



PERFORATING COMPANIES

PRODUCT CATALOG



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Product Catalog



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Table of Contents

<i>About This Catalog</i>	3
<i>Guidelines for Ordering Perforated Materials</i>	4-5
<i>Perforated Patterns – Hole Type & Spacing</i>	6-7
<i>Examples of End Patterns</i>	8-9
<i>Examples of Hole Arrangements</i>	10
<i>Required Order/Inquiry Information</i>	11
<i>Industrial Perforators' Association Trade Practices</i>	12-16
<i>Offices & Stocking Warehouses</i>	17
<i>In-stock Sheets & Coils</i>	19-28
<i>Custom Design Perforating</i>	29-38
<i>Round Patterns</i>	39-82
<i>Square Patterns</i>	83-90
<i>Slot/Oblong Patterns</i>	91-116
<i>Triangle/Indented/Stabbed Hole/Lip Slot Patterns</i>	117-126
<i>Decorative/Architectural Patterns</i>	127-148
<i>Aggregate/Screen Plate Patterns</i>	149-152
<i>Technical Data</i>	153-174

About This Catalog

In these pages, you'll find a broad range of perforated patterns available from Harrington & King. Each is shown ACTUAL SIZE to help you select the perforation best suited for your application.

There are three ways to order quality H&K perforating:

1) In-Stock Sheets and Coils



Many items in this catalog are marked with an "IN STOCK" symbol. These patterns are normally warehoused around the country in various sheet sizes, gauges and materials for immediate shipment.

Please refer to the "In Stock" section of this catalog for more information. Or contact us at www.hkperf.com for a free copy of our complete *Holes In A Hurry* stock catalog.

2) Standard Run-to-Order Sheets and Coils

This is an economical way to get the versatility of custom perforating without the expense of custom dies.

The patterns in this catalog can be perforated in your choice of material and a variety of gauges. The illustrated patterns are those for which we have production dies and for which there will usually be no tooling charge. We've also included listings of some of the non-illustrated patterns available from our thousands of dies.

In any case, if you don't find the pattern you need, we can create any special tooling needed to meet your requirements.

3) Custom Design Perforating

There's virtually no limit to the designs H&K can perforate for you — curved patterns, parts with irregular hole spacing, intermittent solid areas, decorative effects and much more. H&K will work with you to produce the proper tooling to fit your needs. Even if your design is non-standard, in most cases, we could use one of our existing dies and make a few minor changes to give you solid, unperforated areas around or within the main perforated pattern; distinctive designs, perforated within an otherwise solid area; or perforations in a specific irregular pattern — all for little or no additional tooling cost.

For highly complex patterns, prototypes, or especially thick materials, Harrington & King has installed two of the world's largest, computerized, sectional perforating presses. It enables us to produce your parts more accurately and economically than other methods.

Please refer to the "Custom Design Perforating" section of this catalog for more information. Or contact us at www.hkperf.com for a free copy of our *Custom Design Perforating* brochure.



Guidelines for Ordering Perforated Materials

For a faster quotation or processing of your order, please provide all of the following information. We include some points for you to remember that will help you define your specifications. Feel free to contact us to answer questions or to help select the proper pattern.

- MATERIAL** — State the kind of metal or plastic required.
 - State type, thickness or gauge and temper/alloy of material. Specify thickness in gauge numbers or in decimal inches.
- QUANTITY** — State the number of perforated pieces, blanks, full sheets, or linear feet of coil required.
- SHEET SIZE** — Width and length. Unless otherwise specified, the length will be the long dimension of the sheet.
- HOLE SPECS** — Specify the size of holes in inches. Hole dimensions should be greater than or equal to the sheet thickness. The higher the hole to sheet thickness ratio, the better.
 - Shape of holes. Note the various types on the following pages.
 - Arrangement of holes or pattern of perforation. Specify “staggered” or “straight line.” Normally, the straight row of a staggered pattern will run the long dimension of the sheet.
 - Spacing of holes as described in the following pages is standard.
- BRIDGE SIZE** — The bridge between the holes should normally be greater than the sheet thickness.
- OPEN AREA** — To minimize possible distortion, reduce open area.
- SLOTTED PERFORATION** — State whether the long dimension of the slot is parallel to the long or the short dimension of the sheet or plate.
- MARGINS** — If margins are not important, specify “minimum” or “no margins.” If margins are desired, state the margin required for each of the four sides of the sheet. Margins generally increase your costs. The wider the margin, the greater the distortion possibility.
- FLATNESS** — Industrial Perforator’s standard unless specified. See following information on flatness.
- FORMING** — Perforated materials cannot be drawn as deeply or formed as severely as unperforated materials. Please consult us if your parts are to be formed.
- END USE** — State how the product will be used. Make a sketch or send a sample if in doubt.

FLATNESS OF SHEETS AND PLATES

In the majority of requirements, perforated sheets can be furnished to AISI flatness tolerances. Before ordering any of the following special requirements, discuss them with our Engineering Department.

1. Perforated sheets with extra wide margins.
2. Blank areas required within the perforated areas.
3. Perforated sheets with very large percentage of open area.
4. Heavy gauge metal in relation to the size of the perforation.
5. Special alloys.
6. Stretcher leveled sheets.

PACKAGING AND SHIPPING

H&K's products are packaged to prevent damage during shipment. Depending on how susceptible it is to damage, packaging varies based on the size, shape and quantity of the product. Typical packaging for sheets is either skids or crates with water resistant paper, cardboard edging and banding in both directions. Skids will not normally exceed 5,000 pounds. Skids and crates typically packaged for van unloading. Coils are packaged on skids either with the "eye to the side" or "eye to the sky." If you require a flatbed or anything other than H&K standard packaging, please confirm this with your H&K contact. Anything outside of standard packaging may increase costs. Standard packaging includes customer name, part description, quantity, customer purchase order number, and H&K order number. Common freight terms are F.O.B. origin collect, F.O.B. origin pre-paid and add, and F.O.B. origin freight allowed.

Using many of the standard patterns shown in this catalog, we can give you solid, unperforated areas around or within the main perforated pattern; distinctive designs perforated within an otherwise solid area; or perforations in a specific, irregular pattern.

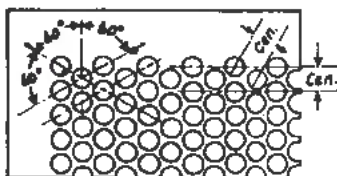
Please refer to the "Custom Design Perforating" section of this catalog for more information, or contact us at www.hkperf.com for a free copy of our Custom Design Perforating brochure.



Perforated Patterns — Hole Type & Spacing

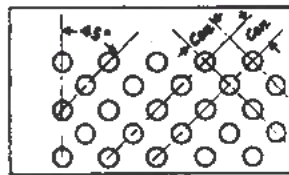
STAGGERED arrangement for round holes. Note that the holes are offset on 60° angles which makes all the bridges the same width. This provides maximum strength and uniform wear.

Round Holes - Staggered



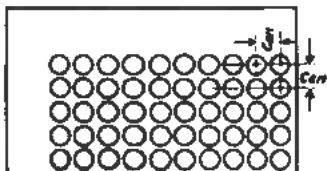
DIAGONAL arrangement for round holes. This arrangement is also referred to as 45° pitch, offset rows, symmetrically. For screening purposes, it is not as efficient as the offset arrangement shown at left because the bridges are not of uniform width.

Round Holes - Diagonal



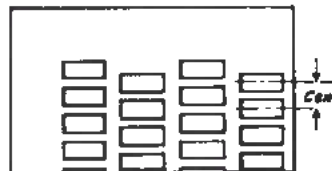
STRAIGHT arrangement for round holes. It is not generally used for screening purposes except for very small holes, but is sometimes preferred for other reasons. This arrangement is also referred to as 90° /straightline.

Round Holes - Straight



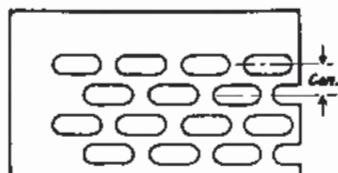
SLOTS are elongated holes with square ends. As shown here, the slots are **END STAGGERED**.

Slots - End Staggered



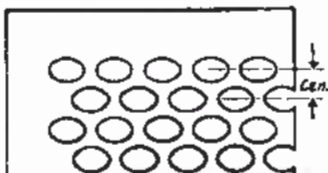
OBLONG holes are elongated with rounded ends. The arrangement here shows the holes **SIDE STAGGERED**.

Oblongs - Side Staggered



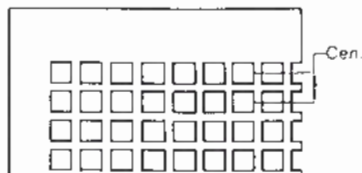
OVAL holes are identified by rounded ends and rounded sides. As shown here, the holes are arranged **SIDE STAGGERED** (the difference between oval and oblong holes should be noted).

Ovals - Side Staggered



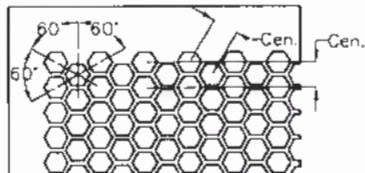
SQUARE holes are four straight, and equal-sided. As shown here, the arrangement shows these holes in **STRAIGHT** rows.

Square Holes - Straight



HEXAGON holes are six straight, and equal-sided. The arrangement here shows these holes as **STAGGERED**.

Hexagonal Holes - Staggered



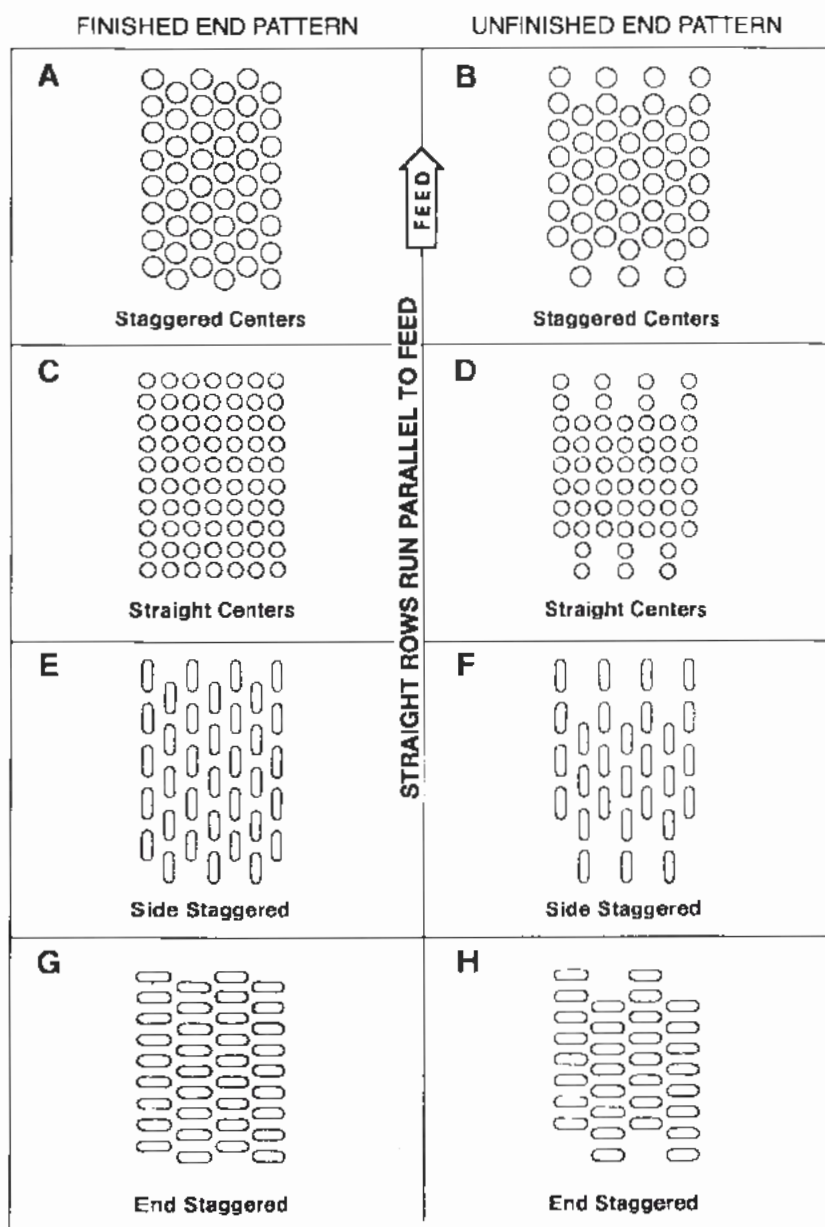
For technical information or further tooling, materials, or processing details, contact H&K Engineering at 800-621-3869.



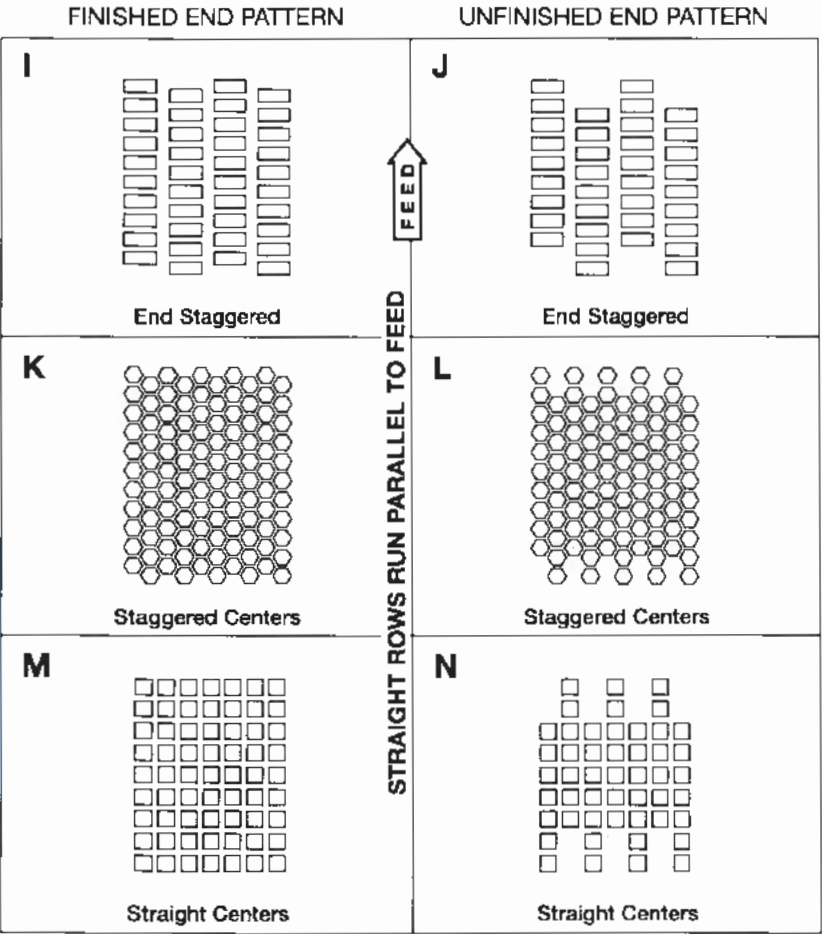
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Examples of End Patterns - Start and Finish

Typical appearance as shown indicates product with margins all around.
Holes appear as produced, start and end of part.



Typical appearance as shown indicates product with margins all around.
 Holes appear as produced, start and end of part.



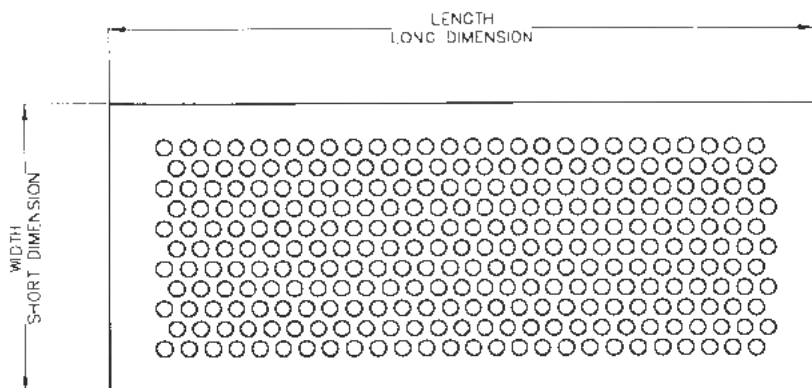
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 contact H&K Engineering at 800-621-3869.



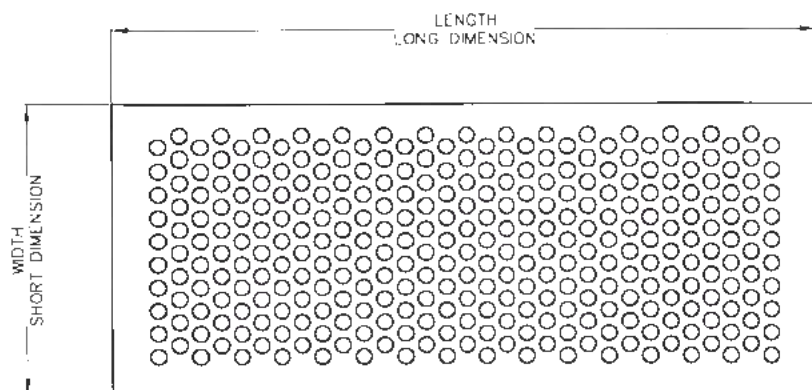
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Examples of Hole Arrangements

Typical staggered (round) hole patterns where straight rows of holes are parallel to length or width.



STRAIGHT ROWS PARALLEL TO LONG DIMENSION



STRAIGHT ROWS PARALLEL TO SHORT DIMENSION

Required Order/Inquiry Information

DATE _____

COMPANY _____

ADDRESS _____

CONTACT _____ POSITION _____

PHONE # _____ FAX # _____

INDUSTRY _____ APPLICATION _____

GAUGE _____ MIN/MAX THICKNESS _____

MATERIAL TYPE & TEMPER _____

PERFORATED PATTERN _____

OPEN AREA % _____ PART SIZE _____

CLOSED OR FINISHED END PATTERN _____

PERFORATED SIZE _____

MARGINS OR DWG. NO. _____

QUANTITIES _____

SPECIAL TOLERANCES:

WIDTH _____ MARGINS _____

LENGTH _____ COIL ID _____

SQUARENESS _____ COIL OD _____

FLATNESS _____ QUANTITY(+/-) _____

SECONDARY OPERATIONS (AS SPECIFIED BY CUSTOMER):

DEGREASE _____ CHROMATE COAT _____ ROLL COAT _____

PRIME COAT _____ TEXTURIZE _____ BLANKING _____

PAINT _____ BOLT HOLES/SLOTS _____ CIRCLE SHEAR _____

POWDER COAT _____ NOTCHING _____ APPLY VINYL _____

ANODIZE _____ FORMING _____ OTHER _____

POLISH _____ DEBURR/TIMESAVE _____

PACKAGING REQUIREMENTS:

MAX. LIFT CAPACITY _____ FOB LOCATION _____

SPECIFIC CARRIER _____

SHIP TO _____

Industrial Perforators' Association Trade Practices

Although each IPA member establishes their own terms and conditions, the following trade practices and terms of sale prevail generally throughout the industry.

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" © 1998 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 weights 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 standards. 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 invoiced value of the perforated material and not to any part of the transportation charges, taxes and/or other charges.

11. Quotations/Acceptances.

Quotations are valid for thirty days only from date of issuance and acceptance must be received by Seller in writing at its main office. 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 the 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 insofar as the same may in any way conflict with the provisions set forth in such order 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 or 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 manufacturing or delivery resulting from any cause beyond Seller's reasonable control, including, but not limited to, compliance with any regulations, orders 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 from 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.



Industrial Perforators' Association Trade Practices

15. Errors in weight or number delivered.

Sellers 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 attorney's 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. Government production standards.

Seller hereby certifies that the perforated material was produced in compliance with all applicable requirements of Sections 6, 7 and 12 of the Fair Labor Standards Act, as amended, and all regulations and orders of the U.S. Department of Labor issued under Section 14 thereof.

19. Correction or errors.

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

20. Warranty matters.

(a) *Consumer products.* Since the Seller is supplying perforated material for incorporation into another product by Buyer which may or may not be considered a "Consumer Product" as defined in the Magnuson-Moss Warranty Act, it is agreed that SELLER MAKES NO WARRANTY OF ANY NATURE WHATSOEVER, EXPRESS OR IMPLIED, WITH RESPECT TO MATERIAL WHICH MAY BECOME INCORPORATED INTO A CONSUMER PRODUCT. THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE WITH RESPECT TO SUCH GOODS.

(b) *Commercial products.* Seller warrants only to Buyer the perforated material sold against defects in material and workmanship for a period of thirty (30) days after Buyer's receipt of shipment. THE OBLIGATION OF SELLER UNDER THIS WARRANTY SHALL BE LIMITED TO REPAIRING OR REWORKING F.O.B. SELLER'S PLANT, OR ALLOWING CREDIT AT SELLER'S OPTION, ANY PERFORATED MATERIAL WHICH MAY PROVE TO BE THUS DEFECTIVE, PROVIDED THAT BUYER GIVES SELLER PROMPT NOTICE OF THE DEFECT OR DEFECTS DURING THE WARRANTY PERIOD AND INSPECTION, IF REQUIRED BY SELLER, CONFIRMS THE DEFECT OR DEFECTS. IT IS EXPRESSLY AGREED THAT

THIS REMEDY OF REWORKING, REPLACEMENT, OR CREDIT, AT SELLER'S OPTION, IS THE EXCLUSIVE REMEDY UNDER THIS WARRANTY.

Goods returned without prior notification to Seller will not be accepted and will be returned to Buyer F.O.B. Seller's Plant. Expenses incurred by Buyer in repairing or replacing any defective product will not be allowed except by written permission of Seller.

THIS SALE IS MADE ON THE EXPRESS UNDERSTANDING THAT THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE CONTAINED IN THIS AGREEMENT, AND THAT THERE ARE NO IMPLIED WARRANTIES THAT THE GOODS SHALL BE MERCHANTABLE OR FIT FOR A PARTICULAR PURPOSE. THE SELLER SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR FOR LOSS, DAMAGE OR EXPENSE DIRECTLY OR INDIRECTLY ARISING FROM THE GOODS SOLD OR THE USE THEREOF OR FROM ANY OTHER CAUSE WHETHER BASED ON BREACH OF THIS CONTRACT BY SELLER, OR WARRANTY (EXPRESS OR IMPLIED) OR TORT OR CONTRACT.

21. Product liability indemnity.

Buyer agrees at its own expense to defend and hold Seller harmless in the event any suits are instituted or claims are made against Seller, whether groundless or not, asserting any damages or liability relating to any product of Buyer which incorporates or utilizes perforated material sold to Buyer. Buyer's indemnification shall include, but not be limited to, all Seller's costs, damages, expenses, attorneys' fees and liabilities associated with any such suit or claim.

22. Tooling.

All tooling used by the Seller in the processing of the perforated material shall remain the property of Seller. Invoices for tooling charges may be rendered prior to commencing the processing of the perforated material.

23. Scrap.

Scrap material resulting from the processing of the perforated material shall be the property of the Seller.

24. Customer's material.

Despite the best precautions taken by the Seller, material may be spoiled in processing due to operator's oversight, failure of tool or equipment, or inherent characteristics of the material beyond the processor's control. Where a customer chooses to supply the raw material, he assumes responsibility for any spoilage that takes place in the course of processing or during transportation to the Seller's plant and while it is awaiting processing. The charge for perforating services covers only the labor involved and doesn't include replacement of material.

For these reasons, the Seller will provide credit for perforating services only and the replacement of the material is the Buyer's obligation.



Industrial Perforators' Association Trade Practices

Material furnished by the Buyer shall be shipped to the Seller freight prepaid and all risk of loss or damage to the material shall remain with the Buyer. Buyer hereby indemnifies and holds Seller harmless against any and all claims for loss, liability, injury or damage arising out of or in connection with the perforated material and/or workmanship applied to or used in connection with the Buyer's material. In the event Buyer-supplied material is defective, Seller reserves the right to change its price and delivery schedules if such defects cause additional risk, expense or time in repairing the goods.

25. Use of lubricants.

The perforating process requires the use of lubricants. The natural condition of perforated material may vary from a light to heavy concentration of oils. Quoted prices do not include degreasing, and if Buyer specifies that the material must be degreased, there will be an additional charge for degreasing. If Buyer specifies total removal of lubricants, Seller is not liable for any surface corrosion resulting from the absence of lubricants.

26. Cancellation, changes or alterations.

Orders placed cannot be cancelled or altered nor can referred deliveries of goods completed or in process be extended beyond original specified delivery dates, except with Seller's express written consent and upon terms which will indemnify Seller against loss.

27. Limitation on waiver of breach.

The waiver by Seller of any breach of this contract shall be limited to the particular instance and shall not operate or be deemed to waive any future breach of the same provision or any other provision on the same or any other occasion, nor operate as a waiver of Seller's right to enforce any rights by such remedies as may be appropriate.

28. Seller's remedies cumulative.

The rights and remedies of Seller under this contract shall be cumulative and the exercise of any one of them shall not be exclusive of any other right or remedy provided by this contract or allowed by law.

29. Assignment of contract.

This contract may not be assigned by Buyer without the prior written consent of Seller. Any assignment without such prior consent shall be void.

30. Entire agreement.

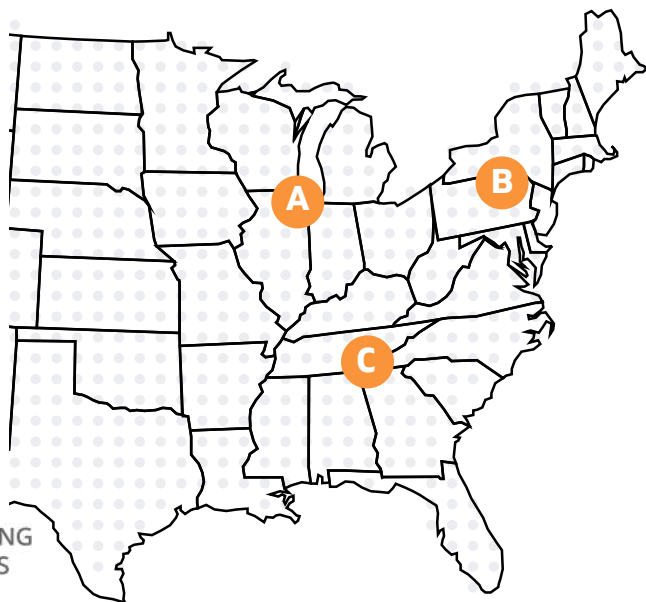
This contract contains the entire agreement between the parties and is not subject to modifications except by written agreement signed by both parties.

31. Law governing contract.

This contract shall be governed by the internal laws of the State in which Seller's mail office is located.



Offices and Stocking Warehouses



CHICAGO, IL LOCATION

A

5655 W. FILLMORE STREET
CHICAGO, IL, 60644
75,644 SQUARE FEET

773-626-1800

CARBONDALE, PA LOCATION

B

166 DUNDAFF ST
CARBONDALE, PA, 18407
53,400 SQUARE FEET

570-282-4344

CLEVELAND, TN LOCATION

C

3939 MICHIGAN AVENUE RD NE
CLEVELAND, TN, 37323
78,750 SQUARE FEET

423-479-8691

**For technical information or further tooling, materials, or processing details,
contact H&K Engineering at 800-621-3869.**



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Stock Sheets: Brass

Soft Temper

STOCKED PATTERN	PART # FS000	WIDTH/ LENGTH	GAUGE/ THICKNESS
.010" Round Straight	683	12" x Coil	28 B&S
.016" Round Straight	686	24" x Coil	26 B&S
.016" Round Staggered	689	"	"
.020" Round Straight	691	"	"
.020" Round Staggered	692	"	"
.024" Round Straight	694	"	"
.027" Round Straight	696	"	"
.033" Round Straight	698	"	"
.038" Round Straight	700	"	"
.040" Round Straight	702	"	"
.045" Round Straight	704	"	"
.057" Round Straight	708	"	"
.065" Round Straight	710	"	"
.079" Round Straight	712	"	"
.103" Round Straight	714	"	"
.138" Round Straight	716	"	"
.020" x .115" Slot	718	"	"

Stock Sheets: Aluminum

3003-H 14

STOCKED PATTERN	PART # FS000	WIDTH/ LENGTH	GAUGE/ THICKNESS
.020" Straight	598	30" x 120"	22 B&S
.033" Straight	600	"	"
.033" Straight	601	36" x 120"	"
.045" Straight	604	"	"
1/16" Round on 7/64" Staggered	610	"	16 B&S
"	614	"	14 B&S
"	619	"	20 B&S
1/16" Round on 1/8" Staggered	606	"	16 B&S
"	609	"	20 B&S
5/64" Round on .125" Staggered	617	48" x 144"	16 B&S
3/32" Round on 5/32" Staggered	618	48" x 120"	12 B&S
"	616	"	14 B&S
"	620	36" x 120"	"



PERFORATING
COMPANIES

VISA



mastercard

Stock Sheets: Aluminum

3003-H 14 (* 5052-H32)

STOCKED PATTERN	PART # FS000	WIDTH/ LENGTH	GAUGE/ THICKNESS
3/32" Round on 5/32" Staggered	621	36" x 120"	16 B&S
"	622	"	18 B&S
"	623	"	20 B&S
1/8" Round on 3/16" Staggered	625*	48" x 120"	14 B&S
"	624	"	8 B&S
"	627	"	14 B&S
"	628*	"	16 B&S
"	631	"	16 B&S
"	633	"	20 B&S
"	626	36" x 120"	14 B&S
"	629	"	16 B&S
"	630	"	18 B&S
"	632	"	20 B&S
5/32" Round on 3/16" Staggered	634	"	14 B&S
"	635*	48" x 120"	"
"	636	36" x 120"	20 B&S
3/16" Round on 1/4" Staggered	640	48" x 120"	14 B&S
"	643	"	16 B&S
"	646	"	20 B&S
"	639	36" x 120"	14 B&S
"	642	"	16 B&S
"	645	"	20 B&S
1/4" Round on 5/16" Staggered	649	"	14 B&S
"	651	"	20 B&S
1/4" Round on 3/8" Staggered	654	"	14 B&S
"	657	"	16 B&S
1/8" Square on 5/32" Straight	677	"	20 B&S
2/10" Square on 1/4" Straight	680	"	"
LINCANE	511	"	"
UNION JACK	594	"	"
DIAMOND (1/4" x 1/2")	522	"	"
9/32" OVALESQUE	564	30" x 120"	"
3/4" OVALESQUE	567	36" x 120"	"
1/4" HEXAGON	543	"	20 B&S
9/32" HEXAGON	545	"	"
INTERWEAVE	555	"	"

For the latest stock list, please request *Holes in a Hurry*.



PERFORATING
COMPANIES

VISA



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Stock Sheets: Stainless

Type 304, 2B Finish (*Type 316, 2B)

STOCKED PATTERN	PART # FS000	WIDTH/ LENGTH	GAUGE/ THICKNESS
.016" Round Straight	722	24" x Coil	.008"
.020" Round Straight	724	"	"
.020" Round Staggered	726	"	"
.033" Round Straight	727	"	26
.045" Round Straight	731	30" x 120"	24
1/16" Round on 3/32" Staggered	738	36" x 120"	22
1/16" Round on 7/64" Staggered	742	"	"
"	734	"	24
1/16" Round on 1/8" Staggered	744	36" x 96"	18
"	745	36" x 120"	20
"	746	"	22
3/32" Round on 5/32" Staggered	747	48" x 120"	16
"	748	36" x 120"	18
"	749	"	20
"	750	"	22
3/32" Round on 3/16" Staggered	771	48" x 120"	20
"	757	"	22
1/8" Round on 3/16" Staggered	751	36" x 96"	16
"	752	36" x 120"	"
"	753*	"	"
"	754	"	18
"	756	"	20
"	758	36" x 96"	22
"	759	36" x 120"	"
"	764	48" x 96"	11
"	755	48" x 120"	18
"	761	"	16
"	762	"	14
"	763	"	11
5/32" Round on 3/16" Staggered	765	36" x 96"	20
"	767	"	18
"	766	36" x 120"	20
3/16" Round on 1/4" Staggered	773	"	16
"	774	48" x 120"	"
"	775	36" x 120"	18
"	777	"	20
"	780	"	24
1/4" Round on 5/16" Staggered	784	"	16
"	785	48" x 120"	16
"	786	36" x 120"	18
"	788	"	20



PERFORATING
COMPANIES

VISA



Stock Sheets: Stainless

Type 304, 2B Finish (*Type 316, 2B)

STOCKED PATTERN	PART # FS000	WIDTH/ LENGTH	GAUGE/ THICKNESS
1/4" Round on 3/8" Staggered	791	48" x 120"	11
"	794	"	14
"	792	48" x 96"	11
"	797*	48" x 120"	16
"	796	36" x 120"	"
"	798	"	18
"	800	"	20
"	804	48" x 120"	16
"	805	48" x 96"	18
5/16" Round on 1/2" Staggered	806	48" x 120"	1/4"
3/8" Round on 1/2" Staggered	807*	"	16
3/8" Round on 9/16" Staggered	810	48" x 96"	"
"	795	36" x 96"	22
1/2" Round on 11/16" Staggered	818	36" x 120"	16
"	820	"	18
2/10" Square on 1/4" Straight	825	"	22

NOTES

For technical information or further tooling, materials, or processing details,



PERFORATING
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Stock Sheets: Steel

STOCKED PATTERN	PART # FS000	WIDTH/ LENGTH	GAUGE/ THICKNESS
.020" Straight	260	24" x Coil	26
.020" Staggered	263	"	"
.024" Straight	265	30" x 120"	"
.024" Staggered	268	"	"
.027" Straight	271	"	"
.030" Staggered	275	"	24
.033" Straight	280	36" x 120"	"
.033" Staggered	283	"	"
.038" Straight	285	30" x 120"	"
.038" Staggered	288	"	"
.040" Straight	291	"	"
.045" Straight	295	36" x 120"	"
.045" Staggered	298	36" x 120"	"
1/20" Round on 3/32" Staggered	300	36" x 120"	22
1/16" Round on 3/32" Staggered	306	"	20
"	307	48" x 120"	"
"	309	36" x 120"	22
"	310	48" x 120"	"
1/16" Round on 7/64" Staggered	312	36" x 120"	16
"	313	"	18
"	314	"	20
1/16" Round on 1/8" Staggered	323	"	16
"	324	"	18
"	325	"	20
"	326	"	22
.075" Round on .100" Staggered	334	"	20
5/64" Round on 7/64" Staggered	337	"	"
"	338	"	22
5/64" Round on 1/8" Staggered	345	"	16
"	346	"	18
"	347	"	20
"	348	"	22
"	349	48" x 120"	16
"	350	"	18
3/32" Round on 5/32" Staggered	355	36" x 120"	16
"	356	"	18
"	357	"	20



PERFORATING
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Stock Sheets: Steel

STOCKED PATTERN	PART # FS000	WIDTH/ LENGTH	GAUGE/ THICKNESS
3/32" Round on 5/32" Staggered	358	36" x 120"	22
"	359	36" x 96"	"
.117" Round on 5/32" Staggered	366	36" x 120"	"
1/8" Round on 5/32" Staggered	368	"	"
1/8" Round on 3/16" Staggered	369	48" x 120"	11
"	370	36" x 120"	16
"	371	"	18
"	372	"	20
"	373	"	22
"	374	"	24
"	375	48" x 120"	14
"	376	"	18
"	377	"	16
"	384	48" x 96"	"
1/8" Round on 1/4" Staggered	396	48" x 120"	11
9/64" Round on 3/16" Staggered	381	36" x 120"	16
"	382	"	18
"	383	"	20
5/32" Round. on 3/16" Staggered	391	"	18
"	392	"	16
"	393	"	20
"	394	"	22
"	397	48" x 120"	16
"	398	48" x 96"	"
5/32" Round on 7/32" Staggered	401	36" x 120"	"
"	402	"	18
"	403	"	20
"	405	48" x 120"	12
3/16" Round on 1/4" Staggered	408	"	11
"	410	"	16
"	411	36" x 120"	"
"	412	"	18
"	413	"	20
"	414	48" x 120"	18
3/16" Round on 5/16" Staggered	421	"	11
"	422	"	7
"	423	36" x 120"	16
"	424	"	18
"	425	48" x 120"	16

For the latest stock list, please request *Holes in a Hurry*.



PERFORATING
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Stock Sheets: Steel

STOCKED PATTERN	PART # FS000	WIDTH/ LENGTH	GAUGE/ THICKNESS
13/64" Round on 1/4" Staggered	433	36" x 120"	22
1/4" Round on 5/16" Staggered	439	"	16
"	440	"	18
"	441	"	20
"	442	"	22
"	443	48" x 120"	16
"	444	"	18
1/4" Round on 3/8" Staggered	450	"	1/4"
"	451	"	7
"	452	"	11
"	453	36" x 120"	14
"	454	"	16
"	455	"	18
"	456	"	20
"	457	48" x 120"	18
"	459	"	16
"	460	48" x 96"	"
17/64" Round on 5/16" Staggered	464	36" x 120"	20
.265 Extruded Rd. (Collared)	467	"	24
5/16" Round on 3/8" Staggered	468	"	16
5/16" Round on 7/16" Staggered	470	"	"
"	471	"	18
"	472	48" x 120"	16
"	469	"	11
3/8" Round on 1/2" Staggered	476	36" x 120"	16
"	478	48" x 120"	1/4"
3/8" Round on 9/16" Staggered	480	"	7
"	481	"	11
"	482	36" x 120"	14
"	483	"	16
"	486	48" x 120"	14
"	487	"	16
"	488	"	18
1/2" Round on 11/16" Staggered	489	"	3/8"
"	491	"	14
"	492	"	16
"	493	"	1/4"
"	494	"	11
"	499	48" x 96"	1/4"
"	495	36" x 120"	14

For the latest stock list, please request *Holes in a Hurry*.



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Stock Sheets: Steel

STOCKED PATTERN	PART # FS000	WIDTH/ LENGTH	GAUGE/ THICKNESS
1/2" Round on 11/16" Staggered	496	36" x 120"	16
"	497	"	18
"	498	"	20
3/4" Round on 1" Staggered	501	"	16
"	502	48" x 120"	7
"	503	"	11
"	504	"	16
1/8" Square on 5/32" Straight	133	36" x 120"	22
"	134	"	24
1/8" Square on 3/16" Straight	141	"	22
2/10" Square on 1/4" Straight	148	"	20
"	149	"	22
5/16" Square on 7/16" Straight	165	"	"
5/16" Square on 11/32" Straight	171	"	"
3/8" Square on 1/2" Straight	174	"	16
29/64" Square on 1/2" Straight	177	"	22
1/2" Square on 11/16" Straight	183	"	16
"	185	"	20
3/4" Square on 1" Straight	192	"	12
"	194	"	16
3/32" x 3/4" Slot-5/32" Straight	207	"	18
1/8" x 1" Oblong-1/4" Side Staggered	215	"	22
.200" x .637" Slot-1/4" Straight	222	"	"
1/4" x 1-1/2" Slot-Straight (Airway)	229	"	16
"	231	"	18
"	232	"	20
9/32" x 1-27/32" Slot-Straight	239	"	16
"	240	"	18
STYLE A-1	001	"	20
CANE 41"	011	"	"
LINCANE	019	"	22
FENCE	042	"	"
1/4" HEXAGON	050	"	"
9/32" HEXAGON	053	"	"
INTERWEAVE	056	"	24
GRECIAN	066	"	22
3/4" OVALESQUE	071	"	"
TRI-SQUARE	114	"	"
DIAMOND (1/4" x 1/2")	121	"	20



PERFORATING
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Stock Sheets: Galvanized Steel

STOCKED PATTERN	PART # FS000	WIDTH/ LENGTH	GAUGE/ THICKNESS
3/32" Round on 3/16" Staggered	505	48" x 120"	22
.125" Round on .187" Staggered	500	48" x 144"	20
1/8" Round on 3/16" Staggered	506	48" x 120"	16
"	507	"	18
"	517	36" x 120"	20
3/16" Round on 1/4" Staggered	516	48" x 120"	16
1/4" Round on 5/16" Staggered	508	"	20
1/4" Round on 3/8" Staggered	462	"	16
.500" Round on .687" Staggered	519	"	22

NOTES

For technical information or further tooling, materials, or processing details, contact H&K Engineering at 800-621-3869.



VISA



Custom Design Perforating

For those applications where a standard perforated sheet or pattern isn't suitable, Harrington & King will custom perforate to your specifications. This is useful when:

- You need solid, unperforated areas around or within the main perforated area.
- You need a distinctive design perforated within an otherwise solid area.
- A component must be perforated in a specific irregular pattern.

Because of our state-of-the-art equipment and over 120 years of perforating know-how, we can readily produce custom work.

On the following pages, you'll find descriptions and examples of H&K custom perforating. For technical assistance or design consultation, please contact any of our H&K locations coast to coast.





A Hole Lot Better

CUSTOM DESIGNED SOLUTIONS

When you choose H&K, your customized perforating can run the gamut from the relatively simple to the highly intricate.

Keep in mind, standard perforating usually involves uniform patterns of standard-size holes punched all across the sheet. Custom perforating by H&K, on the other hand, is infinitely more versatile.

For example, we can easily vary the distance between holes and provide you with perforations in almost any size, shape and arrangement you may need. To ensure extreme accuracy, H&K perforating conforms to Industrial Perforators Association standards and ASTM specifications.

Versatility without limits.

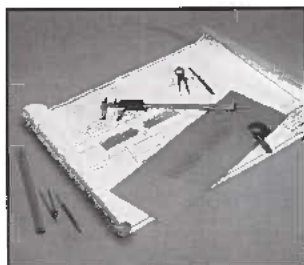
When you have an application where a standard perforated sheet or pattern is not suitable, Harrington & King offers you Custom Design Perforating. So, let your imagination go.

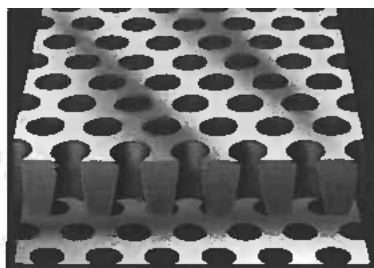
If your needs require highly specialized or unique designs, let us work with you on the best way to keep tooling costs to the absolute minimum.

From the highly intricate to the relatively simple, H&K's total custom perforating experience, facilities, techniques and creativity, amassed over the past 120 years, are ready to help transform your imagination into reality – quickly and economically.

More options. Less cost.

H&K's custom perforating presses, equipped with computerized, programmable feed systems, will vastly expand your design options. We can easily produce blank areas anywhere you desire for functional or decorative purposes, such as where you require mounting holes or need to attach brand nameplates, identification tags or instruction plates.





Through thick and thin.

You have the hole world in your hands with Harrington & King Custom Design Perforating.

- We can perforate materials from .008" foil thin to 1" (25.4 mm) thick plate.

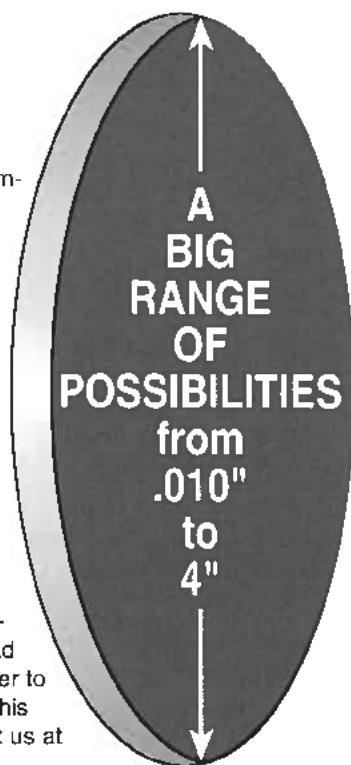
- Sheets up to 18 feet in length (5486 mm).
- Coils up to 20,000 lbs (9072 kg) before perforating.
- Special shapes.

Hole sizes.

A rule of thumb is that the hole diameter should be greater than or equal to the thickness of the material. Our wide range of industry-standard dies runs from .010 (.254 mm) diameter all the way up to 4" (101.6 mm). If you require a die that isn't already in our die bank, our experienced tool and die makers can quickly produce exactly what you need at a reasonable cost.

Hole shapes.

Choose from tooling capable of perforating round, square, oblong, triangle, slot, hex, oval, diamond and a broad variety of odd-shaped holes. Please refer to the "Decorative/Architectural" section of this catalog for more information. Or contact us at www.hkperi.com for a free copy of our *Decorative Perforated Patterns* catalog.



Select from these metals and non-metallics:

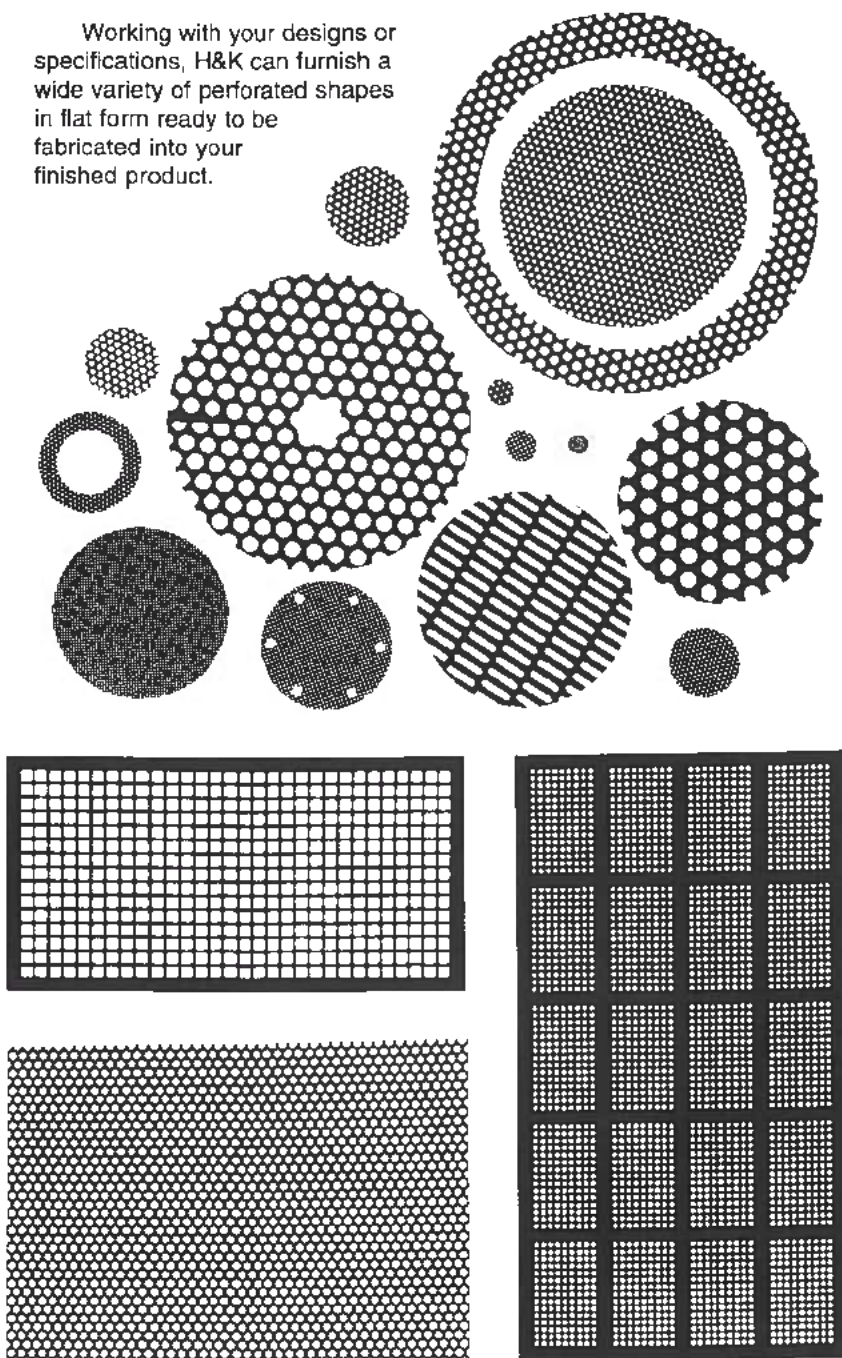
Carbon steel
Pre-painted materials
Nickel alloys
Rubber-bound materials
Composites
Copper

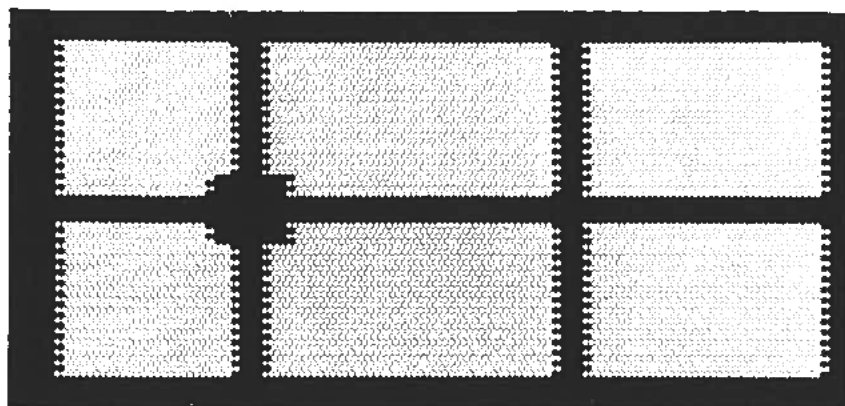
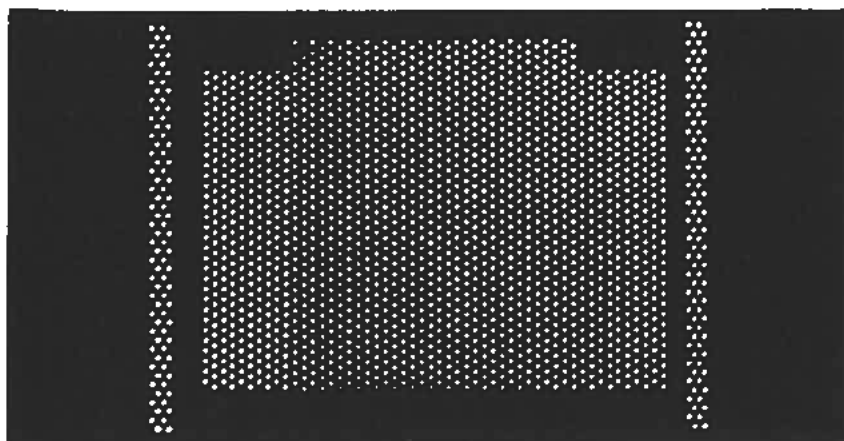
Stainless steel
Aluminized materials
Nickel silver
Bronze
Iron
Plastics

Aluminum
Galvanized steel
Brass
And many others

H&K Custom Design Perforating

Working with your designs or specifications, H&K can furnish a wide variety of perforated shapes in flat form ready to be fabricated into your finished product.



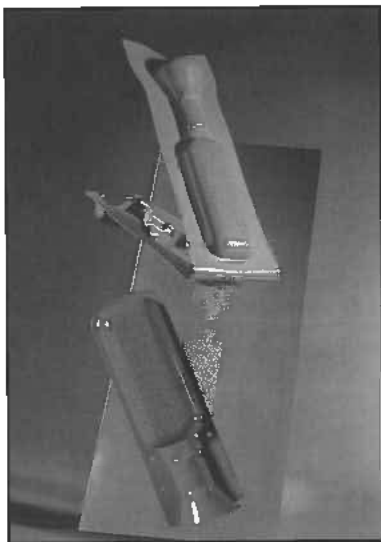


H&K Fabricating & Finishing

H&K can furnish your custom perforated shapes in flat form which can then be perfectly matched to subsequent manufacturing operations. Or, better yet, we can save you time and cost by making the complete part.

We offer you a full range of in-house and out-sourced secondary fabricating and finishing operations, which includes:

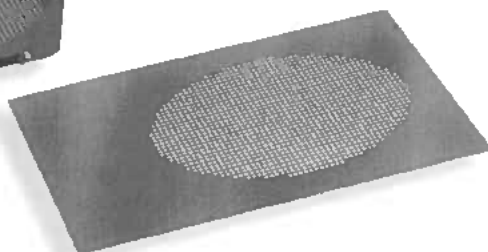
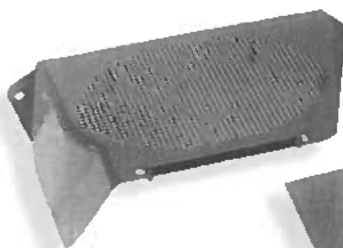
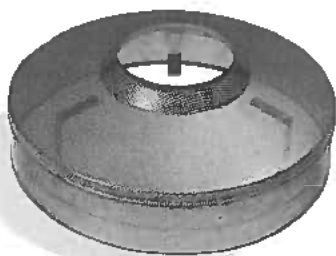
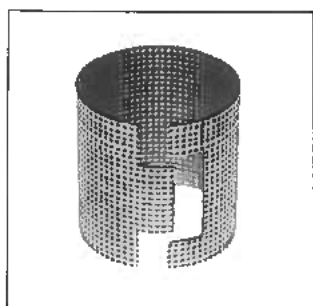
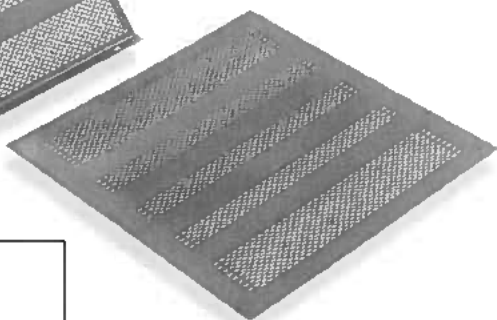
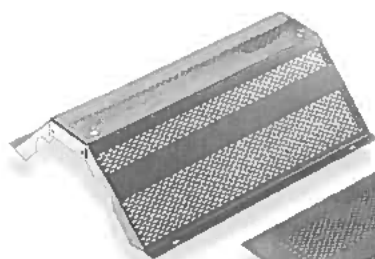
- Leveling
- Shearing
- Circle shearing
- Deburring
- Degreasing
- Forming
- Bending
- Blanking
- Rolling
- Anodizing
- Painting/powder coating
- Polishing
- Bar coding/labeling
- Custom packaging



H&K CUSTOM DESIGN PERFORATING SETS THE STANDARD FOR THE HOLE WORLD.

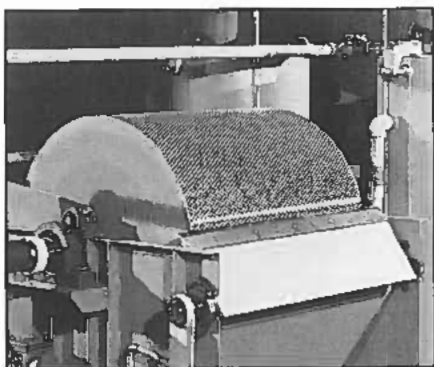
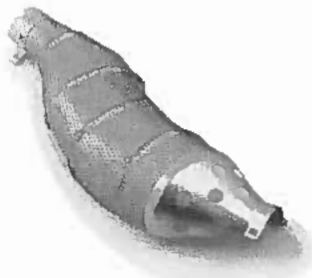
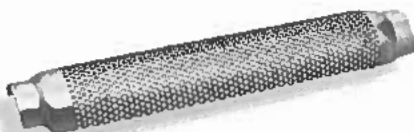
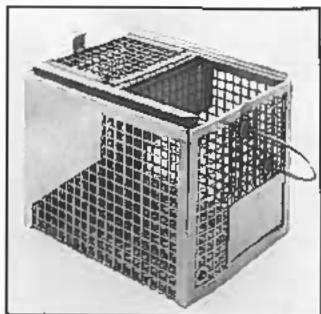
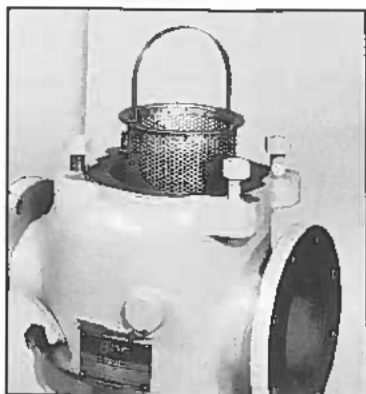
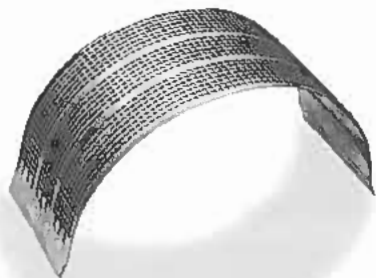
From high-tech uses to a multitude of aesthetic applications, perforating by H&K provides solutions to an array of engineering and design requirements.

Today, you'll find H&K Custom Designed Perforating used in quality home products, automotive, acoustics, architecture, interior design, displays, manufacturing, safety flooring, agriculture, pollution control, transportation, mining, electronics and many other fields.



H&K helps make the possibilities a reality.

Our experienced people and facilities can help you transform your imagination into the reality of a finished product. H&K can supply perforated materials to your specifications, or take a project from the design stage to final fabrication.



Custom Perforating Made Easy, Even On The Short Run.

Strength plus precision.

Highly complex perforated pieces, especially those in heavy gauge materials, are quickly and economically produced by H&K's computer-numerically-controlled presses. These presses can handle sheets up to 84" x 216" (2133 mm x 5486 mm) and thicknesses up to 1" (25.4 mm).

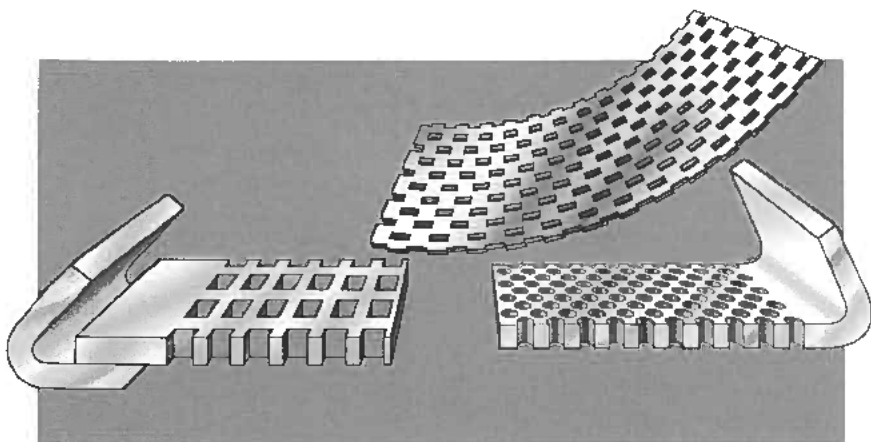
Short or long runs.

Many of our presses are designed for short runs of replacement parts and new equipment fabrications, such as, mining screens, tray plates, extractor plates, hammermill screens, etc. It's also a cost-efficient way of producing prototype parts before building production tooling.

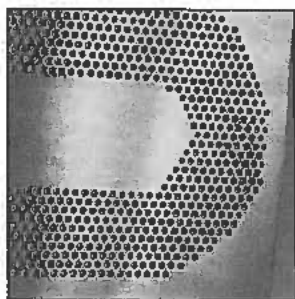
Speed and economy.

Our high-speed sectional presses can easily control the number of holes perforated. So simple, standard tooling can be used to produce even the most complex patterns. This shortens lead times and eliminates expensive custom punches and dies.

For a free brochure describing H&K's computerized perforating services, please contact the H&K sales office nearest you.

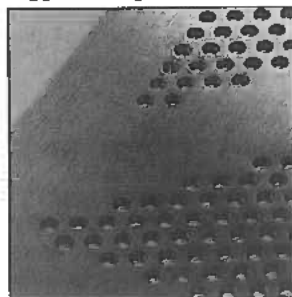


Here are some of the tough perforating problems that can be handled by Harrington & King's computer-numerically-controlled presses:



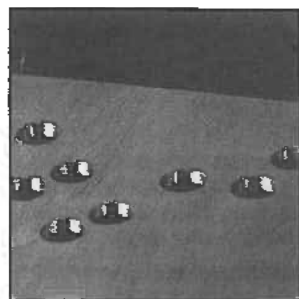
Curved patterns

Until now, this has been one of the trickiest jobs for a perforator using conventional equipment. But with the sophisticated geometry programs in our presses' computers, we can adjust hole spacing for smooth-edged curves or give you a conventional staggered edge.



Intermittent blank spaces

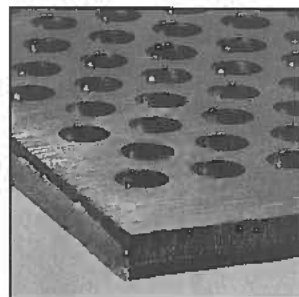
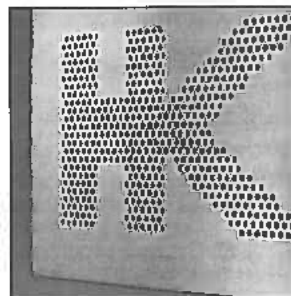
Does your part require blank spaces around or within the main perforated area? We can easily produce blank areas for mounting holes, identification plates, or other functional or decorative purposes.



Irregular hole spacings

Conventional perforating equipment is designed to produce holes with uniform spacing. Our computerized presses, however, can vary the distance between holes throughout the part to meet your exact requirements.

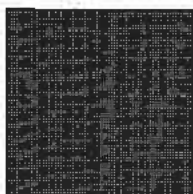
Logos and decorative patterns
The aesthetic possibilities of perforating are limited only by your imagination. With their sophisticated computer controllers, our presses can produce even the most intricate design with absolute precision.



Large holes/thick materials

It takes a lot of tonnage to punch clean, large diameter holes in heavy gauges or hard alloys. And our sectional presses do the job! They can even achieve 1-to-1 ratios of hole diameter to plate thickness in most heavy gauge materials.

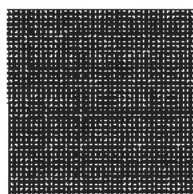




**.010\"
Straight**



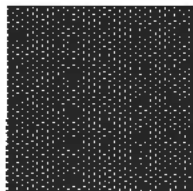
.010" dia. (0.250 mm)
.016" centers (0.406 mm)
3906 holes per sq. in.
30% open



**.016\"
Straight**



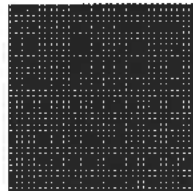
.016" dia. (0.406 mm)
.026" centers (0.660 mm)
1479 holes per sq. in.
30% open



**.016\"
Staggered**



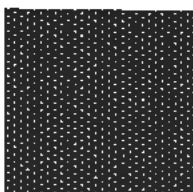
.016" dia. (0.406 mm)
.0346" centers (0.879 mm)
1109 holes per sq. in.
22% open



**.020\"
Straight**



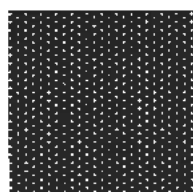
.020" dia. (1/2 mm)
.030" centers (0.762 mm)
952 holes per sq. in.
30% open



**.020\"
Staggered**

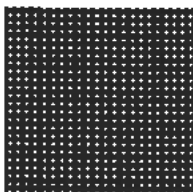


.020" dia. (1/2 mm)
.040" centers (1 mm)
714 holes per sq. in.
22% open



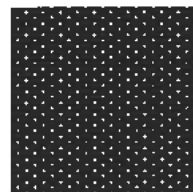
**.020\"
Staggered**

.020" dia. (1/2 mm)
.043" centers (1.092 mm)
625 holes per sq. in.
20% open



**.022\"
Straight**

.022" dia. (0.559 mm)
.044" centers (1.118 mm)
516 holes per sq. in.
20% open



**.022\"
Staggered**

.022" dia. (0.559 mm)
.060" centers (1.524 mm)
379 holes per sq. in.
14% open

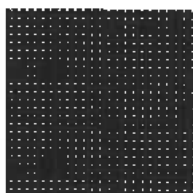
All patterns shown actual size.

Each perforated pattern has certain gauge and width limitations, so it is advisable to consult with Harrington & King before preparing your specifications.



PERFORATING
COMPANIES

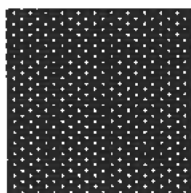
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**.024"
Straight**



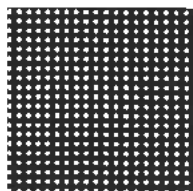
.024" dia. (0.610 mm)
.044" centers (1.118 mm)
516 holes per sq. in.
23% open



**.024"
Staggered**



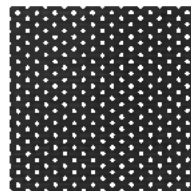
.024" dia. (0.610 mm)
.060" centers (1.524 mm)
379 holes per sq. in.
17% open



**.027"
Straight**

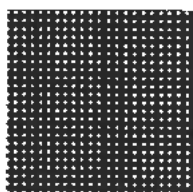


.027" dia. (0.686 mm)
.050" centers (1.270 mm)
400 holes per sq. in.
23% open



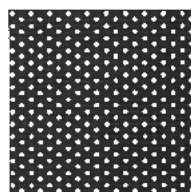
**.027"
Staggered**

.027" dia. (0.686 mm)
.066" centers (1.676 mm)
303 holes per sq. in.
17% open



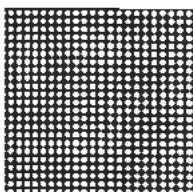
**.028"
Straight**

.028" dia. (0.711 mm)
.044" centers (1.118 mm)
516 holes per sq. in.
32% open



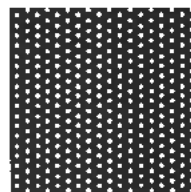
**.028"
Staggered**

.028" dia. (0.711 mm)
.060" centers (1.524 mm)
379 holes per sq. in.
23% open



**.030"
Straight**

.030" dia. (0.750 mm)
.044" centers (1.118 mm)
516 holes per sq. in.
36% open



**.030"
Staggered**

.030" dia. (0.750 mm)
.055" centers (1.397 mm)
331 holes per sq. in.
23% open

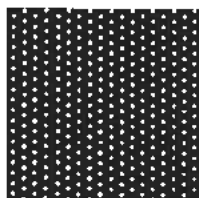


See the "In Stock" section for items available for immediate delivery.



PERFORATING
COMPANIES

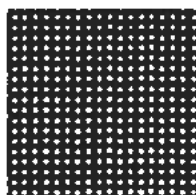
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.030"
Staggered



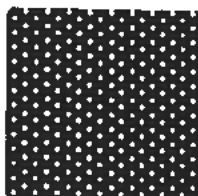
.030" dia. (0.762 mm)
.060" centers (1.524 mm)
379 holes per sq. in.
27% open



.033"
Straight



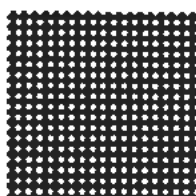
.033" dia. (0.838 mm)
.055" centers (1.397 mm)
331 holes per sq. in.
28% open



.033"
Staggered

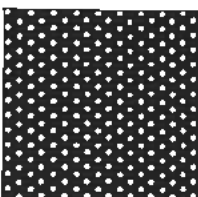


.033" dia. (0.838 mm)
.077" centers (1.956 mm)
236 holes per sq. in.
20% open



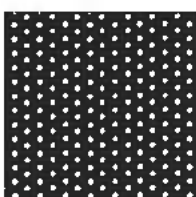
.035"
Straight

.035" dia. (0.889 mm)
.055" centers (1.397 mm)
331 holes per sq. in.
32% open



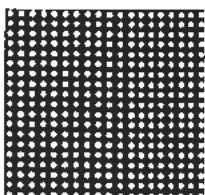
.035"
Staggered

.035" dia. (0.889 mm)
.077" centers (1.956 mm)
236 holes per sq. in.
23% open



.036"
Staggered

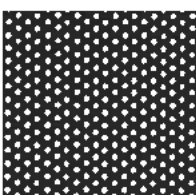
.036" dia. (0.902 mm)
.075" centers (1.905 mm)
205 holes per sq. in.
21% open



.038"
Straight



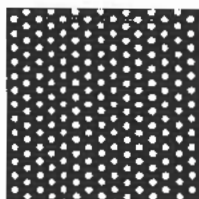
.038" dia. (0.965 mm)
.050" centers (1.270 mm)
400 holes per sq. in.
45% open



.038"
Staggered

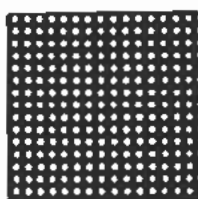


.038" dia. (0.965 mm)
.066" centers (1.676 mm)
303 holes per sq. in.
34% open



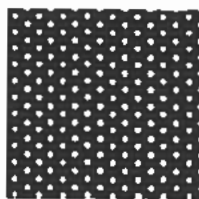
**.039"
Staggered**

.039" dia. (1 mm)
.075" centers (1.905 mm)
206 holes per sq. in.
25% open



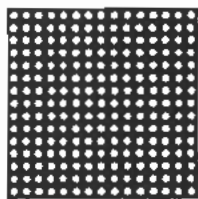
**.040"
Straight**


.040" dia. (1.016 mm)
.066" centers (1.676 mm)
230 holes per sq. in.
29% open



**.040"
Staggered**

.040" dia. (1.016 mm)
.086" centers (2.184 mm)
176 holes per sq. in.
22% open



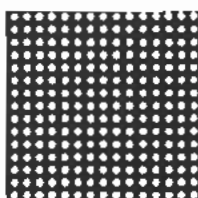
**.042"
Straight**

.042" dia. (1.067 mm)
.066" centers (1.676 mm)
230 holes per sq. in.
32% open



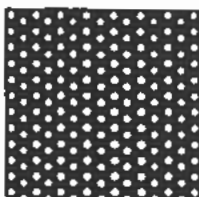
**.042"
Staggered**

.042" dia. (1.067 mm)
.086" centers (2.184 mm)
176 holes per sq. in.
24% open



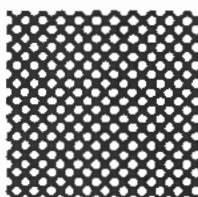
**.045"
Straight**


.045" dia. (1.143 mm)
.066" centers (1.676 mm)
230 holes per sq. in.
37% open



**.045"
Staggered**


.045" dia. (1.143 mm)
.086" centers (2.184 mm)
176 holes per sq. in.
28% open



**.045"
Diagonal**

.045" dia. (1.143 mm)
.066" centers (1.676 mm)
227 holes per sq. in.
36% open

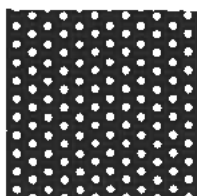


**PERFORATING
COMPANIES**



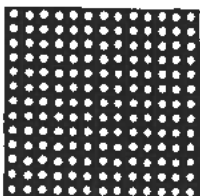
**.046"
Staggered**

.046" dia. (1.168 mm)
5/64" centers (1.984 mm)
183 holes per sq. in.
30% open



**.046"
Staggered**

.046" dia. (1.168 mm)
3/32" centers (2.381 mm)
126 holes per sq. in.
21% open



**.050"
Straight**

.050" dia. (1.270 mm)
.077" centers (1.956 mm)
169 holes per sq. in.
33% open



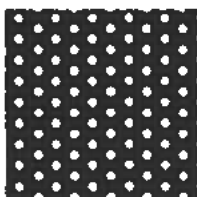
**.050"
Staggered**

.050" dia. (1.270 mm)
.099" centers (2.515 mm)
131 holes per sq. in.
26% open



**.050"
Staggered**

.050" dia. (1.270 mm)
3/32" centers (2.381 mm)
132 holes per sq. in.
26% open



**.050"
Staggered**

.050" dia. (1.270 mm)
7/64" centers (2.778 mm)
97 holes per sq. in.
19% open



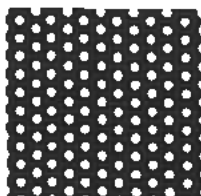
**.050"
Staggered**

.050" dia. (1.270 mm)
9/64" centers (3.572 mm)
59 holes per sq. in.
12% open



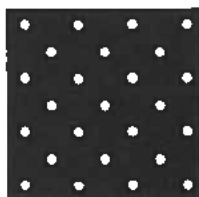
**.050"
Staggered**

.050" dia. (1.270 mm)
5/32" centers (3.969 mm)
41 holes per sq. in.
8% open



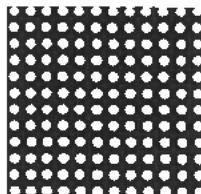
**.055"
Staggered**

.055" dia. (1.397 mm)
3/32" centers (2.381 mm)
132 holes per sq. in.
32% open



**.055"
Diagonal**

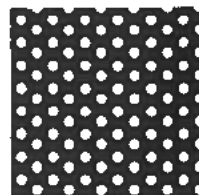
.055" dia. (1.397 mm)
.200" centers (5.080 mm)
25 holes per sq. in.
6% open



**.057"
Straight**

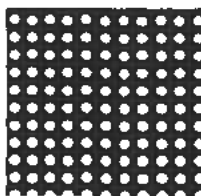


.057" dia. (1.448 mm)
.086" centers (2.184 mm)
135 holes per sq. in.
34% open



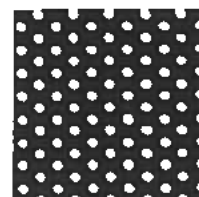
**.057"
Special
Staggered**

.057" dia. (1.448 mm)
.121" centers (3.073 mm)
96 holes per sq. in.
25% open



**.057"
Straight**

.057" dia. (1.448 mm)
.090" centers (2.286 mm)
123 holes per sq. in.
32% open



**.057"
Special
Staggered**

.057" dia. (1.448 mm)
.121" centers (3.073 mm)
92 holes per sq. in.
23% open



**.060"
Staggered**

.060" dia. (1.524 mm)
3/32" centers (2.381 mm)
132 holes per sq. in.
37% open

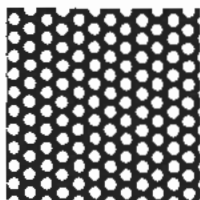


**.060"
Staggered**

.060" dia. (1.524 mm)
7/64" centers (2.778 mm)
97 holes per sq. in.
27% open



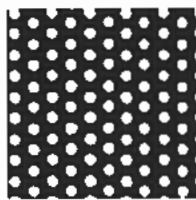
**PERFORATING
COMPANIES**



1/16"
Staggered



.0625" dia. (1.588 mm)
3/32" centers (2.381 mm)
132 holes per sq. in.
41% open



1/16"
Staggered



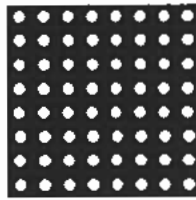
.0625" dia. (1.588 mm)
7/64" centers (2.778 mm)
97 holes per sq. in.
30% open



1/16"
Staggered

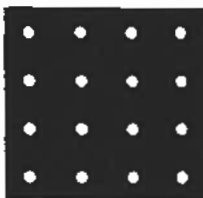


.0625" dia. (1.588 mm)
1/8" centers (3.175 mm)
74 holes per sq. in.
23% open



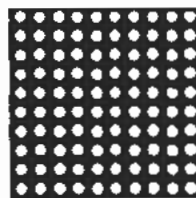
1/16"
Straight

.0625" dia. (1.588 mm)
1/8" centers (3.175 mm)
64 holes per sq. in.
20% open



1/16"
Straight

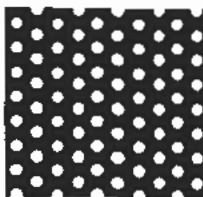
.0625" dia. (1.588 mm)
1/4" centers (6.350 mm)
16 holes per sq. in.
5% open



.065"
Straight

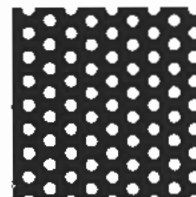


.065" dia. (1.651 mm)
.100" centers (2.540 mm)
100 holes per sq. in.
33% open



.065"
Staggered

.065" dia. (1.651 mm)
.129" centers (3.277 mm)
78 holes per sq. in.
26% open

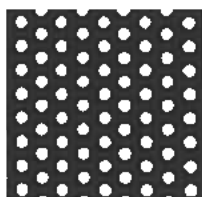


.066"
Staggered

.066" dia. (1.676 mm)
7/64" centers (2.778 mm)
97 holes per sq. in.
33% open

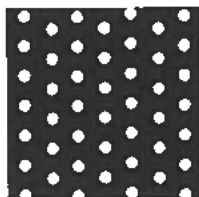


**PERFORATING
COMPANIES**



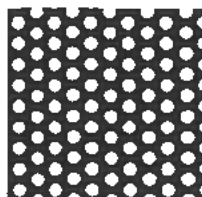
**.066"
Staggered**

.066" dia. (1.676 mm)
1/8" centers (3.175 mm)
74 holes per sq. in.
25% open



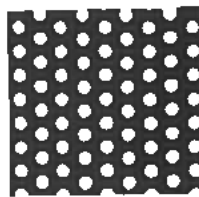
**.066"
Staggered**

.066" dia. (1.676 mm)
5/32" centers (3.969 mm)
47 holes per sq. in.
16% open



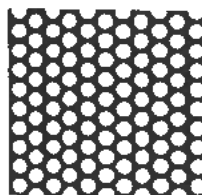
**.070"
Staggered**

.070" dia. (1.778 mm)
7/64" centers (2.778 mm)
97 holes per sq. in.
38% open



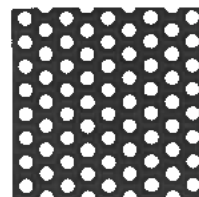
**.072"
Staggered**

.0715" dia. (1.816 mm)
1/8" centers (3.175 mm)
74 holes per sq. in.
30% open



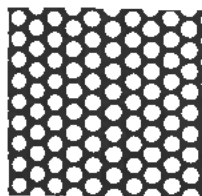
**.075"
Staggered**

.075" dia. (1.905 mm)
.100" centers (2.540 mm)
115 holes per sq. in.
51% open



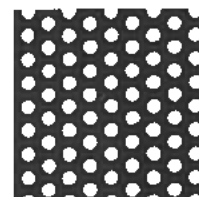
**.075"
Staggered**

.075" dia. (1.905 mm)
1/8" centers (3.175 mm)
74 holes per sq. in.
33% open



**.079"
Staggered**

.079" dia. (2 mm)
7/64" centers (2.778 mm)
97 holes per sq. in.
45% open

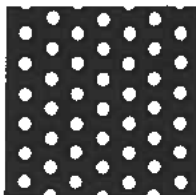


**.079"
Staggered**

.079" dia. (2 mm)
1/8" centers (3.175 mm)
74 holes per sq. in.
36% open



**PERFORATING
COMPANIES**



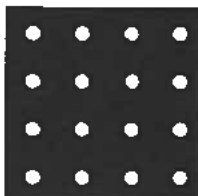
**.079"
Staggered**

.079" dia. (2 mm)
5/32" centers (4 mm)
48 holes per sq. in.
23% open



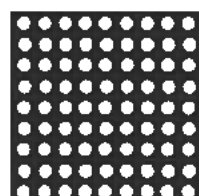
**.079"
Staggered**

.079" dia. (2 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
16% open



**.079"
Straight**

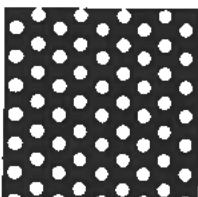
.079" dia. (2 mm)
1/4" centers (6.350 mm)
16 holes per sq. in.
8% open



**.079"
Straight**

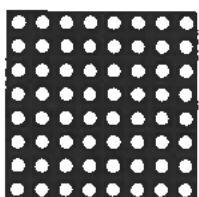


.079" dia. (2 mm)
1/10" centers (2.794 mm)
83 holes per sq. in.
41% open



**.079"
Staggered**

.079" dia. (2 mm)
1/50" centers (3.810 mm)
61 holes per sq. in.
30% open



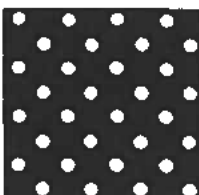
**.079"
Straight**

.079" dia. (2 mm)
1/25" centers (3.175 mm)
64 holes per sq. in.
32% open



**.079"
Staggered**

.079" dia. (2 mm)
1/65" centers (4.191 mm)
49 holes per sq. in.
24% open

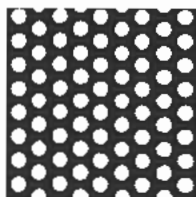


**.079"
Diagonal**

.079" dia. (2 mm)
1/77" centers (4.496 mm)
32 holes per sq. in.
16% open

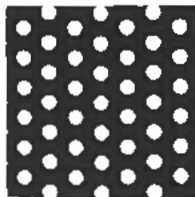


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COMPANIES**



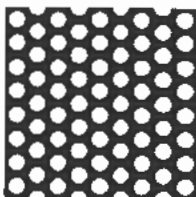
**.081"
Staggered**

.081" dia. (2.057 mm)
1/8" centers (3.175 mm)
74 holes per sq. in.
38% open



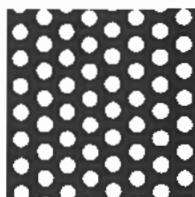
**.081"
Staggered**

.081" dia. (2.057 mm)
5/32" centers (3.969 mm)
48 holes per sq. in.
25% open



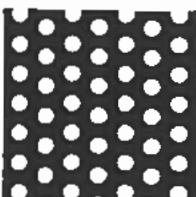
**.085"
Staggered**

.085" dia. (2.159 mm)
1/8" centers (3.175 mm)
74 holes per sq. in.
42% open



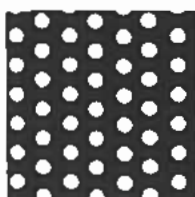
**.085"
Staggered**

.085" dia. (2.159 mm)
9/64" centers (3.572 mm)
59 holes per sq. in.
33% open



**.085"
Staggered**

.085" dia. (2.159 mm)
5/32" centers (3.969 mm)
48 holes per sq. in.
27% open



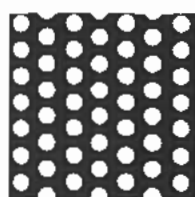
**.090"
Staggered**

.090" dia. (2.286 mm)
5/32" centers (3.969 mm)
46 holes per sq. in.
29% open



**.090"
Staggered**

.090" dia. (2.286 mm)
3/16" centers (4.763 mm)
34 holes per sq. in.
22% open

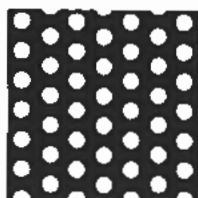


**3/32"
Staggered**

.094" dia. (2.381 mm)
9/64" centers (3.572 mm)
59 holes per sq. in.
41% open



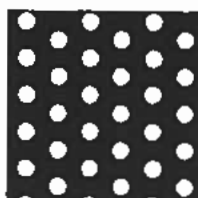
**PERFORATING
COMPANIES**



3/32"
Staggered



.094" dia. (2.381 mm)
5/32" centers (3.969 mm)
47 holes per sq. in.
33% open



3/32"
Staggered



.094" dia. (2.381 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
23% open



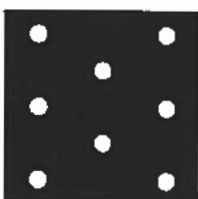
3/32"
Staggered

.094" dia. (2.381 mm)
1/4" centers (6.350 mm)
18.5 holes per sq. in.
13% open



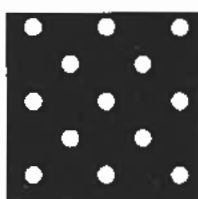
3/32"
Staggered

.094" dia. (2.381 mm)
5/16" centers (7.938 mm)
12 holes per sq. in.
8% open



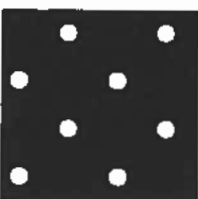
3/32"
Staggered

.094" dia. (2.381 mm)
3/8" centers (9.525 mm)
8 holes per sq. in.
5.5% open



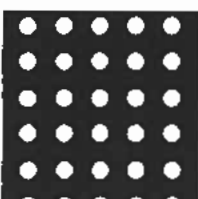
3/32"
Diagonal

.094" dia. (2.381 mm)
17/64" centers (6.747 mm)
14 holes per sq. in.
10% open



3/32"
Diagonal

.094" dia. (2.381 mm)
.353" centers (8.966 mm)
8 holes per sq. in.
5.5% open

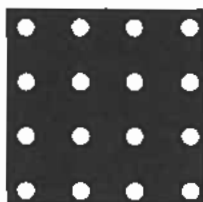


3/32"
Straight

.094" dia. (2.381 mm)
3/16" centers (4.763 mm)
29 holes per sq. in.
20% open

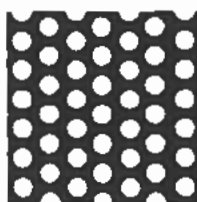


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COMPANIES



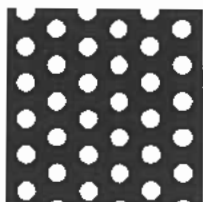
**3/32"
Straight**

.094" dia. (2.381 mm)
9/32" centers (7.144 mm)
13 holes per sq. in.
9% open



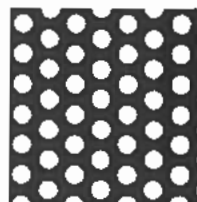
**.098"
Staggered**

.098" dia. (2.489 mm)
5/32" centers (3.969 mm)
47 holes per sq. in.
36% open



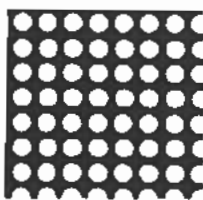
**.098"
Staggered**

.098" dia. (2.489 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
24% open



**.100"
Staggered**

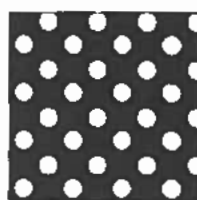
.100" dia. (2.540 mm)
5/32" centers (3.969 mm)
47 holes per sq. in.
37% open



**.103"
Straight**

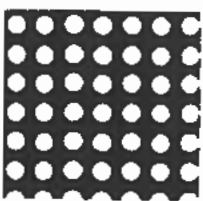


.103" dia. (2.616 mm)
.132" centers (3.353 mm)
57 holes per sq. in.
48% open



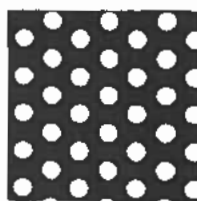
**.103"
Diagonal**

.103" dia. (2.616 mm)
.187" centers (4.763 mm)
29 holes per sq. in.
24% open



**.103"
Straight**

.103" dia. (2.616 mm)
.150" centers (3.810 mm)
44 holes per sq. in.
37% open

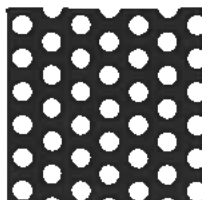


**.103"
Staggered**

.103" dia. (2.616 mm)
.200" centers (5.080 mm)
33 holes per sq. in.
28% open

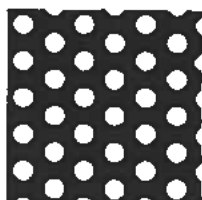


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COMPANIES**



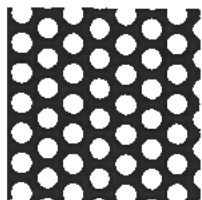
**.103"
Staggered**

.103" dia. (2.616 mm)
11/64" centers (4.366 mm)
39 holes per sq. in.
32% open



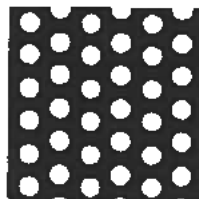
**.106"
Staggered**

.106" dia. (2.692 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
29% open



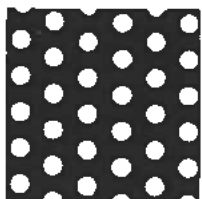
**7/64"
Staggered**

.109" dia. (2.778 mm)
5/32" centers (3.969 mm)
47 holes per sq. in.
45% open



**7/64"
Staggered**

.109" dia. (2.778 mm)
11/64" centers (4.366 mm)
39 holes per sq. in.
35% open



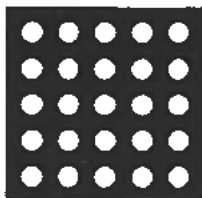
**7/64"
Staggered**

.109" dia. (2.778 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
31% open



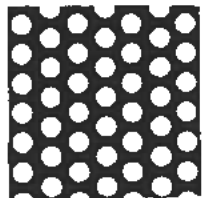
**7/64"
Staggered**

.109" dia. (2.778 mm)
1/4" centers (6.350 mm)
18.5 holes per sq. in.
17% open



**7/64"
Straight**

.109" dia. (2.778 mm)
3/16" centers (4.763 mm)
29 holes per sq. in.
27% open

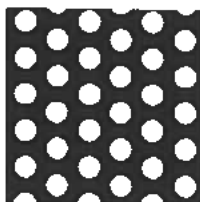


**.113"
Staggered**

.113" dia. (2.870 mm)
5/32" centers (3.969 mm)
47 holes per sq. in.
48% open

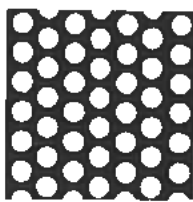


**PERFORATING
COMPANIES**



**.115"
Staggered**

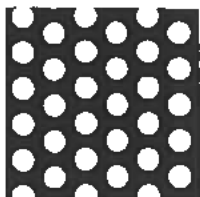
.115" dia. (2.921 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
34% open



**.117"
Staggered**

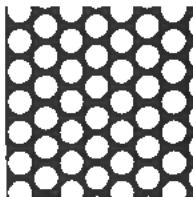


.117" dia. (2.972 mm)
5/32" centers (3.969 mm)
47 holes per sq. in.
51% open



**.118"
Staggered**

.118" dia. (2.997 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
36% open



**1/8"
Staggered**



.125" dia. (3.175 mm)
5/32" centers (3.969 mm)
47 holes per sq. in.
58% open



**1/8"
Staggered**



.125" dia. (3.175 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
40% open



**1/8"
Staggered**



.125" dia. (3.175 mm)
7/32" centers (5.556 mm)
24 holes per sq. in.
30% open



**1/8"
Staggered**

.125" dia. (3.175 mm)
1/4" centers (6.350 mm)
18.5 holes per sq. in.
23% open



**1/8"
Staggered**

.125" dia. (3.175 mm)
5/16" centers (7.938 mm)
12 holes per sq. in.
15% open

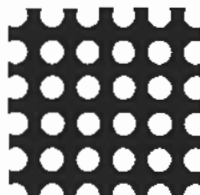


**PERFORATING
COMPANIES**



**1/8"
Staggered**

.125" dia. (3.175 mm)
3/8" centers (9.525 mm)
8 holes per sq. in.
10% open



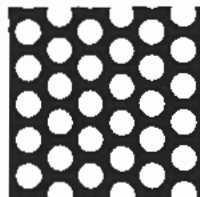
**1/8"
Straight**

.125" dia. (3.175 mm)
3/16" centers (4.763 mm)
28 holes per sq. in.
35% open



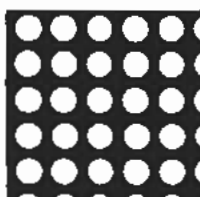
**.133"
Staggered**

.133" dia. (3.378 mm)
7/32" centers (5.556 mm)
24 holes per sq. in.
34% open



**.135"
Staggered**

.135" dia. (3.429 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
47% open



**.138"
Straight**



.138" dia. (3.505 mm)
3/16" centers (4.763 mm)
29 holes per sq. in.
43% open



**.138"
Diagonal**

.138" dia. (3.505 mm)
3/8" centers (9.525 mm)
15 holes per sq. in.
22% open



**.138"
Staggered**

.138" dia. (3.505 mm)
7/32" centers (5.556 mm)
24 holes per sq. in.
36% open

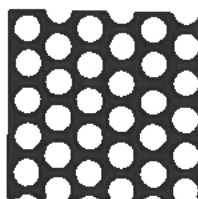


**.138"
Staggered**

.138" dia. (3.505 mm)
1/4" centers (6.350 mm)
18.5 holes per sq. in.
28% open



**PERFORATING
COMPANIES**



9/64"
Staggered

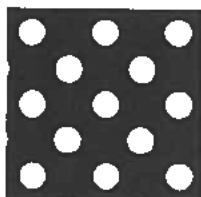


.141" dia. (3.572 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
51% open



9/64"
Staggered

.141" dia. (3.572 mm)
7/32" centers (5.556 mm)
24 holes per sq. in.
37% open



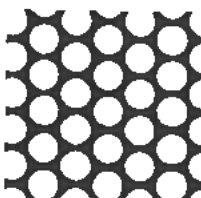
9/64"
Diagonal

.141" dia. (3.572 mm)
17/64" centers (6.747 mm)
14 holes per sq. in.
22% open



.149"
Staggered

.149" dia. (3.785 mm)
7/32" centers (5.556 mm)
24 holes per sq. in.
42% open



5/32"
Staggered



.156" dia. (3.969 mm)
3/16" centers (4.763 mm)
33 holes per sq. in.
63% open



5/32"
Staggered

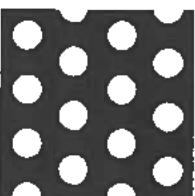


.156" dia. (3.969 mm)
7/32" centers (5.556 mm)
24 holes per sq. in.
46% open



5/32"
Staggered

.156" dia. (3.969 mm)
1/4" centers (6.350 mm)
18.5 holes per sq. in.
36% open



5/32"
Staggered

.156" dia. (3.969 mm)
9/32" centers (7.144 mm)
14 holes per sq. in.
28% open



**PERFORATING
COMPANIES**



5/32"
Staggered

.156" dia. (3.969 mm)
5/16" centers (7.938 mm)
12 holes per sq. in.
23% open



5/32"
Straight

.156" dia. (3.969 mm)
1/4" centers (6.350 mm)
16 holes per sq. in.
30% open



5/32"
Straight

.156" dia. (3.969 mm)
9/32" centers (7.144 mm)
13 holes per sq. in.
24% open



5/32"
Straight

.156" dia. (3.969 mm)
1/2" centers (12.700 mm)
4 holes per sq. in.
8% open



.164"
Staggered

.164" dia. (4.166 mm)
1/4" centers (6.350 mm)
18.5 holes per sq. in.
39% open



.164"
Staggered

.164" dia. (4.166 mm)
17/64" centers (6.747 mm)
16 holes per sq. in.
35% open



11/64"
Staggered

.172" dia. (4.366 mm)
1/4" centers (6.350 mm)
18.5 holes per sq. in.
43% open



11/64"
Staggered

.172" dia. (4.366 mm)
17/64" centers (6.747 mm)
16 holes per sq. in.
38% open



THE
**PERFORATING
COMPANIES**



**.177"
Staggered**

.177" dia. (4.500 mm)
9/32" centers (7.144 mm)
15 holes per sq. in.
36% open



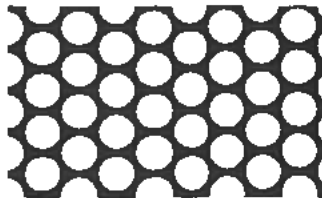
**.177"
Staggered**

.177" dia. (4.500 mm)
5/16" centers (7.938 mm)
12 holes per sq. in.
29% open



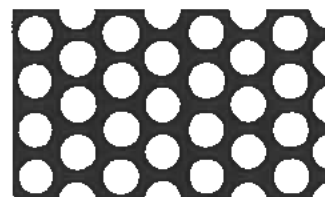
**.180"
Staggered**

.180" dia. (4.572 mm)
1/4" centers (6.350 mm)
18.5 holes per sq. in.
47% open



**3/16"
Staggered**

.1875" dia. (4.763 mm)
7/32" centers (5.556 mm)
24 holes per sq. in.
67% open



**3/16"
Staggered**

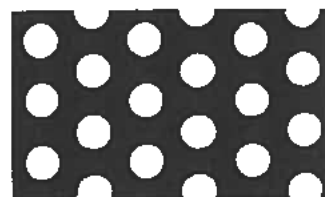


.1875" dia. (4.763 mm)
1/4" centers (6.350 mm)
18.5 holes per sq. in.
51% open



**3/16"
Staggered**

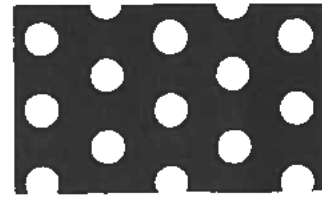
.1875" dia. (4.763 mm)
9/32" centers (7.144 mm)
15 holes per sq. in.
41% open



**3/16"
Staggered**



.1875" dia. (4.763 mm)
5/16" centers (7.938 mm)
12 holes per sq. in.
33% open



**3/16"
Staggered**

.1875" dia. (4.763 mm)
3/8" centers (9.525 mm)
8 holes per sq. in.
23% open



**PERFORATING
COMPANIES**



**.197"
Staggered**

.197" dia. (5 mm)
9/32" centers (7.144 mm)
15 holes per sq. in.
45% open



**.197"
Staggered**

.197" dia. (5 mm)
5/16" centers (7.938 mm)
12 holes per sq. in.
37% open



**.197"
Straight**

.197" dia. (5 mm)
1/2" centers (12.700 mm)
4 holes per sq. in.
12% open



**13/64"
Staggered**



.203" dia. (5.159 mm)
1/4" centers (6.350 mm)
18.5 holes per sq. in.
60% open



**13/64"
Staggered**

.203" dia. (5.159 mm)
9/32" centers (7.144 mm)
14 holes per sq. in.
46% open



**13/64"
Staggered**

.203" dia. (5.159 mm)
5/16" centers (7.938 mm)
12 holes per sq. in.
38% open



**7/32"
Staggered**

.219" dia. (5.556 mm)
5/16" centers (7.938 mm)
12 holes per sq. in.
45% open



**7/32"
Staggered**

.219" dia. (5.556 mm)
13/32" centers (10.319 mm)
7 holes per sq. in.
27% open



**PERFORATING
COMPANIES**



**15/64"
Staggered**

.234" dia. (5.953 mm)
5/16" centers (7.938 mm)
11 holes per sq. in.
49% open



**15/64"
Staggered**

.234" dia. (5.953 mm)
3/8" centers (9.525 mm)
8 holes per sq. in.
35% open



**.236"
Staggered**

.236" dia. (6 mm)
5/16" centers (7.938 mm)
11 holes per sq. in.
51% open



**.236"
Staggered**

.236" dia. (6 mm)
3/8" centers (9.525 mm)
8 holes per sq. in.
36% open



**1/4"
Staggered**



.250" dia. (6.350 mm)
5/16" centers (7.938 mm)
58% open



**1/4"
Staggered**

.250" dia. (6.350 mm)
11/32" centers (8.731 mm)
48% open



**1/4"
Staggered**



.250" dia. (6.350 mm)
3/8" centers (9.525 mm)
40% open



**1/4"
Staggered**

.250" dia. (6.350 mm)
13/32" centers (10.319 mm)
34% open



**PERFORATING
COMPANIES**



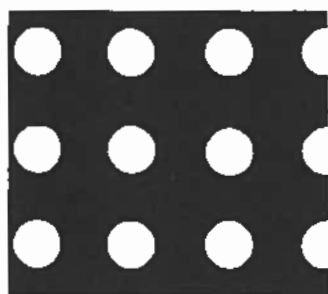
**1/4"
Staggered**

.250" dia. (6.350 mm)
7/16" centers (11.113 mm)
30% open



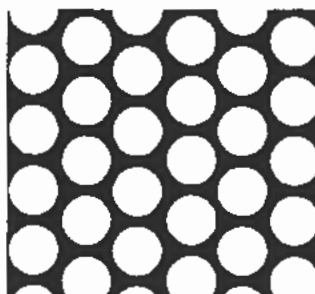
**1/4"
Staggered**

.250" dia. (6.350 mm)
1/2" centers (12.700 mm)
23% open



**1/4"
Straight**

.250" dia. (6.350 mm)
1/2" centers (12.700 mm)
20% open



**17/64"
Staggered**



.265" dia. (6.747 mm)
5/16" centers (7.938 mm)
65% open



**17/64"
Staggered**

.265" dia. (6.747 mm)
3/8" centers (9.525 mm)
46% open

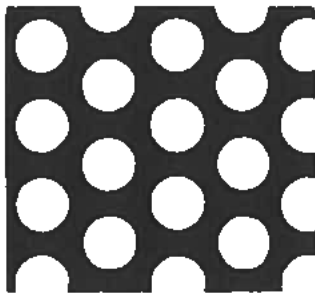


**17/64"
Staggered**

.265" dia. (6.747 mm)
7/16" centers (11.113 mm)
33% open

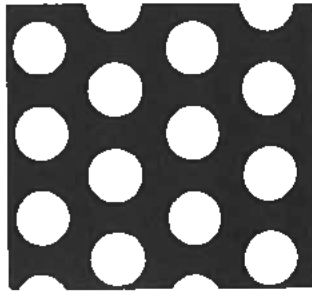


**PERFORATING
COMPANIES**



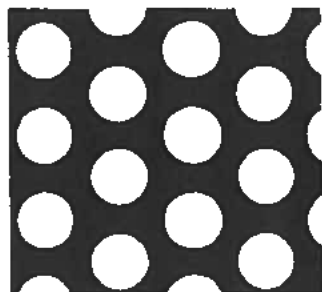
**9/32"
Staggered**

.281" dia. (7.144 mm)
13/32" centers (10.319 mm)
44% open



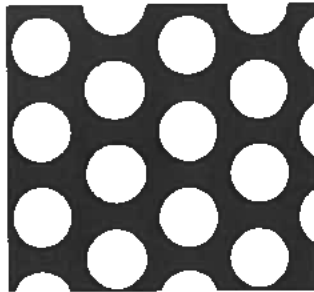
**9/32"
Staggered**

.281" dia. (7.144 mm)
7/16" centers (11.113 mm)
38% open



**19/64"
Staggered**

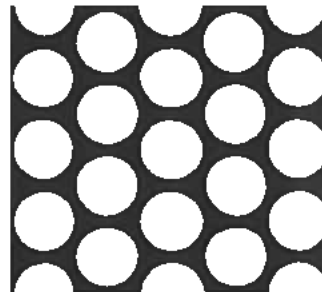
.297" dia. (7.541 mm)
7/16" centers (11.113 mm)
42% open



**5/16"
Staggered**

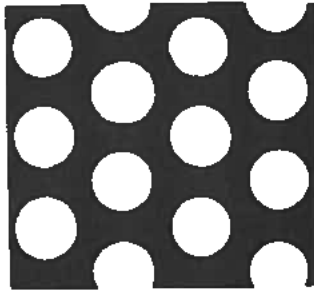


.3125" dia. (7.938 mm)
7/16" centers (11.113 mm)
47% open



**5/16"
Staggered**

.3125" dia. (7.938 mm)
3/8" centers (9.525 mm)
63% open

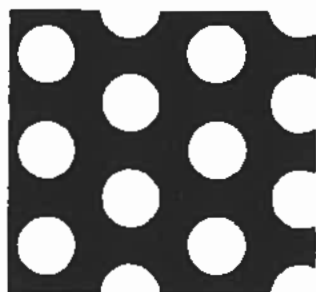


**5/16"
Staggered**

.3125" dia. (7.938 mm)
15/32" centers (11.906 mm)
40% open

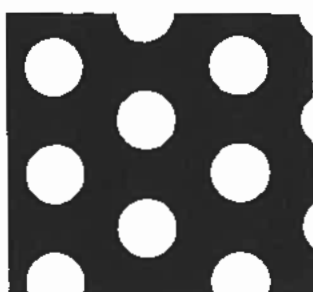


THE
**PERFORATING
COMPANIES**



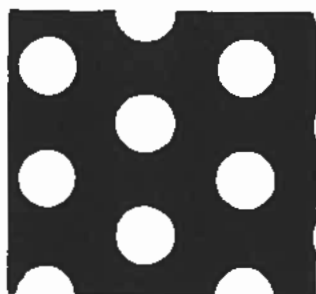
5/16"
Staggered

.3125" dia. (7.938 mm)
1/2" centers (12.700 mm)
35% open



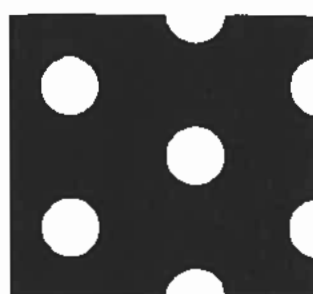
5/16"
Staggered

.3125" dia. (7.938 mm)
9/16" centers (14.288 mm)
28% open



5/16"
Staggered

.3125" dia. (7.938 mm)
19/32" centers (15.081 mm)
25% open



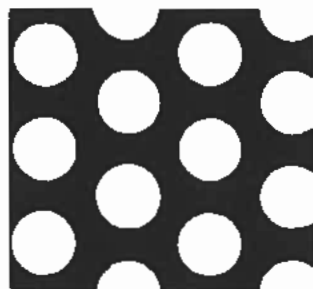
5/16"
Staggered

.3125" dia. (7.938 mm)
3/4" centers (19.050 mm)
16% open



21/64"
Staggered

.328" dia. (8.334 mm)
7/16" centers (11.113 mm)
51% open

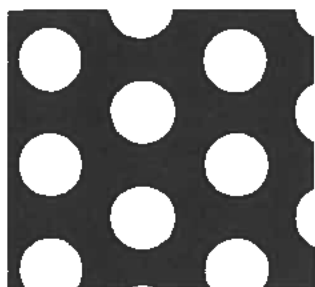


11/32"
Staggered

.344" dia. (8.731 mm)
1/2" centers (12.700 mm)
42% open

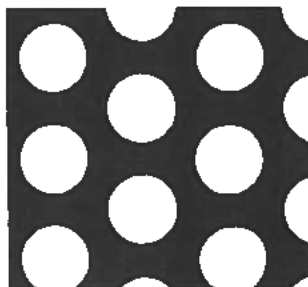


THE
**PERFORATING
COMPANIES**



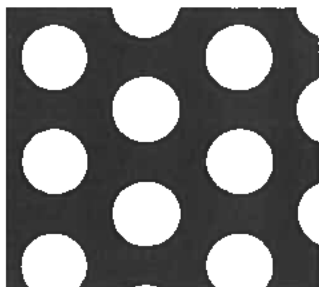
11/32"
Staggered

.344" dia. (8.731 mm)
9/16" centers (14.288 mm)
34% open



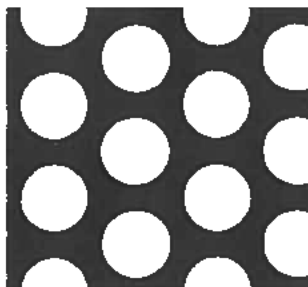
.354"
Staggered

.354" dia. (9 mm)
17/32" centers (13.494 mm)
40% open



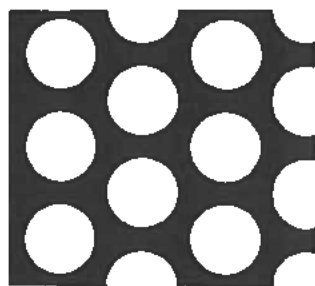
.354"
Staggered

.354" dia. (9 mm)
9/16" centers (14.288 mm)
36% open



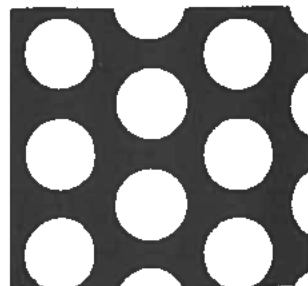
23/64"
Staggered

.359" dia. (9.128 mm)
1/2" centers (12.700 mm)
47% open



3/8"
Staggered

.375" dia. (9.525 mm)
1/2" centers (12.700 mm)
51% open

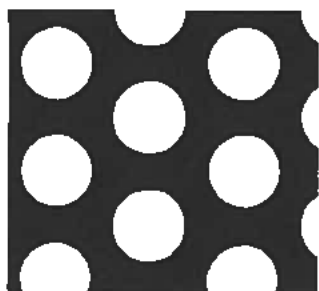


3/8"
Staggered

.375" dia. (9.525 mm)
17/32" centers (13.494 mm)
45% open



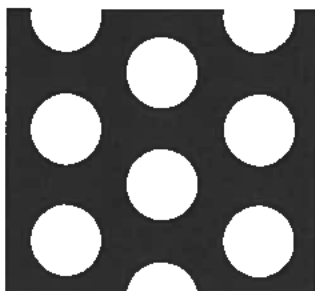
**PERFORATING
COMPANIES**



3/8"
Staggered

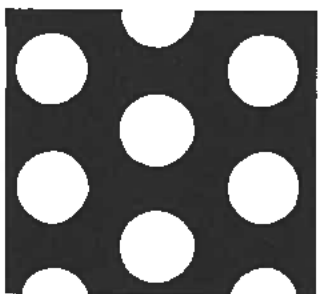


.375" dia. (9.525 mm)
9/16" centers (14.288 mm)
40% open



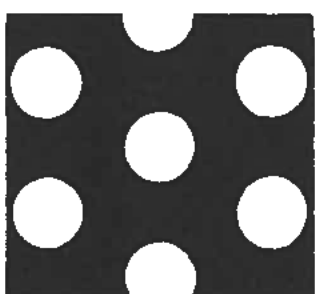
3/8"
Staggered

.375" dia. (9.525 mm)
19/32" centers (15.081 mm)
36% open



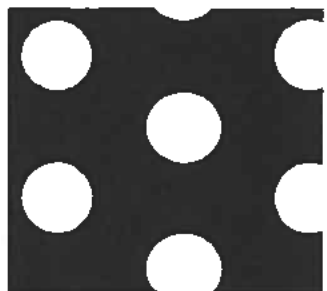
3/8"
Staggered

.375" dia. (9.525 mm)
5/8" centers (15.875 mm)
33% open



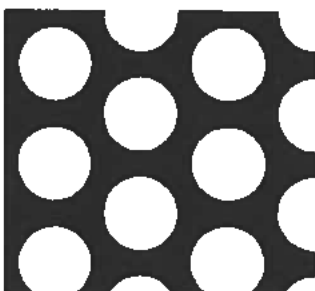
3/8"
Staggered

.375" dia. (9.525 mm)
11/16" centers (17.463 mm)
27% open



3/8"
Staggered

.375" dia. (9.525 mm)
3/4" centers (19.050 mm)
23% open



25/64"
Staggered

.390" dia. (9.906 mm)
17/32" centers (13.494 mm)
49% open

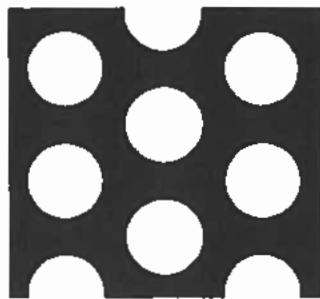


**PERFORATING
COMPANIES**



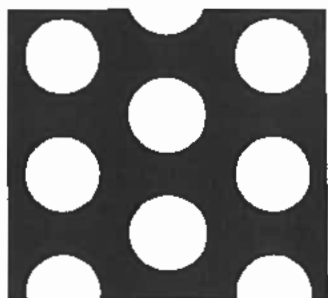
**.394"
Staggered**

.394" dia. (10 mm)
9/16" centers (14.288 mm)
45% open



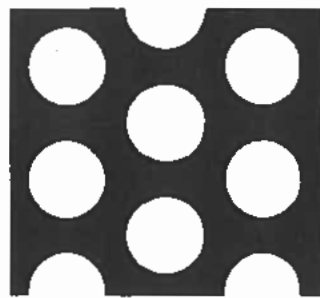
**.394"
Staggered**

.394" dia. (10 mm)
19/32" centers (15.081 mm)
40% open



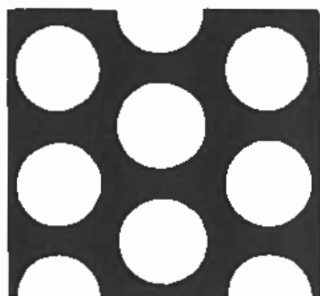
**.394"
Staggered**

.394" dia. (10 mm)
5/8" centers (15.875 mm)
36% open



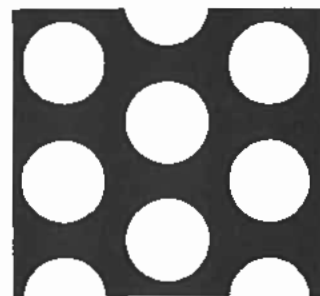
**13/32"
Staggered**

.406" dia. (10.319 mm)
19/32" centers (15.081 mm)
43% open



**7/16"
Staggered**

.438" dia. (11.113 mm)
19/32" centers (15.081 mm)
49% open



**7/16"
Staggered**

.438" dia. (11.113 mm)
5/8" centers (15.875 mm)
45% open

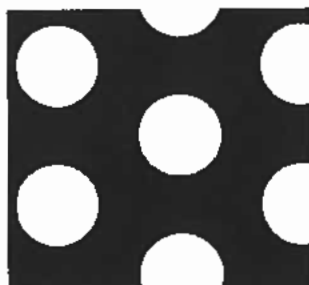


**PERFORATING
COMPANIES**



**7/16"
Staggered**

.438" dia. (11.113 mm)
21/32" centers (16.669 mm)
40% open



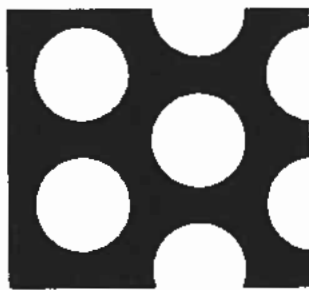
**7/16"
Staggered**

.438" dia. (11.113 mm)
3/4" centers (19.050 mm)
31% open



**15/32"
Staggered**

.469" dia. (11.906 mm)
11/16" centers (17.463 mm)
42% open



**1/2"
Staggered**

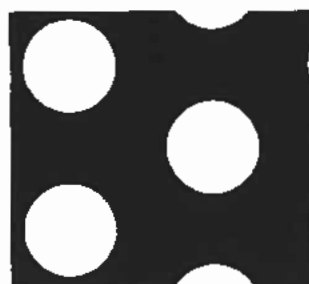


.500" dia. (12.700 mm)
11/16" centers (17.463 mm)
48% open



**1/2"
Staggered**

.500" dia. (12.700 mm)
3/4" centers (19.050 mm)
40% open

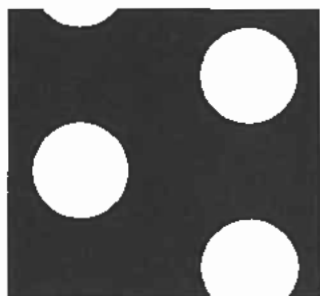


**1/2"
Staggered**

.500" dia. (12.700 mm)
7/8" centers (22.225 mm)
29% open

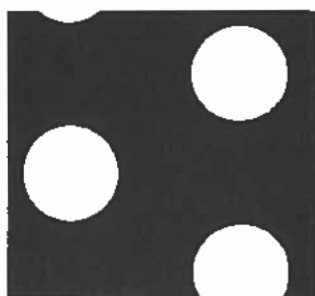


**PERFORATING
COMPANIES**



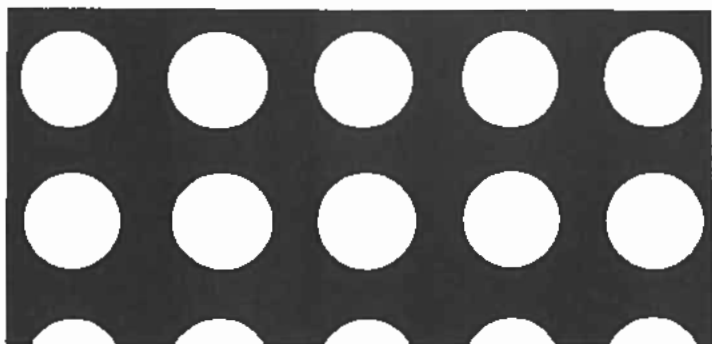
**1/2"
Staggered**

.500" dia. (12.700 mm)
1" centers (25.400 mm)
22% open



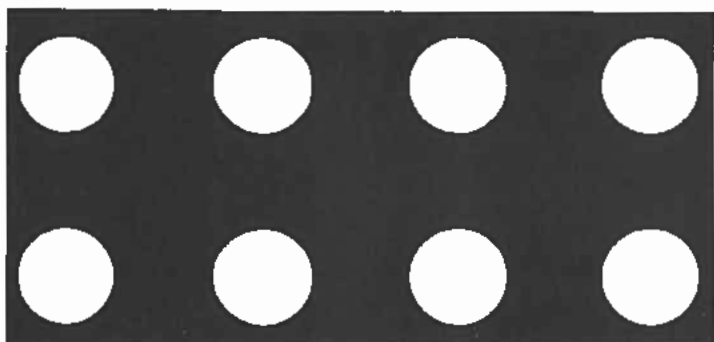
**1/2"
Staggered**

.500" dia. (12.700 mm)
1-1/32" centers (26.194 mm)
21% open



**1/2"
Straight**

.500" dia. (12.700 mm)
3/4" centers (19.050 mm)
35% open

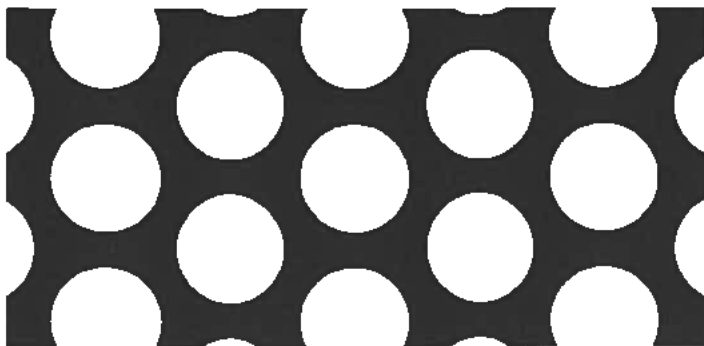


**1/2"
Straight**

.500" dia. (12.700 mm)
1" centers (25.400 mm)
20% open

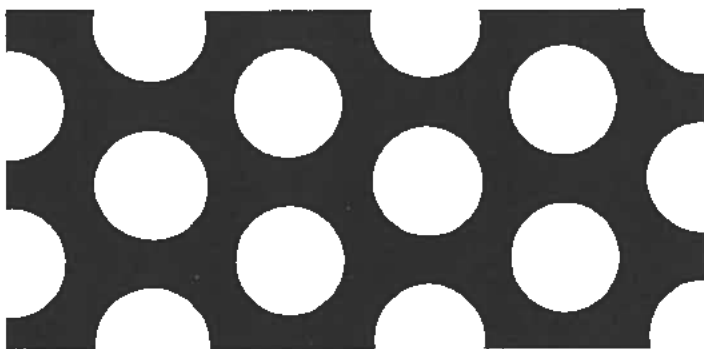


**PERFORATING
COMPANIES**



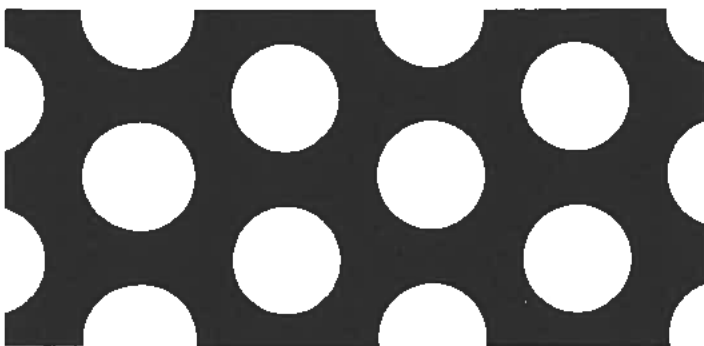
9/16"
Staggered

.563" dia. (14.288 mm)
3/4" centers (19.050 mm)
51% open



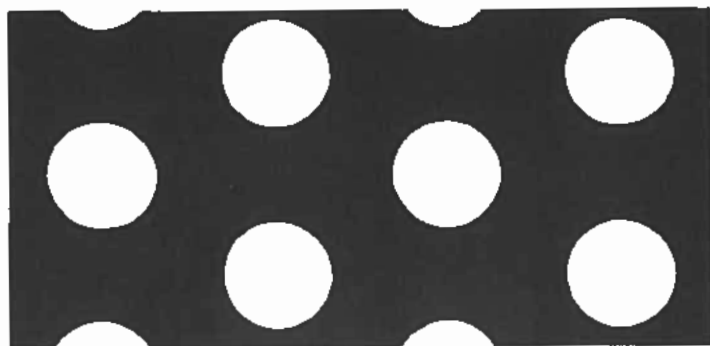
9/16"
Staggered

.563" dia. (14.288 mm)
13/16" centers (20.638 mm)
44% open



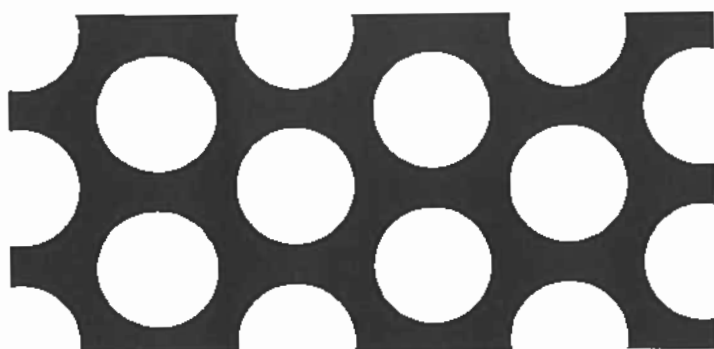
9/16"
Staggered

.563" dia. (14.288 mm)
7/8" centers (22.225 mm)
38% open



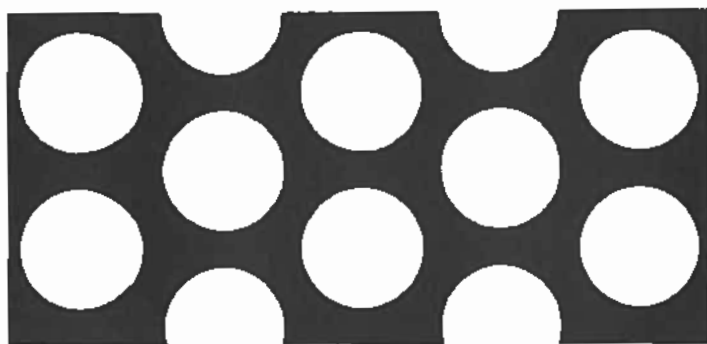
**9/16"
Staggered**

.563" dia. (14.288 mm)
1-1/32" centers (26.194 mm)
27% open



**19/32"
Staggered**

.594" dia. (15.081 mm)
13/16" centers (20.638 mm)
48% open

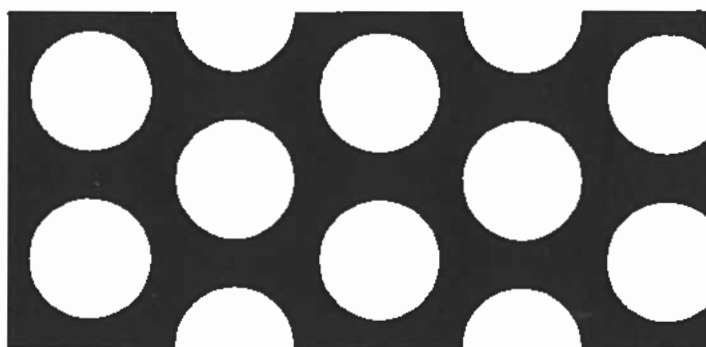


**5/8"
Staggered**

.625" dia. (15.875 mm)
13/16" centers (20.638 mm)
54% open

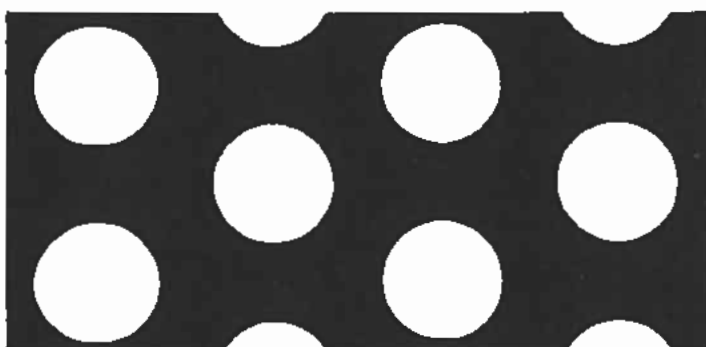


THE
HK & PERFORATING
COMPANIES



**5/8"
Staggered**

.625" dia. (15.875 mm)
7/8" centers (22.225 mm)
47% open



**5/8"
Staggered**

.625" dia. (15.875 mm)
1-1/32" centers (26.194 mm)
33% open

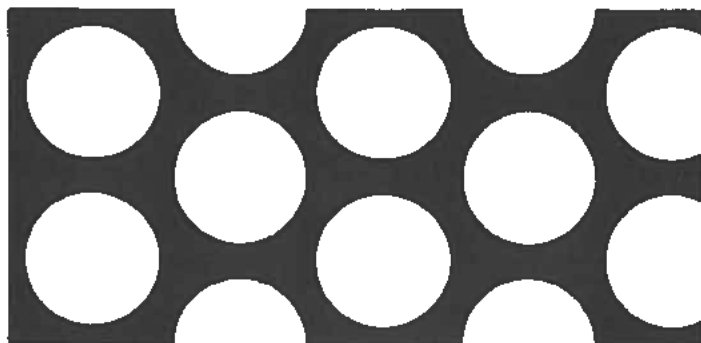


**21/32"
Staggered**

.656" dia. (16.669 mm)
7/8" centers (22.225 mm)
52% open

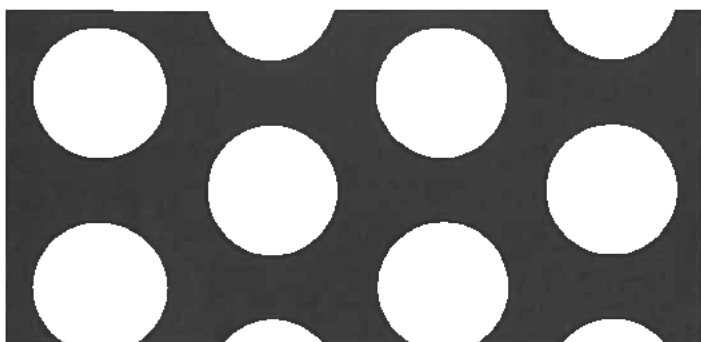


**PERFORATING
COMPANIES**



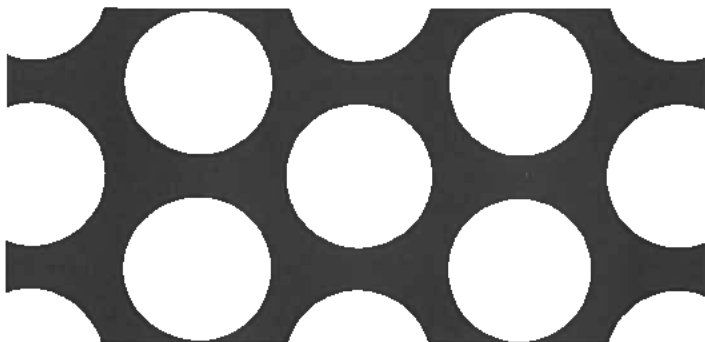
11/16"
Staggered

.688" dia. (17.463 mm)
7/8" centers (22.225 mm)
57% open



11/16"
Staggered

.688" dia. (17.463 mm)
1-1/32" centers (26.194 mm)
40% open



3/4"
Staggered

.750" dia. (19 mm)
31/32" centers (24.606 mm)
55% open



**3/4"
Staggered**

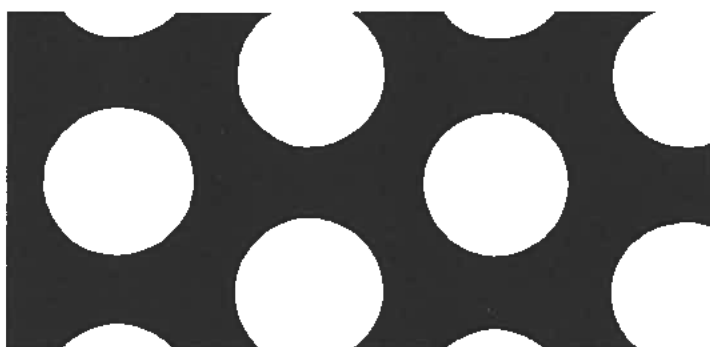


.750" dia. (19 mm)
1" centers (25.400 mm)
51% open



**3/4"
Staggered**

.750" dia. (19 mm)
1-1/32" centers (26.194 mm)
48% open

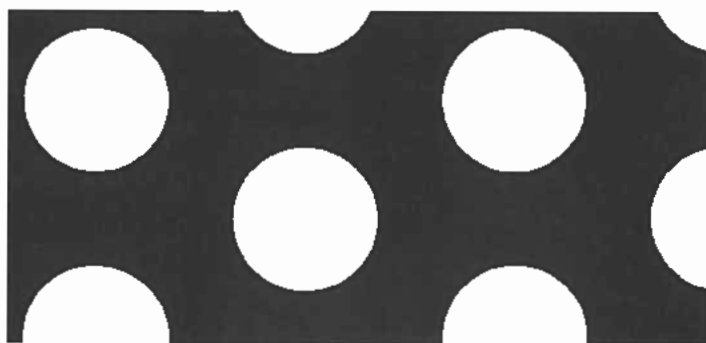


**3/4"
Staggered**

.750" dia. (19 mm)
1-1/8" centers (28.575 mm)
40% open

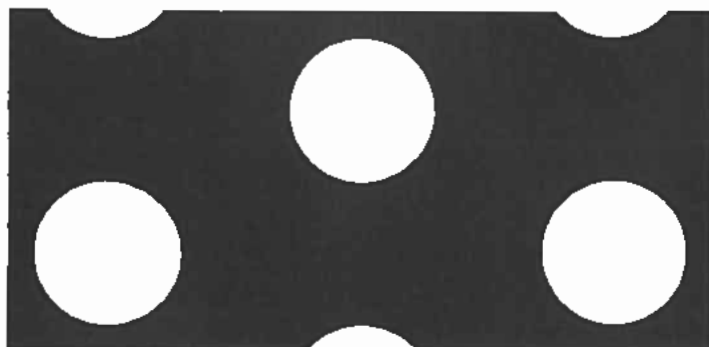


**PERFORATING
COMPANIES**



**3/4"
Staggered**

.750" dia. (19 mm)
1-1/4" centers (31.750 mm)
33% open



**3/4"
Staggered**

.750" dia. (19 mm)
1-1/2" centers (38.100 mm)
22% open

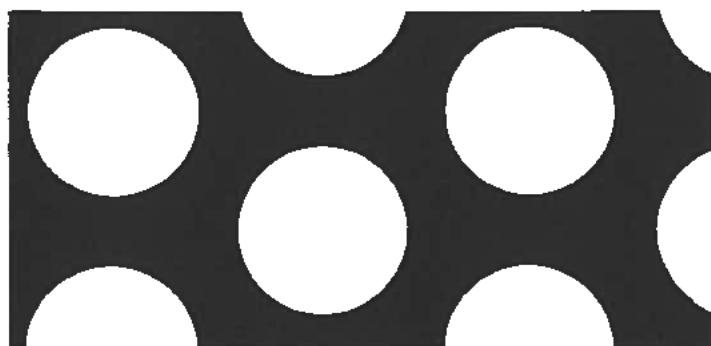


**7/8"
Staggered**

.875" dia. (22.225 mm)
1-1/16" centers (26.988 mm)
62% open



**PERFORATING
COMPANIES**



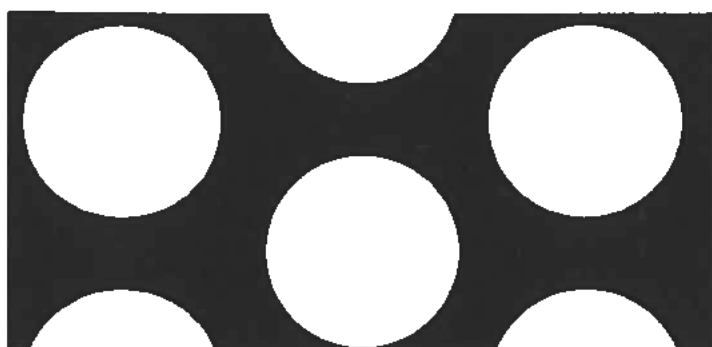
**7/8"
Staggered**

.875" dia. (22.225 mm)
1-1/4" centers (31.750 mm)
45% open



**1"
Staggered**

1" dia. (25.400 mm)
1-1/4" centers (31.750 mm)
58% open

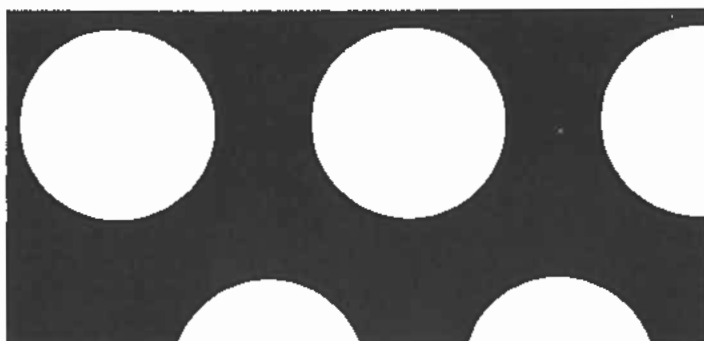


**1"
Staggered**

1" dia. (25.400 mm)
1-3/8" centers (34.925 mm)
48% open

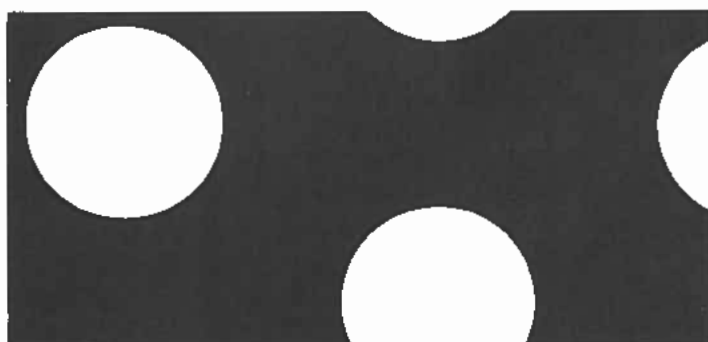


THE
**PERFORATING
COMPANIES**



**1"
Staggered**

1" dia. (25.400 mm)
1-1/2" centers (38.100 mm)
40% open



**1"
Staggered**

1" dia. (25.400 mm)
1-7/8" centers (47.625 mm)
26% open



**PERFORATING
COMPANIES**

ADDITIONAL ROUND HOLE PATTERNS NOT ILLUSTRATED

The following lists are additional round hole patterns which we can furnish with tools available from our die inventory.

The "Centers" shown represent the standard arrangement if no spacing were specified. However, all of these perforations can be arranged on special centers at little or no cost.

We also can produce in our die shop designs of a special nature to meet your exact requirements.

DIAMETERS (in Inches)	CENTERS (in Inches)	LAYOUT	% OPEN
.010	.026	Straight	12
.015	.026	"	26
.020	.120	Staggered	3
.020	9/32	Straight	1
.023	.083	Staggered	7
.024	.055	"	17
.024	.063	"	13
.030	.066	"	19
.033	.055	"	32.6
.033	.062	"	25.7
.033	.187	"	2.8
.034	.075	"	19
.035	7/32	"	4
.035	3/32	"	13
.038	.055	"	43.3
.040	.056	"	46.3
.040	.066	"	33.3
.040	.132	Straight	7.2
.040	.156	Staggered	6
.040	3/32	"	16
.044	5/64	"	28
.044	3/32	"	19
.045	.078	"	30.2
.045	3/32	"	20
.047	.059	"	57.6
.048	3/32	"	23
.050	.200	Diagonal	5
.052	3/32	Staggered	27
.055	.078	"	45.1
.056	3/32	"	32
.057	.083	Straight	37
.058	7/64	Staggered	25
.058	1/8	"	20
.060	1/8	"	21
.063	.100	Straight	31.2
.063	3/16	Staggered	10
.063	.250	Diagonal	5
.063	.546	Staggered	1.2
.065	1/8	"	23
.066	3/32	"	45
.066	.173	Diagonal	11
.066	.220	"	6.3
.068	7/64	Staggered	35
.068	1/8	"	27



**PERFORATING
COMPANIES**

ADDITIONAL ROUND HOLE PATTERNS NOT ILLUSTRATED

DIAMETERS (in inches)	CENTERS (in inches)	LAYOUT	% OPEN
.070	1/8	Staggered	28
.074	.110	"	41
.078	1/8	"	36
.079	.136	"	30.6
.079	.177	Diagonal	15.6
.080	.220	"	10.4
.081	1/4	Straight	8
.083	1/8	Staggered	40
.085	3/16	"	18
.086	9/64	"	34
.086	.177	Diagonal	27
.086	1/8	Straight	46
.094	.250	Staggered	12.8
.094	.265	Diagonal	9.9
.094	.265	Straight	10
.095	5/32	Staggered	33
.095	3/16	"	22
.098	1/4	"	14
.098	1/4	Straight	13
.098	7/16	"	4
.100	.141	Staggered	45.6
.100	1/2	"	3.7
.103	.212	Diagonal	28
.103	3/16	Straight	24
.103	5/32	Staggered	40
.103	3/16	"	27
.104	.312	"	10.1
.105	5/32	"	36
.105	11/64	"	34
.105	3/16	"	28
.109	.500	Straight	3.7
.117	9/64	Staggered	63
.118	.156	"	51.9
.118	5/32	"	52
.118	.197	"	32.5
.120	3/16	"	38
.125	.144	"	68.3
.125	.500	Straight	4.9
.125	17/64	Staggered	20
.125	21/64	"	15
.125	.541	"	5
.125	1/4	Straight	20
.135	7/32	Staggered	35
.135	1/4	"	25
.138	3/16	"	48
.145	7/32	"	40
.145	1/4	"	30
.145	5/16	"	20
.150	3/16	"	58
.150	7/32	"	43



**PERFORATING
COMPANIES**

ADDITIONAL ROUND HOLE PATTERNS NOT ILLUSTRATED

DIAMETERS (in inches)	CENTERS (in inches)	LAYOUT	% OPEN
.150	1/4	Staggered	32
.156	.250	Straight	30.6
.156	.437	"	10
.156	.200	Diagonal	48
.172	3/8	Staggered	19
.180	9/32	"	38
.180	3/8	"	21
.185	1/4	"	50
.185	9/32	"	39
.185	3/8	"	22
.187	1.250	Straight	1.8
.187	.625	Staggered	8.1
.187	13/32	"	19
.187	7/16	"	17
.187	17/32	"	11
.187	7/16	Straight	14
.187	1/2	"	11
.195	9/32	Staggered	42
.197	.793	"	5.6
.197	1	Straight	3
.203	11/32	Diagonal	26
.203	.375	Staggered	26.6
.218	3/8	"	30
.218	7/16	"	22
.226	5/16	"	46
.226	3/8	"	33
.236	11/32	"	42
.236	7/16	"	26
.236	5/8	"	13
.242	5/16	"	55
.242	11/32	"	44
.242	3/8	"	36
.242	7/16	"	28
.242	1/2	"	21
.250	.360	"	43.7
.250	15/32	"	26
.250	.541	"	19
.250	9/16	"	18
.250	1	Straight	5
.257	3/8	Staggered	42
.257	7/16	"	30
.261	3/8	"	43
.261	7/16	"	31
.269	13/32	"	41
.273	13/32	"	42
.276	13/32	"	41
.276	7/16	"	35
.277	13/32	"	43
.281	.375	"	50.9
.281	.563	"	22.6

ADDITIONAL ROUND HOLE PATTERNS NOT ILLUSTRATED

DIAMETERS (In inches)	CENTERS (in inches)	LAYOUT	% OPEN
.281	1	Straight	6.2
.281	1/2	Staggered	28
.285	7/16	Staggered	38
.289	7/16	"	40
.297	1/2	"	32
.302	7/16	"	43
.312	.406	"	53.6
.312	.500	Straight	30.6
.312	3/8	Staggered	63
.312	5/8	"	23
.315	7/16	"	47
.320	7/16	"	47
.324	1/2	"	38
.328	15/32	"	45
.328	9/16	"	31
.344	5/8	"	26
.354	1/2	"	42
.367	17/32	"	43
.375	.437	"	66.8
.375	.500	Straight	44.2
.375	.625	"	28.3
.375	1	"	11
.375	2.050	Diagonal	2.6
.375	13/16	Staggered	19
.375	31/32	"	14
.375	1-1/6	Diagonal	9
.390	5/8	Staggered	35
.394	3/4	"	25
.406	5/8	"	38
.423	5/8	"	41
.433	19/32	"	50
.437	11/16	"	37
.437	3/4	Straight	27
.437	1	Staggered	17
.453	11/16	"	40
.469	19/32	"	57
.472	11/16	"	44
.472	3/4	"	36
.472	1	"	20
.484	11/16	"	46
.484	3/4	"	37
.500	.687	Straight	41.6
.500	1.060	Staggered	20.2
.500	1.625	"	8.6
.500	5/8	"	58
.500	5/8	Straight	50
.500	1.094	"	16.4
.500	1.625	"	7.4
.510	3/4	Staggered	41
.515	11/16	"	51



**PERFORATING
COMPANIES**

ADDITIONAL ROUND HOLE PATTERNS NOT ILLUSTRATED

DIAMETERS (in inches)	CENTERS (in inches)	LAYOUT	% OPEN
.525	11/16	Staggered	53
.531	3/4	"	45
.546	3/4	"	47
.551	7/8	"	36
.562	1	"	29
.562	1-1/16	"	25
.575	7/8	"	40
.578	13/16	"	46
.590	7/8	"	45
.609	13/16	"	51
.610	13/16	"	51
.610	7/8	"	44
.625	1	"	35.4
.625	1.312	"	20.6
.625	1-1/2	"	16
.625	1	Straight	31
.630	7/8	Staggered	47
.641	1	"	41
.669	7/8	"	52
.669	1-1/32	"	38
.687	1-1/8	"	34
.687	3/4	Straight	65
.688	1.063	"	38
.709	31/32	Staggered	48
.709	1-1/8	"	36
.719	1	"	46
.719	1-1/8	"	37
.734	1-1/8	"	39
.750	1-1/16	"	46
.750	1	Straight	44
.750	.937	Staggered	58.1
.750	1.625	"	19.3
.750	-	Any	N/A
.750	1.125	Straight	34.9
.750	1.187	Staggered	36.2
.750	1-1/2	Straight	20
.750	2	"	11
.781	1-1/2	Staggered	24
.787	1-1/16	"	50
.787	1-1/4	"	36
.812	1	"	59.8
.812	1-1/4	"	38
.812	1-1/2	"	26
.875	1.125	"	54.9
.875	1.312	"	40.3
.875	-	Any	N/A
.875	1-1/2	Staggered	30
.875	1-3/4	"	23
.875	2-1/2	Diagonal	11
.937	1.125	Staggered	62.9



**PERFORATING
COMPANIES**

ADDITIONAL ROUND HOLE PATTERNS NOT ILLUSTRATED

DIAMETERS (in inches)	CENTERS (In Inches)	LAYOUT	% OPEN
.937	1-1/2	Straight	31
.984	1-1/4	Staggered	55
.984	1-3/8	"	45
.984	1-1/2	"	38
.984	1-7/8	"	25
1	1.188	"	64.3
1	1.625	"	34.3
1	1.750	"	29.6
1	2	Straight	19.6
1	2.750	Staggered	12
1	2-3/4	"	12
1	1-1/2	Straight	39
1	3	"	8.7
1	-	Any	N/A
1.016	1-1/2	Staggered	42
1.031	1-1/2	"	43
1.062	-	Any	N/A
1.063	1-1/2	Staggered	45
1.125	1-3/8	"	59
1.125	1-1/2	"	51
1.125	1.688	"	34.9
1.125	-	Any	N/A
1.181	1-1/2	Staggered	56
1.181	1-7/8	"	33
1.187	1-5/16	"	74
1.187	1.500	Straight	48.2
1.234	1-3/4	Staggered	45
1.250	1.625	"	53.7
1.250	1.969	"	36.6
1.250	1-7/8	"	40
1.250	2-3/8	"	24
1.266	1-7/8	"	42
1.312	1-7/8	"	45
1.375	1-3/4	"	56
1.375	1-7/8	"	49
1.375	2-1/8	"	38
1.437	2	"	47
1.500	1.750	"	66.6
1.500	1.844	"	41.7
1.500	-	Any	N/A
1.500	2	Staggered	51
1.500	2-1/8	"	45
1.500	3	"	23
1.562	3	Straight	21.3
1.575	2-1/8	Staggered	50
1.625	2-1/8	"	45
1.625	3	Straight	23
1.687	3	"	24.8
1.687	2-1/2	Staggered	42
1.719	2-1/2	"	43



**PERFORATING
COMPANIES**

ADDITIONAL ROUND HOLE PATTERNS NOT ILLUSTRATED

DIAMETERS (In Inches)	CENTERS (In Inches)	LAYOUT	% OPEN
1.750	-	Any	N/A
1.750	2-1/2	Staggered	45
1.750	2-5/8	"	41
1.772	2-19/32	"	42
1.812	2-1/4	Straight	51
1.812	2-1/2	Staggered	50
1.812	3	Straight	28.7
1.875	2-1/2	Staggered	51
1.875	3	Straight	30.7
1.969	2-5/8	Staggered	51
2	2-5/8	"	53
2	2-1/2	Straight	50
2	3.375	"	27.6
2	4.222	"	17.8
2	4.500	"	15.5
2	-	Any	N/A
2.031	2-5/8	Staggered	55
2.125	-	Any	N/A
2.125	2-3/4	Staggered	54
2.165	2-3/4	"	55
2.188	2-7/8	"	53
2.250	-	Any	N/A
2.250	2-3/4	Staggered	51
2.281	2-3/4	"	62
2.362	3-1/4	"	48
2.375	3-1/8	"	51
2.437	3-1/8	"	55
2.500	-	Any	N/A
2.500	3-1/4	Staggered	54
2.531	3-1/4	"	55
2.559	3-3/8	"	51
2.562	3-3/8	"	52
2.625	-	Any	N/A
2.625	3-1/2	Staggered	51
2.687	3-1/2	"	54
2.750	3-1/2	"	55
2.756	3-1/2	"	55
2.812	-	Any	N/A
2.812	3-3/4	Staggered	54
2.875	-	Any	N/A
2.875	3-1/2	Staggered	61
3	-	Any	N/A
3	3-3/4	Staggered	58
3.063	3-3/4	"	60
3.125	3-3/4	"	63
3.149	4	"	56
3.250	4	"	60
3.375	4-1/4	"	57
3.500	4-1/2	"	55
3.543	4-1/2	"	55



**PERFORATING
COMPANIES**

ADDITIONAL ROUND HOLE PATTERNS NOT ILLUSTRATED

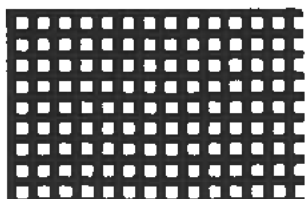
DIAMETERS (in inches)	CENTERS (in inches)	LAYOUT	% OPEN
3.563	4-1/2	Staggered	57
3.625	4-5/8	"	56
3.688	4-3/4	"	55
3.750	4-3/4	"	57
3.875	5	"	54
3.973	5	"	55
4	5	"	58

NOTES

For technical information or further tooling, materials, or processing details,
contact H&K Engineering at 800-621-3869.

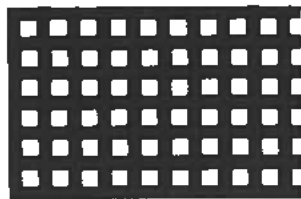


THE
PERFORATING
COMPANIES



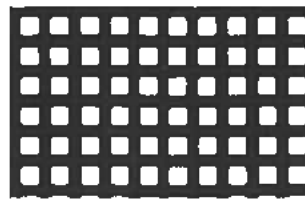
**1/16"
Square**

.0625" sq. (1.588 mm)
7/64" (2.778 mm)
centers straight
33% open



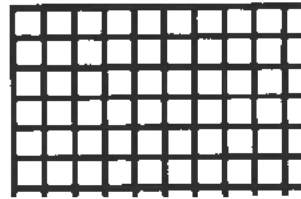
**1/12"
Square**

.083 sq. (2.108 mm)
5/32" (3.969 mm)
centers straight
28% open



**3/32"
Square**

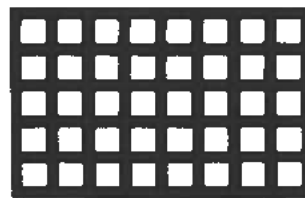
.094" sq. (2.381 mm)
5/32" (3.969 mm)
centers straight
36% open



**1/8"
Square**



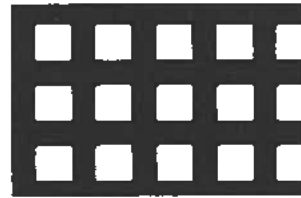
.125" sq. (3.175 mm)
5/32" (3.969 mm)
centers straight
64% open



**1/8"
Square**

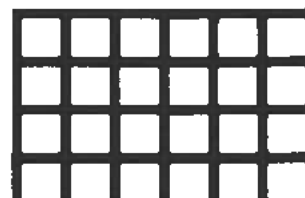


.125" sq. (3.175 mm)
3/16" (4.763 mm)
centers straight
45% open



**3/16"
Square**

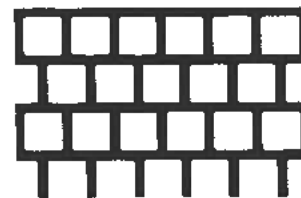
.1875" sq. (4.763 mm)
5/16" (7.938 mm)
centers straight
36% open



**2/10"
Square**



.200" sq. (5.080 mm)
1/4" (6.350 mm)
centers straight
64% open



**2/10"
Square**

.200" sq. (5.080 mm)
1/4" (6.350 mm)
centers staggered
64% open



**PERFORATING
COMPANIES**



**7/32"
Square
Diagonal**

.218" sq. diag. (5.556 mm)
1/2" (12.700 mm)
centers
19% open



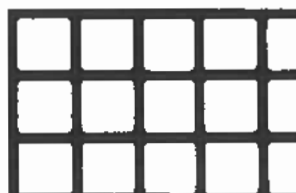
**1/4"
Square**

.250" sq. (6.350 mm)
3/8" (9.525 mm)
centers straight
45% open



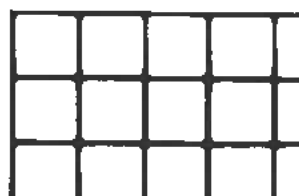
**1/4"
Square**

.250" sq. (6.350 mm)
1/2" (12.700 mm)
centers straight
25% open



**9/32"
Square**

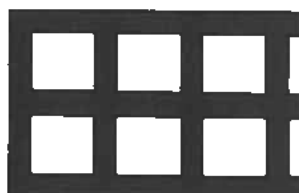
.281" sq. (7.144 mm)
1/3" (8.458 mm)
centers straight
71% open



**5/16"
Square**



.3125" sq. (7.938 mm)
11/32" (8.731 mm)
centers straight
83% open



**5/16"
Square**



.3125" sq. (7.938 mm)
7/16" (11.113 mm)
centers straight
51% open



**3/8"
Square**



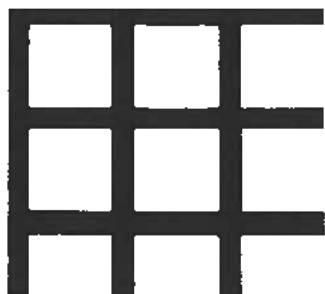
.375" sq. (9.525 mm)
1/2" (12.700 mm)
centers straight
56% open



See the "In Stock" section for items available for immediate delivery.

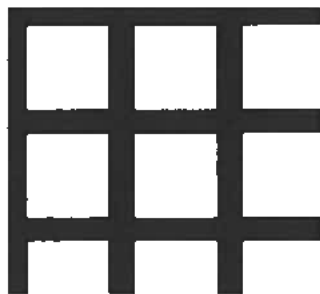


**PERFORATING
COMPANIES**



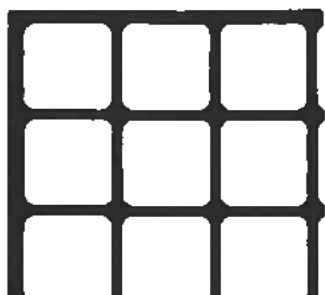
**7/16"
Square**

.4375" sq. (11.113 mm)
35/64" (13.891 mm)
centers straight
64% open



**7/16"
Square**

.4375" sq. (11.113 mm)
9/16" (14.288 mm)
centers straight
61% open



**29/64"
Square**



.453" sq. (11.509 mm)
1/2" (12.700 mm)
centers straight
81% open



**1/2"
Square**

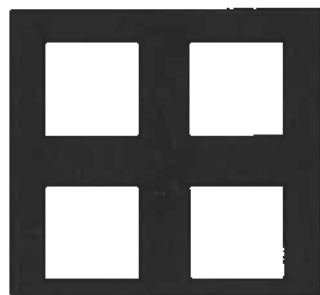
.500" sq. (12.700 mm)
5/8" (15.875 mm)
centers straight
64% open



**1/2"
Square**



.500" sq. (12.700 mm)
11/16" (17.463 mm)
centers straight
53% open



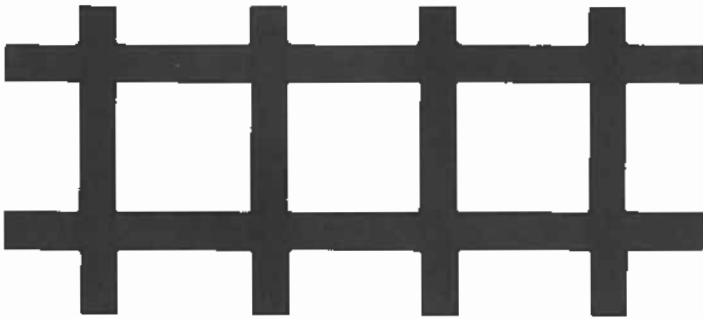
**1/2"
Square**

.500" sq. (12.700 mm)
3/4" (19.050 mm)
centers straight
45% open



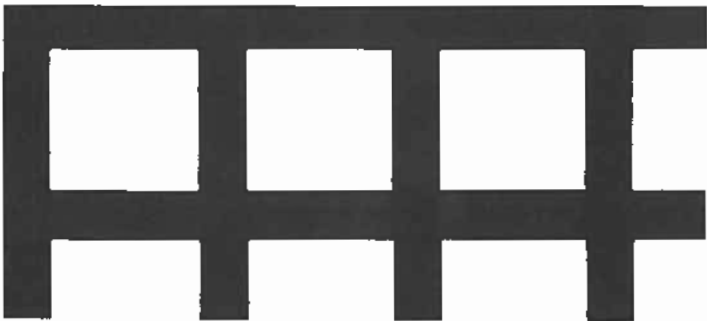
**1/2"
Square
Diagonal**

.500" sq. diag. (12.700 mm)
11/16" (17.463 mm)
centers diagonal
53% open



**11/16"
Square**

.6875" sq. (17.463 mm)
7/8" (22.225 mm)
centers straight
62% open

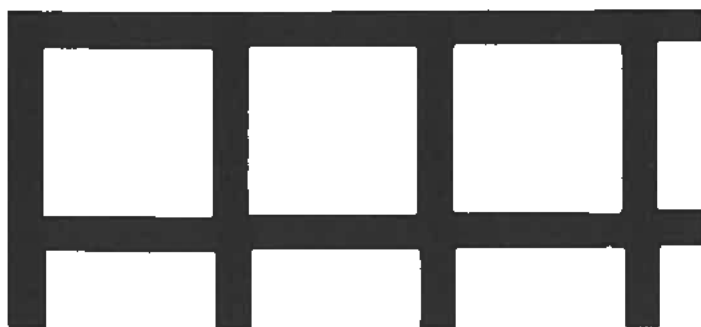


**3/4"
Square**

.750" sq. (19.050 mm)
1" (25.400 mm)
centers straight
56% open

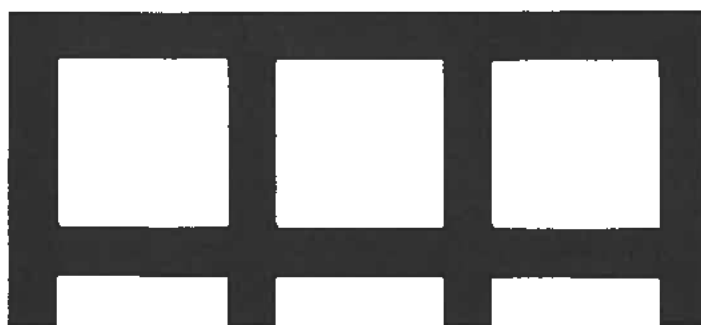


**PERFORATING
COMPANIES**



**7/8"
Square**

.875" sq. (22.225 mm)
1-1/16" (26.988 mm)
centers straight
68% open



**7/8"
Square**

.875" sq. (22.225 mm)
1-1/8" (28.575 mm)
centers straight
61% open



**1"
Square**

1" sq. (25.400 mm)
1-3/16" (30.163 mm)
centers straight
71% open



**PERFORATING
COMPANIES**



**1"
Square**

1" sq. (25.400 mm)
1-1/4" (31.750 mm)
centers straight
64% open



**1-1/4"
Square**

1-1/4" sq. (31.750 mm)
1-1/2" (38.100 mm)
centers straight
70% open



**PERFORATING
COMPANIES**

ADDITIONAL SQUARE HOLE PATTERNS NOT ILLUSTRATED

The following lists are additional square hole patterns which we can furnish with tools available from our die inventory.

The "Centers" shown represent the standard arrangement if no spacing were specified. However, all of these perforations can be arranged on special centers at little or no extra cost.

We also can produce in our die shop designs of a special nature to meet your exact requirements.

DIMENSIONS (In Inches)	CENTERS (In Inches)	LAYOUT	% OPEN
.079	7/32	Straight	13
.094	7/32	"	19
.118	7/32	"	29
.125	7/32	"	33
.139	1/4	Staggered	31
.156	5/16	Straight	25
.165	7/32	"	57
.166	5/16	"	27
.188	11/32	"	30
.200	.276	"	52
.219	1/2	"	19
.236	3/8	"	40
.250	.312	"	64
.250	7/16	"	33
.250	3/8	Staggered	45
.250	7/16	Diagonal	33
.250	.640	Straight	15
.281	15/32	"	36
.313	1/2	"	39
.375	5/8	"	36
.375	9/16	Diagonal	44
.394	.591	Straight	44
.438	11/16	"	41
.563	47/64	"	56
.563	7/8	"	41
.625	11/16	"	83
.625	13/16	"	39
.625	1	"	39
.688	15/16	"	54
.688	15/16	Staggered	54
.750	N/A	Any	-
.750	15/16	Staggered	64
.750	1.062	"	49
.750	1-1/8	Straight	45
.781	1	"	61
.875	1-1/4	"	49
.875	1-1/8	Diagonal	61
.938	1-1/8	Straight	69
1	N/A	Any	-
1	1-3/8	Straight	53
1	1.125	"	79
1	1-1/4	Diagonal	64
1.125	1-3/8	Straight	67
1.188	1-1/2	"	63
1.250	1-5/8	"	59



ADDITIONAL SQUARE HOLE PATTERNS NOT ILLUSTRATED

DIMENSIONS (In inches)	CENTERS (In inches)	LAYOUT	% OPEN
1.313	1-5/8	Straight	66
1.375	1-9/16	"	78
1.375	1.687	"	66
1.500	N/A	Any	-
1.500	1-7/8	Straight	64
1.563	2	"	61
1.563	2-1/16	Straight	57
1.625	N/A	Any	-
1.625	2-1/2	Straight	42
1.750	2-1/16	"	72
1.750	2-1/8	"	67
1.750	2-1/4	"	61
2	N/A	Any	-
2	2-1/4	Straight	79
2	2-3/8	"	62
2	2-1/2	"	64
2.250	N/A	Any	-
2.250	Any	-	-
2.375	"	-	-
2.500	"	-	-
3	"	-	-
3.250	"	-	-
3.750	"	-	-
4	"	-	-

NOTES

For technical information or further tooling, materials, or processing details,
contact H&K Engineering at 800-621-3869.



**PERFORATING
COMPANIES**

ADJUSTABLE SLOT PATTERNS

Slots 11/32" (8.731 mm) long as illustrated below can be furnished either in straight rows or end staggered up to 24" wide (length of slot running parallel to the 24" dimension).

STRAIGHT



.018" x 11/32" Slot
(0.457 x 8.731 mm)

END STAGGERED



.025" x 11/32" Slot
(0.635 x 8.731 mm)

The following list are slot widths presently available for fabrication.

SLOT WIDTH		SIDE CENTERS		SLOT WIDTH		SIDE CENTERS	
.010"	(0.254 mm)	.050"	(1.270 mm)	.020"	(0.508 mm)	.0625"	(1.588 mm)
.0105"	(0.267 mm)	.050"	(1.270 mm)	.0225"	(0.572 mm)	.0625"	(1.588 mm)
.011"	(0.279 mm)	.050"	(1.270 mm)	.025"	(0.635 mm)	.0625"	(1.588 mm)
.012"	(0.305 mm)	.050"	(1.270 mm)	.0285"	(0.724 mm)	.0625"	(1.588 mm)
.013"	(0.330 mm)	.050"	(1.270 mm)	.0305"	(0.775 mm)	.0625"	(1.588 mm)
.0145"	(0.368 mm)	.050"	(1.270 mm)	.032"	(0.813 mm)	5/64"	(1.984 mm)
.016"	(0.406 mm)	.0625"	(1.588 mm)	.035"	(0.889 mm)	5/64"	(1.984 mm)
.018"	(0.457 mm)	.0625"	(1.588 mm)	.050"	(1.270 mm)	7/64"	(2.778 mm)
				.060"	(1.524 mm)	1/8"	(3.175 mm)

Slots 15/32" (11.906 mm) long as illustrated below can be furnished either in straight rows or end staggered up to 24" wide (length of slot running parallel to the 24" dimension).

STRAIGHT



.015" x 15/32" Slot
(0.381 x 11.906 mm)

END STAGGERED



.040" x 15/32" Slot
(1.016 x 11.906 mm)

The following list are slot widths presently available for fabrication.

SLOT WIDTH		SIDE CENTERS		SLOT WIDTH		SIDE CENTERS	
.010"	(0.254 mm)	.050"	(1.270 mm)	.042"	(1.067 mm)	3/32"	(2.381 mm)
.012"	(0.305 mm)	.050"	(1.270 mm)	.046"	(1.168 mm)	3/32"	(2.381 mm)
.013"	(0.330 mm)	.050"	(1.270 mm)	.049"	(1.245 mm)	7/64"	(2.778 mm)
.015"	(0.381 mm)	.0625"	(1.588 mm)	.0505"	(1.283 mm)	7/64"	(2.778 mm)
.018"	(0.457 mm)	.0625"	(1.588 mm)	.055"	(1.397 mm)	7/64"	(2.778 mm)
.020"	(0.508 mm)	.0625"	(1.588 mm)	.058"	(1.473 mm)	7/64"	(2.778 mm)
.022"	(0.559 mm)	.0625"	(1.588 mm)	.060"	(1.524 mm)	1/8"	(3.175 mm)
.025"	(0.635 mm)	.0625"	(1.588 mm)	.065"	(1.651 mm)	1/8"	(3.175 mm)
.028"	(0.711 mm)	5/64"	(1.984 mm)	.0705"	(1.791 mm)	9/64"	(3.572 mm)
.029"	(0.737 mm)	5/64"	(1.984 mm)	.076"	(1.930 mm)	9/64"	(3.572 mm)
.031"	(0.787 mm)	5/64"	(1.984 mm)	.078"	(1.981 mm)	9/64"	(3.572 mm)
.032"	(0.813 mm)	5/64"	(1.984 mm)	.082"	(2.083 mm)	5/32"	(3.969 mm)
.0345"	(0.876 mm)	5/64"	(1.984 mm)	.085"	(2.159 mm)	5/32"	(3.969 mm)
.035"	(0.889 mm)	5/64"	(1.984 mm)	.088"	(2.235 mm)	5/32"	(3.969 mm)
.038"	(0.965 mm)	5/64"	(1.984 mm)	.0945"	(2.400 mm)	3/16"	(4.763 mm)
.0395"	(1.003 mm)	5/64"	(1.984 mm)	.101"	(2.565 mm)	3/16"	(4.763 mm)
				.145"	(3.683 mm)	3/16"	(4.763 mm)

All patterns shown actual size.

Each perforated pattern has certain gauge and width limitations, so it is advisable to consult with Harrington & King before preparing your specifications.

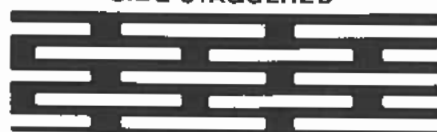


PERFORATING
COMPANIES

ADJUSTABLE SLOT PATTERNS

Slots 3/4" (19.050 mm) long as illustrated below can be furnished in straight rows, side staggered or end staggered up to 40" wide (length of slot running parallel to the 40" dimension).

SIDE STAGGERED



.065" x 3/4" Slot
(1.651 x 19.050 mm)

END STAGGERED



.140" x 3/4" Slot
(3.556 x 19.050 mm)

STRAIGHT



3/32" x 3/4" Slot
(2.381 x 19.050 mm)



The following list are slot widths presently available for fabrication.

SLOT WIDTH		SIDE CENTERS		SLOT WIDTH		SIDE CENTERS	
.022"	(0.559 mm)	1/16"	(1.588 mm)	.1685"	(4.280 mm)	9/32"	(7.144 mm)
.032"	(0.813 mm)	5/64"	(1.984 mm)	.1689"	(4.290 mm)	9/32"	(7.144 mm)
.038"	(0.965 mm)	5/64"	(1.984 mm)	.1694"	(4.303 mm)	9/32"	(7.144 mm)
.0467"	(1.186 mm)	3/32"	(2.381 mm)	.171"	(4.343 mm)	9/32"	(7.144 mm)
.050"	(1.270 mm)	7/64"	(2.778 mm)	.177"	(4.496 mm)	9/32"	(7.144 mm)
.054"	(1.372 mm)	7/64"	(2.778 mm)	.184"	(4.674 mm)	9/32"	(7.144 mm)
.056"	(1.422 mm)	7/64"	(2.778 mm)	.187"	(4.750 mm)	9/32"	(7.144 mm)
.059"	(1.499 mm)	7/64"	(2.778 mm)	.1894"	(4.811 mm)	5/16"	(7.938 mm)
.0625"	(1.588 mm)	1/8"	(3.175 mm)	.195"	(4.953 mm)	5/16"	(7.938 mm)
.065"	(1.651 mm)	1/8"	(3.175 mm)	.197"	(5.004 mm)	5/16"	(7.938 mm)
.0665"	(1.689 mm)	1/8"	(3.175 mm)	.203"	(5.156 mm)	5/16"	(7.938 mm)
.070"	(1.718 mm)	9/64"	(3.572 mm)	.2109"	(5.357 mm)	5/16"	(7.938 mm)
.0742"	(1.885 mm)	9/64"	(3.572 mm)	.212"	(5.385 mm)	11/32"	(8.731 mm)
.076"	(1.930 mm)	9/64"	(3.572 mm)	.215"	(5.461 mm)	11/32"	(8.731 mm)
.0765"	(1.943 mm)	9/64"	(3.572 mm)	.216"	(5.486 mm)	11/32"	(8.731 mm)
.077"	(1.956 mm)	9/64"	(3.572 mm)	.218"	(5.537 mm)	11/32"	(8.731 mm)
.078"	(1.981 mm)	9/64"	(3.572 mm)	.226"	(5.740 mm)	11/32"	(8.731 mm)
.0824"	(2.093 mm)	5/32"	(3.969 mm)	.2265"	(5.753 mm)	11/32"	(8.731 mm)
.083"	(2.108 mm)	5/32"	(3.969 mm)	.234"	(5.944 mm)	11/32"	(8.731 mm)
.086"	(2.184 mm)	5/32"	(3.969 mm)	.245"	(6.223 mm)	3/8"	(9.525 mm)
.0882"	(2.240 mm)	5/32"	(3.969 mm)	.247"	(6.274 mm)	3/8"	(9.525 mm)
.090"	(2.286 mm)	5/32"	(3.969 mm)	.250"	(6.350 mm)	3/8"	(9.525 mm)
.093"	(2.362 mm)	5/32"	(3.969 mm)	.265"	(6.731 mm)	3/8"	(9.525 mm)
.097"	(2.464 mm)	3/16"	(4.763 mm)	.276"	(7.010 mm)	13/32"	(10.319 mm)
.098"	(2.489 mm)	3/16"	(4.763 mm)	.278"	(7.061 mm)	13/32"	(10.319 mm)
.101"	(2.565 mm)	3/16"	(4.763 mm)	.281"	(7.137 mm)	13/32"	(10.319 mm)
.103"	(2.616 mm)	3/16"	(4.763 mm)	.295"	(7.493 mm)	7/16"	(11.113 mm)
.1055"	(2.680 mm)	3/16"	(4.763 mm)	.309"	(7.849 mm)	7/16"	(11.113 mm)
.109"	(2.769 mm)	3/16"	(4.763 mm)	.312"	(7.925 mm)	7/16"	(11.113 mm)
.1132"	(2.875 mm)	3/16"	(4.763 mm)	.315"	(8.001 mm)	7/16"	(11.113 mm)
.118"	(2.997 mm)	7/32"	(5.556 mm)	.3359"	(8.532 mm)	1/2"	(12.700 mm)
.122"	(3.098 mm)	7/32"	(5.556 mm)	.3405"	(8.649 mm)	1/2"	(12.700 mm)
.125"	(3.175 mm)	7/32"	(5.556 mm)	.343"	(8.712 mm)	1/2"	(12.700 mm)
.137"	(3.480 mm)	1/4"	(6.350 mm)	.372"	(9.449 mm)	1/2"	(12.700 mm)
.140"	(3.556 mm)	1/4"	(6.350 mm)	.375"	(9.525 mm)	1/2"	(12.700 mm)
.153"	(3.886 mm)	9/32"	(7.144 mm)	.4025"	(10.224 mm)	9/16"	(14.288 mm)
.156"	(3.962 mm)	9/32"	(7.144 mm)	.4335"	(11.011 mm)	9/16"	(14.288 mm)
				.4985"	(12.662 mm)	9/16"	(14.288 mm)



See the "In Stock" section for items available for immediate delivery.

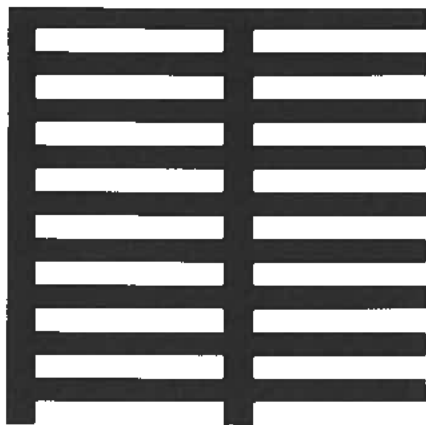


PERFORATING
COMPANIES

ADJUSTABLE SLOT PATTERNS

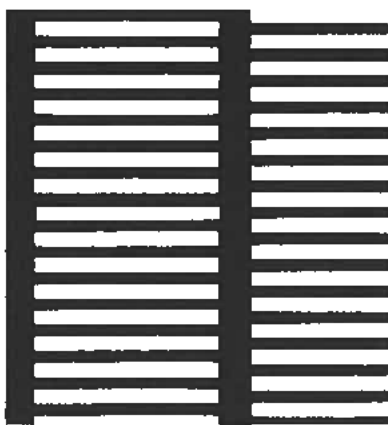
Slots 1" (25.400 mm) long as illustrated below can be furnished either in straight rows, side staggered or end staggered up to 40" wide (length of slot running parallel to the 40" dimension).

STRAIGHT



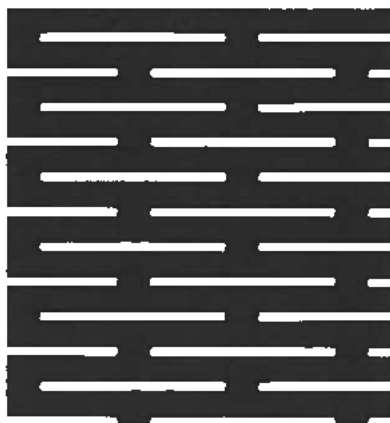
.125" x 1" Slot
(3.175 x 25.400 mm)

END STAGGERED



.078" x 1" Slot
(1.981 x 25.400 mm)

SIDE STAGGERED



.047" x 1" Slot
(1.194 x 25.400 mm)

The following list are slot widths presently available for fabrication.

SLOT WIDTH	SIDE CENTERS	SLOT WIDTH	SIDE CENTERS
.047" (1.194 mm)	7/64" (2.778 mm)	.125" (3.175 mm)	1/4" (6.350 mm)
.065" (1.651 mm)	9/64" (3.572 mm)	.137" (3.480 mm)	9/32" (7.144 mm)
.0715" (1.816 mm)	9/64" (3.572 mm)	.1562" (3.967 mm)	5/16" (7.938 mm)
.078" (1.981 mm)	5/32" (3.969 mm)	.1715" (4.356 mm)	5/16" (7.938 mm)
.0835" (2.121 mm)	3/16" (4.763 mm)	.1875" (4.763 mm)	5/16" (7.938 mm)
.085" (2.159 mm)	3/16" (4.763 mm)	.204" (5.182 mm)	3/8" (9.525 mm)
.087" (2.210 mm)	3/16" (4.763 mm)	.250" (6.350 mm)	3/8" (9.525 mm)
.0938" (2.383 mm)	3/16" (4.763 mm)		
.100" (2.540 mm)	13/64" (5.159 mm)		

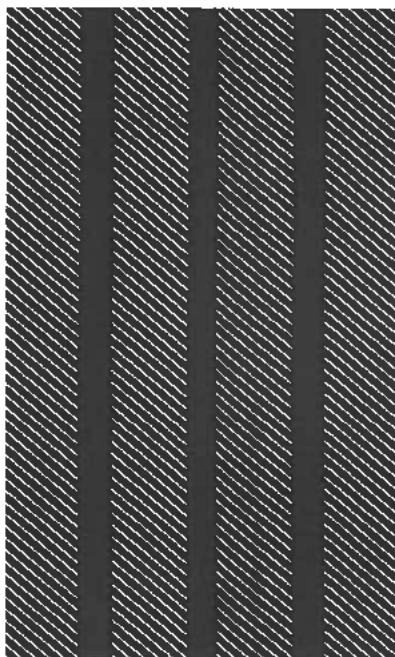


PERFORATING
COMPANIES

ADJUSTABLE SLOT PATTERNS

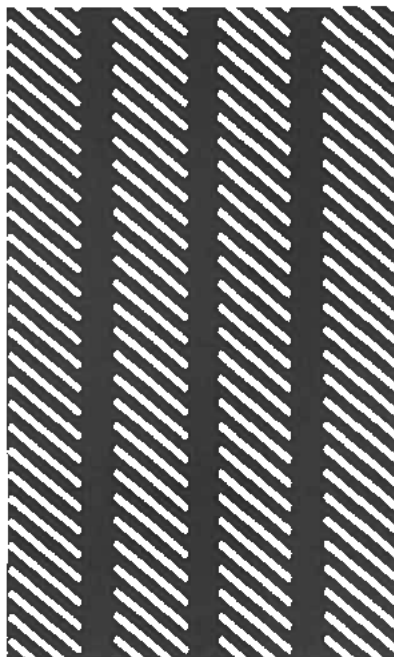
Diagonal slots 17/32" (13.494 mm) long arranged diagonally can be produced from our semi production dies up to practical width limitations (straight rows of slots parallel to the length of sheet). While the bridges between the holes endwise cannot be varied, the bridges side-ways can be altered.

DIAGONAL



.010" x 17/32" Slot
(0.254 x 13.494 mm)

DIAGONAL



.042" x 17/32" Slot
(1.067 x 13.494 mm)

The following list are slot widths presently available for fabrication.

SLOT WIDTH	SIDE CENTERS	SLOT WIDTH	SIDE CENTERS
.010" (0.254 mm)	.048" (1.219 mm)	.0625" (1.588 mm)	.119" (3.023 mm)
.012" (0.305 mm)	.048" (1.219 mm)	.068" (1.727 mm)	.119" (3.023 mm)
.015" (0.381 mm)	.048" (1.219 mm)	.075" (1.905 mm)	.144" (3.658 mm)
.018" (0.457 mm)	.060" (1.524 mm)	.076" (1.930 mm)	.144" (3.658 mm)
.019" (0.483 mm)	.060" (1.524 mm)	.078" (1.981 mm)	.144" (3.658 mm)
.020" (0.508 mm)	.060" (1.524 mm)	.080" (2.032 mm)	.144" (3.658 mm)
.022" (0.559 mm)	.072" (1.829 mm)	.083" (2.108 mm)	.167" (4.242 mm)
.025" (0.635 mm)	.072" (1.829 mm)	.085" (2.159 mm)	.167" (4.242 mm)
.028" (0.711 mm)	.083" (2.108 mm)	.093" (2.362 mm)	.167" (4.242 mm)
.030" (0.762 mm)	.083" (2.108 mm)	.098" (2.489 mm)	.192" (4.877 mm)
.031" (0.787 mm)	.083" (2.108 mm)	.100" (2.540 mm)	.192" (4.877 mm)
.032" (0.813 mm)	.083" (2.108 mm)	.118" (2.997 mm)	.213" (5.410 mm)
.035" (0.889 mm)	.083" (2.108 mm)	.125" (3.175 mm)	.213" (5.410 mm)
.039" (0.991 mm)	.095" (2.413 mm)	.140" (3.556 mm)	.239" (6.071 mm)
.042" (1.067 mm)	.095" (2.413 mm)	.156" (3.962 mm)	.263" (6.680 mm)
.046" (1.168 mm)	.095" (2.413 mm)	.172" (4.369 mm)	.287" (7.290 mm)
.049" (1.245 mm)	.107" (2.718 mm)	.185" (4.700 mm)	.311" (7.900 mm)
.051" (1.295 mm)	.107" (2.718 mm)	.197" (5.004 mm)	.334" (8.484 mm)
.054" (1.372 mm)	.107" (2.718 mm)	.218" (5.537 mm)	.334" (8.484 mm)
.055" (1.397 mm)	.107" (2.718 mm)	.234" (5.944 mm)	.359" (9.119 mm)
.058" (1.473 mm)	.107" (2.718 mm)	.250" (6.350 mm)	.384" (9.754 mm)
.060" (1.524 mm)	.119" (3.023 mm)		

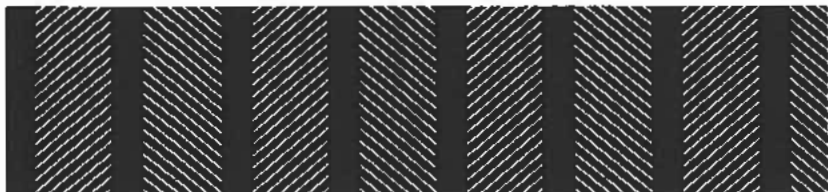


**PERFORATING
COMPANIES**

ADJUSTABLE SLOT PATTERNS

Slots 17/32" (13.494 mm) long arranged in a herringbone pattern can be produced from our semi production dies up to practical width limitations (straight rows of slots parallel to the length of sheet).

HERRINGBONE PATTERNS



.012" x 17/32" Slot (0.305 x 13.494 mm)



.032" x 17/32" Slot (0.813 x 13.494 mm)



.058" x 17/32" Slot (1.473 x 13.494 mm)



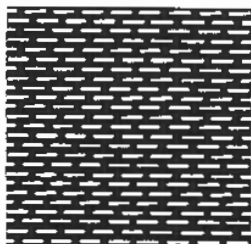
1/8" x 17/32" Slot (3.175 x 13.494 mm)

The following list are slot widths presently available for fabrication.

SLOT WIDTHS	SIDE CENTERS	SLOT WIDTHS	SIDE CENTERS
.010" (0.254 mm)	1/16" (1.588 mm)	.042" (1.067 mm)	1/8" (3.175 mm)
.012" (0.305 mm)	1/16" (1.588 mm)	.0467" (1.186 mm)	1/8" (3.175 mm)
.013" (0.330 mm)	1/16" (1.588 mm)	.050" (1.270 mm)	9/64" (3.572 mm)
.015" (0.381 mm)	1/16" (1.588 mm)	.058" (1.473 mm)	9/64" (3.572 mm)
.018" (0.457 mm)	5/64" (1.984 mm)	.0625" (1.588 mm)	5/32" (3.969 mm)
.020" (0.508 mm)	5/64" (1.984 mm)	.078" (1.981 mm)	3/16" (4.763 mm)
.022" (0.559 mm)	3/32" (2.381 mm)	.125" (3.175 mm)	9/32" (7.144 mm)
.025" (0.635 mm)	3/32" (2.381 mm)	.156" (3.969 mm)	11/32" (8.731 mm)
.031" (0.787 mm)	7/64" (2.778 mm)	.1815" (4.763 mm)	13/32" (10.319 mm)
.035" (0.889 mm)	7/64" (2.778 mm)		



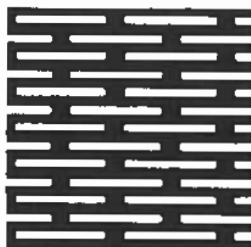
PERFORATING
COMPANIES



.020" x .115"
Slot
Side Staggered

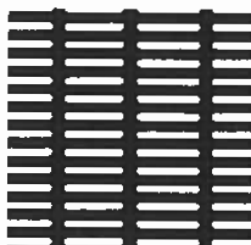


.020" x .115" slot
 (0.508 mm x 2.921 mm)
 .050" centers (1.270 mm)
 30% open



.039" x .47"
Slot
Side Staggered

.039" x .47" slot
 (1 mm x 12 mm)
 3/32" centers (2.381 mm)
 35% open



.039" x .3125"
Oblong
Straight

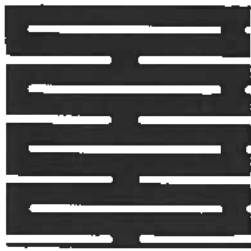
.039" x .3125" oblong
 (1 mm x 7.938 mm)
 3/32" centers (2.381 mm)
 35% open

NOTES

For technical information or further tooling, materials, or processing details,
 contact H&K Engineering at 800-621-3869.

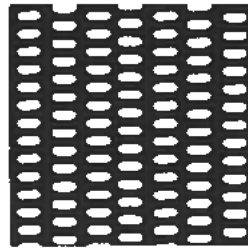


**PERFORATING
 COMPANIES**



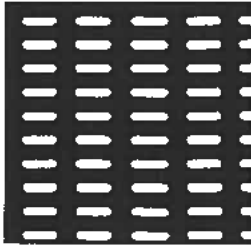
**.040" x 1"
Oblong
Side Staggered**

.040" x 1" oblong
(1.016 mm x 25.400 mm)
5/32" centers (3.969 mm)
23% open



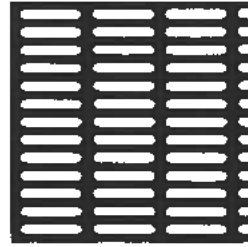
**3/64" x 1/8"
Oblong
End Staggered**

.047" x .125" oblong
(1.194 mm x 3.175 mm)
3/32" centers (2.381 mm)
35% open



**3/64" x 3/16"
Oblong
Straight**

.047" x .1875" oblong
(1.194 mm x 4.763 mm)
1/8" centers (3.175 mm)
24% open



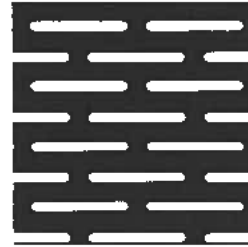
**3/64" x 5/16"
Oblong
Straight**

.047" x .3125" oblong
(1.194 mm x 7.938 mm)
3/32" centers (2.381 mm)
41% open



**3/64" x 3/8"
Oblong
End Staggered**

.047" x .375" oblong
(1.194 mm x 9.525 mm)
1/8" centers (3.175 mm)
34% open



**3/64" x 1/2"
Oblong
Side Staggered**

.047" x .500" oblong
(1.194 mm x 12.700 mm)
5/32" centers (3.969 mm)
25% open

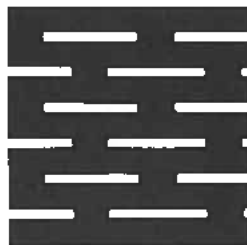


**PERFORATING
COMPANIES**



**3/64" x 1/2"
Slot
Side Staggered**

.047" x .500" slot
(1.194 mm x 12.700 mm)
1/8" centers (3.175 mm)
30% open



**3/64" x 1/2"
Slot
Side Staggered**

.047" x .500" slot
(1.194 mm x 12.700 mm)
3/16" centers (4.763 mm)
18% open



**3/64" x 1"
Oblong
Side Staggered**

.047" x 1" oblong
(1.194 mm x 25.400 mm)
5/32" centers (3.969 mm)
27% open

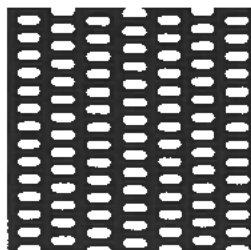


**3/64" x 1"
Slot
Side Staggered**

.047" x 1" slot
(1.194 mm x 25.400 mm)
3/16" centers (4.763 mm)
21% open

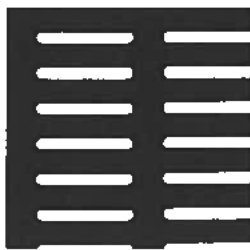


**PERFORATING
COMPANIES**



**1/20" x 1/8"
Oblong
End Staggered**

.050" x .125" oblong
(1.270 mm x 3.175 mm)
3/32" centers (2.381 mm)
35% open



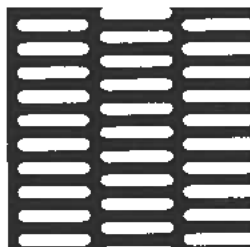
**1/18" x 1/2"
Oblong
Straight**

.056" x .500" oblong
(1.411 mm x 12.700 mm)
3/16" centers (4.763 mm)
23% open



**.060" x 1/2"
Oblong
Straight**

.060" x .500" oblong
(1.524 mm x 12.700 mm)
3/16" centers (4.763 mm)
24% open



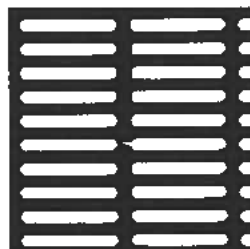
**1/16" x 3/8"
Oblong
End Staggered**

.0625" x .375" oblong
(1.588 mm x 9.525 mm)
1/8" centers (3.175 mm)
42% open



**1/16" x 7/16"
Slot
End Staggered**

.0625" x .4375" slot
(1.588 mm x 11.113 mm)
5/32" centers (3.969 mm)
32% open

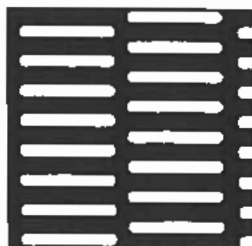


**1/16" x 1/2"
Oblong
Straight**

.0625" x .500" oblong
(1.588 mm x 12.700 mm)
1/8" centers (3.175 mm)
43% open



**PERFORATING
COMPANIES**



**1/16" x 1/2"
Oblong
End Staggered**

.0625" x .500" oblong
(1.588 mm x 12.700 mm)
5/32" centers (3.969 mm)
36% open



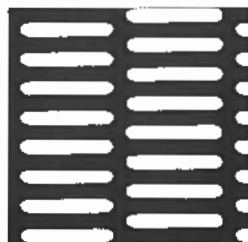
**1/16" x 1/2"
Slot
Side Staggered**

.0625" x .500" slot
(1.588 mm x 12.700 mm)
5/32" centers (3.969 mm)
32% open



**1/16" x 1"
Oblong
End Staggered**

.0625" x 1" oblong
(1.588 mm x 25.400 mm)
1/4" centers (6.350 mm)
22% open



**1/14" x 1/2"
Oblong
End Staggered**

.071" x .500" oblong
(1.814 mm x 12.700 mm)
5/32" centers (3.969 mm)
41% open



**5/64" x 1/2"
Slot
Side Staggered**

.078" x .500" slot
(1.984 mm x 12.700 mm)
1/4" centers (6.350 mm)
25% open



**5/64" x 9/16"
Oblong
Side Staggered**

.078" x .5625" oblong
(1.984 mm x 14.288 mm)
1/4" centers (6.350 mm)
23% open



**PERFORATING
COMPANIES**



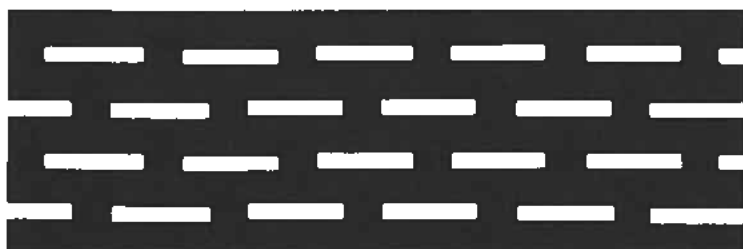
**1/12" x 1/2"
Oblong
End Staggered**

.083" x .500" oblong
(2.117 mm x 12.700 mm)
3/16" centers (4.763 mm)
36% open



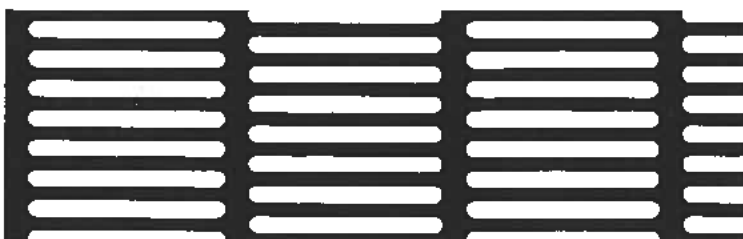
**1/12" x 1/2"
Slot
Side Staggered**

.083" x .500" slot
(2.117 mm x 12.700 mm)
1/4" centers (6.350 mm)
24% open



**1/12" x 1/2"
Slot
Side Staggered**

.083" x .500" slot
(2.117 mm x 12.700 mm)
9/32" centers (7.144 mm)
26% open

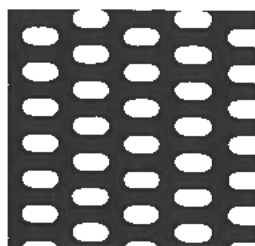


**1/12" x 1"
Oblong
End Staggered**

.083" x 1" oblong
(2.117 mm x 25.400 mm)
5/32" centers (3.969 mm)
46% open



**PERFORATING
COMPANIES**



3/32" x 3/16"
Oblong
End Staggered

.094" x .1875" oblong
(2.381 mm x 4.763 mm)
3/16" centers (4.763 mm)
35% open



3/32" x 1/2"
Oblong
End Staggered

.094" x .500" oblong
(2.381 mm x 12.700 mm)
3/16" centers (4.763 mm)
40% open



3/32" x 1/2"
Oblong
Side Staggered

.094" x .500" oblong
(2.381 mm x 12.700 mm)
7/32" centers (5.556 mm)
33% open



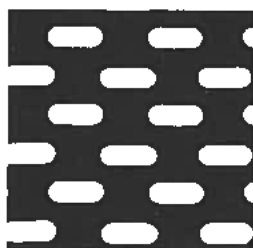
3/32" x 1/2"
Oblong
Side Staggered

.094" x .500" oblong
(2.381 mm x 12.700 mm)
1/4" centers (6.350 mm)
24% open



3/32" x 1"
Oblong
End Staggered

.094" x 1" oblong
(2.381 mm x 25.400 mm)
1/4" centers (6.350 mm)
32% open



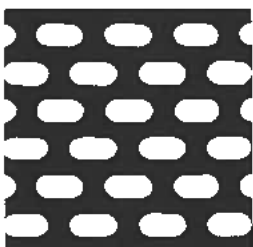
**7/64" x 9/32"
Oblong
Side Staggered**

.109" x .281" oblong
(2.778 mm x 7.144 mm)
13/64" centers (5.159 mm)
28% open



**7/64" x 1"
Oblong
Side Staggered**

.109" x 1" oblong
(2.778 mm x 25.400 mm)
1/4" centers (6.350 mm)
34% open



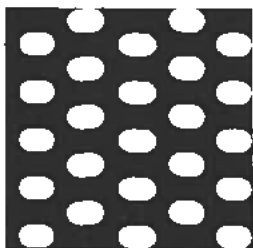
**.118" x .236"
Oblong
Side Staggered**

.118" x .236" oblong
(3 mm x 6 mm)
.197" centers (5 mm)
37% open



**.118" x 1"
Oblong
Side Staggered**

.118" x 1" oblong
(3 mm x 25.400 mm)
1/4" centers (6.350 mm)
41% open



**1/8" x 3/16"
Oblong
End Staggered**

.125" x .1875" oblong
(3.175 mm x 4.763 mm)
1/4" centers (6.350 mm)
32% open



**1/8" x 1/2"
Oblong
End Staggered**

.125" x .500" oblong
(3.175 mm x 12.700 mm)
1/4" centers (6.350 mm)
40% open



**PERFORATING
COMPANIES**



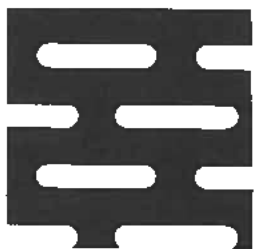
1/8" x 1/2"
Oblong
Side Staggered

.125" x .500" oblong
(3.175 mm x 12.700 mm)
1/4" centers (6.350 mm)
38% open



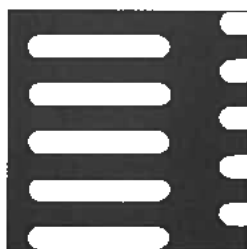
1/8" x 9/16"
Oblong
End Staggered

.125" x .5625" oblong
(3.175 mm x 14.288 mm)
5/16" centers (7.938 mm)
37% open



1/8" x 5/8"
Oblong
Side Staggered

.125" x .625" oblong
(3.175 mm x 15.875 mm)
5/16" centers (7.938 mm)
29% open



1/8" x 3/4"
Oblong
End Staggered

.125" x .750" oblong
(3.175 mm x 19.050 mm)
1/4" centers (6.350 mm)
41% open



1/8" x 3/4"
Oblong
Side Staggered

.125" x .750" oblong
(3.175 mm x 19.050 mm)
1/4" centers (6.350 mm)
41% open



1/8" x 3/4"
Oblong
End Staggered

.125" x .750" oblong
(3.175 mm x 19.050 mm)
5/16" centers (7.938 mm)
34% open



**PERFORATING
COMPANIES**



**1/8" x 1"
Oblong
Side Staggered**



.125" x 1" oblong
(3.175 mm x 25.400 mm)
1/4" centers (6.350 mm)
43% open



**9/64" x 3/4"
Slot
Straight**

.141" x .750" slot
(3.572 mm x 19.050 mm)
1/4" centers (6.350 mm)
47% open



**9/64" x 3/4"
Oblong
End Staggered**

.141" x .750" oblong
(3.572 mm x 19.050 mm)
5/16" centers (7.938 mm)
38% open



**.147" x 5/8"
Oblong
End Staggered**

.147" x .625" oblong
(3.734 mm x 15.875 mm)
5/16" centers (7.938 mm)
41% open



**5/32" x 5/8"
Oblong
End Staggered**

.156" x .625" oblong
(3.969 mm x 15.875 mm)
5/16" centers (7.938 mm)
43% open



**PERFORATING
COMPANIES**



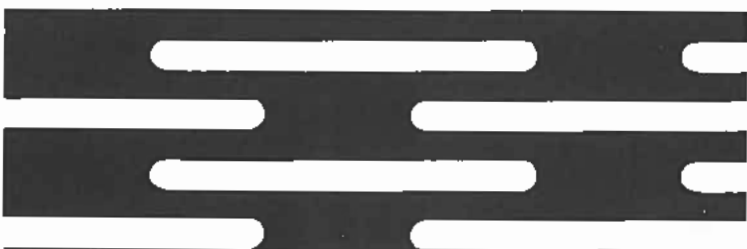
5/32" x 3/4"
Oblong
End Staggered

.156" x .750" oblong
 (3.969 mm x 19.050 mm)
 5/16" centers (7.938 mm)
 42% open



5/32" x 1-1/2"
Oblong
Side Staggered

.156" x 1.500" oblong
 (3.969 mm x 38.100 mm)
 5/16" centers (7.938 mm)
 44% open



5/32" x 2"
Oblong
Side Staggered

.156" x 2" oblong
 (3.969 mm x 50.800 mm)
 5/16" centers (7.938 mm)
 36% open



**1 1/64" x 47/64"
Oblong
Side Staggered**

.172" x .734" oblong
(4.366 mm x 18.653 mm)
11/32" centers (8.731 mm)
41% open



**1 1/64" x 3/4"
Oblong
End Staggered**

.172" x .750" oblong
(4.366 mm x 19.050 mm)
3/8" centers (9.525 mm)
39% open



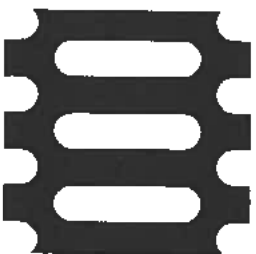
**3/16" x 5/8"
Oblong
End Staggered**

.1875" x .625" oblong
(4.763 mm x 15.875 mm)
5/16" centers (7.938 mm)
45% open



**3/16" x 1"
Oblong
Side Staggered**

.1875" x 1" oblong
(4.763 mm x 25.400 mm)
3/8" centers (9.525 mm)
38% open



**3/16" x 3/4"
Oblong
End Staggered**

.1875" x .750" oblong
(4.763 mm x 19.050 mm)
3/8" centers (9.525 mm)
43% open

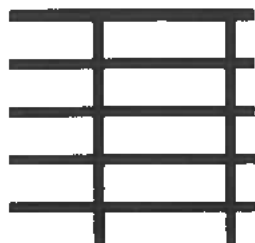


**PERFORATING
COMPANIES**



**3/16" x 1"
Oblong
End Staggered**

.1875" x 1" oblong
(4.763 mm x 25.400 mm)
3/8" centers (9.525 mm)
38% open



**.200" x .637"
Slot
Straight**



.200" x .637" slot
(5.080 mm x 16.180 mm)
1/4" centers (6.350 mm)
74% open

NOTES

For technical information or further tooling, materials, or processing details,
contact H&K Engineering at 800-621-3869.



PERFORATING
COMPANIES



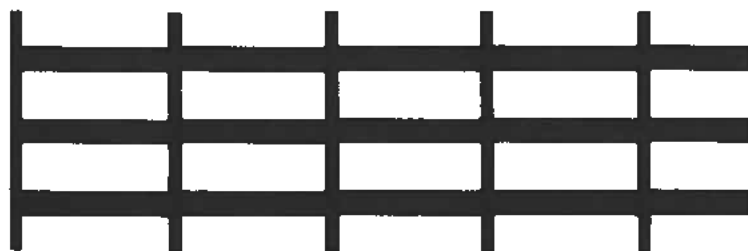
**1/4" x 5/8"
Oblong
End Staggered**

.250" x .625" oblong
(6.350 mm x 15.875 mm)
13/32" centers (10.319 mm)
45% open



**1/4" x 5/8"
Oblong
End Staggered**

.250" x .625" oblong
(6.350 mm x 15.875 mm)
7/16" centers (11.113 mm)
45% open



**1/4" x 3/4"
Slot
Straight**

.250" x .750" slot
(6.350 mm x 19.050 mm)
3/8" centers (9.525 mm)
61% open



**1/4" x 1-1/2"
Oblong
Side Staggered**

.250" x 1.500" oblong
(6.350 mm x 38.100 mm)
7/16" centers (11.113 mm)
47% open



**PERFORATING
COMPANIES**



AIRWAY
1/4" x 1-1/2"
Slot
Straight

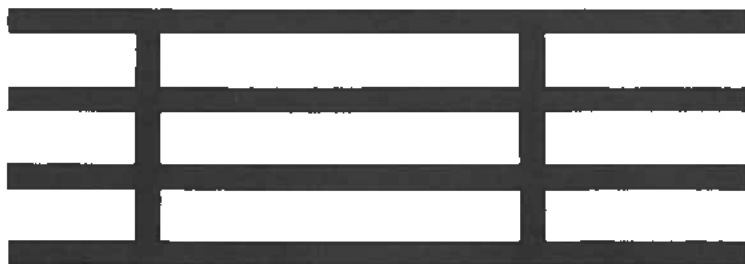


.250" x 1.500" slot
 (6.350 mm x 38.100 mm)
 Every third end bridge is 3/16"
 (4.763 mm) wide as shown.
 Other bridges are 3/32" (2.381 mm)
 67% open



1/4" x 2"
Oblong
Side Staggered

.250" x 2" oblong
 (6.350 mm x 50.800 mm)
 1/2" centers (12.700 mm)
 43% open



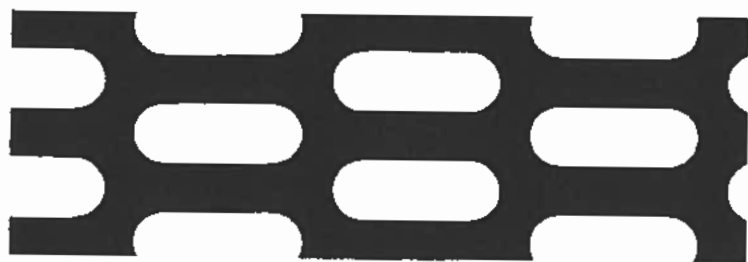
9/32" x 1-27/32
Slot
Straight



.281" x 1.844" slot
 (7.144 mm x 46.831 mm)
 All bridges are 1/8" (3.175 mm) wide.
 65% open



PERFORATING
COMPANIES



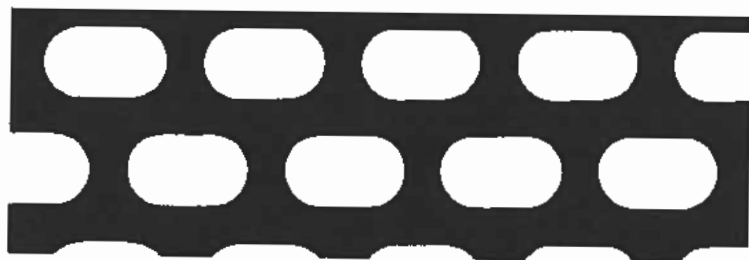
**5/16" x 7/8"
Oblong
End Staggered**

.3125" x .875" oblong
(7.938 mm x 22.225 mm)
9/16" centers (14.288 mm)
44% open



**5/16" x 1"
Oblong
End Staggered**

.3125" x 1" oblong
(7.938 mm x 25.400 mm)
1/2" centers (12.700 mm)
52% open

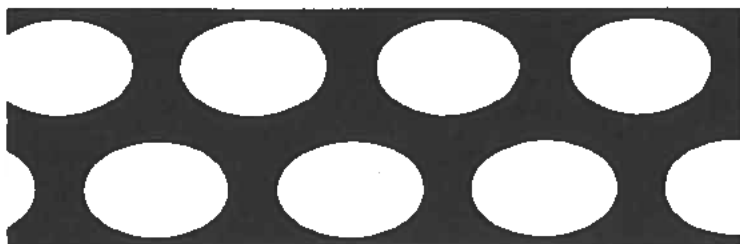


**3/8" x 5/8"
Oblong
Side Staggered**

.375" x .625" oblong
(9.525 mm x 15.875 mm)
9/16" centers (14.288 mm)
45% open

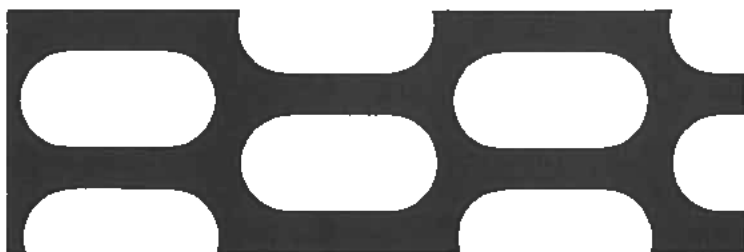


**PERFORATING
COMPANIES**



1/2" x 3/4"
Oval
Side Staggered

.500" x .750" oval
(12.700 mm x 19.050 mm)
5/8" centers (15.875 mm)
47% open



1/2" x 1"
Oblong
End Staggered

.500" x 1" oblong
(12.700 mm x 25.400 mm)
3/4" centers (19.050 mm)
53% open



1/2" x 1-1/16"
Oblong
Side Staggered

.500" x 1.0625" oblong
(12.700 mm x 26.988 mm)
3/4" centers (19.050 mm)
55% open



**PERFORATING
COMPANIES**



1/2" x 3-1/2"
Oblong
Straight

.500" x 3.500" oblong
(12.700 mm x 88.900 mm)
15/16" centers (23.813 mm)
49% open



9/16" x 1-1/2"
Oblong
Side Staggered

.5625" x 1.500" oblong
(14.288 mm x 38.100 mm)
7/8" centers (22.225 mm)
47% open



5/8" x 2"
Oblong
Straight

.625" x 2" oblong
(15.875 mm x 50.800 mm)
1" centers (25.4 mm)
49% open



**3/4" x 1-1/2"
Slot
Straight**

.750" x 1.500" slot
(19.050 mm x 38.100 mm)
1" centers (26.988 mm)
62% open



**1" x 3"
Oblong
Straight**

1" x 3" oblong
(25.400 mm x 76.200 mm)
1-7/16" centers (36.513 mm)
56% open

NOTES

**For technical information or further tooling, materials, or processing details,
contact H&K Engineering at 800-621-3869.**



**PERFORATING
COMPANIES**

ADDITIONAL SLOT AND OBLONG HOLE PATTERNS NOT ILLUSTRATED

The following lists are additional slot and oblong patterns which we can furnish with tools available from our die inventory.

The "Centers" shown represent the standard arrangement if no spacing were specified. However, all of these perforations can be arranged on special centers at little or no extra cost.

We also can produce in our die shop designs of a special nature to meet your exact requirements.

DIMENSIONS (In Inches)	CENTERS (In Inches)	SHAPE	LAYOUT
.025 x 1/2	1/8	Slot	Side Staggered
.027 x .128	.055	"	Straight
.029 x 23/64	7/64	"	Side Staggered
.040 x .472	5/32	"	"
.042 x .500	.625	Oblong	"
.045 x .200	3/32	"	End Staggered
.046 x .780	3/32	Slot	Side Staggered
.050 x .500	3/16	Oblong	"
.062 x .625	5/32	Slot	Straight
.062 x .750	11/32	"	Side Staggered
.072 x 3/8	5/32	Oblong	Any
.078 x 13/64	3/16	"	Side Staggered
.078 x 3/8	15/64	"	"
.078 x .787	.236	"	"
.078 x 1	5/16	Slot	Any
.080 x 1	5/32	Oblong	End Staggered
.083 x 3/16	7/32	"	Side Staggered
.093 x 3/4	1/4	Slot	"
.098 x .787	.176	Oblong	"
.125 x 7/8	1/4	"	Any
.150 x 5/8	5/16	"	End Staggered
.156 x 5/8	5/16	"	"
.156 x 1-1/4	3/8	"	Any
.172 x 7/16	7/16	"	Straight
.187 x 3.250	-	"	Any
.187 x 7/16	5/16	"	End Staggered
.250 x 3/8	1/2	"	"
.250 x 5/8	1/2	"	Side Staggered
.250 x 5/8	1/2	Slot	Any
.250 x 3/4	7/16	Oblong	"
.250 x 1	.562	"	Side Staggered
.250 x 1-1/4	7/16	"	Any
.250 x 1.500	.437	"	Straight
.250 x 2	-	"	Any
.250 x 2	-	Slot	"
.281 x 5/8	1/2	Oblong	End Staggered
.281 x 5/8	17/32	Slot	Any
.313 x 5/8	1/2	Oblong	End Staggered
.313 x 3/4	11/16	"	Any
.313 x 1	5/8	"	"
.313 x 1-1/2	1/2	"	"
.375 x 5/8	1	"	Side Staggered
.375 x 2	11/16	"	Any
.394 x 1.181	11/16	"	"



**PERFORATING
COMPANIES**

ADDITIONAL SLOT AND OBLONG HOLE PATTERNS NOT ILLUSTRATED

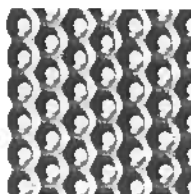
DIMENSIONS (in inches)	CENTERS (in inches)	SHAPE	LAYOUT
.438 x 7/8	3/4	Oblong	End Staggered
.438 x 1	3/4	"	Any
.438 x 1-1/8	11/16	"	End Staggered
.500 x 3/4	3/4	"	"
.500 x 7/8	3/4	"	"
.500 x 1	.875	"	Side Staggered
.500 x 1-1/2	7/8	"	End Staggered
.500 x 2	.750	"	Side Staggered
.562 x 2.406	.937	"	"
.593 x 1	.812	"	"
.625 x 3	13/16	Slot	Straight
.688 x 2	-	Oblong	Any
.750 x 1	-	"	"
.750 x 1-1/2	-	Oblong	Any
.750 x 1-3/4	-	"	"
.875 x 2-1/2	-	"	"
1 x 1-1/4	-	"	"
1 x 2	1-3/16	"	Side Staggered

NOTES

For technical information or further tooling, materials, or processing details,
contact H&K Engineering at 800-621-3869.

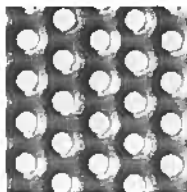


**PERFORATING
COMPANIES**



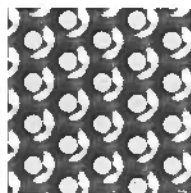
**1/14"
INDENTED
STAGGERED**

.0715" Dia. (1.816 mm)
3/16" Centers (4.763 mm)
33 Holes per sq. in.
13% Open



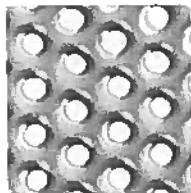
**3/32"
INDENTED
STAGGERED**

.094" Dia. (2.381 mm)
7/32" Centers (5.556 mm)
25 Holes per sq. in.
17.5% Open



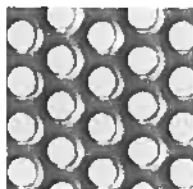
**7/64"
INDENTED
STAGGERED**

.109" Dia. (2.778 mm)
7/32" Centers (5.556 mm)
24 Holes per sq. in.
23% Open



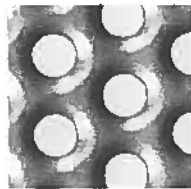
**1/8"
INDENTED
STAGGERED**

.125" Dia. (3.175 mm)
1/4" Centers (6.350 mm)
18.5 Holes per sq. in.
23% Open



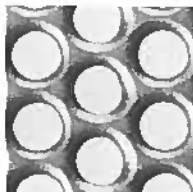
**5/32"
INDENTED
STAGGERED**

.156" Dia. (3.969 mm)
1/4" Centers (6.350 mm)
18.5 Holes per sq. in.
36% Open



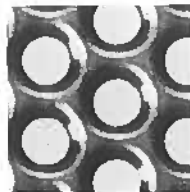
**.238"
INDENTED
STAGGERED**

.238" Dia. (6.045 mm)
7/16" Centers (11.113 mm)
27% Open



**1/4"
INDENTED
STAGGERED**

.250" Dia. (6.350 mm)
3/8" Centers (9.525 mm)
40% Open



**1/4"
INDENTED
STAGGERED**

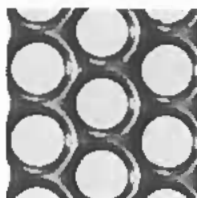
.250" Dia. (6.350 mm)
7/16" Centers (11.113 mm)
30% Open

All patterns shown actual size.

Each perforated pattern has certain gauge and width limitations, so it is advisable to consult with Harrington & King before preparing your specifications.

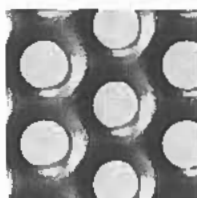


PERFORATING
COMPANIES



**.257"
INDENTED
STAGGERED**

.257" Dia. (6.528 mm)
3/8" Centers (9.525 mm)
43% Open



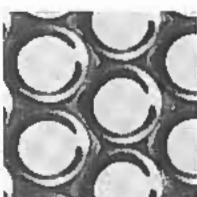
**.257"
INDENTED
STAGGERED**

.257" Dia. (6.528 mm)
7/16" Centers (11.113 mm)
31% Open



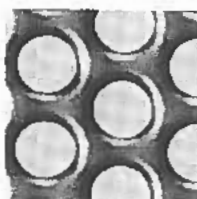
**.273"
INDENTED
STAGGERED**

.273" Dia. (6.934 mm)
13/32" Centers (10.319 mm)
42% Open



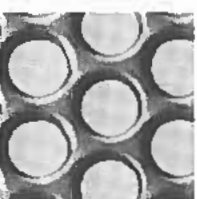
**9/32"
INDENTED
STAGGERED**

.281" Dia. (7.144 mm)
7/16" Centers (11.113 mm)
38% Open



**.289"
INDENTED
STAGGERED**

.289" Dia. (7.341 mm)
7/16" Centers (11.113 mm)
40% Open



**.304"
INDENTED
STAGGERED**

.304" Dia. (7.722 mm)
7/16" Centers (11.113 mm)
44% Open



**5/16"
INDENTED
STAGGERED**

.3125" Dia. (7.938 mm)
7/16" Centers (11.113 mm)
47% Open



**.316"
INDENTED
STAGGERED**

.316" Dia. (8.026 mm)
9/16" Centers (14.288 mm)
29% Open

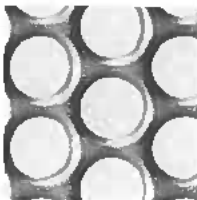


See the "In Stock" section for items available for immediate delivery.



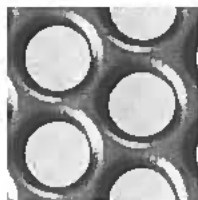
PERFORATING
COMPANIES

www.hkperf.com | 800-621-3869 | sales@hkperf.com



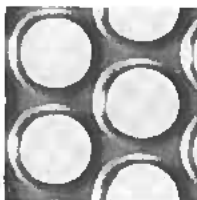
.321" INDENTED STAGGERED

.321" Dia. (8.153 mm)
7/16" Centers (11.113 mm)
49% Open



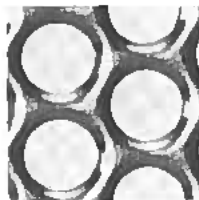
.336" INDENTED STAGGERED

.336" Dia. (8.534 mm)
1/2" Centers (12.700 mm)
41% Open



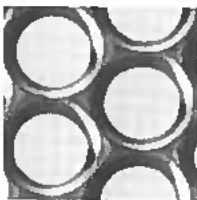
.359" INDENTED STAGGERED

.359" Dia. (9.119 mm)
1/2" Centers (12.700 mm)
47% Open



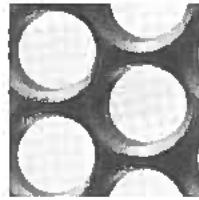
3/8" INDENTED STAGGERED

.375" Dia. (9.525 mm)
17/32" Centers (13.494 mm)
45% Open



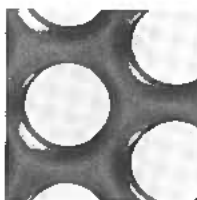
.379" INDENTED STAGGERED

.379" Dia. (9.627 mm)
17/32" Centers (13.494 mm)
46% Open



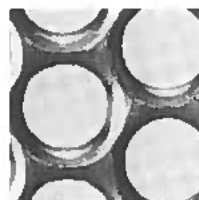
25/64" INDENTED STAGGERED

.390" Dia. (9.906 mm)
17/32" Centers (13.494 mm)
49% Open



13/32" INDENTED STAGGERED

.406" Dia. (10.312 mm)
19/32" Centers (15.081 mm)
42% Open



27/64" INDENTED STAGGERED

.422" Dia. (10.719 mm)
19/32" Centers (15.081 mm)
46% Open



**PERFORATING
COMPANIES**



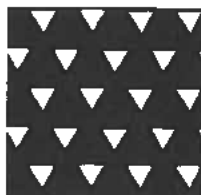
**.066" (1.676 mm)
TRIANGULAR**

SINGLE SPACED
Inscribed Circle Dia. .066"
Side Dimension .114" (2.896 mm)
6% open



**.066" (1.676 mm)
TRIANGULAR**

DOUBLE SPACED
Inscribed Circle Dia. .066"
Side Dimension .114" (2.896 mm)
24% open



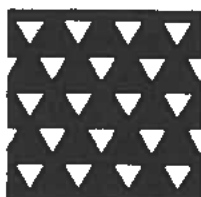
**.078" (1.981 mm)
TRIANGULAR**

SINGLE SPACED
Inscribed Circle Dia. .078"
Side Dimension .135" (3.429 mm)
9% open



**.078" (1.981 mm)
TRIANGULAR**

DOUBLE SPACED
Inscribed Circle Dia. .078"
Side Dimension .135" (3.429 mm)
34% open



**.083" (2.108 mm)
TRIANGULAR**

SINGLE SPACED
Inscribed Circle Dia. .083"
Side Dimension .144" (3.658 mm)
10% open



**.083" (2.108 mm)
TRIANGULAR**

DOUBLE SPACED
Inscribed Circle Dia. .083"
Side Dimension .144" (3.658 mm)
38% open



**.090" (2.286 mm)
TRIANGULAR**

DOUBLE SPACED
Inscribed Circle Dia. .090"
Side Dimension .156" (3.962 mm)
32% open



**.097" (2.464 mm)
TRIANGULAR**

DOUBLE SPACED
Inscribed Circle Dia. .097"
Side Dimension .168" (4.267 mm)
37% open

The size of a triangular hole is measured on the basis of the diameter of the inscribed circle. Commercial perforations are held to an accuracy of .002" plus or minus; precision perforations to .0005" plus or minus.



**PERFORATING
COMPANIES**



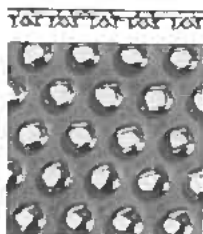
**.109" (2.769 mm)
TRIANGULAR**

Double Spaced
Inscribed Circle Dia. .109"
Side Dimension .164" (4.166 mm)
36% Open



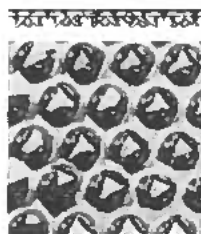
**.119" (3.023 mm)
TRIANGULAR**

Double Spaced
Inscribed Circle Dia. .119"
Side Dimension .178" (4.521 mm)
43% Open



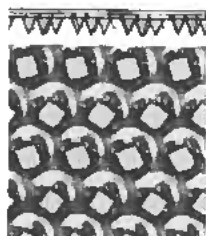
**1/16"
TRIANGULAR
STABBED**

.0625" Dia. (1.588 mm)
1/4" Centers (6.350 mm)



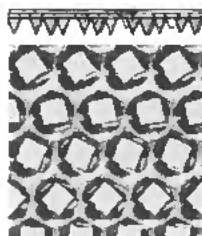
**1/12"
TRIANGULAR
STABBED**

.0835" Dia. (2.121 mm)
1/4" Centers (6.350 mm)



**1/10"
SQUARE
STABBED**

.100" Dia. (2.540 mm)
1/4" Centers (6.350 mm)



**1/8"
SQUARE
STABBED**

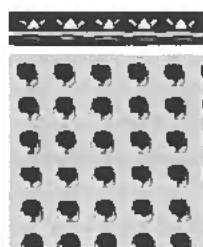
.125" Dia. (3.175 mm)
1/4" Centers (6.350 mm)

The size of a stabbed hole is determined by the diameter of a round pin which can be inserted in the holes.

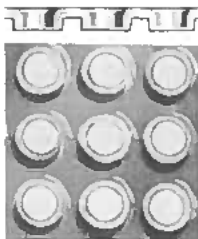


Fine Surfacing (SSD)

This material which is known as Loom Filet or surfacing, is furnished in .006" tinned steel, 1-1/2" (38.100 mm) and 2-1/4" (57.150 mm) wide. Wrapped around rolls in textile machinery, it provides a rough surface which prevents slipping.

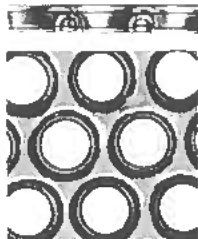


Coarse Surfacing (LSD)



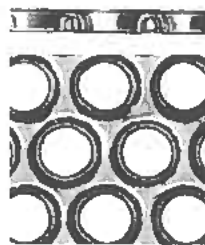
3/16"
COLLARED
STRAIGHT

.1875" Dia. (4.763 mm)
.333" Centers (8.458 mm)
25% Open



1/4"
COLLARED
STAGGERED

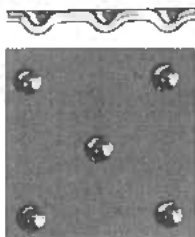
.250" Dia. (6.350 mm)
7/16" Centers (11.113 mm)
30% Open



17/64"
COLLARED
STAGGERED

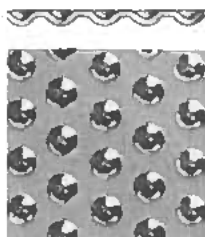


.266" Dia. (6.747 mm)
13/32" Centers (10.319 mm)
40% Open



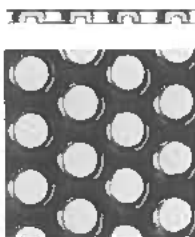
1/8"
INDENTED
SURFACE
STAGGERED

.125" Dia. (3.175 mm)
1/2" Centers (12.700 mm)



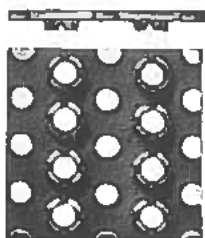
1/8"
INDENTED
SURFACE
STAGGERED

.125" Dia. (3.175 mm)
1/4" Centers (6.350 mm)



3/16"
ROUND
BURRED
STAGGERED

.1875" Dia. (4.763 mm)
5/16" Centers (7.938 mm)

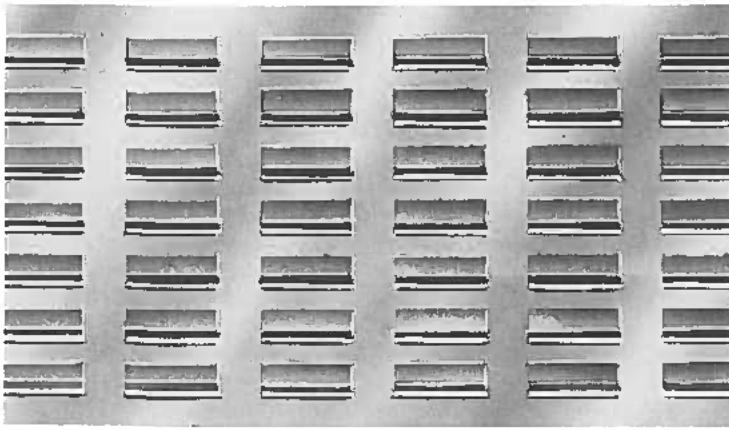


1/12"
SPECIAL
BURRED
HOLES
1/8"
ROUND
HOLES
STAGGERED

.083" Dia. (2.117 mm)
.125" Dia. (3.175 mm)
1/4" Centers (6.350 mm)



PERFORATING
COMPANIES

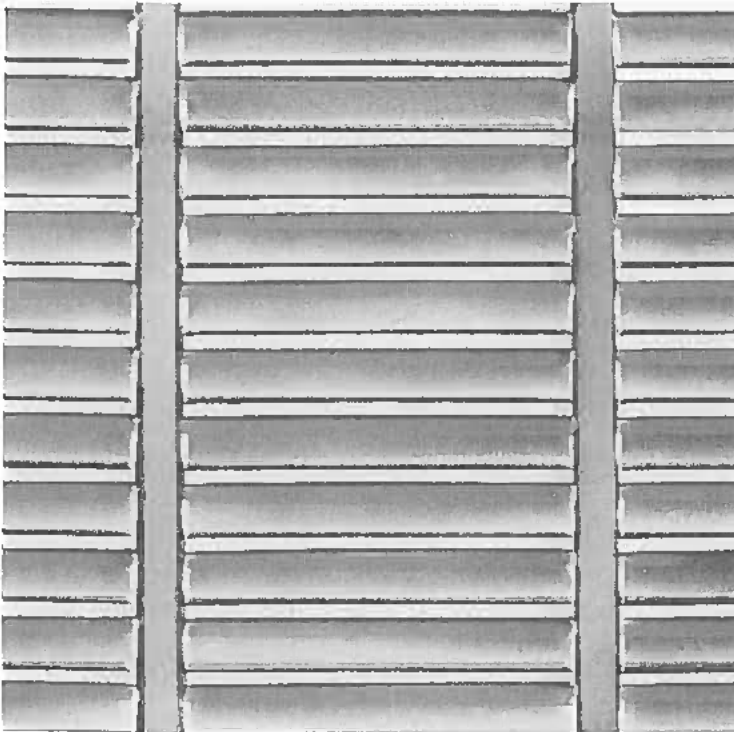


1MM X 12 MM LIP SLOT

1 mm x 12 mm (.040" x .473") lip slot

7.144 mm (9/32") centers straight

The 1 mm (.040") designation is that of the opening at the bottom of the lip



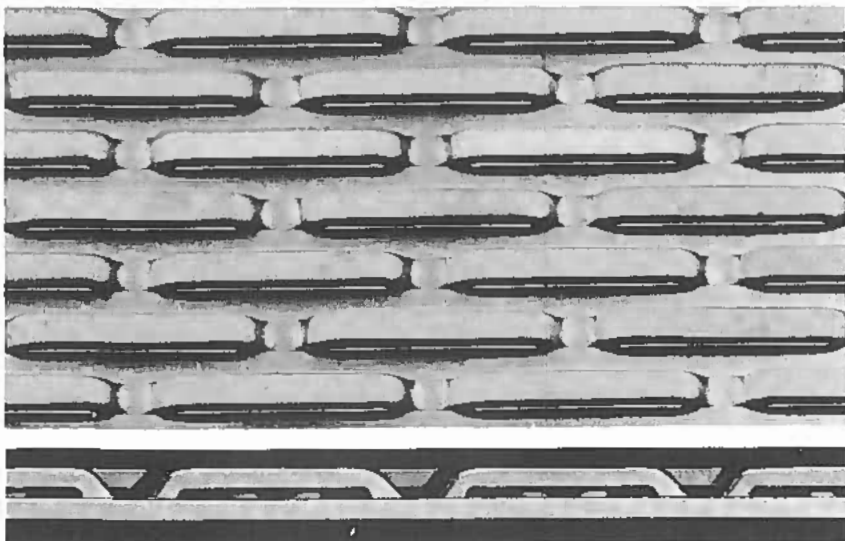
11/32" X 2" LIP SLOT

.344" (8.731 mm) x 2" (50.800 mm) lip slot

60% effective open area



PERFORATING
COMPANIES



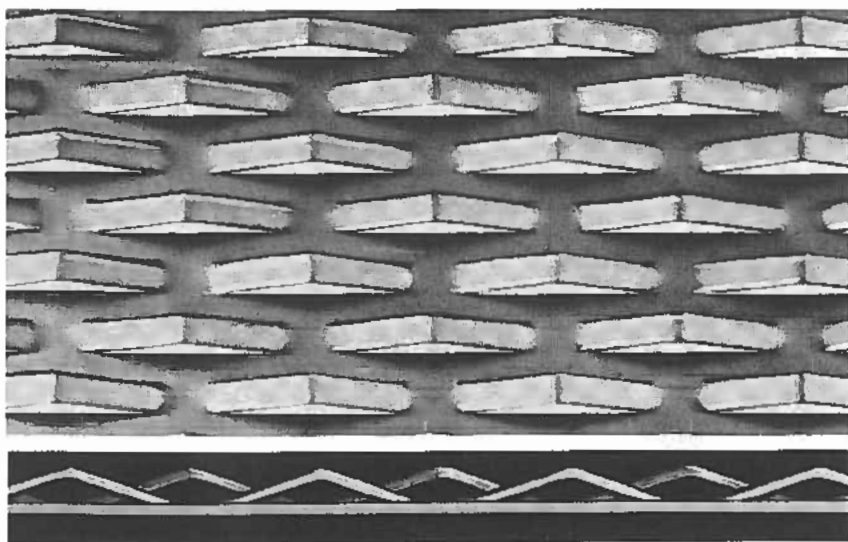
3/16" X 1-1/4" STANDARD SHIELDED SLOT

3/16" x 1-1/4" [4.763 mm x 31.750 mm]

3/8" centers [9.525 mm] side staggered

1/64" (0.397 mm) to 1/8" (3.175 mm) opening

This is a special lip perforation with a small lip size which provides very fine openings in heavy gauge steel and stainless steel



5/32" X 1" MODIFIED SHIELDED SLOT

5/32" x 1" [3.969 mm x 25.400 mm]

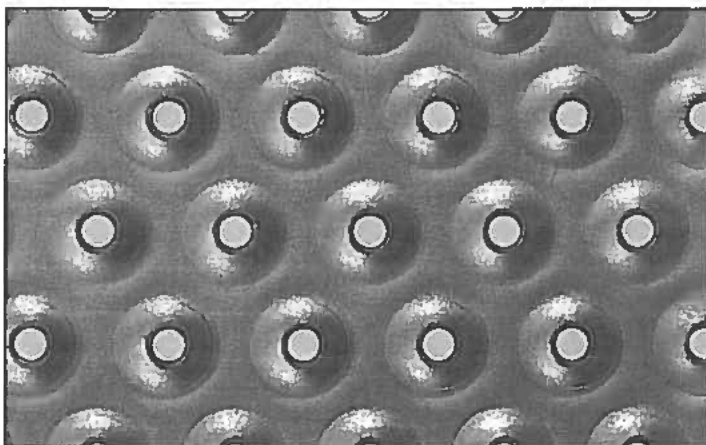
5/16" centers [7.938 mm] side staggered

Basically similar to the standard shielded slot but with V-lip



**PERFORATING
COMPANIES**

H&K Perforated Material for Safety Flooring



Gator Tread

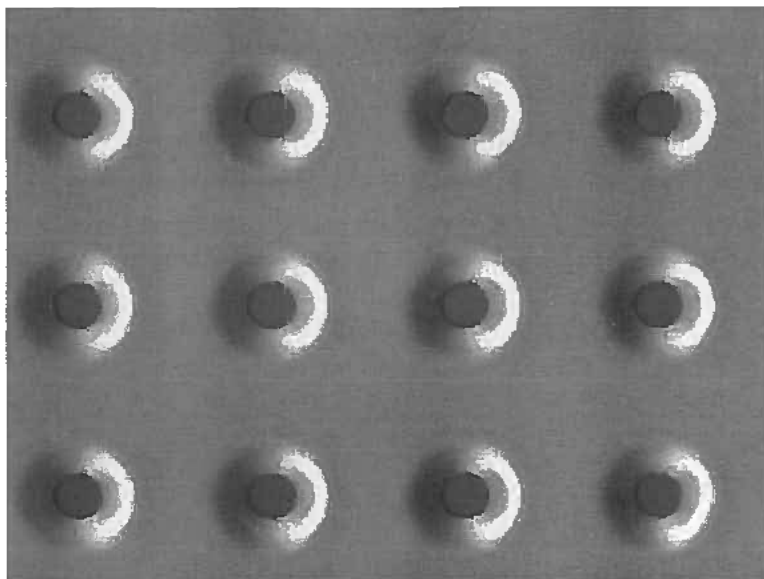
Safe, sure-foot gripping action in all directions.

Material	Gauge	Maximum size	Availability
H.R.P.O. steel	14	4' x 8'	
H.R.P.O. steel	11, 12, 14, 16	4' x 10'	To order
Galvanized 6-90 steel	11, 12, 14, 16	4' x 10'	To order
Aluminum #5052-H32	11, 12, 14, 16	4' x 10'	To order
Stainless steel #304-2B	11, 12, 14, 16	4' x 10'	To order



PERFORATING
COMPANIES

H&K Perforated Metal Indented Pegboard Pattern

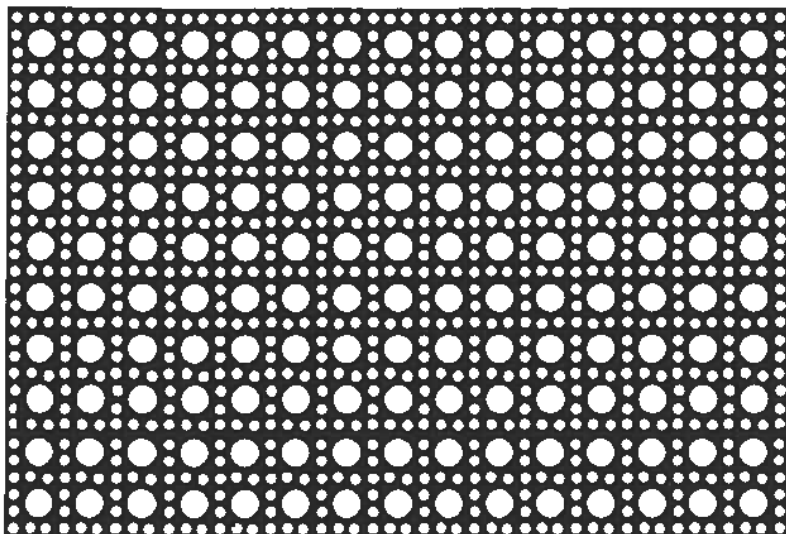


1/4" Round x 1" Straight Line
Sure-hold gripping action in both directions.

Material	Gauge	Sizes	Availability
CR steel	20	4'x10'	 Run to order
H.R.P.O. steel	14,16	up to 60"W	Run to order
Galvanized	14,16	—	Run to order
Stainless steel #304-2B	16	to 144"L	Run to order

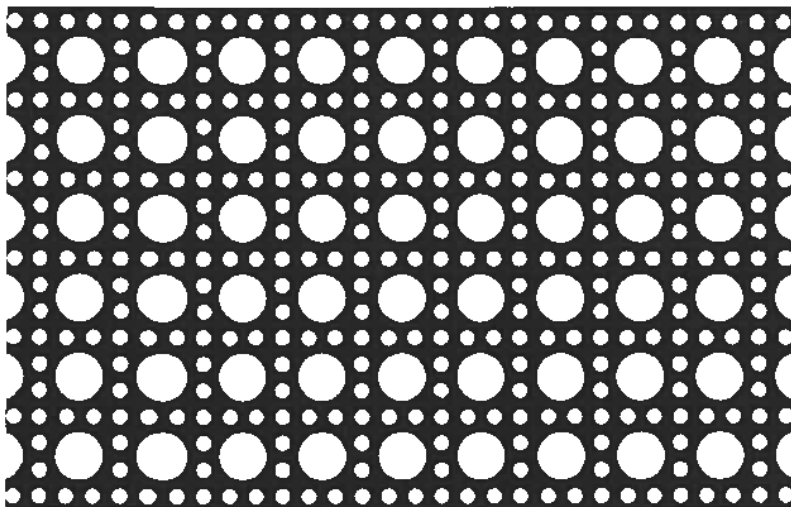


PERFORATING
COMPANIES



LINCANE • 44% OPEN

An attractive presentation of the Cane pattern with perforations small enough to provide excellent concealment, yet with a high percentage of open area. Available in 22 gauge steel or 20 B & S gauge aluminum, 36" x 120" sheets.



ROUND CANE • 45% OPEN

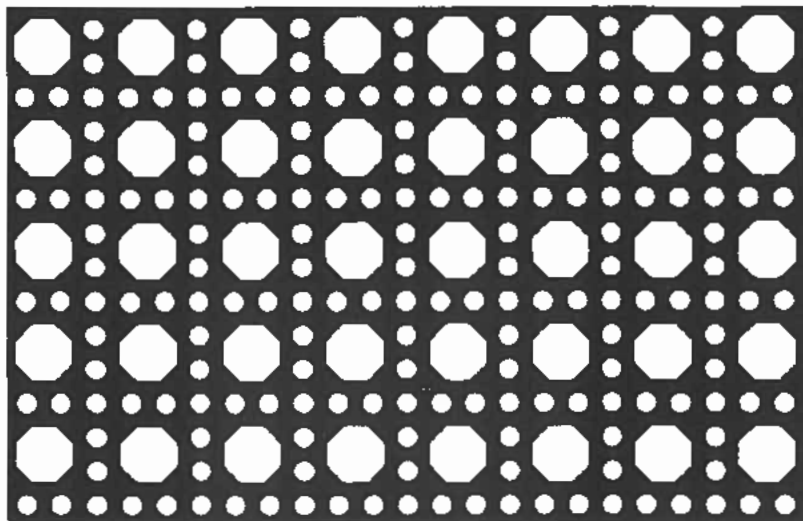
A pattern developed as an intermediate size between Lincane and Cane "41". Available in 22 gauge steel, 36" x 120" sheets.

All patterns shown actual size.

Each perforated pattern has certain gauge and width limitations, so it is advisable to consult with Harrington & King before preparing your specifications.

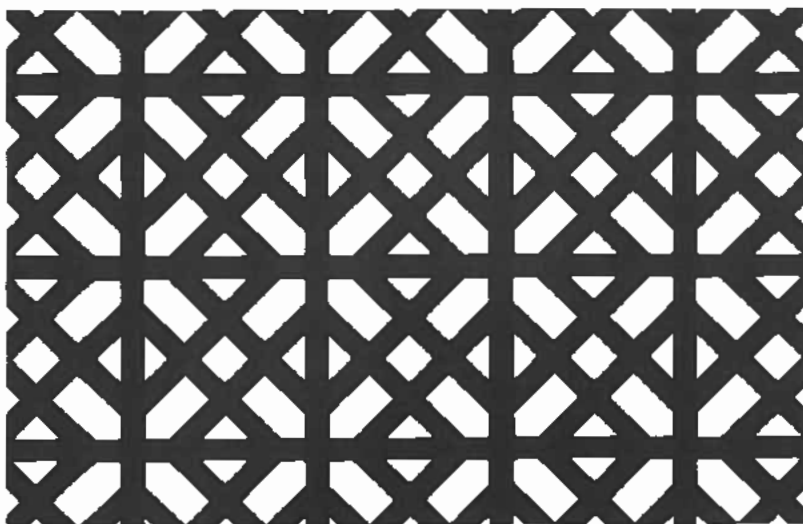


PERFORATING
COMPANIES



CANE "41" • 41% OPEN

A pattern designed to be the same both horizontally and vertically, thus facilitating the shearing of sheets to smaller pieces. Available in 16 and 20 gauge steel, or 20 B & S gauge aluminum, 36" x 120" sheets. Run to order up to 48" wide.



MORESQUE • 36% OPEN

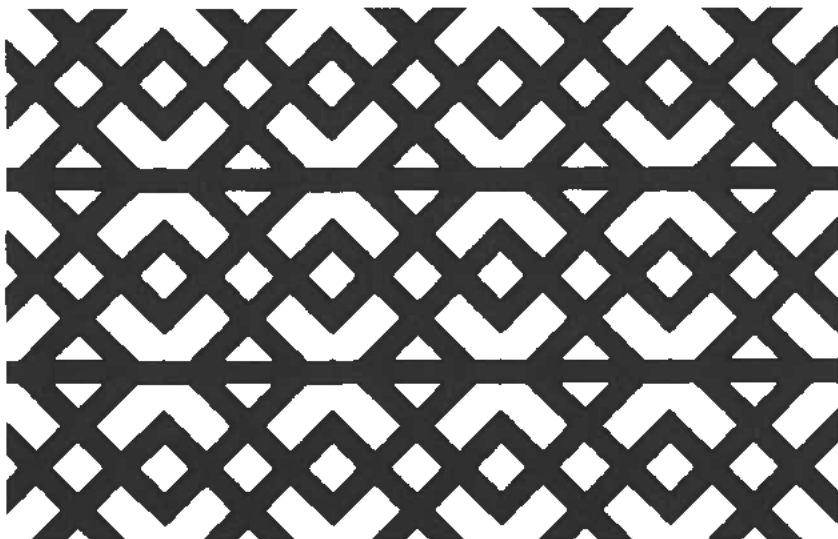
The motif of this design is Moorish and was used in the decoration of the Alhambra built in Granada, Spain, in the thirteenth century. Can be fabricated to order in 22 gauge steel, 36" x 120" sheets.



See the "In Stock" section for items available for immediate delivery.

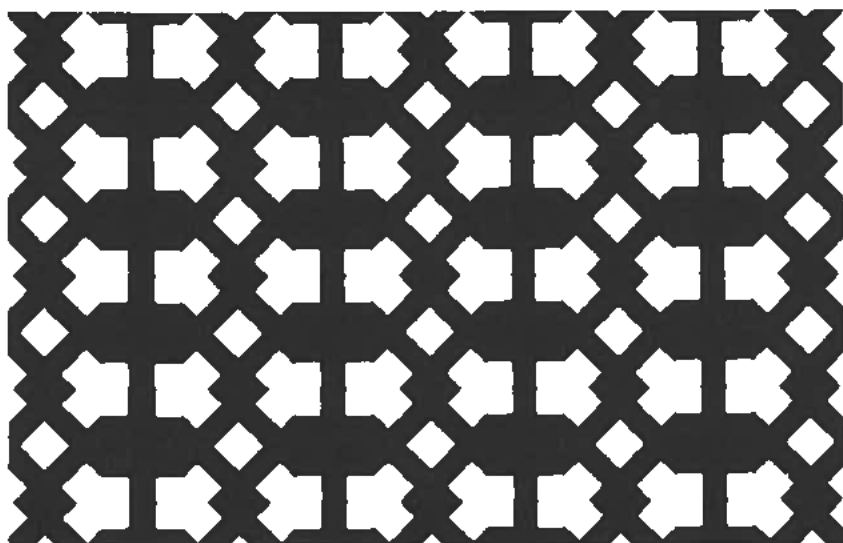


PERFORATING
COMPANIES



SHADOW BOX • 38% OPEN

A pattern that can be fabricated to order in 22 gauge steel or 20 B & S gauge aluminum, 24" wide.

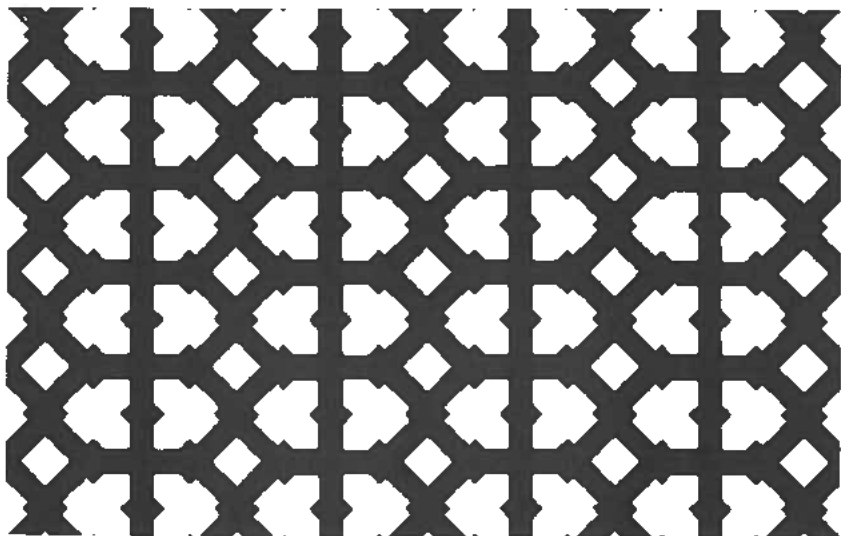


ORIENTAL • 40% OPEN

A unique contemporary pattern with a Far East look. Can be fabricated to order in 22 gauge steel or 20 B & S gauge aluminum, 24" wide.

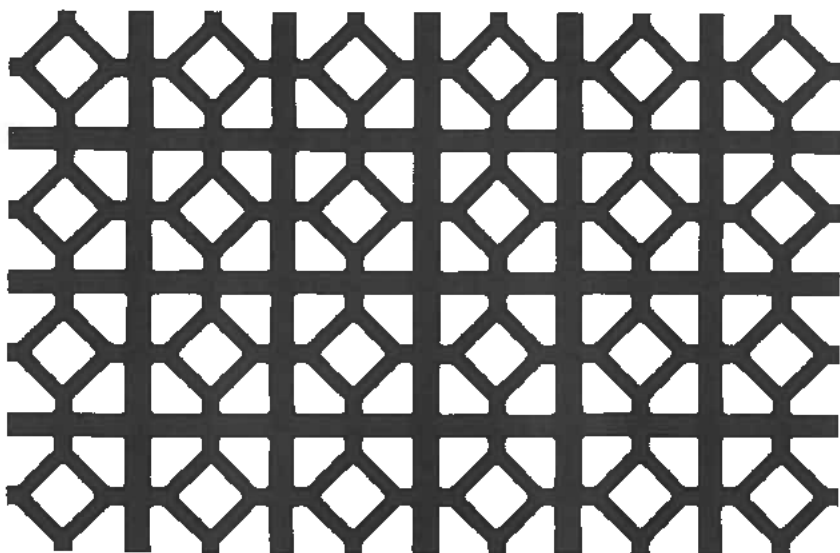


**PERFORATING
COMPANIES**



CATHEDRAL • 46% OPEN

A classic yet intriguing pattern that can be fabricated to order in 22 gauge steel or 20 B & S gauge aluminum, 36" wide.

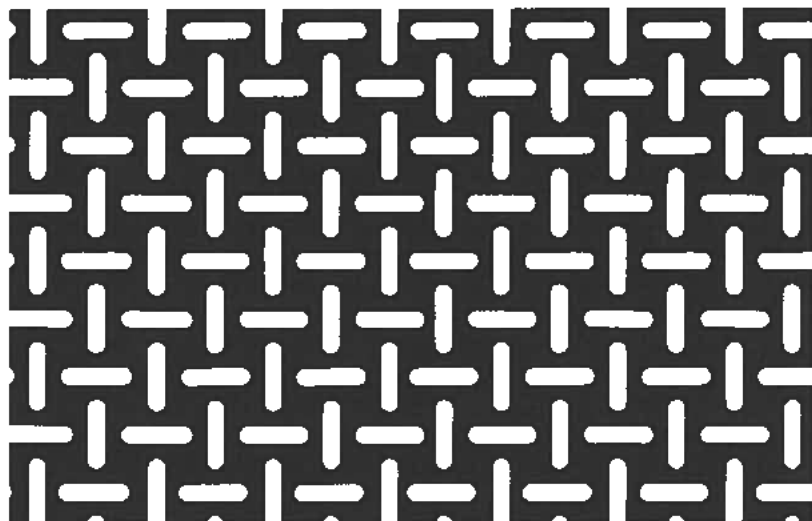


TRI-SQUARE • 47% OPEN

A popular pattern of traditional beauty. Available in 22 gauge steel, 36" x 120" sheets.



**PERFORATING
COMPANIES**



PLAID • 34% OPEN

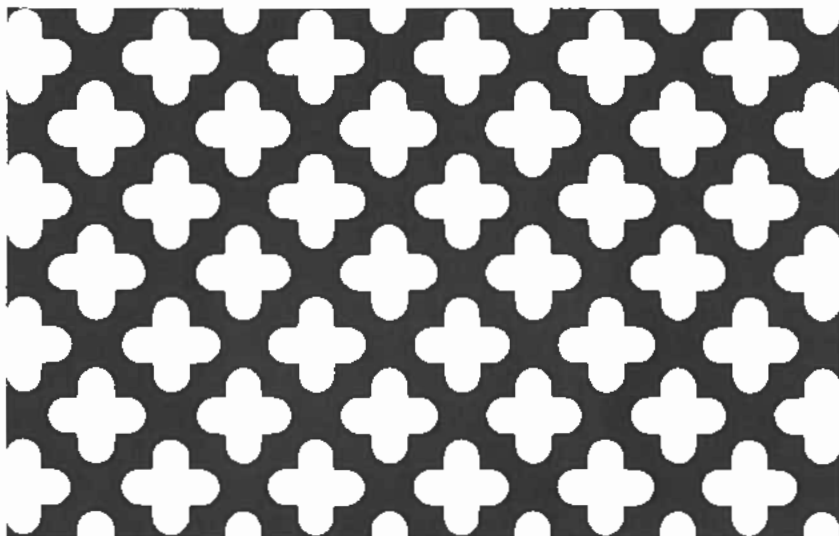
One of a series of patterns developed for the contemporary look. Can be fabricated to order in 16 gauge steel, 36" wide.

NOTES

For technical information or further tooling, materials, or processing details, contact H&K Engineering at 800-621-3869.

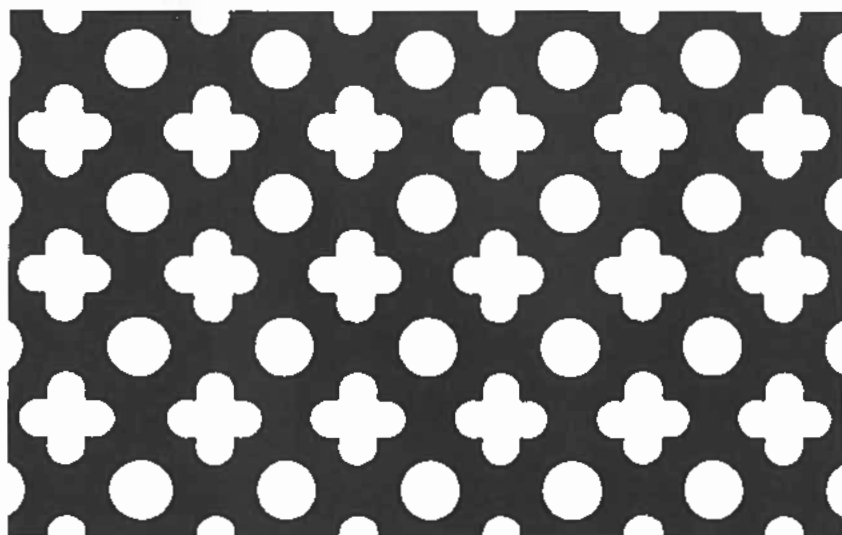


**PERFORATING
COMPANIES**



FULL CLOVERLEAF • 49% OPEN

A beautiful pattern providing a high percentage of open area. Can be fabricated to order in 22 gauge steel, 36" wide.

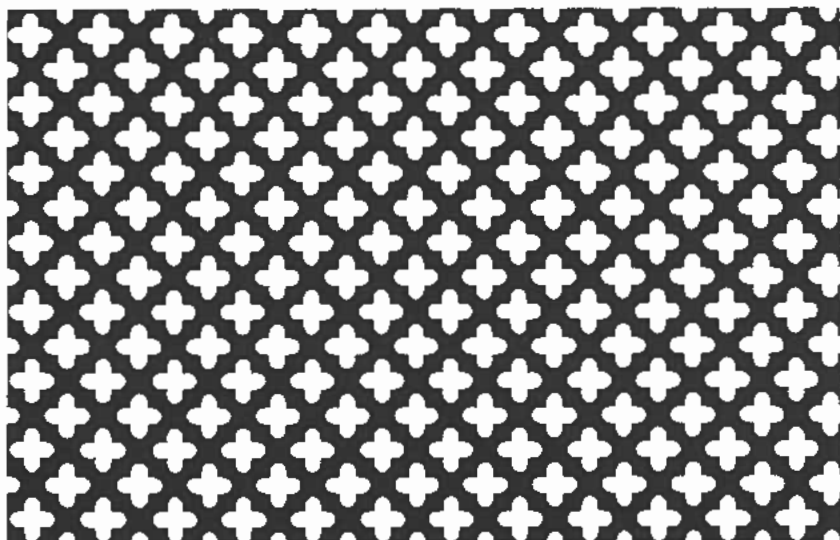


CLOVERLEAF & ROUND • 40% OPEN

Unusual beauty and versatility make this a very popular pattern. Can be fabricated to order in 20 and 22 gauge steel, in widths up to 48".

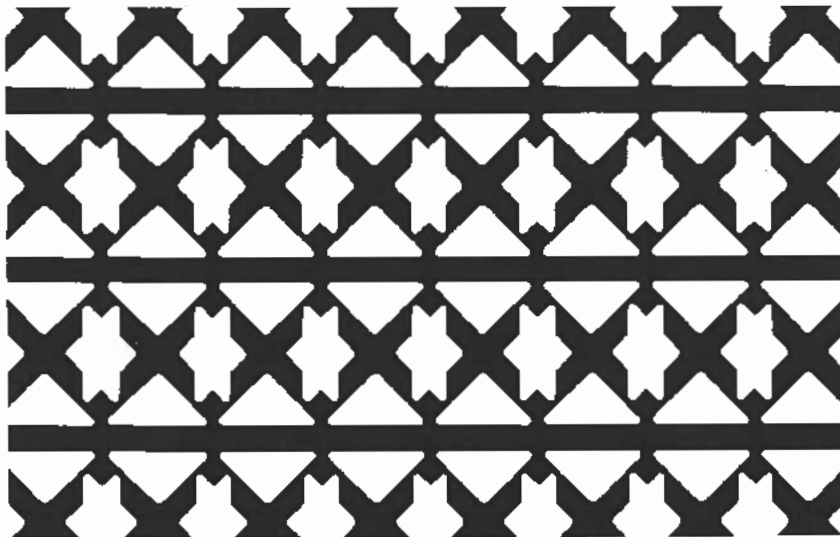


**PERFORATING
COMPANIES**



MINI-LEAF • 46% OPEN

A diminutive version of a popular "Classic." Can be fabricated to order in 24 gauge steel, 36" wide.

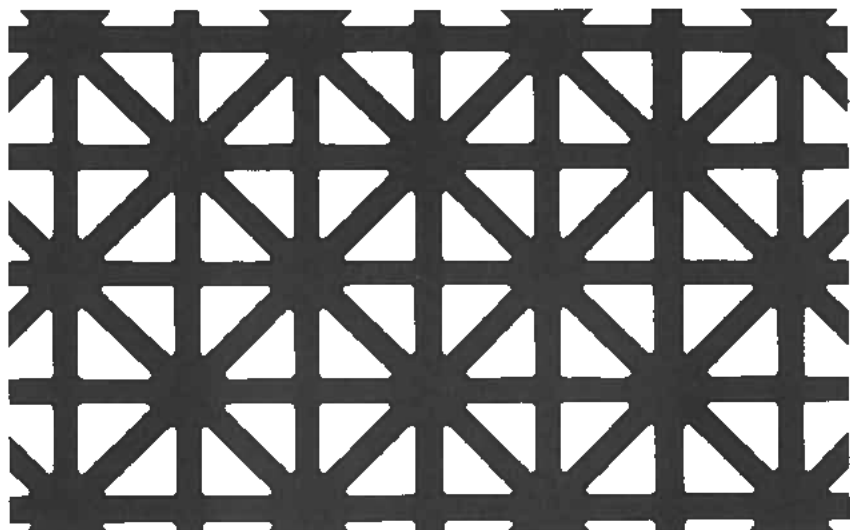


INDIAN • 51% OPEN

A distinctive pattern developed from Hindu decoration motifs. Can be fabricated to order in 22 gauge steel or 20 B & S gauge aluminum, 36" wide.

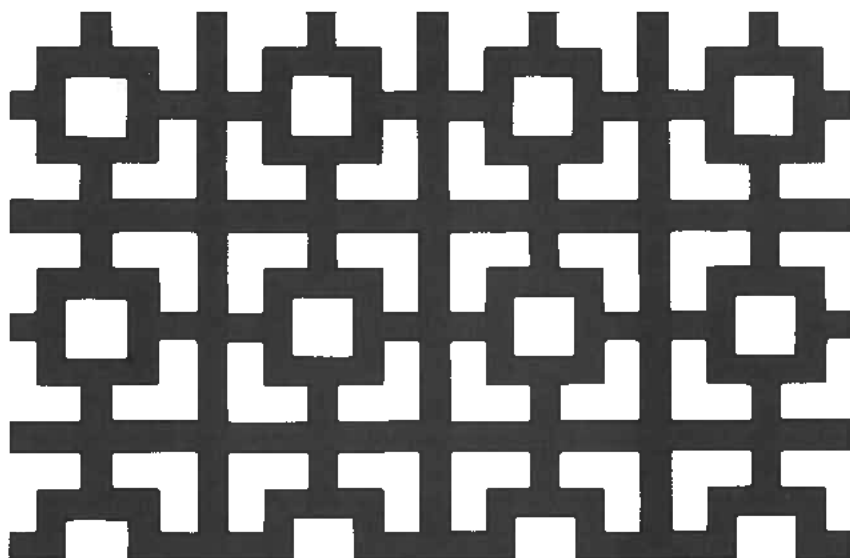


**PERFORATING
COMPANIES**



UNION JACK • 40% OPEN

A large and pleasing design which has a variety of applications. Available in 20 B & S gauge aluminum, 36" x 120" sheets.

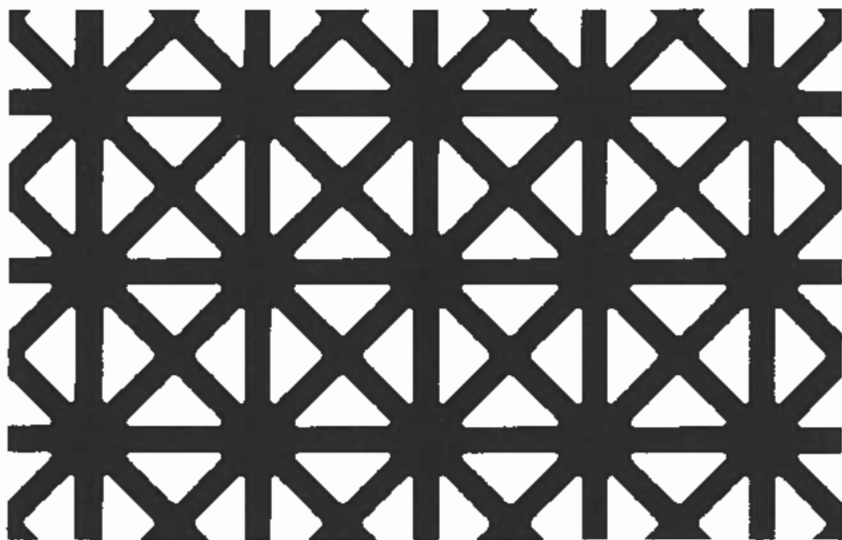


STYLE A-1 • 45% OPEN

A classical pattern which is particularly suitable for use in stoves and heaters, as well as in cabinets. Available in 20 and 22 gauge steel, or 20 B & S gauge aluminum, 36" x 120" sheets. Run to order up to 48" wide.

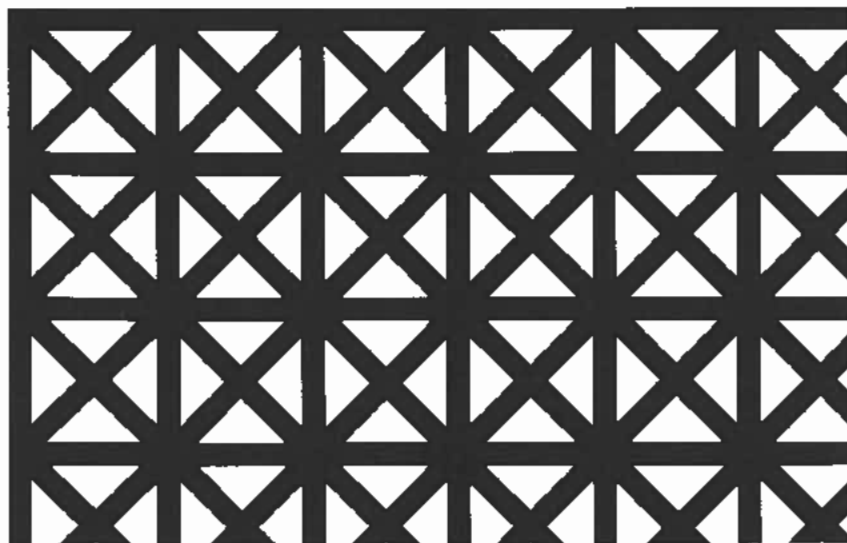


**PERFORATING
COMPANIES**



LARGEX • 41% OPEN

A striking bolder version of the Grecian design which is available in 22 gauge steel, 36" x 120" sheets.

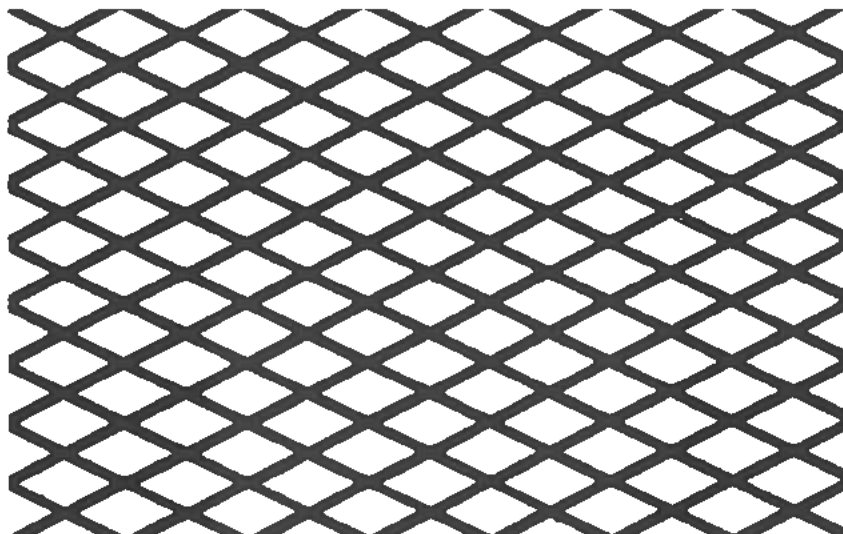


GRECIAN • 35% OPEN

A pattern of beautiful lace-like appearance which provides a maximum of concealment with satisfactory open area. Available in 22 gauge steel, 36" x 120" sheets.

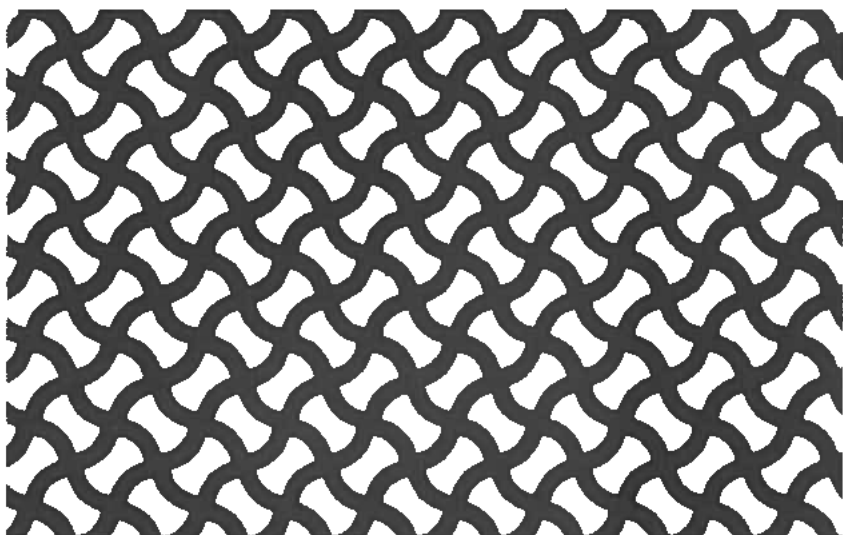


**PERFORATING
COMPANIES**



DIAMOND • 64% OPEN

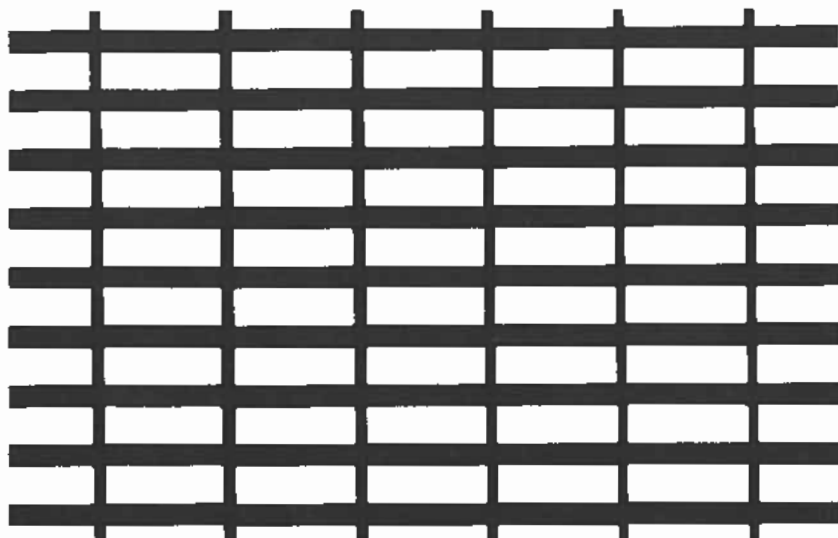
A lozenge shaped plane figure $\frac{1}{4}$ " x $\frac{1}{2}$ " (6.350 x 12.700 mm) opening that is available in 20 and 22 gauge steel, or 20 B & S gauge aluminum, 36" x 120" sheets.



RIPPLE • 45% OPEN

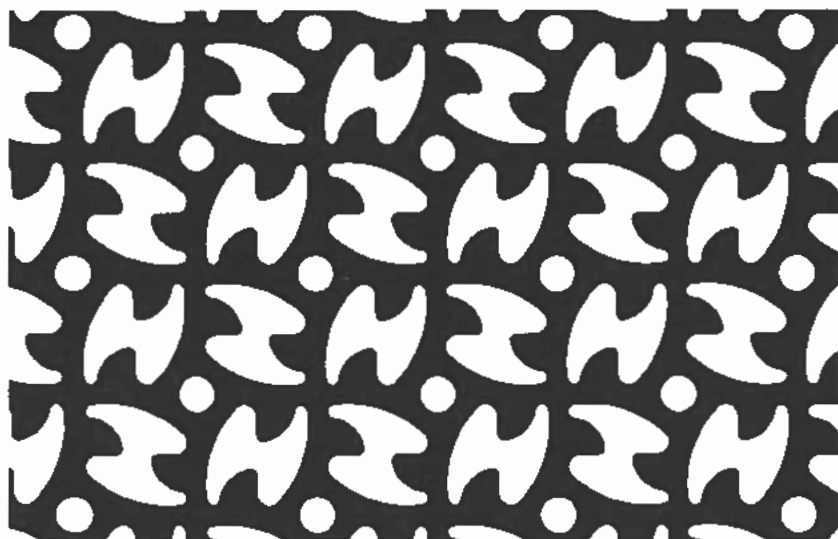
An attractive pattern giving the appearance of small waves stirred by a breeze. Can be fabricated to order in 22 gauge steel, 36" wide.





FENCE • 59% OPEN

A contemporary pattern developed for today's style. Available in 22 gauge steel, 36" x 120" sheets.

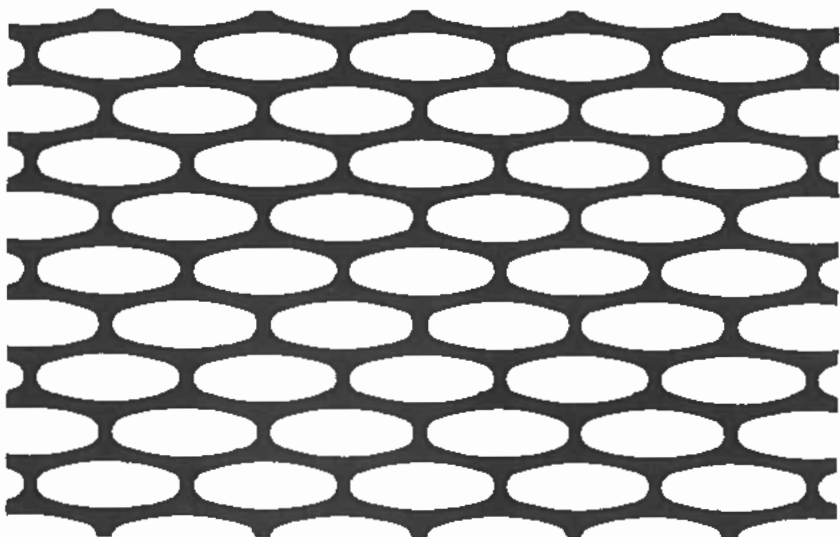


FANTASY • 51% OPEN

One of a series of contemporary patterns. Can be fabricated to order in 22 and 24 gauge steel, or 20 B & S gauge aluminum, 36" wide.

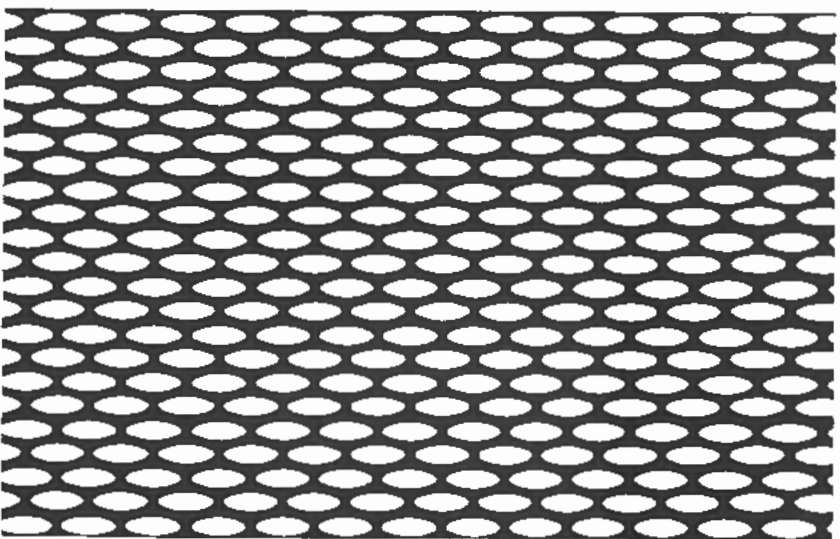


**PERFORATING
COMPANIES**



3/4" OVALESQUE • 66% OPEN

A simple but versatile contemporary design. Ovalesque is available in 22 gauge steel or 20 B & S gauge aluminum, 36" x 120" sheets.

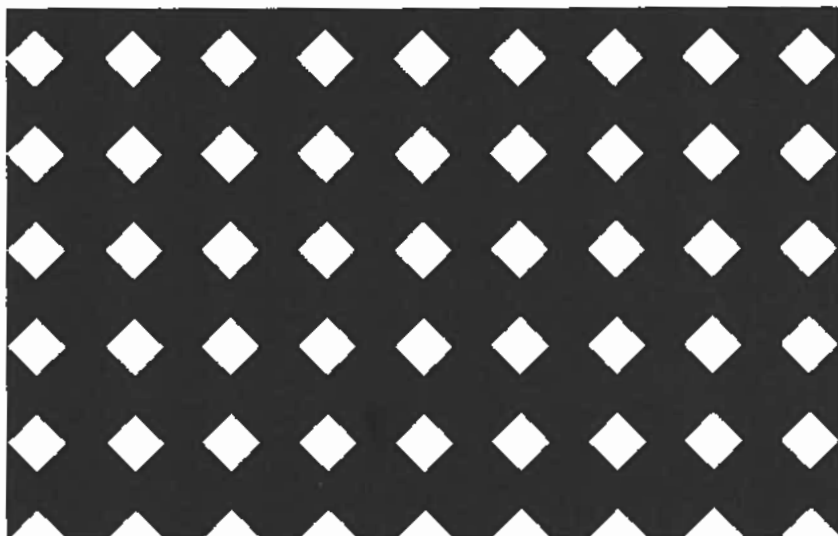


9/32" OVALESQUE • 50% OPEN

Excellent concealment with a mini version of a popular pattern. Available in 20 B & S gauge aluminum, 36" x 120" sheets.

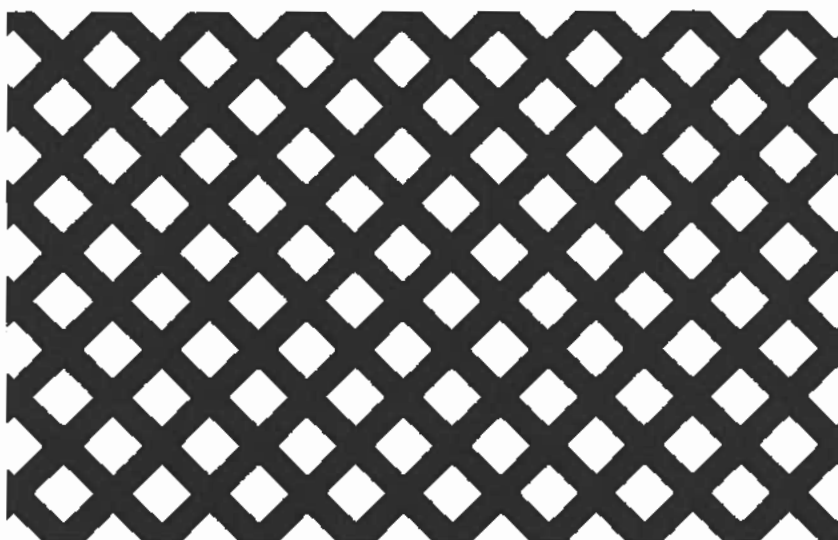


**PERFORATING
COMPANIES**



CAMELOT (Straight) • 19% OPEN

A pattern of basic simplicity. Can be fabricated to order in 22 gauge steel up to 48" wide.

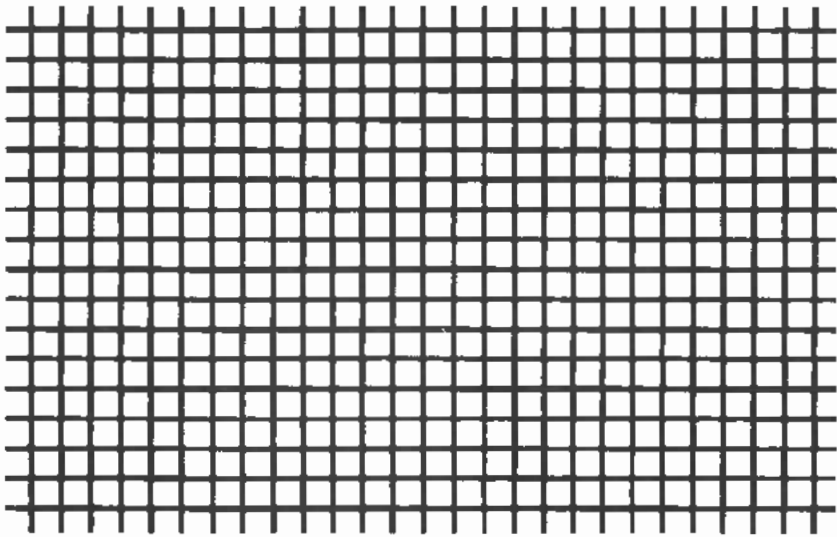


CAMELOT (Diagonal) • 38% OPEN

This pattern offers a higher percent of open area while retaining its distinctive simplicity. Can be fabricated to order in 22 gauge steel up to 48" wide.



THE
H&K PERFORATING
COMPANIES



1/8" SQUARE • 66% OPEN

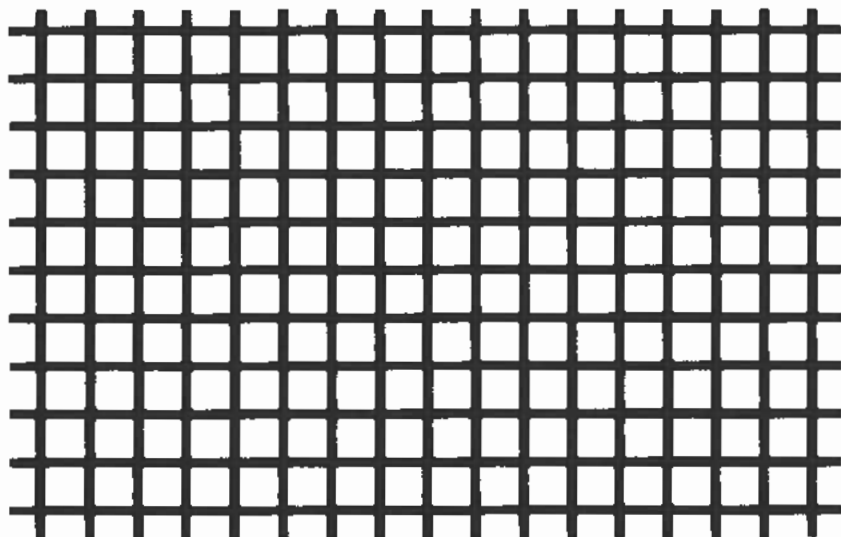
Neatly attractive, with more open area than it appears to have. Available in 22 and 24 gauge steel, or 20 B & S gauge aluminum, 36" x 120" sheets.

NOTES

**For technical information or further tooling, materials, or processing details,
contact H&K Engineering at 800-621-3869.**

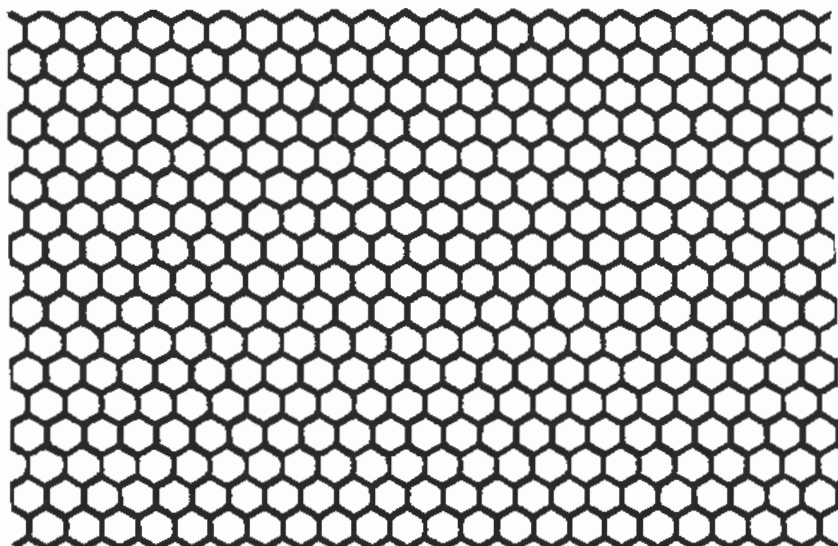


**PERFORATING
COMPANIES**



2 1/10" SQUARE • 64% OPEN

A simple yet most effective pattern having a high percentage of open area. Available in 20, 22 and 24 gauge steel, 20 B & S gauge aluminum, or 22 gauge stainless, 36" x 120" sheets. Run to order up to 48" wide.

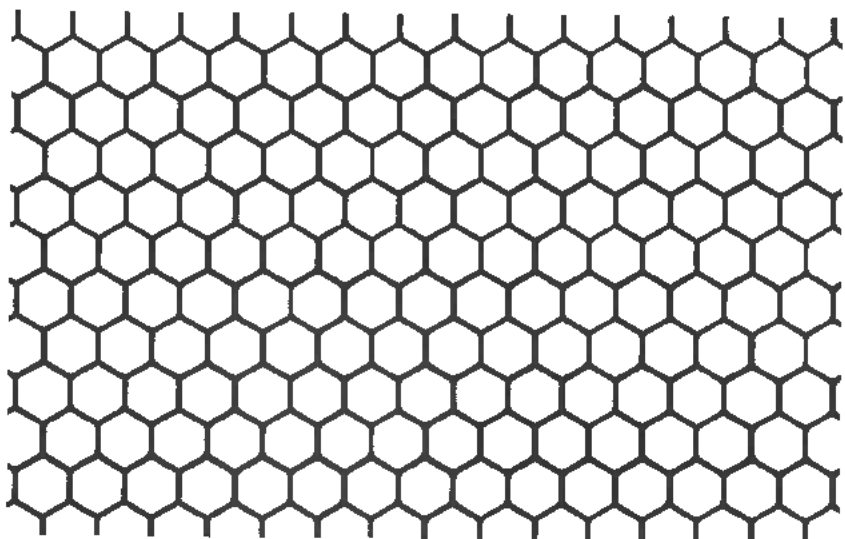


5/32" HEXAGONAL • 70% OPEN

This attractive "Honeycomb" pattern combines strength with high open area. It can be run to order in 22 gauge steel or 20 B & S gauge aluminum, up to 36" wide.

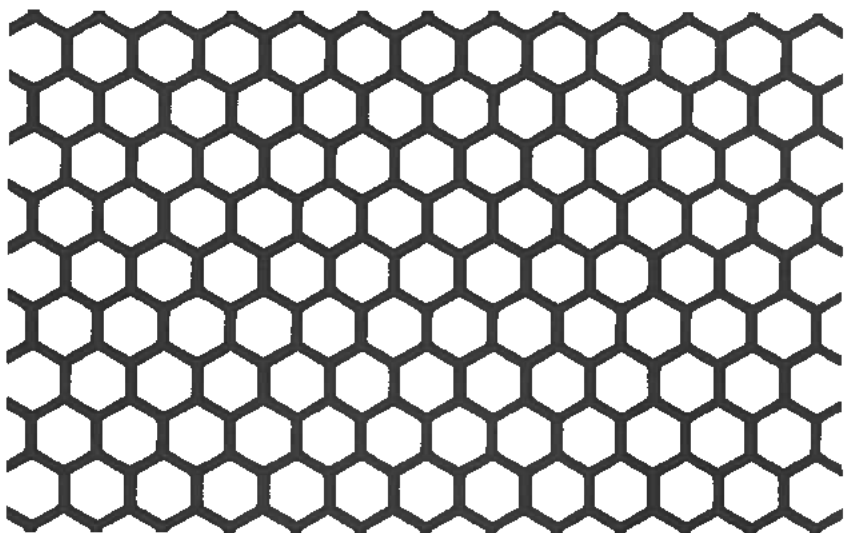


**PERFORATING
COMPANIES**



1/4" HEXAGONAL • 79% OPEN

This versatile "Honeycomb" pattern offers a wide range of application possibilities. Available in 22 gauge steel or 20 B & S gauge aluminum, 36" x 120" sheets.

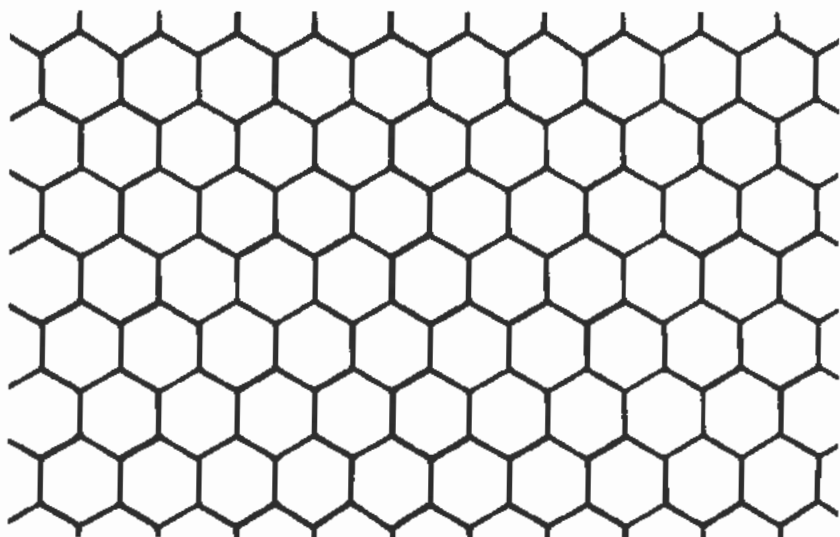


9/32" HEXAGONAL • 69% OPEN

One of a growing family of "Honeycomb" patterns offers the highest strength in design with a minimal loss in open area. Can be fabricated to order in 22, 24 and 26 gauge steel, 20 or 22 B & S gauge aluminum, 36" wide.

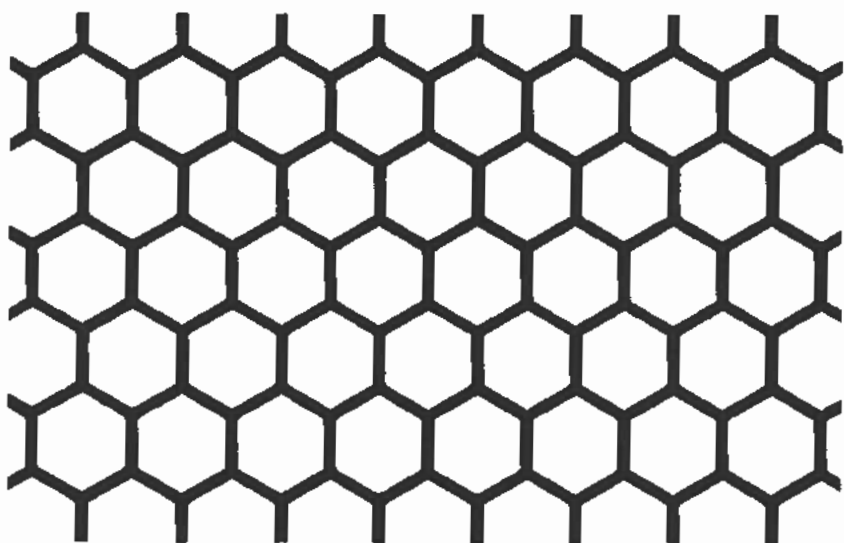


**PERFORATING
COMPANIES**



3/8" HEXAGONAL • 85% OPEN

An intermediate "Honeycomb" pattern. Can be fabricated to order in 20 gauge steel or 18 B & S gauge aluminum, 15" wide.

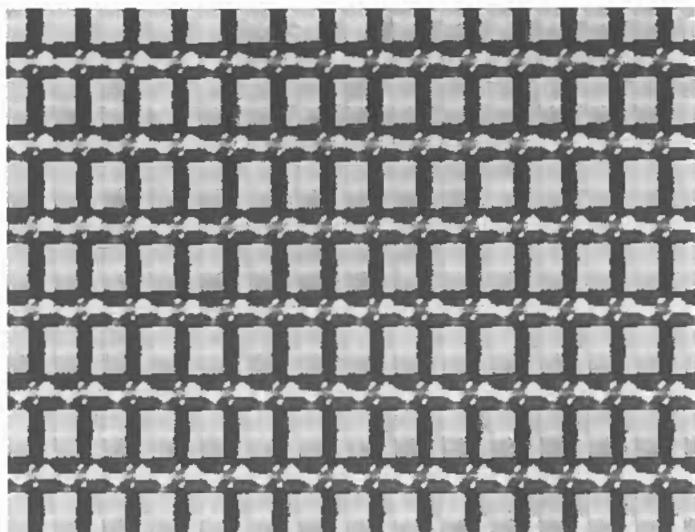


.45" HEXAGONAL • 78% OPEN

A larger unit than those preceding, but actually a minimal reduction in open area. Can be fabricated to order in 20 gauge steel or 20 B & S aluminum, 36" wide.

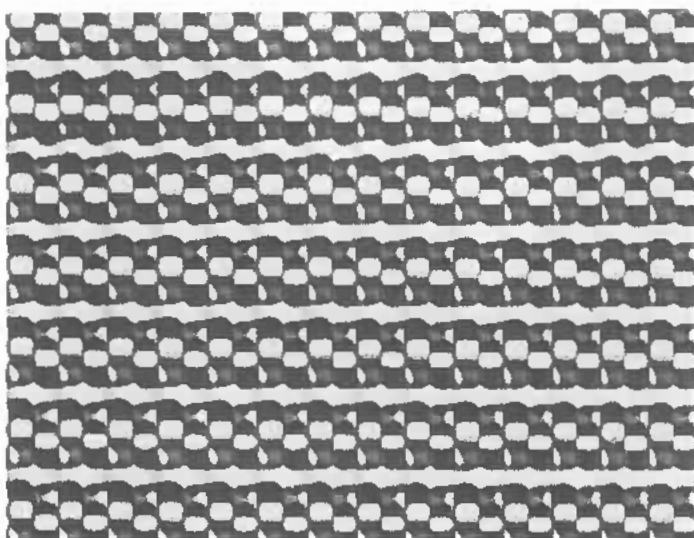


**PERFORATING
COMPANIES**



INTERWEAVE • 53% OPEN

This exciting design combines a high degree of concealment and light diffusion with excellent ventilation. Available in 24 gauge steel or 20 B & S gauge aluminum, 36" x 120" sheets.

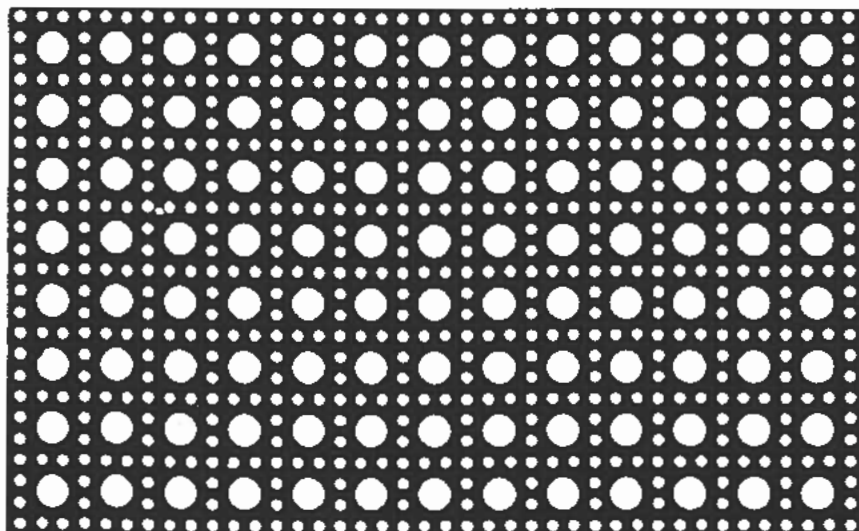


BASKETWEAVE • 35% OPEN

Similar to Interweave (above) except for less open area and rounded contour. Can be fabricated to order in 24 gauge steel, or 20 and 22 gauge aluminum, 24" wide.

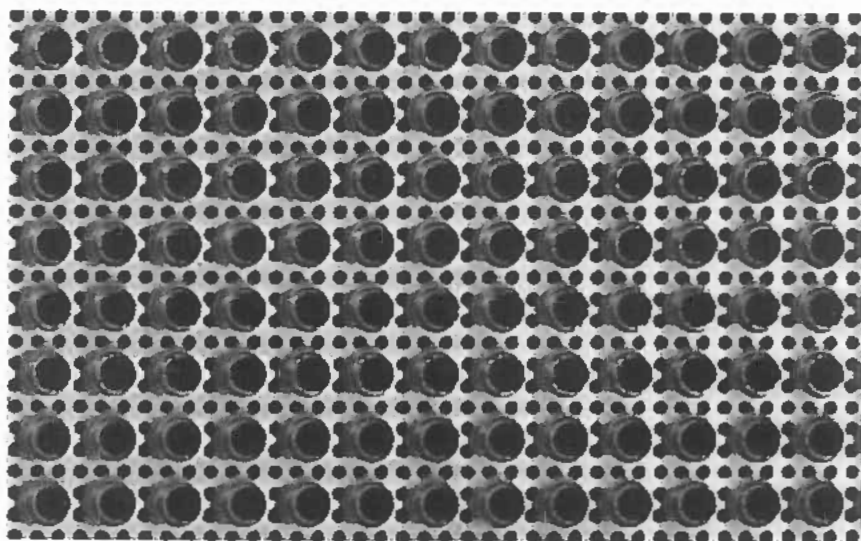


**PERFORATING
COMPANIES**



HOOK CANE FLAT • 35% OPEN

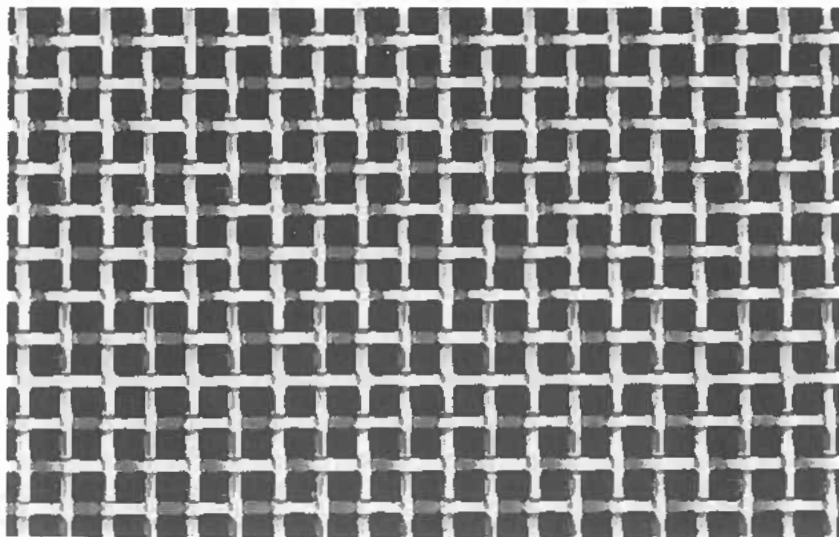
A versatile, ever popular favorite. Can be fabricated to order in 20 B & S gauge aluminum, 36" wide.



HOOK CANE COLLARED • 35% OPEN

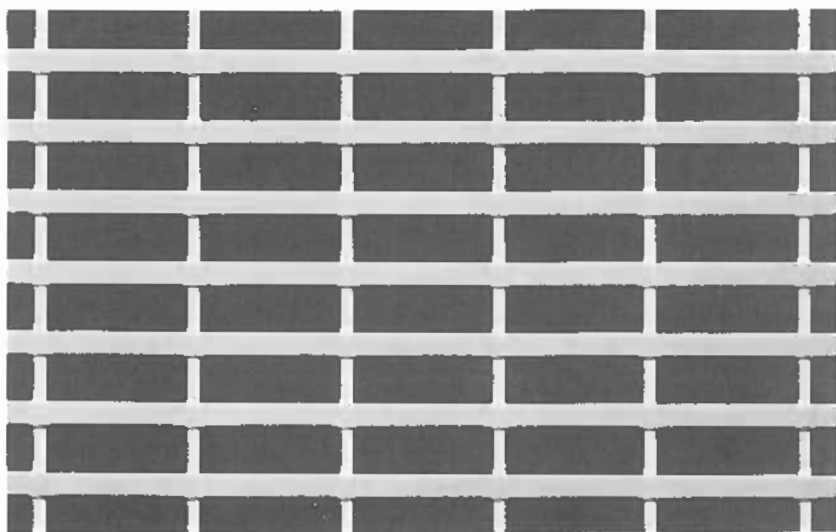
Same design as above, but with holes collared adding a new texture and dimension. Can be fabricated to order in 20 B & S gauge aluminum, 36" wide.





5/32" SQUARE-TEX • 51% OPEN

A woven design, making this a truly unusual and distinctive perforated pattern. Can be fabricated to order in 22 gauge steel or 20 B & S gauge aluminum, 36" wide.



RIBBED SLOT • 60% OPEN

Simple yet versatile styling with a dimensional effect. Can be fabricated to order in 20 and 22 gauge steel, or 20 B & S gauge aluminum, 36" wide.



**PERFORATING
COMPANIES**

ADDITIONAL HEX HOLE PATTERNS NOT ILLUSTRATED

DIMENSIONS (In Inches)	CENTERS (In Inches)	SHAPE	LAYOUT	% OPEN
.375	.500	HEX	Staggered	56
.437	.594	"	"	54
.500	.875	"	"	32
.500	.687	"	"	53
.500	.750	"	"	44
.750	N/A	"	Any	-
.812	1.187	"	Staggered	46
1	1.375	"	"	52
1.125	N/A	"	Any	-
1.250	1.625	"	Staggered	59
1.500	N/A	"	Any	-
1.750	N/A	"	"	-
2	N/A	"	"	-

NOTES

For technical information or further tooling, materials, or processing details, contact H&K Engineering at 800-621-3869.

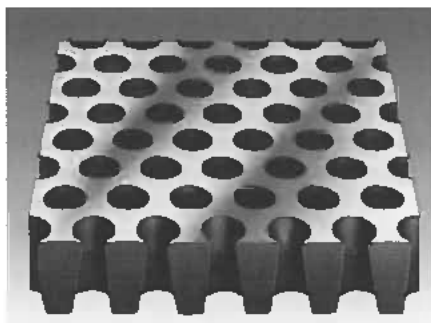


**For technical information or further tooling, materials, or processing details,
contact H&K Engineering at 800-621-3869.**



Perforated Screen Plates for Every Mining and Aggregate Application

For maximum wear, minimum blinding and long-term economy in screening operations, nothing beats perforated plate. And no one beats Harrington & King for quality perforating, fast delivery and competitive pricing of all types of perforated screening products and custom perforated sheets to your exact specifications.



Choose from literally hundreds of hole shapes, sizes and patterns. Tell us where you want margins or unperforated areas. Specify crowned or flat; with or without hook flanges; in plate thicknesses up to 1" and sizes up to 84" x 216."

Because of the speed and accuracy of our computerized presses, H&K screen plates are extremely competitively priced, whether you need one sheet or hundreds.

Turn-around is fast, too. When your order comes in, it's programmed, perforated and shipped. There's no waiting for special tooling, lengthy set-up, manual press operation, spoiled sheets, etc.

See the difference over 120 years of perforating experience makes. Next time, specify Harrington & King for your perforated screen plate requirements.

- Every sheet custom-perforated to your specifications
- Hundreds of hole shapes, sizes and patterns
- Plate thicknesses up to 1"
- Sheet sizes up to 84" x 216"
- Competitive pricing for large or small orders
- For a quote, call H&K Regional Estimating



How to order perforated screen plates

When placing an order or requesting a quotation, please include all of the following information.

- 1. Quantity**
- 2. Thickness**
- 3. Material**
See chart A for materials available.
- 4. Width**
See chart B. If hook flanges are required, specify width "to outside of hook flanges."
- 5. Length**
See chart B.
- 6. Perforation size and shape**
See chart E.
- 7. Bar width**
See chart E.
- 8. Arrangement of perforations**
See chart E. When ordering oblong slotted screens, specify whether the length of the slot is parallel to the length or width of the screen. Available with finished or unfinished end pattern.
- 9. Flanges/bolt holes**
See chart C. For bolt holes, send sketch showing location, size and type of holes. Also specify size of end and side margins.
See chart D.
- 10. Crown**
See chart B. Indicate height of crown and whether a single or double crown is desired.

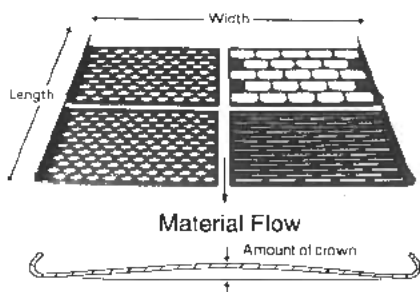
EXAMPLE: 10 perforated screen plates, 1/2" HK-230 alloy, 36" wide to outside of hook flanges x 48" long, 7/8" round perforations, staggered, with 1/4" bars, IPA#4 welded hook flange, 1/2" single crown.

A Materials Available

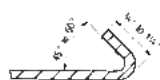
Material	HK-135 alloy	HK-230 alloy	HK-265 alloy	HK-S150 stainless
Brinell Hardness	137	212-255	235-293	150
Carbon Content	.25	.35-.50	.25-.50	.08
Manganese Content	.80-1.20	1.20-2.00	.30-.90	—
Description	Economical, general purpose mild steel	Inexpensive, abrasion-resistant alloy that will significantly outwear mild steel	High strength steel with best impact and abrasion-resistance	Excellent corrosion and abrasion-resistance

For technical information or further tooling, materials, or processing details, contact H&K Engineering at 800-621-3869.

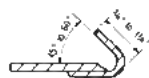
B Width/Length/Crown



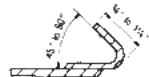
C Hook Flanges



IPA #1
hook flange



IPA #2
welded hook flange

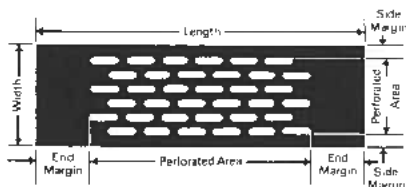


IPA #3
welded hook flange

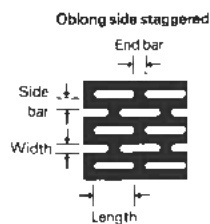
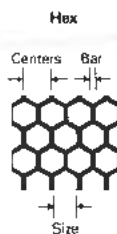
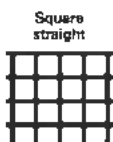
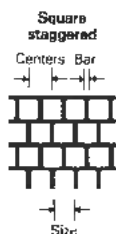
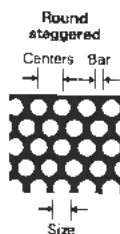


IPA #4
welded hook flange

D Margins/End Patterns



E Perforated Patterns



Oblong end staggered



Oblong straight



**For technical information or further tooling, materials, or processing details,
contact H&K Engineering at 800-621-3869.**



**PERFORATING
COMPANIES**

GENERAL TRADE CUSTOMS

QUOTATIONS

All quotations are subject to change without notice, subject to prior sale and unless otherwise agreed are binding only for immediate acceptance. All sales are made subject to strikes, accidents or other causes beyond our control. We reserve the privilege to cancel contracts upon which full specifications have not been given within the time agreed.

Special material is not subject to cancellation without our written consent.

CONFIRMATION ORDERS

Confirming orders should be marked "Confirmation"—preferably across face of order. Confirmation orders not so marked may be treated as original open orders and duplicated—in such cases we will not be responsible for expense and inconvenience incurred.

Telephone orders are accepted at the risk of the purchaser and shipments made before the receipt of confirmation are for the special convenience of the customer.

DELIVERIES AND CLAIMS AGAINST CARRIER

Promises of delivery on special orders are estimated as carefully as possible and although we do our best to ship within the time mentioned, we cannot guarantee to do so. A clear receipt given to the Carrier by the Consignee eliminates the possibility of a claim for damage or shortage against the Consignee. In cases of shortages or damaged goods the receipt, freight bill and/or delivery memo, both your copy and the carrier's copy, is to be noted with the detail of the shortage or damage and all copies signed and acknowledged by the carrier's driver or representative. This will enable you to recover damage from the carrier without controversy.

WARRANTIES

There are no warranties, express or implied, except that all goods shall conform to their description, subject however, to commercial tolerances and variations.

TECHNICAL ADVICE

It is expressly understood that any technical advice furnished by seller with respect to the use of its goods or services is given without charge, and seller assumes no obligation or liability for the advice given or results obtained, all such advice being given and accepted at buyer's risk.

DEFECTIVE MATERIAL

In spite of the greatest care it is sometimes impossible to detect all imperfections. We guarantee to replace, with new material such goods as prove defective within a reasonable time when properly worked or used, but under no circumstances will we be responsible for any damage beyond this.

In case any shipment of metal proves unsatisfactory, it is understood that the buyer will immediately discontinue its use and advise the seller of the facts that the seller may have the opportunity of deciding what shall be done under the circumstances, so that possible loss or damage to either party shall be prevented or minimized. No charges for labor or expense required to repair defective goods or occasioned by them will be allowed.



TABLE OF GAUGES AND WEIGHTS

Gauge	Steel (1)		Galv. Steel (1)		Stainless Steel			Monel (2)		Long Tenne	
	Mfgs. Stan. Ga.		Galv. Sheet Ga.		Gauge			Gauge		Mfgs. Stan. Ga.	
	Deci- mal Thick.	Lbs. per Sq. Ft.	Deci- mal Thick.	Lbs. per Sq. Ft.	Deci- mal Thick.	Lbs. per Sq. Ft. Chrome Nickel Alloy	Chrome Alloy	Deci- mal Thick.	Lbs. per Sq. Ft.	Deci- mal Thick.	Lbs. per Sq. Ft.
32	.0100	.4080	.0134	.560	.009	.378	.371	.....	.....	.....	.....
31	.0110	.4487	.0142	.594	.010	.420	.412	.010	.459	.....	.....
30	.0120	.4896	.0157	.656	.012	.504	.495	.012	.551	.0120	.518
29	.0135	.563	.0172	.719	.013	.546	.536	.014	.650	.0135	.581
28	.0149	.625	.0187	.781	.015	.630	.618	.015	.689	.0149	.643
27	.0164	.6875	.0202	.844	.016	.672	.659	.....	.....	.0164	.706
26	.0179	.750	.0217	.906	.018	.756	.742	.018	.827	.0179	.766
25	.0209	.875	.0247	1.031	.021	.882	.866	.021	.965	.0209	.892
24	.0239	1.000	.0276	1.156	.024	1.008	.989	.025	1.148	.0239	1.016
23	.0269	1.125	.0306	1.281	.026	1.092	1.071	.028	1.286	.0269	1.143
22	.0299	1.250	.0336	1.406	.030	1.260	1.236	.031	1.424	.0299	1.266
21	.0329	1.375	.0366	1.531	.032	1.344	1.318	.034	1.562	.0329	1.391
20	.0359	1.500	.0396	1.656	.036	1.512	1.483	.037	1.700	.0359	1.516
19	.0418	1.750	.0456	1.906	.042	1.764	1.730	.043	1.975	.0418	1.766
18	.0478	2.000	.0516	2.156	.048	2.016	1.978	.050	2.297	.0478	2.016
17	.0538	2.250	.0575	2.406	.054	2.268	2.225	.056	2.572	.0538	2.266
16	.0598	2.500	.0635	2.656	.060	2.520	2.472	.062	2.848	.0598	2.516
15	.0673	2.8125	.0710	2.969	.067	2.814	2.760	.070	3.216	.0673	2.802
14	.0747	3.125	.0785	3.281	.075	3.150	3.090	.078	3.583	.0747	3.188
13	.0897	3.750	.0934	3.906	.090	3.780	3.708	.093	4.272	.0897	3.768
12	.1046	4.375	.1084	4.531	.105	4.410	4.326	.109	5.007	.1046	4.393
11	.1196	5.000	.1233	5.156	.120	5.040	4.944	.125	5.742	.1196	5.018
10	.1346	5.625	.1382	5.781	.135	5.670	5.562	.140	6.431	.1346	5.643
9	.1495	6.250	.1532	6.406	.150	6.300	6.180	.156	7.166	.....	.....
8	.1644	6.875	.1681	7.031	.165	6.930	6.798	.172	7.855	.....	.....
7	.1793	7.500	.....	.....	.1874	7.871	7.721	.187	8.590	.....	.....
6	.1943	8.125	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	.2092	8.750	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	.2242	9.375	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

(1) Actual weights in this table are based on 41.82 Lbs., per Sq. Ft., per inch thick. Theoretical weights are based on 40.80 Lbs., per Sq. Ft., per inch thick (.2833 lbs. per cubic inch).

(2) The table shown above is for Monel. To determine approximate theoretical weight for other alloys multiply the Monel weight shown by the conversion factor following: Nickel 200 (x 1.006) Inconel 600 (x .953) Inconel 625 (x .956) Incoloy 800 (x .909).

TABLE OF GAUGE AND WEIGHTS

Gauge	Aluminum (3)		Brass		Zinc		Copper			Tin Plate (4)		
	B & S Gauge		B & S Gauge		American Zinc Gauge		B & S Gauge			Tin Plate Gauges		
	Deci- mal Thick.	Lbs. per Sq. Ft.	Deci- mal Thick.	Lbs. per Sq. Ft.	Deci- mal Thick.	Lbs. per Sq. Ft.	B & S Ga. or Ozs. per Sq. Ft.	Deci- mal Thick.	Lbs. per Sq. Ft.	Deci- mal Thick.	Lbs. per Sq. Ft.	Lbs. per Base Box
32	.008	.114	.0080	.353	....	....	No. 30	.0100	.464	.0081	.2526	55
31	.009	.128	.0089	.392	....	....	10 oz.	.0135	.625	.0066	.2755	60
30	.010	.143	.0100	.441	....	....	No. 26	.0159	.737	.0072	.2985	65
29	.011	.157	.0113	.498	....	....	12 oz.	.0162	.750	.0077	.3214	70
28	.012	.171	.0126	.555	....	....	No. 25	.0179	.830	.0083	.3444	75
27	.014	.199	.0142	.626	.500	18.60	14 oz.	.0189	.875	.0088	.3673	80
26	.016	.228	.0159	.700	.375	14.00	No. 24	.0201	.932	.0094	.3903	85
25	.018	.266	.0179	.789	.250	9.30	16 oz.	.0216	1.000	.0099	.4133	90
24	.020	.285	.0201	.886	.125	4.70	No. 23	.0226	1.060	.0105	.4362	95
23	.022	.313	.0226	.996	.100	3.75	18 oz.	.0243	1.125	.0110	.4592	100
22	.025	.356	.0254	1.115	.090	3.37	No. 22	.0253	1.170	.0118	.4913	107
21	.028	.399	.0285	1.266	.080	3.00	20 oz.	.0270	1.250	.0123	.5143	112
20	.032	.456	.0320	1.410	.070	2.62	No. 21	.0286	1.320	.0130	.5418	118
19	.036	.513	.0359	1.582	.060	2.25	No. 20	.0320	1.480	.0141	.5878	128
18	.040	.570	.0403	1.776	.055	2.06	24 oz.	.0323	1.500	.0149	.6199	135
17	.045	.641	.0453	1.996	.050	1.87	26 oz.	.0350	1.625	.0153	.6383	139
16	.050	.713	.0508	2.238	.045	1.68	No. 19	.0359	1.660	.0163	.6796	148
15	.056	.798	.0571	2.516	.040	1.50	28 oz.	.0377	1.750	.0171	.7117	156
14	.063	.898	.0641	2.825	.036	1.35	No. 18	.0403	1.870	.0185	.7714	168
13	.071	1.010	.0720	3.173	.032	1.20	32 oz.	.0431	2.000	.0193	.8036	175
12	.080	1.140	.0808	3.560	.028	1.05	No. 17	.0453	2.105	.0198	.8265	180
11	.090	1.283	.0907	3.997	.024	.90	36 oz.	.0485	2.250	.0207	.8633	188
10	.100	1.426	.1019	4.490	.020	.75	No. 16	.0508	2.360	.0215	.8954	195
9	.112	1.595	.1144	5.041	.018	.67	38 oz.	.0512	2.375	.0229	.9551	208
8	.125	1.782	.1285	5.662	.016	.60	40 oz.	.0539	2.500	.0231	.9643	210
7	.140	2.000	.1443	6.358	.014	.52	No. 14	.0641	2.970	.0237	.9872	215
6	.160	2.276	.1620	7.138	.012	.45	48 oz.	.0647	3.000	.0251	1.0469	228
5	.190	2.709	.1819	8.015	.010	.375	56 oz.	.0755	3.500	.0259	1.0791	235
4	....	....	.2043	9.000	.008	.30	64 oz.	.0863	4.000	.0264	1.1020	240
3	....	....	.2294	10.108	.006	.225	72 oz.	.0972	4.500	.0273	1.1388	248
2	....	....	.2576	11.350	.004	.15	80 oz.	.1080	5.000	.0281	1.1709	255
1	....	....	.2893	12.750	.002	.075	96 oz.	.1290	6.000	.0295	1.2306	268

(3) Weights shown are for 3003 Aluminum. For weights of other Aluminum Alloys, use conversion table on page 149.

(4) A base box is measured in terms of pounds per base box (112 sheets 14" x 20") a unit peculiar to the tin plate industry and refers to thickness indirectly. To convert weight per base box to decimal thickness multiply by .00011.

AREAS OF SQUARES & CIRCLES CIRCUMFERENCES OF CIRCLES

Sizes 1/64 Inch to 1-1/4 Inch

Dimension In Inches		Area of □	Area of ○	Circum- ference of ○	Dimension In Inches		Area of □	Area of ○	Circum- ference of ○
Fraction	Decimal				Fraction	Decimal			
1/64	.015625	.000244	.00019	.04909	41/64	.640625	.41040	.32233	2.0126
1/32	.03125	.000977	.00077	.09818	21/32	.65625	.43066	.33824	2.0617
3/64	.046875	.002197	.00173	.14726	43/64	.671875	.45142	.35454	2.1108
1/16	.0625	.003906	.00307	.19635	11/16	.6875	.47266	.37122	2.1598
5/64	.078125	.006104	.00479	.24544	45/64	.703125	.49438	.38829	2.2089
3/32	.09375	.008789	.00690	.29452	23/32	.71875	.51660	.40574	2.2580
7/64	.109375	.01196	.00939	.34361	47/64	.734375	.53931	.42357	2.3071
1/8	.125	.01563	.01227	.39270	3/4	.750	.56250	.44179	2.3562
9/64	.140625	.01978	.01554	.44179	49/64	.765625	.58618	.46038	2.4053
5/32	.15625	.02441	.01917	.49087	25/32	.78125	.61035	.47937	2.4544
11/64	.171875	.02954	.02320	.53996	51/64	.796875	.63501	.49874	2.5035
3/16	.1875	.03516	.02761	.58905	13/16	.8125	.66016	.51849	2.5525
13/64	.203125	.04126	.03241	.63814	53/64	.828125	.68579	.53862	2.6016
7/32	.21875	.04785	.03758	.68722	27/32	.84375	.71191	.55914	2.6507
15/64	.234375	.05493	.04314	.73631	55/64	.859375	.73853	.58004	2.6998
1/4	.250	.0625	.04909	.78540	7/8	.875	.76563	.60132	2.7489
17/64	.265625	.07056	.05542	.83448	57/64	.890625	.79321	.62299	2.7980
9/32	.28125	.07910	.06213	.88357	29/32	.90625	.82129	.64504	2.8471
19/64	.296875	.08813	.06922	.93266	59/64	.921875	.84985	.66747	2.8962
5/16	.3125	.09766	.07670	.98175	15/16	.9375	.87891	.69029	2.9452
21/64	.328125	.10767	.08456	1.0308	61/64	.953125	.90845	.71349	2.9943
11/32	.34375	.11816	.09281	1.0799	31/32	.96875	.93848	.73708	3.0434
23/64	.359375	.12915	.10143	1.1290	63/64	.984375	.96899	.76104	3.0925
3/8	.375	.14063	.11045	1.1781	1	1.00	1.00	.7854	3.1416
25/64	.390625	.15259	.11984	1.2272	1-1/64	1.015625	1.0315	.8101	3.1907
13/32	.40625	.16504	.12962	1.2763	1-1/32	1.03125	1.0635	.8353	3.2398
27/64	.421875	.17798	.13979	1.3254	1-3/64	1.046875	1.0959	.8607	3.2889
7/16	.4375	.19141	.15033	1.3744	1-1/16	1.0625	1.1289	.8866	3.3380
29/64	.453125	.20532	.16126	1.4235	1-5/64	1.078125	1.1624	.9129	3.3870
15/32	.46875	.21973	.17257	1.4726	1-3/32	1.09375	1.1963	.9396	3.4361
31/64	.484375	.23462	.18427	1.5217	1-7/64	1.109375	1.2307	.9666	3.4852
1/2	.500	.2500	.19635	1.5708	1-1/8	1.125	1.2656	.9940	3.5343
33/64	.515625	.26587	.20881	1.6199	1-9/64	1.140625	1.3010	1.0218	3.5834
17/32	.53125	.28223	.22166	1.6690	1-5/32	1.15625	1.3369	1.0500	3.6325
35/64	.546875	.29907	.23489	1.7181	1-11/64	1.171875	1.3733	1.0786	3.6816
9/16	.5625	.31641	.24850	1.7671	1-3/16	1.1875	1.4102	1.1075	3.7307
37/64	.578125	.33423	.26250	1.8162	1-13/64	1.203125	1.4475	1.1369	3.7797
19/32	.59375	.35254	.27688	1.8653	1-7/32	1.21875	1.4854	1.1666	3.8288
39/64	.609375	.37134	.29165	1.9144	1-15/64	1.234375	1.5237	1.1967	3.8779
5/8	.625	.39063	.30680	1.9635	1-1/4	1.250	1.5625	1.2272	3.9270



AREAS OF SQUARES & CIRCLES CIRCUMFERENCE OF CIRCLES

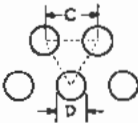
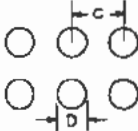
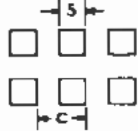
Sizes 1-5/16 Inch to 6-1/4 Inch

Dimension Inches		Area of □	Area of ○	Circum- ference of ○	Dimension Inches		Area of □	Area of ○	Circum- ference of ○
Fraction	Decimal				Fraction	Decimal			
1-5/16	1.3125	1.7227	1.3530	4.1234	3-13/16	3.8125	14.535	11.416	11.977
1-3/8	1.375	1.8906	1.4849	4.3197	3-7/8	3.875	15.016	11.793	12.174
1-7/16	1.4375	2.0664	1.6230	4.5161	3-15/16	3.9375	15.504	12.177	12.370
1-1/2	1.500	2.2500	1.7672	4.7124	4	4.000	16.000	12.566	12.566
1-9/16	1.5625	2.4414	1.9175	4.9088	4-1/16	4.0625	16.504	12.962	12.763
1-5/8	1.625	2.6406	2.0739	5.1051	4-1/8	4.125	17.016	13.364	12.959
1-11/16	1.6875	2.8477	2.2365	5.3015	4-3/16	4.1875	17.535	13.772	13.155
1-3/4	1.750	3.0625	2.4053	5.4978	4-1/4	4.250	18.063	14.186	13.352
1-13/16	1.8125	3.2852	2.5802	5.6942	4-5/16	4.3125	18.598	14.607	13.548
1-7/8	1.875	3.5156	2.7612	5.8905	4-3/8	4.375	19.141	15.033	13.745
1-15/16	1.9375	3.7539	2.9483	6.0869	4-7/16	4.4375	19.691	15.466	13.941
2	2.000	4.000	3.1416	6.2832	4-1/2	4.500	20.250	15.904	14.137
2-1/16	2.0625	4.2539	3.3410	6.4796	4-9/16	4.5625	20.816	16.349	14.334
2-1/8	2.125	4.5156	3.5466	6.6759	4-5/8	4.625	21.391	16.800	14.530
2-3/16	2.1875	4.7852	3.7583	6.8723	4-11/16	4.6875	21.973	17.257	14.726
2-1/4	2.250	5.0625	3.9761	7.0686	4-3/4	4.750	22.563	17.721	14.923
2-5/16	2.3125	5.3477	4.2000	7.2650	4-13/16	4.8125	23.160	18.190	15.119
2-3/8	2.375	5.6406	4.4301	7.4613	4-7/8	4.875	23.766	18.666	15.315
2-7/16	2.4375	5.9414	4.6664	7.6577	4-15/16	4.9375	24.379	19.147	15.512
2-1/2	2.500	6.2500	4.9088	7.8540	5	5.000	25.000	19.635	15.708
2-9/16	2.5625	6.5664	5.1573	8.0504	5-1/16	5.0625	25.629	20.129	15.904
2-5/8	2.625	6.8906	5.4119	8.2467	5-1/8	5.125	26.266	20.629	16.101
2-11/16	2.6875	7.2227	5.6727	8.4431	5-3/16	5.1875	26.910	21.135	16.297
2-3/4	2.750	7.5625	5.9396	8.6394	5-1/4	5.250	27.563	21.648	16.493
2-13/16	2.8125	7.9102	6.2126	8.8358	5-5/16	5.3125	28.223	22.166	16.690
2-7/8	2.875	8.2656	6.4918	9.0321	5-3/8	5.375	28.891	22.691	16.886
2-15/16	2.9375	8.6289	6.7771	9.2285	5-7/16	5.4375	29.566	23.221	17.082
3	3.000	9.000	7.0686	9.4248	5-1/2	5.500	30.250	23.758	17.279
3-1/16	3.0625	9.3789	7.3662	9.6212	5-9/16	5.5625	30.941	24.301	17.475
3-1/8	3.125	9.7656	7.6699	9.8175	5-5/8	5.625	31.641	24.851	17.672
3-3/16	3.1875	10.160	7.9798	10.014	5-11/16	5.6875	32.348	25.406	17.868
3-1/4	3.250	10.563	8.2958	10.210	5-3/4	5.750	33.063	25.967	18.064
3-5/16	3.3125	10.973	8.6179	10.407	5-13/16	5.8125	33.785	26.535	18.261
3-3/8	3.375	11.391	8.9462	10.603	5-7/8	5.875	34.516	27.109	18.457
3-7/16	3.4375	11.816	9.2806	10.799	5-15/16	5.9375	35.254	27.688	18.653
3-1/2	3.500	12.250	9.6212	10.996	6	6.000	36.000	28.274	18.850
3-9/16	3.5625	12.691	9.9678	11.192	6-1/16	6.0625	36.754	28.867	19.046
3-5/8	3.625	13.141	10.321	11.388	6-1/8	6.125	37.516	29.465	19.242
3-11/16	3.6875	13.598	10.680	11.585	6-3/16	6.1875	38.285	30.069	19.439
3-3/4	3.750	14.063	11.045	11.781	6-1/4	6.250	39.063	30.680	19.635



PERFORATING
COMPANIES

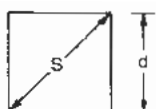
PERCENTAGE OF OPEN AREA TABLE

Diameter divided by Centers or Side of Square divided by Centers $\frac{D}{C}$ or $\frac{S}{C}$	Round Holes Standard Staggered 	Round Holes Standard Straight 	Square Holes Straight or Staggered 
	% Open	% Open	% Open
.200	3.6	3.1	4.0
.225	4.6	4.0	5.1
.250	5.7	4.9	6.3
.275	6.9	5.9	7.6
.300	8.1	7.1	9.0
.325	9.6	8.3	10.6
.350	11.1	9.6	12.3
.375	12.8	11.0	14.1
.400	14.5	12.6	16.0
.425	16.4	14.2	18.1
.450	18.4	15.9	20.3
.475	20.5	17.7	22.6
.500	22.7	19.6	25.0
.525	25.0	21.6	27.6
.550	27.4	23.8	30.3
.575	30.0	26.0	33.1
.600	32.7	28.3	36.0
.625	35.4	30.7	39.1
.650	38.3	33.2	42.3
.675	41.3	35.8	45.6
.700	44.4	38.5	49.0
.725	47.7	41.3	52.6
.750	51.0	44.2	56.3
.775	54.4	47.2	60.0
.800	58.0	50.3	64.0
.825	61.7	53.5	68.0
.850	65.5	56.7	72.3
.875	69.5	60.1	76.6
.900	73.5	63.6	81.0
.925	77.6	67.2	85.6
.950	81.9	70.9	90.3



PERFORATING
COMPANIES

DISTANCE ACROSS CORNERS OF SQUARES, HEXAGONS AND OCTAGONS



$$S = 1.414d$$



$$H = 1.155d$$



$$O = 1.082d$$

d Size in Inches	Distance Across Corners, Inches			d Size in Inches	Distance Across Corners, Inches		
	S Square	H Hexagon	O Octagon		S Square	H Hexagon	O Octagon
1/8	.177	.144	.135	2	2.828	2.309	2.165
3/16	.265	.217	.203	1/16	2.917	2.382	2.232
1/4	.354	.289	.271	1/8	3.005	2.454	2.300
5/16	.442	.361	.338	3/16	3.094	2.526	2.368
3/8	.530	.433	.406	1/4	3.182	2.598	2.435
7/16	.619	.505	.474	5/16	3.270	2.670	2.503
1/2	.707	.577	.541	3/8	3.359	2.742	2.571
9/16	.795	.650	.609	7/16	3.447	2.815	2.638
5/8	.884	.722	.677	1/2	3.536	2.887	2.706
11/16	.972	.794	.744	9/16	3.624	2.959	2.774
3/4	1.061	.866	.812	5/8	3.712	3.031	2.841
13/16	1.149	.938	.879	11/16	3.801	3.103	2.909
7/8	1.237	1.010	.947	3/4	3.889	3.175	2.977
15/16	1.326	1.083	1.015	13/16	3.977	3.248	3.044
				7/8	4.066	3.320	3.112
				15/16	4.154	3.392	3.180
1	1.414	1.155	1.082	3	4.243	3.464	3.247
1/16	1.503	1.227	1.150	1/8	4.419	3.608	3.383
1/8	1.591	1.299	1.218	1/4	4.596	3.753	3.518
3/16	1.679	1.371	1.285	3/8	4.773	3.897	3.653
1/4	1.768	1.443	1.353	1/2	4.950	4.041	3.788
5/16	1.856	1.516	1.421	5/8	5.126	4.186	3.924
3/8	1.945	1.588	1.488	3/4	5.303	4.330	4.059
7/16	2.033	1.660	1.556	7/8	5.480	4.474	4.194
1/2	2.121	1.732	1.624	4	5.657	4.619	4.330
9/16	2.210	1.804	1.691	1/4	6.010	4.907	4.600
5/8	2.298	1.876	1.759	1/2	6.364	5.196	4.871
11/16	2.386	1.949	1.827	3/4	6.717	5.485	5.141
3/4	2.475	2.021	1.894	5	7.071	5.774	5.412
13/16	2.563	2.093	1.962	1/4	7.425	6.062	5.683
7/8	2.652	2.165	2.030	1/2	7.778	6.351	5.953
15/16	2.740	2.237	2.097	3/4	8.132	6.640	6.224
				6	8.485	6.928	6.494



**PERFORATING
COMPANIES**

ALUMINUM SHEET, PLATE AND COIL

CHARACTERISTICS AND SPECIFICATIONS NON-HEAT TREATABLE ALLOYS

1100 is commercially pure aluminum (99.00% minimum). Excellent corrosion resistance, workability and weldability; high thermal conductivity. Tensile strength range 14,000 to 24,000 psi. Uses include deep drawing and spinning requirements, sheet metal work, decorative and architectural applications, air ducts, name plates, fan blades, etc. Conforms to Federal specification QQ-A-250/1E.

3003 is alloyed with 1.2% manganese to provide a tensile strength range of 17,000 to 30,000 psi. Excellent workability, weldability and corrosion resistance. Used for drawing, spinning, fuel tanks, sheet metal work and other applications where slightly higher strength than 1100 is required. Conforms to Federal specification QQ-A-250/2D.

5005 is alloyed with 8% magnesium. Tensile strength range 18,000 to 30,000 psi. Excellent workability, weldability and corrosion resistance. Specified for applications comparable to 1100 and 3003—where anodizing is required. Anodized finish matches that of architectural alloy 6063. Conforms to ASTM specification B209-76.

5052 is alloyed with 2.5% magnesium. Tensile strength range 31,000 to 44,000 psi. Very good corrosion resistance, good workability, weldability and strength. Used for aircraft fuel tanks, storm shutters, refrigerator liners, utensils, electronic mounting plates and panels, fan blades, etc. Conforms to Federal specification QQ-A-250/8E.

5083 is alloyed with 4.45% magnesium, 0.65% manganese and 0.15% chromium. Tensile strength range: 40,000 to 59,000 psi. For use in structures requiring high weld efficiency for maximum joint strength—plus light weight and corrosion resistance. Applications: marine components, truck bodies, construction equipment, tanks, structural towers, drilling rigs, cryogenic applications, etc. Conforms to Federal specification QQ-A-250/6F.

5086 is alloyed with 4.0% magnesium, .45% manganese and 0.15% chromium. This alloy has a typical tensile strength range of 40,000 to 54,000 psi. It offers resistance to stress corrosion and superior resistance to atmospheric corrosion plus good general workability. Applications include tanks (stationary, trailer and railcar), marine components and welded assemblies of all kinds. Conforms to Federal specification QQ-A-250/7E.

5454 is alloyed with 2.7% magnesium, 0.8% manganese and 0.12% chromium. Tensile strength range 36,000 to 47,000 psi. Good formability, weldability and corrosion resistance. Uses include pressure vessels (ASME code approved for up to 400° F), tanks, welded structures, etc. Conforms to Federal specifications QQ-A-250/10D.



5456 is alloyed with 5.1% magnesium, 0.8% manganese and .10% chromium. Tensile strength range 46,000 to 58,000 psi. It has good general corrosion resistance but is not quite as weldable and formable as 5086. In some cases, 5456 should be annealed or stress relieved after forming and should always be used with caution if subject to stress corrosion. Uses include pressure vessels, welded structures, etc. Conforms to Federal specification QQ-A-250/9F.

HEAT TREATABLE ALLOYS

2014, Alclad 2014 are alloyed with 4.5% copper and have typical ultimate tensile strengths from 30,000 psi in the annealed condition to 67,000 psi in the -T6 condition. Used for high strength applications in aircraft and machinery parts. Available clad on both sides where corrosion resistance is important. 2014 conforms to ASTM specification B209 (latest); Alclad 2014 conforms to Federal specification QQ-A-250/3E.

2024, Alclad 2024 are alloyed with 4.5% copper. Tensile strength range 30,000 to 63,000 psi. Fair workability and corrosion resistance. Forming operations are limited. Used for high strength structural and aircraft applications. The clad form offers improved corrosion resistance. 2024 conforms to Federal spec. QQ-A-250/4E. Alclad 2024 to QQ-A-250/5F.

6061 is alloyed with 1.0% magnesium and .6% silicon. Tensile strength range 20,000 to 42,000 psi. Good formability, weldability and corrosion resistance. Used for engineering and structural applications, boats, furniture, transportation equipment, etc. Conforms to Federal specification QQ-A-250/11E.

7075, Alclad 7075 are heavily alloyed with zinc together with lesser amounts of magnesium, copper and chromium. One of the strongest of the aluminum alloys, its use parallels that of 2024 with 7075 selected when higher mechanical properties are desired. Forming operations are limited. The clad form offers improved corrosion resistance. 7075 conforms to Federal specification QQ-A-250/12E. Alclad 7075 to QQ-A-250/13E.

WEIGHT CONVERSION FACTORS

The theoretical weights used for aluminum sheets, plates and coils are based on 1100, 5005 and 6061. For weights of other aluminum alloys, use the conversion factors below:

	1100 5005 6061	3003	5052 5454	5083 5086 5456	2014, Alclad 2014	2024, Alclad 2024	7075, Alclad 7075
Conversion Factor:	1.00 (.098)	1.01 (.099)	0.98 (.097)	0.979 (.096)	1.03 (.101)	1.02 (.100)	1.03 (.101)

NOTE: Densities in lbs./cubic inch are indicated in parentheses.

COMPLETE CHEMICAL ANALYSES OF THE MORE POPULAR TYPES OF STAINLESS STEEL

Type No.	Carbon	Chromium	Nickel	Other Elements
201	.15 Max.	16.00-18.00	3.50- 5.50	Mn 5.50- 7.50, P .060 Max., N .25 Max.
202	.15 Max.	17.00-19.00	4.00- 6.00	Mn 7.50-10.00, P .060 Max., N .25 Max.
301	.15 Max.	16.00-18.00	6.00- 8.00	— —
302	.15 Max.	17.00-19.00	8.00-10.00	— —
302B	.15 Max.	17.00-19.00	8.00-10.00	Si 2.00-3.00
303	.15 Max.	17.00-19.00	8.00-10.00	P .20 Max., S .15 Min., Mo .60 Max.
303 Se	.15 Max.	17.00-19.00	8.00-10.00	P .20 Max., S .06 Max., Se .15 Min.
304	.08 Max.	18.00-20.00	8.00-10.00	— —
304L	.03 Max.	18.00-20.00	8.00-10.00	— —
305	.12 Max.	17.00-19.00	10.00-13.00	— —
307	.15 Max.	19.00-22.00	9.00-10.50	Mn 3.75-4.75
308	.08 Max.	19.00-21.00	10.00-12.00	— —
309	.20 Max.	22.00-24.00	12.00-15.00	— —
309S	.08 Max.	22.00-24.00	12.00-15.00	— —
310	.25 Max.	24.00-26.00	19.00-22.00	Si 1.50 Max.
314	.25 Max.	23.00-26.00	19.00-22.00	Si 1.50-3.00
316	.08 Max.	16.00-18.00	10.00-14.00	Mo 2.00-3.00
316L	.03 Max.	16.00-18.00	10.00-14.00	Mo 2.00-3.00
316F	.10 Max.	16.00-18.00	10.00-14.00	P or S .07 Min., Mo 1.75-2.50
317	.08 Max.	18.00-20.00	11.00-15.00	Mo 3.00-4.00
D319	.07 Max.	17.50-19.50	11.00-15.00	Mo 2.25-3.00
321	.08 Max.	17.00-19.00	9.00-12.00	Ti 5 C Min.
325	.25 Max.	7.00-10.00	19.00-23.00	— —
329	.20 Max.	25.00-30.00	3.00- 5.00	Mo 1.50-2.50
347	.08 Max.	17.00-19.00	9.00-13.00	Cb Ta 10 C Min.
347F Se	.08 Max.	17.00-19.00	9.00-12.00	Cb Ta 10 C Min., Se
348	.08 Max.	17.00-19.00	9.00-13.00	Cb Ta 10 C Min., Ta 10 Max., Co .20 Max.
403	.15 Max.	11.50-13.00	—	Si .50 Max.
405	.08 Max.	11.50-14.50	—	Al .10-.30
410	.15 Max.	11.50-13.50	—	— —
414	.15 Max.	11.50-13.50	1.25-.250	— —
416	.15 Max.	12.00-14.00	—	Mn 1.25 Max., P .06 Max., S .15 Min., Mo .60 Max.
	.08 Max.	13.50-15.00	—	Mn 1.00 Max., P .05 Max., S .35 Min., Mo .60 Max.
416 Se	.15 Max.	12.00-14.00	—	Mn 1.25 Max., P .06 Max., Se .15 Min.
420	Over .15	12.00-14.00	—	— —
420F	Over .15	12.00-14.00	—	P or S .07 Min., Zr or Mo .60
420F Se	Over .15	12.00-14.00	—	P or Se .07 Min., Zr or Mo .60 Max.
430	.12 Max.	14.00-18.00	—	— —
430 Ti	.12 Max.	14.00-18.00	—	Ti 6 C Min.
430F	.12 Max.	14.00-18.00	—	Mn 1.25 Max., P .06 Max., S .15 Min., Mo .60 Max.
431	.20 Max.	15.00-17.00	1.25- 2.50	— —
440A	.60- .75	16.00-18.00	—	Mo .75 Max.
440B	.75- .95	16.00-18.00	—	Mo .75 Max.
440C	.95-1.20	16.00-18.00	—	Mo .40-.60
440F	.95-1.20	16.00-18.00	—	P or S .05 Min., Zr or Mo .60 Max.
440F Se	.95-1.20	16.00-18.00	—	P or Se .07 Min.
442	.25 Max.	18.00-23.00	—	— —
446	.20 Max.	23.00-27.00	—	Mn 1.50 Max., N .25 Max.

Unless otherwise shown—

Manganese—2.00 Maximum all 300 types.
—1.00 Maximum all 400 types.

Silicon—1.00 Maximum all types.

Phosphorus—.045 Maximum all 300 types.
—.040 Maximum all 400 types.

Sulphur—.030 Maximum all types.



PERFORATING
COMPANIES

**COMPARATIVE SPECIFICATIONS
STAINLESS STEEL
SHEET-STRIP-PLATE**

A.I.S.I.	Federal	Military	AMS	ASME-SA ASTM-A
Type 301	QQ-S-766C	MIL-S-5059C	AMS-5517E	...
Type 302/304	QQ-S-766C	MIL-S-5059C	AMS-5513A	-240
Type 304L	QQ-S-766C	MIL-S-4043B	AMS-5511B	-240
Type 305	QQ-S-766C	...	AMS-5514B	-240
Type 309	QQ-S-766C	...	AMS-5523A	-240
Type 310	QQ-S-766C	MIL-S-854	AMS-5521C	-240
Type 316	QQ-S-766C	MIL-S-5059C	AMS-5524C	-240
Type 316L	QQ-S-766C	...	AMS-5507A	-240
Type 321	QQ-S-766C	MIL-S-6721B	AMS-5510	-240
Type 347	QQ-S-766C	MIL-S-6721B	AMS-5512D	-240
Type 410	QQ-S-766C	MIL-S-854	AMS-5504D	-240
Type 430	QQ-S-766C	MIL-S-854	...	-240
Type 631 (17-7PH)	...	MIL-S-25043C	AMS-5528C	...
Type 632 (PH15-7MO)	...	...	AMS-5526D	...
Type 651 (19-9DL)	...	...	AMS-5526D	...

**STANDARD CHEMICAL ANALYSIS SPECIFICATIONS
FOR CARBON STEELS**

A.I.S.I. Number	Chemical Composition Limits, Per Cent				Similar SAE Number
	C	Mn	P. Max.	S. Max.	
1008	.10 Max.	.25-.50	.040	.050	1008
1010	.08-.13	.30-.60	.040	.050	1010
1012	.10-.15	.30-.60	.040	.050	—
1015	.13-.18	.30-.60	.040	.050	1015
1016	.13-.18	.60-.90	.040	.050	1016
1017	.15-.20	.30-.60	.040	.050	1017
1019	.15-.20	.70-1.00	.040	.050	1019
1020	.18-.23	.30-.60	.040	.050	1020
1022	.18-.23	.70-1.00	.040	.050	1022
1023	.20-.25	.30-.60	.040	.050	—
1025	.22-.28	.30-.60	.040	.050	1025
1030	.28-.34	.60-.90	.040	.050	1030
1035	.32-.38	.60-.90	.040	.050	1035
1040	.37-.44	.60-.90	.040	.050	1040
1043	.40-.47	.70-1.00	.040	.050	1043
1045	.43-.50	.60-.90	.040	.050	1045
1050	.48-.55	.60-.90	.040	.050	1050
1055	.50-.60	.60-.90	.040	.050	1055
1060	.55-.65	.60-.90	.040	.050	1060
1065	.60-.70	.60-.90	.040	.050	1065
1070	.65-.75	.60-.90	.040	.050	1070
1074	.70-.80	.50-.80	.040	.050	1074
1075	.70-.80	.60-.90	.040	.050	1075
1080	.75-.88	.60-.90	.040	.050	1080
1085	.80-.93	.70-1.00	.040	.050	1085
1095	.90-1.03	.30-.50	.040	.050	1095



**PERFORATING
COMPANIES**

HARDNESS CONVERSION NUMBERS FOR STEEL

BRINNEL 3000 kg. Load—10mm. Ball		ROCKWELL				SHORE SCLERO- SCOPE	TENSILE STRENGTH psi (Approx.)
Diameter Millimeters	Hardness Number	A Scale	B Scale	C Scale	15-N Scale		
2.25	745	84.1	—	65.3	92.3	91	—
2.30	712	—	—	—	—	—	—
2.35	682	82.2	—	61.7	91.0	84	—
2.40	653	81.2	—	60.0	90.2	81	—
2.45	627	80.5	—	58.7	89.6	79	—
2.50	601	79.8	—	57.3	89.0	77	—
2.55	578	79.1	—	56.0	88.4	75	—
2.60	555	78.4	—	54.7	87.8	73	298000
2.65	534	77.8	—	53.5	87.2	71	288000
2.70	514	76.9	—	52.1	86.5	70	274000
2.75	495	76.3	—	51.0	85.9	68	264000
2.80	477	75.6	—	49.6	85.3	66	252000
2.85	461	74.9	—	48.5	84.7	65	242000
2.90	444	74.2	—	47.1	84.0	63	230000
2.95	429	73.4	—	45.7	83.4	61	219000
3.00	415	72.8	—	44.5	82.8	59	212000
3.05	401	72.0	—	43.1	82.0	58	202000
3.10	388	71.4	—	41.8	81.4	56	193000
3.15	375	70.6	—	40.4	80.6	54	184000
3.20	363	70.0	—	39.1	80.0	52	177000
3.25	352	69.3	110.0	37.9	79.3	51	170000
3.30	341	68.7	109.0	36.6	78.6	50	163000
3.35	331	68.1	108.5	35.5	78.0	48	158000
3.40	321	67.5	108.0	34.3	77.3	47	152000
3.45	311	66.9	107.5	33.1	76.7	46	147000
3.50	302	66.3	107.0	32.1	76.1	45	143000
3.55	293	65.7	106.0	30.9	75.5	43	139000
3.60	285	65.3	105.5	29.9	75.0	—	136000
3.65	277	64.6	104.5	28.8	74.4	41	131000
3.70	269	64.1	104.0	27.6	73.7	40	128000
3.75	262	63.6	103.0	26.6	73.1	39	125000
3.80	255	63.0	102.0	25.4	72.5	38	121000
3.85	248	62.5	101.0	24.2	71.7	37	118000
3.90	241	61.8	100.0	22.8	70.9	36	114000
3.95	235	61.4	99.0	21.7	70.3	35	111000
4.00	229	60.8	98.2	20.5	69.7	34	109000
4.05	223	—	97.3	18.8	—	—	104000
4.10	217	—	96.4	17.5	—	33	103000
4.15	212	—	95.5	16.0	—	—	100000
4.20	207	—	94.6	15.2	—	32	99000
4.25	201	—	93.8	13.8	—	31	97000
4.30	197	—	92.8	12.7	—	30	94000
4.35	192	—	91.9	11.5	—	29	92000
4.40	187	—	90.7	10.0	—	—	90000
4.45	183	—	90.0	9.0	—	28	89000
4.50	179	—	89.0	8.0	—	27	88000
4.55	174	—	87.8	6.4	—	—	86000
4.60	170	—	86.8	5.4	—	26	84000
4.65	167	—	86.0	4.4	—	—	83000
4.70	163	—	85.0	3.3	—	25	82000
4.80	156	—	82.9	0.9	—	—	80000
4.90	149	—	80.8	—	—	23	—
5.00	143	—	78.7	—	—	22	—
5.10	137	—	76.4	—	—	21	—
5.20	131	—	74.0	—	—	—	—
5.30	126	—	72.0	—	—	20	—
5.40	121	—	69.8	—	—	19	—
5.50	116	—	67.6	—	—	18	—
5.60	111	—	65.7	—	—	15	—



PERFORATING
COMPANIES

HARDNESS CONVERSION NUMBERS FOR SOFT METALS

ROCKWELL							BRINELL 500 kg. Load 10mm. Ball
B Scale	F Scale	15-T Scale	30-T Scale	E Scale	H Scale	A Scale	
74	99.0	—	66.0	—	—	46.0	118
72	98.0	84.0	65.0	—	—	45.0	114
70	97.0	83.5	63.5	99.5	—	44.0	110
68	95.5	—	62.0	98.0	—	43.0	107
66	94.5	82.0	60.5	97.0	—	42.0	104
64	93.5	81.5	59.5	95.5	—	41.5	101
62	92.0	—	58.0	94.5	—	40.5	98
60	91.0	—	56.5	93.0	—	39.5	95
58	90.0	79.5	55.0	92.0	—	38.5	92
56	89.0	79.0	54.0	90.5	—	—	90
54	87.5	—	52.5	89.5	—	37.0	87
52	86.5	77.5	51.0	88.0	—	36.0	85
50	85.5	77.0	49.5	87.0	—	35.0	83
48	84.5	—	48.5	85.5	—	34.5	81
46	83.0	75.5	47.0	84.5	—	33.5	—
44	82.0	75.0	45.5	83.5	—	32.5	78
42	81.0	—	44.0	82.0	—	31.5	76
40	79.5	73.5	43.0	81.0	—	—	—
38	78.5	73.0	41.5	79.5	—	30.0	73
36	77.5	—	40.0	78.5	100.0	29.0	—
34	76.5	71.5	38.5	77.0	99.0	28.0	70
32	75.0	71.0	37.5	76.0	98.5	27.5	—
30	74.0	70.5	36.0	75.0	—	26.5	67
28	73.0	—	34.5	73.5	97.0	25.5	66
26	72.0	69.0	33.0	72.5	—	24.5	65
24	70.5	68.5	32.0	71.0	95.5	24.0	—
22	69.5	—	30.5	70.0	95.0	23.0	—
20	68.5	—	29.0	68.5	—	22.0	—
18	67.0	66.5	27.5	67.5	93.5	—	—
16	66.0	66.0	26.0	66.5	—	20.5	—
14	65.0	—	25.0	65.0	92.0	—	—
12	64.0	64.5	23.5	64.0	91.5	—	—
10	63.0	64.0	22.0	62.5	90.5	—	57
8	61.5	63.5	20.5	61.5	90.0	—	—
6	60.5	—	19.5	60.5	—	—	—
4	59.5	62.0	18.0	59.0	88.5	—	—
2	58.0	61.5	16.5	58.0	—	—	54
0	57.0	—	15.0	57.0	87.0	—	53

ROCKWELL HARDNESS SCALES

Scale	Major Load, kg.	Indenter	Use of Scale
A	60	Diamond cone	Extremely hard materials such as tungsten carbide or hard sheet material too thin for heavy load.
B	100	1/16" ball	Materials of B 0 to B 100 hardness.
C	150	Diamond cone	Materials of C 20 to C 70 hardness.
E	100	1/8" ball	Very soft materials such as bearing metals.
F	60	1/16" ball	Very soft materials such as bearing metals.
H	60	1/8" ball	Very soft materials such as bearing metals.
ROCKWELL SUPERFICIAL HARDNESS SCALES			
15-N	15	Diamond cone	Materials comparable in hardness of C 20 to C 70.
15-T	15	1/16" ball	Materials comparable in hardness of B 0 to B 100.
30-T	30	1/16" ball	Materials comparable in hardness of B 0 to B 100.



**PERFORATING
COMPANIES**

USEFUL INFORMATION

To find circumference of a circle, multiply diameter by 3.1416.

To find diameter of a circle, multiply circumference by .31831.

To find area of a circle, multiply square of diameter by .7854.

Area of a rectangle = length multiplied by breadth.

Doubling the diameter of a circle increases its area four times.

To find area of a triangle, multiply base by $\frac{1}{2}$ perpendicular height.

Area of ellipse = product of both diameters $\times$.7854.

Area of a parallelogram = base $\times$ altitude.

To find side of an inscribed square, multiply diameter by 0.7071 or multiply circumference by 0.2251 or divide circumference by 4.4428.

Side of inscribed cube = radius of sphere $\times$ 1.1547.

To find side of an equal square, multiply diameter by .8862.

Square. A side multiplied by 1.4142 equals diameter of its circumscribing circle.

A side multiplied by 4.443 equals circumference of its circumscribing circle.

A side multiplied by 1.128 equals diameter of an equal circle.

A side multiplied by 3.547 equals circumference of an equal circle.

To find cubic inches in a ball, multiply cube of diameter by .5236.

To find cubic contents of a cone, multiply area of base by $\frac{1}{3}$ the altitude.

Surface of frustum of cone or pyramid = sum of circumference of both ends $\times$ $\frac{1}{2}$ slant height plus area of both ends.

Contents of frustum of cone or pyramid = multiply area of two ends and get square root. Add the 2 areas and $\times$ $\frac{1}{2}$ altitude.

Doubling the diameter of a pipe increases its capacity four times.

A gallon of water (U.S. standard) weighs 8 $\frac{1}{8}$ lbs. and contains 231 cubic inches.

A cubic foot of water contains 7 $\frac{1}{2}$ gallons, 1728 cubic inches, and weighs 62 $\frac{1}{2}$ lbs.

To find the pressure in pounds per square inch of a column of water, multiply the height of the column in feet by .434.

Steam rising from water at its boiling point (212° F.) has a pressure equal to the atmosphere (14.7 lbs. to the square inch.)

A standard horse power: the evaporation of 30 lbs. of water per hour from a feed water temperature of 100° F. into steam at 70 lbs. gauge pressure.

To find capacity of tanks any size, given dimensions of a cylinder in inches, to find its capacity in U.S. gallons: square the diameter, multiply by the length and by .0034.

To ascertain heating surface in tubular boilers, multiply $\frac{3}{4}$ the circumference of boiler by length of boiler in inches and add to it the area of all the tubes.

WEIGHTS AND SPECIFIC GRAVITIES

Substance	Ave. Wt. Per Cu. Ft., Lbs.	Ave. Specific Gravity
Acid, acetic 90%	66.3	1.061
Acid, muriatic (hydrochloric) 40%	75	1.20
Acid, nitric 91%	94	1.50
Acid, sulphuric 87%	112	1.80
Acid, sulphuric 97%	115	1.839
Air, 0° C and 760 mm	.08071	.0012929
Alcohol, 100%	49	.79
Aluminum, pure, rolled	167.1	2.68
Ammonia, gas	.0478	(.5920)
Antimony, cast	418	6.70
Arsenic	354	5.67
Ashes, cinders	40-45	
Babbitt	454	7.27
Barium	236	3.78
Bismuth	611	9.79
Bituminous coal, solid 1.2 to 1.5	84 Av.	1.35
Borax	110	1.7-1.8
Brass 67% Cu. 33% Zn. cast	519	8.31
Brick, common and hard	125	
Bronze 90% Cu. 10% Sn	541	8.67
Cadmium	540	8.65
Carbon dioxide	1234	(1.5291)
Carbon monoxide	.0781	(.9673)
Caustic soda	88	1.41
Cement Portland, standard prop.	100	
Charcoal, pine	23	28-44
Chromium	428	6.86
Cinders (coal ashes and clinkers)	40	
Clay, hard, ordinary	150	2.40
Cobalt	548	8.75
Coke	75	1.0-1.4
Columbium	535.68	8.57
Copper plates and sheets	557	8.92
Cork, dry	15	24
Earth, common loam	75-90	
Glass, common window	156	2.40-2.60
Gold, cast, pure or 24-karat	1204	19.29
Gravel, sand, dry, loose	90-105	
Hydrogen	.00559	(0.0693)
Ice .917 to .922	57.4	.92
India Rubber	58	.93
Iron, cast grey	442	7.08
Lead, sheet	712	11.41
Limestone and marble	165	2.64
Magnesium	109	1.75
Mercury at 32° F.	849	13.60
Molybdenum	636	10.19
Nickel, rolled	541	8.67
Nickel, silver (52 Cu—26 Zn—22 Ni)	527	8.44
Nitrogen	.0784	(0.9714)
Oil, kerosene 150° to 300° F.	51.7	.83
Oil, mineral lubricating	57	.91
Oxygen	.0892	(1.1056)
Paper, strawboard, newspaper	33-44	
Paraffin	56	87-91
Phosphorus	146	2.34
Platinum	1342	21.50
Rubber, goods	94	1.0-2.0
Salt, per struck bushel 56 lb.	45	
Saltpeter, loose	88	
Sand, of pure quartz, dry	90-106	
Sandstone, bluestone	147	2.2-2.5
Silver	653	10.46
Soda ash	74	1.19
Sodium	61	.98
Spelter 6.8 to 7.2	437.5	7.00
Steel	489	7.84
Sulphur	125	2.00
Tantalum	1036.80	16.6
Tar, bituminous	75	1.20
Tin, cast, 7.2 to 7.5	459	7.35
Titanium, pure	281	4.5
Tungsten	1224	19.6
Vanadium	343	5.49
Water, pure, 32° F. and 30 in.	62.417	
Water, sea	64	1.026-1.030
Water, solid ice	56	.88-92
Zinc, rolled	449	7.19

The specific gravities of solids and liquids refer to water at 4° C.; those of gases, when in { }, to air at 0° C. and 760 mm. pressure. Weight of water at 4° C. = 62.4283 lbs. per cu. ft.



PERFORATING
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U.S. and METRIC SYSTEM EQUIVALENTS

LENGTH EQUIVALENTS—Basic unit is meter (m)

Unit	Millimeters	Centimeters	Inches	Feet	Yards	Meters
1 Millimeter	1	.1	.03937	.003281	.001094	.001
1 Centimeter	10	1	.3937	.032808	.010936	.01
1 Inch	25.4001	2.54001	1	.083333	.027778	.025400
1 Foot	304.801	30.4801	12	1	.333333	.304801
1 Yard	914.402	91.4402	36	3	1	.914402
1 Meter	1000	100	39.37	3.28083	1.09361	1

Unit	Feet	Yards	Meters	Rods	Furlongs	Miles (Statute)
1 Rod	16.5	5.5	5.02921	1	.025 (1/40)	.003125 (1/320)
1 Furlong	660	220	201.168	40	1	.125 (1/8)
1 Kilometer	3280.8	1093.6	1000	199	4.971	.62137
1 Mile (Statute)	5280	1760	1609.35	320	8	1

1 Nautical Mile = 6080.2 feet = 1.15155 statute miles = 1/3 league.

1 Light Year = 5.879 trillion miles = 9.46 trillion kilometers.

To convert In. to Millimeters—multiply by 25.4
 Millimeters to In.—multiply by .03937
 Feet to Meters—multiply by .3048
 Meters to Feet—multiply by 3.281
 Yards to Meters—multiply by .9144
 Meters to Yards—multiply by 1.094
 Miles to Kilometers—multiply by 1.609
 Kilometers to Miles—multiply by .6214

VOLUME AND CAPACITY EQUIVALENTS

VOLUME—Basic unit is stere (s) which is 1 cubic meter

CAPACITY—Basic unit is liter (l)

Unit	Cubic Centimeters	Cubic Inches	Liters	Quarts (Liquid)	Quarts (Dry)	Gals. (Liquid)	Gals. (Dry)	Cubic Feet
1 Cu. Centimeter	1	.06102	.001	.00106	.00091	.00026	.00023	.00004
1 Cu. Inch	16.387	1	.01639	.01732	.01488	.00433	.00372	.00058
1 Gill	118.29	7.2188	.11829	.125	.10742	.03125	.02686	.00418
1 Pint (liquid)	473.18	28.875	.47318	.5	.42968	.125	.10742	.01671
1 Pint (dry)	550.62	33.800	.55062	.58182	.5	.14546	.125	.01945
1 Liter	1000	61.023	1	1.0567	.90808	.26417	.22702	.03531
1 Quart (liquid)	946.36	57.75	.94636	1	.85937	.25	.21484	.03342
1 Quart (dry)	1101.2	67.201	1.1012	1.1637	1	.29091	.25	.03889
1 Gallon (liquid)	3785.4	231	3.7854	4	3.4375	1	.85937	.13368
1 Gallon (dry)	4404.9	268.80	4.4049	4.6546	4	1.1636	1	.15556
1 Peck	8809.8	537.61	8.8098	9.3092	8	2.3273	2	.31111
1 Cu. Foot	28317.0	1728	28.317	29.922	25.714	7.4805	6.4285	1
1 Bushel	35239.3	2150.4	35.239	37.237	32	9.3092	8	1.2445
1 Barrel	119241.2	7276.5	119.24	126	108.28	31.5	27.070	4.2109
1 Cu. Yard	764559.4	46656	764.56	807.90	694.28	201.97	173.57	27
1 Cu. Meter	1000000	61023.4	1000	1056.7	908.08	264.17	227.02	35.314

To convert Cu. In. to Cu. mm—multiply by 1639
 Cu. mm to Cu. In.—multiply by .00061
 Cu. In. to Cu. cm—multiply by 16.39
 Cu. cm to Cu. In.—multiply by .06102
 Cu. Ft. to Cu. m—multiply by .0283
 Cu. m to Cu. Ft.—multiply by 35.31
 Cu. Yds. to Cu. m—multiply by .7646
 Cu. m to Cu. Yds.—multiply by 1.308

To convert Cu. In. to Centiliter—multiply by 1.639
 Centiliter to Cu. In.—multiply by .61023
 Cu. Ft. to Liter—multiply by 28.32
 Liter to Cu. Ft.—multiply by .0353
 Fl. Oz. to Centiliter—multiply by 2.957
 Centiliter to Fl. Oz.—multiply by .33815
 Pints to Liters—multiply by .4732
 Liters to Pints—multiply by 2.113
 Quarts to Liters—multiply by .9463
 Liters to Quarts—multiply by 1.057
 Gallons to Liters—multiply by 3.785
 Liters to Gallons—multiply by .2642



**PERFORATING
COMPANIES**

WEIGHT EQUIVALENTS—Basic unit is gram (g)

Unit	Grains	Grams	Ounces (Troy)	Ounces (Avoir.)	Pounds (Troy)	Pounds (Avoir.)	Kilograms
1 Grain =	1	.064799	.002083	.002286	.000174	.000143	.000065
1 Gram	15.4324	1	.032151	.035274	.002679	.002205	.001
1 Ounce (Troy) =	480	31.1035	1	1.09714	.083333	.068571	.031104
1 Ounce (Avoir.) =	437.5	28.3496	.911458	1	.075955	.0625	.028350
1 Pound (Troy) =	5760	373.242	12	13.1657	1	.822857	.373242
1 Pound (Avoir.) =	7000	453.592	14.5833	16	1.21528	1	.453592
1 Kilogram =	15432.4	1000	32.1507	35.2740	2.67923	2.20462	1

Unit	Kilograms	Pounds (Troy)	Pounds (Avoir.)	Metric Tons	Net (Short) Tons	Gross (Long) Tons
1 Metric Ton =	1000	2679.23	2204.62	1	1.10231	.984206
1 Net (Short) Ton =	907.185	2430.56	2000	.907185	1	.892857
1 Gross (Long) Ton =	1016.05	2722.22	2240	1.01605	1.12	1

To convert Grains to Centigrams—multiply by 6.48
 Centigrams to Grains—multiply by .1543
 Ounces to Grams—multiply by 31.103
 Grams to Ounces—multiply by .03527
 Pounds to Kilograms—multiply by .4536
 Kilograms to Pounds—multiply by 2.2046
 Tons (2000#) to Metric Tons—multiply by .9078
 Metric Tons to Tons (2000#)—multiply by 1.1023

WEIGHT CONVERSION TABLE

Pounds to Kilograms				Kilograms to Pounds			
Pounds	Kilograms	Pounds	Kilograms	Kilograms	Pounds	Kilograms	Pounds
10	4.536	60	27.216	10	22.046	60	132.28
20	9.072	70	31.751	20	44.092	70	154.32
30	13.608	80	36.287	30	66.139	80	176.37
40	18.144	90	40.823	40	88.185	90	198.42
50	22.680	100	45.359	50	110.23	100	220.46

1 Pound equals .4536 Kilograms

1 Kilogram equals 2.2046 Pounds

AREA EQUIVALENTS

—Basic unit is centare (ca) which is 1 square meter

Unit	Square Inches	Square Feet	Square Yards	Square Meters
1 Square Foot =	144	1	.1111	.09290
1 Square Yard =	1296	9	1	.83613
1 Square Meter =	1550	10.7639	1.19599	1
1 Square Rod =	39204	272.25	30.25	25.293
1 Acre =	155000	1076.39	119.599	100
1 Acre =	6272640	43560	4840	4046.86
1 Square Mile (640 Acres) =	—	27878400	3097600	2589999
1 Square Kilometer =	—	10763867	1195985	1000000

To convert Sq. in. to Sq. cm—multiply by 6.452
 Sq. cm to Sq. in.—multiply by .1550
 Sq. Ft. to Sq. m.—multiply by .0929
 Sq. m. to Sq. Ft.—multiply by 10.76
 Sq. Yds. to Sq. m.—multiply by 8361
 Sq. m. to Sq. Yds.—multiply by 1.196
 Acres to Hectares—multiply by .4047
 Hectares to Acres—multiply by 2.471
 Acres to Sq. km.—multiply by .004047
 Sq. km. to Acres—multiply by 247.1
 Sq. Miles to Sq. km.—multiply by 2.590
 Sq. km. to Sq. Miles—multiply by .3861



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AVOIRDUPOIS WEIGHT

Grains	Drams	Ounces	Pounds	Hundred-weight	Gross Tons
1.	.03657	.002286	.000143	.0000128	.00000064
27.34375	1.	.0625	.003906	.00003488	.00001744
437.5	16.	1.	.0625	.00055803	.00002790
7000.	256.	16.	1.	.0089286	.0004464
784000.	28672.	1792.	112.	1.	.05
15680000.	573440.	35840.	2240.	20.	1.

1 pound avoirdupois = 1.215278 pounds troy.

1 net ton = 2000 pounds = .892857 gross ton.

LINEAR MEASURE

Inches	Feet	Yards	Rods	Furlongs	Miles
1	.08333	.02778	.0050505	.00012625	.00001577
12	1.	.33333	.0606061	.00151515	.00018939
36	3.	1.	.1818182	.00454545	.00056818
198	16.5	5.5	1.	.025	.003125
7920	660.	220.	40.	1.	125
63360	5280.	1760.	320.	8.	1.

SQUARE OR LAND MEASURE

Square Inches	Square Feet	Square Yards	Square Rods	Acres	Square Miles
1	.006944	.0007716			
144	1.	.111111			
1296	9.0	1.	.03306	.0002066	
39204	272.25	30.25	1.	.00625	.0000977
6272640	43560.	4840.	160.	1.	.0015625
.....	27878400.	3097600.	102400.	640.	1.

1 square rod = 40 square rods.

1 acre = 4 square rods.

1 square acre = 208.71 feet square.

CUBIC OR SOLID MEASURE

1 cubic inch = .0005787 cubic foot = .000021433 cubic yard

1 cubic foot = 1728 cubic inches = .03703704 cubic yard.

1 cubic yard = 27 cubic feet = 46656 cubic inches.

1 cord of wood = 128 cubic feet = 4 feet by 4 feet by 8 feet.

DRY MEASURE

Pints	Quarts	Gallons	Pecks	Bushels	Cubic Inches
1	.50	.125	.0625	.015625	33.6003125
2	1.	.25	.125	.03125	67.200625
8	4.	1.	.50	.125	268.8025
16	8.	2.	1.	.25	537.605
64	32.	8.	4.	1.	2150.42

1 heaped bushel = 1.25 struck bushel, and the cone must be not less than 6 inches high.

LIQUID MEASURE

Gills	Pints	Quarts	Gallons	Barrels	Cubic Inches
1	.25	.125	.03125	.000992	7.21875
4	1.	.5	.125	.003968	28.875
8	2.	1.	.25	.007937	57.75
32	8.	4.	1.	.031746	231.
1008	252.	126.	31.5	1.	7276.5

The British imperial gallon = 277.410 cubic inches or 10 pounds avoirdupois of pure water at 62 degrees Fahrenheit and barometer at 30 inches.

The British imperial gallon = 1.20091 United States gallons.

1 fluid ounce = 480 minims = 8 drachms = .0625 pint.



**PERFORATING
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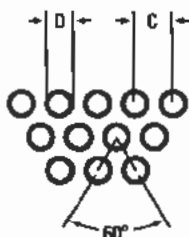
FRACTION, DECIMAL AND METRIC EQUIVALENTS

Fractional Inch	Dec. Equiv.	Millimeters	Fractional Inch	Dec. Equiv.	Millimeters
1/64	—	.0156 — .397	33/64	—	.5156 — 13.097
1/32	—	.0313 — .794	17/32	—	.5313 — 13.494
3/64	—	.0469 — 1.191	35/64	—	.5469 — 13.891
1/16	—	.0625 — 1.588	9/16	—	.5625 — 14.288
5/64	—	.0781 — 1.984	37/64	—	.5781 — 14.684
1/12	—	.0833 — 2.117	7/12	—	.5833 — 14.817
3/32	—	.0938 — 2.381	19/32	—	.5938 — 15.081
1/10	—	.1000 — 2.540	3/5	—	.6000 — 15.240
7/64	—	.1094 — 2.778	39/64	—	.6094 — 15.478
1/8	—	.1250 — 3.175	5/8	—	.6250 — 15.875
9/64	—	.1406 — 3.572	41/64	—	.6406 — 16.272
5/32	—	.1563 — 3.969	21/32	—	.6563 — 16.669
1/6	—	.1667 — 4.233	2/3	—	.6667 — 16.933
11/64	—	.1719 — 4.366	43/64	—	.6719 — 17.066
3/16	—	.1875 — 4.700	11/16	—	.6875 — 17.463
1/5	—	.2000 — 5.080	7/10	—	.7000 — 17.780
13/64	—	.2031 — 5.159	45/64	—	.7031 — 17.859
7/32	—	.2188 — 5.556	23/32	—	.7188 — 18.256
15/64	—	.2344 — 5.953	47/64	—	.7344 — 18.653
1/4	—	.2500 — 6.350	3/4	—	.7500 — 19.050
17/64	—	.2656 — 6.747	49/64	—	.7656 — 19.447
9/32	—	.2813 — 7.144	25/32	—	.7813 — 19.844
19/64	—	.2969 — 7.541	51/64	—	.7969 — 20.241
3/10	—	.3000 — 7.620	4/5	—	.8000 — 20.320
5/16	—	.3125 — 7.937	13/16	—	.8125 — 20.638
21/64	—	.3281 — 8.334	53/64	—	.8281 — 21.034
1/3	—	.3333 — 8.467	5/6	—	.8333 — 21.167
11/32	—	.3438 — 8.731	27/32	—	.8438 — 21.431
23/64	—	.3594 — 9.128	55/64	—	.8594 — 21.828
3/8	—	.3750 — 9.525	7/8	—	.8750 — 22.225
25/64	—	.3906 — 9.922	57/64	—	.8906 — 22.622
2/5	—	.4000 — 10.160	9/10	—	.9000 — 22.860
13/32	—	.4063 — 10.319	29/32	—	.9063 — 23.019
5/12	—	.4167 — 10.583	11/12	—	.9167 — 23.283
27/64	—	.4219 — 10.716	59/64	—	.9219 — 23.416
7/16	—	.4375 — 11.112	15/16	—	.9375 — 23.813
29/64	—	.4531 — 11.509	61/64	—	.9531 — 24.209
15/32	—	.4688 — 11.906	31/32	—	.9688 — 24.606
31/64	—	.4844 — 12.303	63/64	—	.9844 — 25.003
1/2	—	.5000 — 12.700	1"	—	1.0000 — 25.400

To convert a decimal to percentage, carry the decimal point two places to the right. Thus, .9844, or .9844, equals 98.44%.

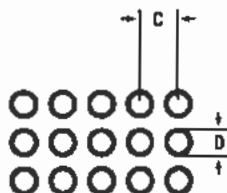
FORMULAS FOR DETERMINING PERCENT OF OPEN AREA

STAGGERED ROUND HOLES



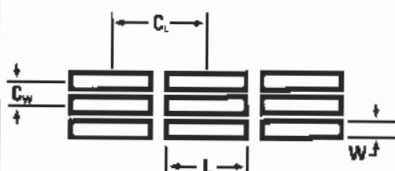
$$\frac{D^2 \times 90.69}{C^2} = \%$$

STRAIGHT ROUND HOLES



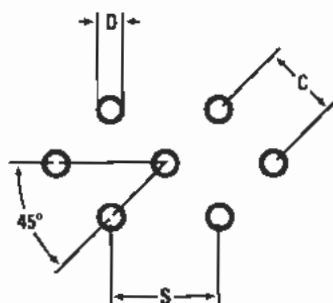
$$\frac{D^2 \times 78.54}{C^2} = \%$$

SLOT



$$\frac{L \times W}{C_L \times C_W} = \%$$

45° STAGGERED CENTERS PATTERN (SPECIAL)



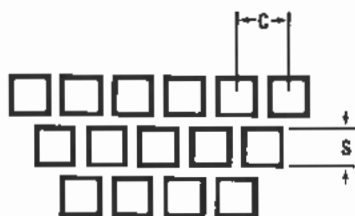
$$\frac{D^2 \times 157.08}{S^2} = \%$$



PERFORATING
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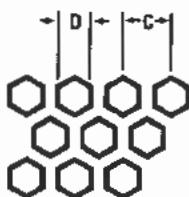
FORMULAS FOR DETERMINING PERCENT OF OPEN AREA

SQUARE HOLES (STRAIGHT OR STAGGERED)



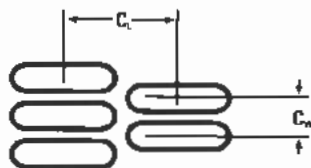
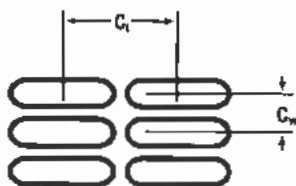
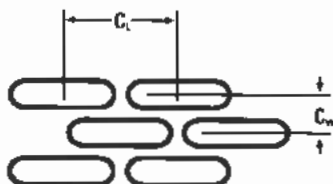
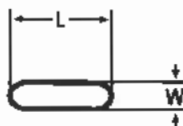
$$\frac{S^2 \times 100}{C^2} = \%$$

HEXAGON



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

OBLONGS



$$\frac{W \times L - .215W^2}{C_l \times C_w} = \%$$



PERFORATING
COMPANIES



PERFORATING
COMPANIES

