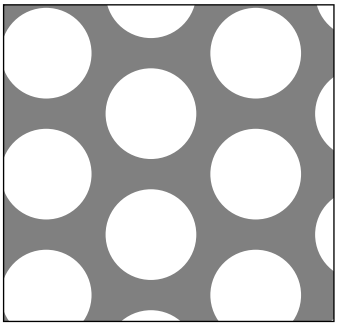

E275/393 44% open area

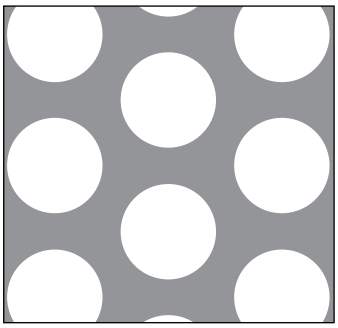

E314/393 58% open area

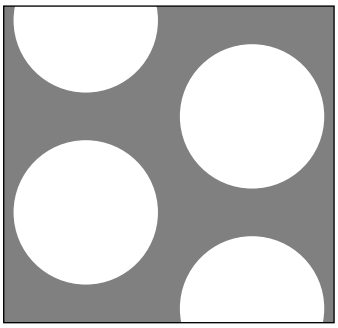

E354/472 51% open area

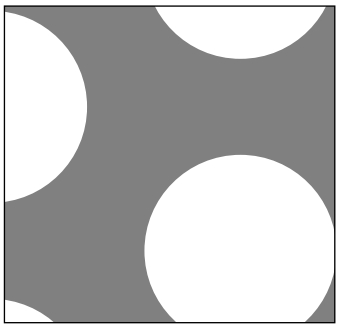

E375/500 51% open area


E393/511 54% open area

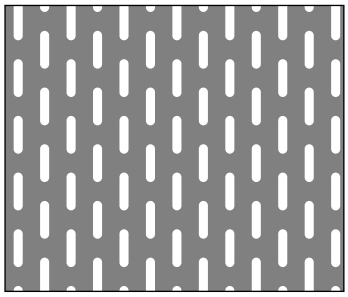

E472/629 51% open area


E500/687 48% open area

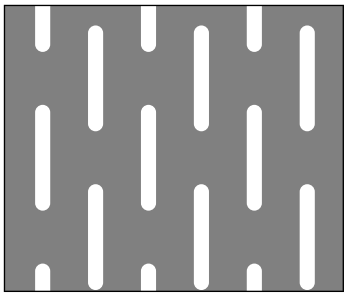

E750/1000 51% open area


E1000/1500 40% open area

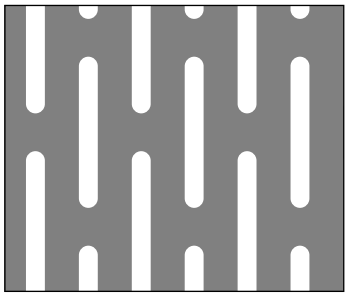
SLOTTED HOLES



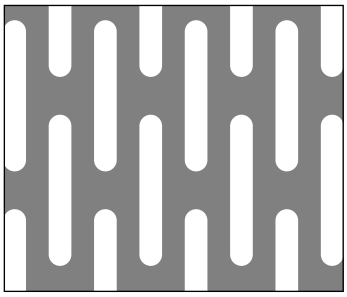
SS 1.2 x 5/7 x 7.5 22% open area



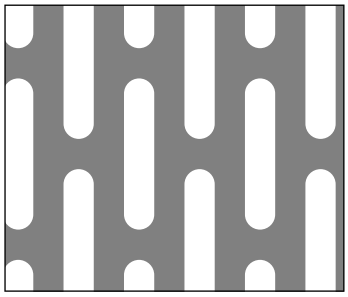
SS 2.0 x 14/14 x 21 18% open area



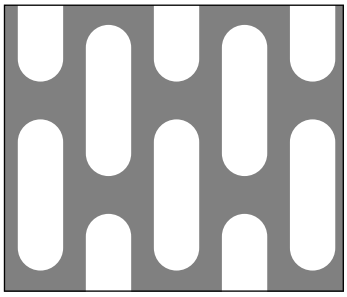
SS 2.5 x 20/14 x 25 28% open area



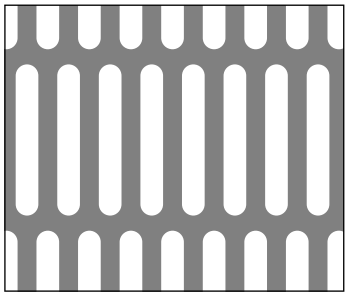
SS 3.0 x 20/12 x 25 40% open area



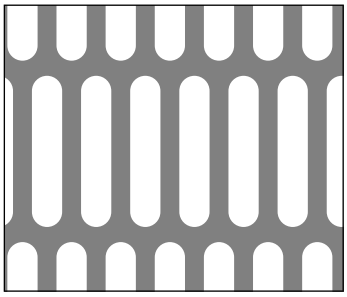
SS 4.0 x 20/16 x 24 40% open area



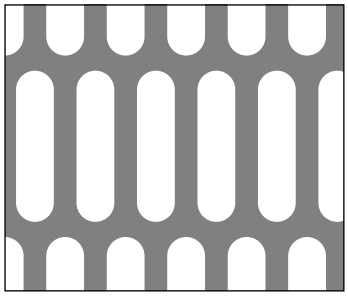
ES 6.0 x 20/18 x 25 50% open area



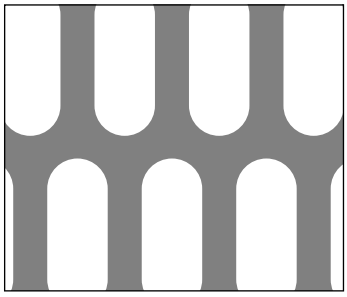
ES 3.0 x 20/11 x 44 24% open area



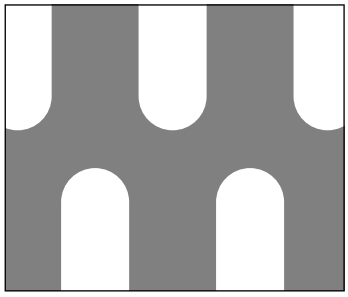
ES 4.0 x 20/13 x 44 27% open area



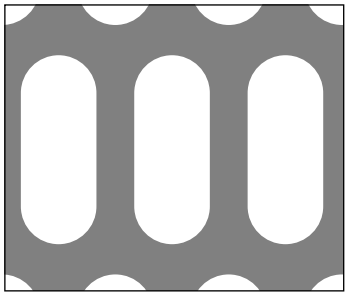
ES 5.0 x 20/16 x 44 28% open area



ES 8.0 x 20/25 x 46 28% open area



ES 9.0 x 30/41 x 70 18% open area



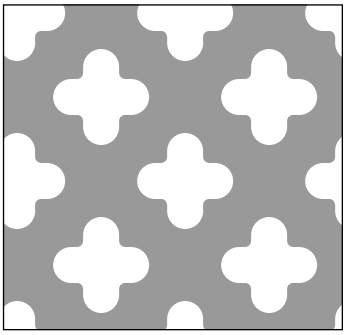
ES 10.0 x 25/30 x 58 26% open area

PRODUCT	SIZE OF PERFORATION		DISTANCE BETWEEN CENTERS		OPEN AREA %	PERFORATION PATTERN	STANDARD GAUGE
	Width "A" (mm.)	Length "B" (mm.)	"W" (mm.)	"Y" (mm.)			
SS 1.2 X 5/7 X 7.5	1.2	5	7	7.5	22	SS-LW	20
SS 2.0 X 14/14 X 21	2	14	14	21	18	SS-LW	14
SS 2.5 X 20/14 X 25	2.5	20	14	25	28	SS-LW	18
SS 3.0 X 20/12 X 25	3	20	12	25	40	SS-LW	20
SS 4.0 X 20/16 X 24	4	20	16	24	40	SS-LW	20
SS 6.0 x 20/18 x 25	6	20	18	25	50	SS-LW	22
ES 2.0 X 20/8 X 44	2	20	8	44	22	ES-NW	22
ES 3.0 X 20/11 X 44	3	20	11	44	24	ES-NW	22
ES 4.0 X 20/13 X 44	4	20	13	44	27	ES-NW	20
ES 5.0 X 20/16 X 44	5	20	16	44	28	ES-NW	22
ES 8.0 X 20/25 X 46	8	20	25	46	28	ES-NW	22
ES 9.0 X 30/41 X 70	9	30	41	70	18	ES-NW	22
ES 10.0 X 25/30 X 58	10	25	30	58	26	ES-NW	20

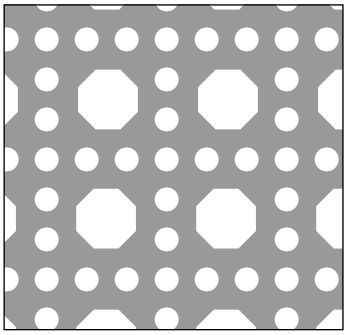
Nomenclature:
SS = Side Staggered
ES = End Staggered
LW = Holes run the long way of the sheet
NW = Holes run the narrow way of the sheet

Note: Please contact our service department for sizes and/or gauges not shown above

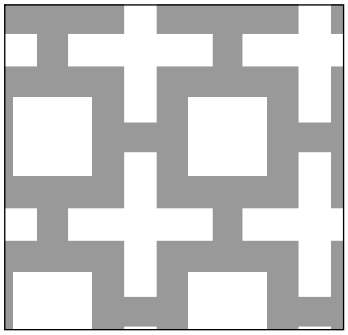
DECORATIVE HOLES



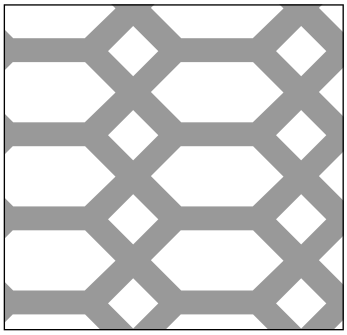
Trébol - PD 1001 *36% open area*



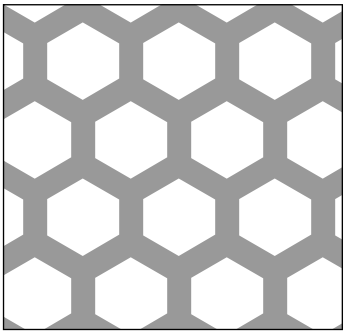
Bejuco - PD 1002 *30% open area*



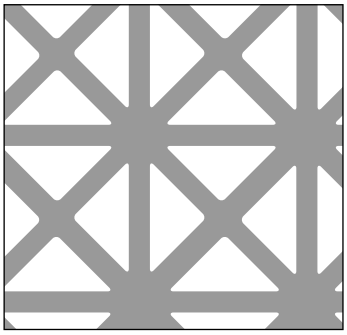
La Cruz - PD 1003 *41% open area*



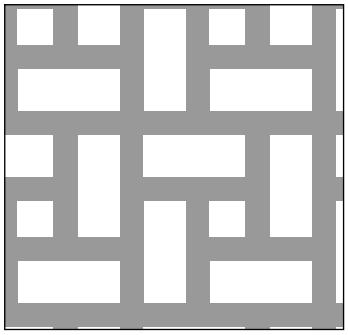
Arabesco - PD 1004 *53% open area*



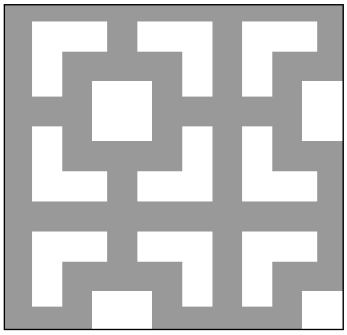
Hexagonal - PD 1005 *54% open area*



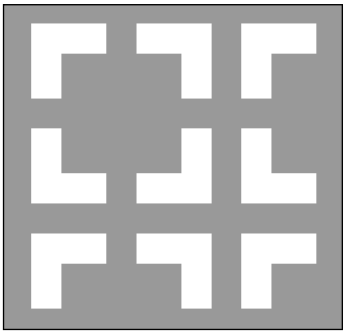
Maltés - PD 1006 *42% open area*



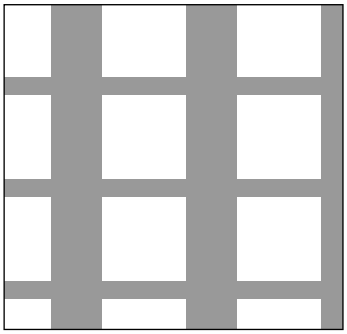
Molino - PD 1007 *50% open area*



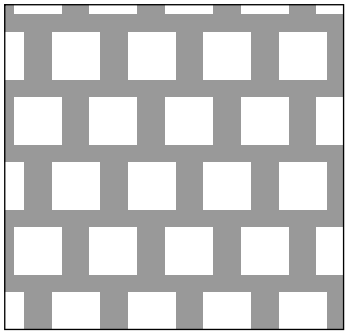
Cadena - PD 1008 *37% open area*



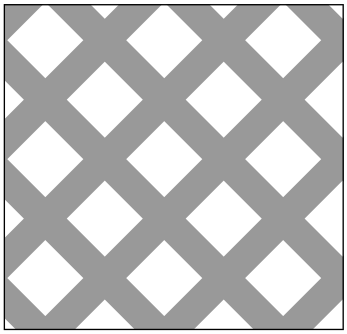
Plaza - PD 1009 *29% open area*



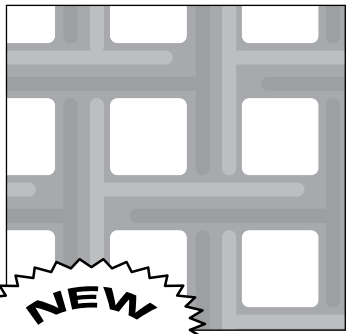
Cuadrado 12 - PD 1010 *42% open area*



Cuadrado 18 - PD 1011 *45% open area*



Diamante - PD 1012 *40% open area*



NEW

Weave 10 - PD 1013 *30% open area*

COMMONLY USED TABLES IN THE PERFORATED METAL INDUSTRY

ROUND HOLES

IPA Numbers	Perforations	Centers	Holes per sq. in.	Open area	Line
100	.020"	-	625	20%	Staggered
101	.023"	-	576	24%	Straight
102	.027"	-	400	23%	Straight
103	.032"	-	324	26%	Straight
104	.040"	-	225	30%	Straight
105	0045"	-	224	37%	Straight
106	1/16"	1/8"	-	23%	Staggered
107	5/64"	7/64"	-	41%	Staggered
108	5/64"	1/8"	-	36%	Staggered
109	3/32"	4/32"	-	32%	Staggered
110	3/32"	3/16"	-	23%	Staggered
111	3/32"	1/4"	-	12%	Staggered
112	1/10"	5/32"	-	36%	Staggered
113	1/8"	3/16"	-	40%	Staggered
114	1/8"	7/32"	-	29%	Staggered
115	1/8"	1/4"	-	23%	Staggered
116	5/32"	7/32"	-	46%	Staggered
117	2/32"	1/4"	-	36%	Staggered
118	3/16"	1/4"	-	51%	Staggered
119	3/16"	5/16"	-	33%	Staggered
120	1/4"	5/16"	-	58%	Staggered
121	1/4"	3/8"	-	40%	Staggered
122	1/4"	7/16"	-	30%	Staggered
123	1/4"	1/2"	-	23%	Staggered
124	3/8"	1/2"	-	51%	Staggered
125	3/8"	9/16"	-	40%	Staggered
126	3/8"	5/8"	-	33%	Staggered
127	7/16"	5/8"	-	45%	Staggered
128	1/2"	11/16"	-	47%	Staggered
129	9/16"	3/4"	-	51%	Staggered
130	5/8"	13/16"	-	53%	Staggered
131	3/4"	1"	-	51%	Staggered

SQUARES

IPA Numbers	Perforations	Centers	Holes per sq. in.	Open area	Line
200	2/10"	1/4"	-	64%	Straight
201	1/4"	3/8"	-		Straight
202	3/8"	1/2"	-	56%	Straight
203	1/2"	11/16"	-	53%	Straight
204	3/4"	1"	-	56%	Straight
205	1"	1-1/4"	-		Straight
206	1"	1-3/8"	-		Straight

SLOTS

IPA Numbers	Perforations	Centers	Holes per sq. in.	Open	Line
207	1/8"	3/4"	-	area	Side Staggered
208	1/8"	1"	-	43%	Side Staggered

TABLE OF GAUGES AND WEIGHTS

The weights and sizes are calculated according to standard commercial tolerances.

Gauge	Steel		Galv Steel		Long Terne		Stainless			Aluminum	
	USS Gauge		USS Gauge		USS Gauge		USS Gauge			USS Gauge	
	In.	Lbs. per sq. ft.	In.	Lbs. per sq. ft.	In.	Lbs. per sq. ft.	In.	Chrome alloy (lbs per sq. ft.)	Chrome nickel (lbs. per sq. ft.)	In.	Lbs. per sq. ft.
32	.0100	-	.0130	.563	-	-	.0100	.415	.427	.008	.115
31	.0110	-	.0140	.594	-	-	.0109	.450	.459	.009	.130
30	.0120	.500	.0157	.656	.012	.518	.0125	.515	.525	.010	.144
29	.0135	.563	.0172	.719	.014	.581	.0140	.579	.591	.011	.158
28	.0149	.625	.0187	.781	.015	.643	.0156	.643	.656	.012	.173
27	.0164	.688	.0202	.844	.017	.706	.0171	.706	.721	.014	.202
26	.0179	.750	.0217	.906	.018	.766	.0187	.772	.787	.015	.230
25	.0209	.875	.0247	1.031	.021	.893	.0218	.901	.918	.018	.259
24	.0239	1.000	.0278	1.158	.024	1.018	.0250	1.030	1.050	.020	.296
23	.0269	1.125	.0308	1.281	.027	1.143	.0281	1.158	1.181	.022	.331
22	.0299	1.250	.0336	1.406	.030	1.268	.0312	1.287	1.312	.025	.360
21	.0329	1.373	.0366	1.531	.033	1.393	.0343	1.416	1.443	.028	.403
20	.0359	1.500	.0396	1.656	.038	1.518	.0375	1.545	1.575	.032	.461
19	.0418	1.750	.0450	1.906	.042	1.768	.0437	1.802	1.837	.036	.518
18	.0478	2.000	.0516	2.156	.048	2.016	.0500	2.060	2.100	.040	.576
17	.0538	2.250	.0575	2.406	.054	2.266	.0562	2.317	2.362	.045	.648
16	.0598	2.500	.0635	2.558	.060	2.518	.0625	2.575	2.625	.050	.734
15	.0673	2.812	.0710	2.969	.068	2.831	.0703	2.898	2.953	.056	.821
14	.0747	3.125	.0785	3.261	.075	3.143	.0761	3.218	3.281	.063	.992
13	.0897	3.750	.0934	3.905	.090	3.768	.0937	3.882	3.937	.071	1.040
12	.1046	4.375	.1064	4.531	.105	4.393	.1092	4.506	4.593	.080	1.170
11	.1156	5.000	.1233	5.156	.120	5.018	.1250	5.150	5.250	.090	1.310
10	.1345	5.625	.1382	5.781	.135	5.643	.1406	5.793	5.906	.100	1.470
9	.1494	6.250	.1532	6.400	-	-	.1562	6.437	6.562	.112	1.640
8	.1644	6.875	.1691	7.031	-	-	.1718	7.081	7.216	.125	1.760
7	.1783	7.500	-	-	-	-	.1875	7.590	7.752	.140	1.980

METRIC TO ENGLISH CONVERSION TABLE

** Approximate equivalents*

millimeters (mm) to inches (in)	Multiply by	0.04
centimeters (cm) to inches (in)	Multiply by	0.4
meters (m) to feet (ft)	Multiply by	3.3
meters (m) to yards (yd)	Multiply by	1.1
kilometers (km) to miles (mi)	Multiply by	0.6
SURFACE MEASUREMENTS:		
square centimeters (cm^2) to square inches (in^2)	Multiply by	0.16
square meters (m^2) to square yards (yd^2)	Multiply by	1.2
square kilometers (km^2) to square miles (mi^2)	Multiply by	0.4
hectares (ha) (10,000 m^2) to acres	Multiply by	2.5
MASS MEASUREMENTS:		
grams (g) to ounces (oz)	Multiply by	0.035
kilograms (kg) to Lbs.	Multiply by	2.2
metric tons (t) (1,000 kg) to short tons	Multiply by	1.1
VOLUME MEASUREMENTS:		
milliliters (ml) to fl. ounces (fl oz)	Multiply by	0.03
milliliters (ml) to cubic inches (in^3)	Multiply by	0.06
liters (L) to pints (pt)	Multiply by	2.1
liters (L) to quarts (qt)	Multiply by	1.06
liters (L) to gallons (gal)	Multiply by	0.26
cubic meters (m^3) to cubic feet (ft^3)	Multiply by	35.0
cubic meters (m^3) to cubic yards (yd^3)	Multiply by	1.3

CONVERSIONS OF FRACTIONS OF AN INCH TO DECIMAL AND MILLIMETER EQUIVALENTS

Inches		mm.	Inches		mm.	Inches		mm.
1/64	.015625	.397	23/64	.359375	9.128	45/64	.703125	17.859
1/32	.03125	.794	3/8	.375	9.525	23/32	.71875	18.256
3/64	.046875	1.191	25/64	.390625	9.922	47/64	.734375	18.653
1/16	.0625	1.588	13/32	.40625	10.319	3/4	.750	19.050
5/64	.078125	1.984	27/64	.421875	10.716	49/64	.765625	19.447
3/32	.09375	2.381	7/16	.4375	11.113	25/32	.78125	19.844
7/64	.109375	2.778	29/64	.453125	11.509	51/64	.796875	20.241
1/8	.125	3.175	15/32	.46875	11.906	13/16	.8125	20.638
9/64	.140625	3.572	31/64	.484375	12.303	53/64	.828125	21.034
2/32	.15825	3.969	1/2	.500	12.700	27/32	.84375	21.431
11/64	.171875	4.366	33/64	.515625	13.097	55/64	.859375	21.828
3/16	.1875	4.763	17/32	.53125	13.494	7/8	.875	22.225
13/64	.203125	5.159	35/64	.546875	13.891	57/64	.890625	22.622
7/32	.21875	5.556	9/16	.5625	14.288	29/32	.90625	23.019
15/64	.234375	5.953	37/64	.578125	14.664	59/64	.921875	23.416
1/4	.250	6.350	19/32	.69375	15.081	15/16	.9375	23.813
17/64	.265625	6.747	39/64	.609375	15.478	61/64	.953125	24.209
9/32	.28125	7.144	5/8	.625	15.875	31/32	.96875	24.606
19/64	.296875	7.540	41/64	.640625	16.272	63/64	.984375	25.003
5/16	.3125	7.938	21/32	.65625	16.669	1	1.0000	25.400
21/64	.328125	8.334	43/64	.671875	.17.066	-	-	-
11/32	.34375	8.731	11/16	.6875	17.463	-	-	-

COMMON METRIC EQUIVALENTS

APROXIMATE EQUIVALENTS		ACCURATE CONVERSIONS
1 inch	25 millimeters	25.4 millimeters
1 foot	0.3 meter	0.3048 meters
1 yard	0.9 meter	0.9144 meters
1 mile	1.6 kilometers	1.60934 kilometers
1 square inch	6.5 square centimeters	6.4516 sq. centimeters
1 square foot	0.09 square meter	0.092903 square meters
1 square yard	0.8 square meter	0.836127 square meters
1 acre	0.4 hectare	0.404686 hectare
1 cubic inch	16 cubic centimeters	16.3871 cubic centimeters
1 cubic foot	0.30 cubic meter	0.028316 cubic meters
1 cubic yard	0.8 cubic meter	0.764555 cubic meters
1 quart (lq.)	1 liter	0.946353 liters
1 gallon	0.004 cubic meter	0.00378541 cubic meters
1 ounce (avdp.)	28 grams	28.349 grams
1 pound (avdp.)	0.45 kilograms	0.453592 kilograms
1 horsepower	0.75 kilowatt	0.745700 kilowatts
1 milimeter	0.04 inch	0.039370 inches
1 meter	3.3 feet	3.28084 feet
1 meter	1.1 yards	1.09361 yards
1 kilometer	0.6 mile	0.621371 miles
1 square centimeter	0.16 square inch	0.155 square inches
1 square meter	11 squera feet	10.7639 square feet
1 square meter	1.2 square yards	1.19599 square yards
1 hectare	2.5 acres	2.47106 acres
1 cubic centimeter	0.06 cubic inch	0.061023 cubic inches
1 cubic meter	35 cubic feet	35.3147 cubic feet
1 cubic meter	1.3 cubic yards	1.30795 cubic yards
1 liter	1 quart (lq.)	1.05669 quarts (lq.)
1 cubic meter	250 gallons	264.172 gallons
1 gram	0.035 ounces (avdp.)	0.035274 ounces (avdp.)
1 kilogram	2.2 pounds (avdp.)	2.20462 pounds (avdp.)
1 kilowatt	1.3 horsepower	1.34102 horsepower

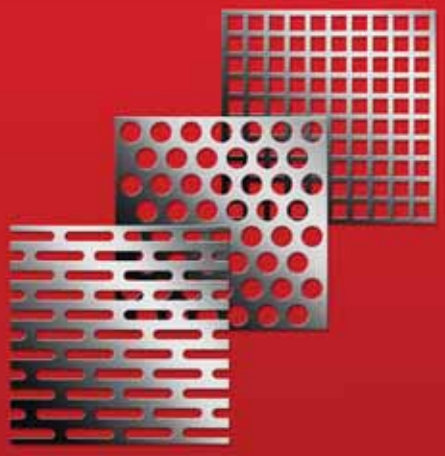
AREAS OF SQUARES AND CIRCLES

Circumferences of Circles
Sizes 1/64 to 2 inches

Dimensions in inches		Area of square	Area of circle	Circumference of circles	Dimensions in inches		Area of square	Area of circle	Circumference of circles
Fraction	Decimal				Fraction	Decimal			
1/64	.015625	.000244	.00019	.04909	49/64	.765625	.58618	.46038	2.4053
1/32	.03125	.000977	.00077	.09618	25/32	.78125	.61035	47937	2.4544
1/16	.0625	.003906	.00307	.19635	13/16	.8125	.66016	.51849	2.5525
3/32	.09375	.008789	.00690	.29452	27/32	.84375	.71191	.55914	2.6507
1/8	.125	.01563	.01227	.39270	7/8	.875	.76563	.60132	2.7489
5/32	.15625	.02441	.01917	.49087	29/32	.90625	.82129	.64504	2.8471
3/16	.1875	.03516	.02761	.58905	15/16	.9375	.87691	.69029	2.9452
7/32	.21875	.04785	.03758	.68722	31/32	.96875	.93848	.73708	3.0434
1/4	.250	.0625	.04909	.78540	1	1.00	1.00	.7854	3.1416
9/32	.28125	.07910	.06213	.88357	1-1/32	1.03125	1.0635	.8353	3.2398
5/16	.3125	.09766	.07670	.98175	1-1/16	1.0625	1.1289	.8866	3.3380
11/32	.34375	.11816	.09281	1.0799	1-3/32	1.09375	1.1963	.9396	3.4361
3/8	.375	.14063	.11045	1.1781	1-1/8	1.125	1.2656	.9940	3.5343
13/32	.40625	.16504	.12962	1.2763	1-5/32	1.15625	1.3369	1.0500	3.6325
7/16	.4375	.19141	.15033	1.3744	1-3/16	1.1875	1.4102	1.1075	3.7307
15/32	.46875	.21973	.17257	1.4726	1-7/32	1.21875	1.4854	1.1666	3.8288
1/2	.500	.2500	.19635	1.5708	1-1/4	1.250	1.5625	1.2272	3.9270
17/32	.53125	.28223	.22165	1.6690	1-3/8	1.375	1.8906	1.4849	4.3197
9/16	.5625	.31641	.24850	.1.7671	1-1/2	1.500	2.2500	1.7672	4.7124
19/32	.59375	.35254	.27688	1.8653	1-5/8	1.625	2.6406	2.0739	5.1051
5/8	.625	.39063	.30680	1.9635	1-3/4	1.750	3.0625	2.4053	5.4978
21/32	.65825	.43066	.33824	2.0617	1-7/8	1.875	3.5156	2.7612	5.8905
11/16	.6875	.47266	.37122	2.1598	2	2.000	4.000	3.1416	6.2832
23/32	.71875	.51660	.40574	2.2580					
3/4	.750	.56250	.44179	2.3562					

USEFUL INFORMATION

Circumference of a circle	Diameter x 3.1416
Diameter of a circle	Circumference x 0.31931
Area of a circle	Diameter^2 x 0.7854
Doubling the diameter of a circle increases its area four times	
Area of a triangle	Base x 1/2 of perpendicular height
Area of ellipse	Products of both diameters x 0.7854
Area of a parallelogram	Base x altitude
Side of inscribed square	Diameter x 0.7071 or circumference x 0.2251 or circumference / 4.4428
Side of inscribed cube	Radius of sphere x 1.1547
Side of a square of equal area to a circle	Diameter x 0.8862
A side of a square x 1.4142	Diameter of its circumscribing circle
A side of a square x 4.443	Circumference of its circumscribing circle
A side of a square x 1.128	Diameter of an equal circle
A side of a square x 3.547	Circumference of an equal circle
Cubic inches in a ball	Cube diameter x 0.5236
Cubic contents of a cone	Area of base x 1/3 the altitude
Doubling the diameter of a pipe increases its capacity four times	
A gallon of water (U.S. Standard) weighs 8 1/2 lbs. and contains 231 cubic inches	
A cubic foot of water contains 7 1/2 gallons. 1728 cubic inches and weighs 62 1/1 lbs	
Pressure in pounds per square inch of a column of water=height of the column in feet X .434	
The capacity of a cylindrical tank in U.S. gallons=diameter^2 (inches) X length (inches) X .0034	



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