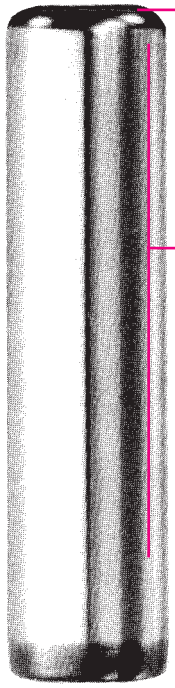
Unbrako

**Viewmold provides high quality injection mold tooling**

## DOWEL PINS ■ Dimensions ■ Application Data

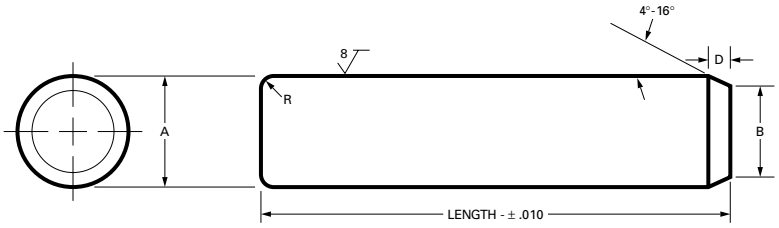


Formed ends resist chipping

Surface hardness: Rockwell “C” 60 minimum
Surface finish: 8 microinch maximum
Core hardness: Rockwell “C” 50–58
Case depth: .020-inch minimum
Shear strength: 150,000 psi (calculated based on conversion from hardness)
Heat treated alloy steel for strength and toughness
Material, Heat Treatment, Dimensions: ASME B18.8.2
.0002 – inch oversize typically used for first installation.
.0010 – inch oversize typically used after hole enlarges.

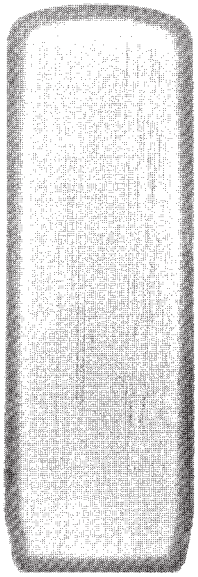
**Installation Warning** – Do not strike. Use safety shield or glasses when pressing chamfered end in first.

Single shear load calculated as 150,000 psi x π (nom. A)$^2$ ÷ 4



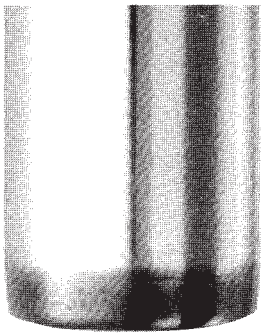

### DIMENSIONS and APPLICATION DATA

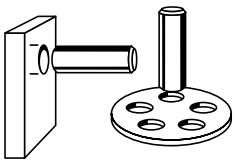
| | A | | | | B | D | R | calculated single shear strength (pounds) | recommended hole size (.0002 over nom.) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | .0002 over nom. | | .001 over nom. | | | | | | | |
| nom. | max. | min. | max. | min. | max. | min. | min. | | max. | min. |
| 1/16 | .0628 | .0626 | .0636 | .0634 | .058 | .016 | .008 | 465 | .0625 | .0620 |
| 3/32 | .0941 | .0939 | .0949 | .0947 | .089 | .018 | .012 | 1,035 | .0937 | .0932 |
| 1/8 | .1253 | .1251 | .1261 | .1259 | .120 | .022 | .016 | 1,845 | .1250 | .1245 |
| 5/32 | .1565 | .1563 | .1573 | .1571 | .150 | .022 | .020 | 2,880 | .1562 | .1557 |
| 3/16 | .1878 | .1876 | .1886 | .1884 | .180 | .023 | .023 | 4,140 | .1875 | .1870 |
| 1/4 | .2503 | .2501 | .2511 | .2509 | .240 | .031 | .031 | 7,370 | .2500 | .2495 |
| 5/16 | .3128 | .3126 | .3136 | .3134 | .302 | .034 | .039 | 11,500 | .3125 | .3120 |
| 3/8 | .3753 | .3751 | .3761 | .3759 | .365 | .038 | .047 | 16,580 | .3750 | .3745 |
| 7/16 | .4378 | .4376 | .4386 | .4384 | .424 | .047 | .055 | 22,540 | .4375 | .4370 |
| 1/2 | .5003 | .5001 | .5011 | .5009 | .486 | .047 | .063 | 29,460 | .5000 | .4995 |
| 9/16 | .5628 | .5626 | .5636 | .5634 | .548 | .047 | .070 | 37,270 | .5625 | .5620 |
| 5/8 | .6253 | .6251 | .6261 | .6259 | .611 | .047 | .078 | 46,020 | .6250 | .6245 |
| 3/4 | .7503 | .7501 | .7511 | .7509 | .735 | .059 | .094 | 66,270 | .7500 | .7495 |
| 7/8 | .8753 | .8751 | .8761 | .8759 | .860 | .059 | .109 | 90,190 | .8750 | .8745 |
| 1 | 1.0003 | 1.0001 | 1.0011 | 1.0009 | .980 | .059 | .125 | 117,810 | 1.0000 | .9995 |

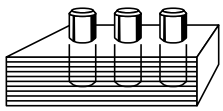


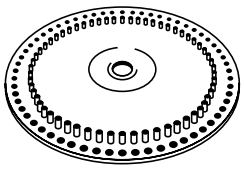
**Continuous grain flow** resists chipping of ends. Precision heat treated for greater strength and surface hardness.

**Chamfered end** provides easier insertion in hole. Surface finish to 8 microinch maximum.







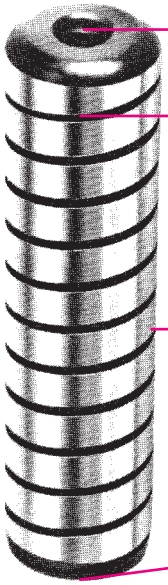


**APPLICATIONS**

Widely used as plug gages in various production operations, and as guide pins, stops, wrist pins, hinges and shafts. Also used as position locators on indexing machines, for aligning parts, as feeler gages in assembly work, as valves and valve plungers on hydraulic equipment, as fasteners for laminated sections and machine parts, and as roller bearings in casters and truck wheels.

Unbrako

## PULL-OUT DOWEL PINS ■ Dimensions ■ Application Data



Tapped hole for easy pull-out (ANSI B1.1)

Exclusive spiral grooves afford uniform relief for insertion and removal, reduce chances of hole-scoring

Surface hardness-Rockwell C60 minimum

Surface finish-8 microinch maximum

Core hardness-Rockwell C 50–58

Shear strength: 150,000 psi (calculated based on conversion from hardness)

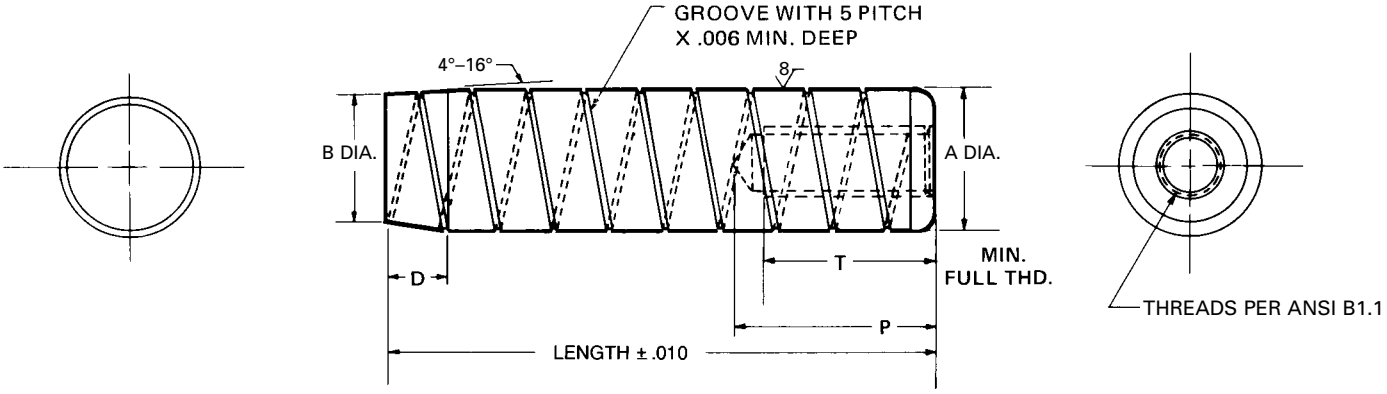
Heat treated alloy steel for strength and toughness

Held to precise tolerance – .0002-inch on diameter and roundness to 50 millionths of an inch (T.I.R.)

Formed ends resist chipping

Material and Heat Treatment: ASME B18.8.2

Single shear load calculated as 150,000 psi x $\pi$ (nom. A)$^2$ ÷ 4

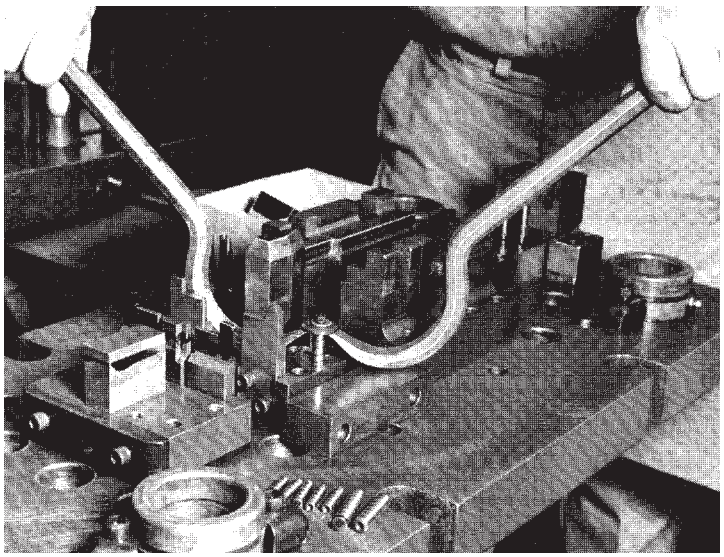



### DIMENSIONS and APPLICATION DATA

| size nom. | thread size | B max. | A max. | A min. | D min. | P note 1 max. | T min. | X note 2 | calculated single shear strength (pounds) | recommended hole diameter max. | recommended hole diameter min. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | #8-32 UNC-2B | .237 | .2503 | .2501 | .031 | .500 | .212 | 7/16 | 7,370 | .2500 | .2495 |
| 5/16 | #10-32 UNF-2B | .302 | .3128 | .3126 | .034 | .625 | .243 | 1/2 | 11,500 | .3125 | .3120 |
| 3/8 | #10-32 UNF-2B | .365 | .3753 | .3751 | .038 | .625 | .243 | 9/16 | 16,580 | .3750 | .3745 |
| 7/16 | #10-32 UNF-2B | .424 | .4378 | .4376 | .047 | .625 | .243 | 5/8 | 22,540 | .4315 | .4370 |
| 1/2 | 1/4-20 UNC-2B | .486 | .5003 | .5001 | .047 | .750 | .315 | 3/4 | 29,460 | .5000 | .4995 |
| 5/8 | 1/4-20 UNC-2B | .611 | .6253 | .6251 | .047 | .750 | .315 | 3/4 | 46,020 | .6250 | .6245 |
| 3/4 | 5/16-18 UNC-2B | .735 | .7503 | .7501 | .059 | .875 | .390 | 13/16 | 66,270 | .7500 | .7495 |
| 7/8 | 3/8-16 UNC-2B | .860 | .8753 | .8751 | .059 | .875 | .390 | 13/16 | 90,190 | .8750 | .8745 |
| 1 | 3/8-16 UNC-2B | .980 | 1.0003 | 1.0001 | .059 | .875 | .390 | 13/16 | 117,810 | 1.0000 | .9995 |

**NOTES**

1. Lengths equal to or shorter than "P" max. values may be drilled through.
2. Point angle (approx.) 5° on point for lengths equal to or longer than X. For shorter lengths, use 15° angle.



**5 WAYS TO SAVE**

**UNBRAKO** Pull-Out Dowel Pins are easier, more accurate and more economical than "do-it-yourself" modifications of standard dowels. They save you money FIVE ways:

**1. YOU SAVE COST OF SEPARATE KNOCK-OUT HOLES IN BLIND HOLES WHERE PINS MUST BE REMOVED.**

UNBRAKO pull-out pins are easy to install in blind holes, easy to remove. Exclusive spiral grooves release trapped air for insertion or removal without danger of hole-scoring.

**2. YOU MUST SAVE COST OF NEW PINS EACH TIME DIE IS SERVICED OR DISMANTLED.**

UNBRAKO pull-out dowel pins are reusable. The hole tapped in one end for a removal screw or threaded "puller" makes it easy and fast to remove the pin without damage to pin or hole, permits repeated re-use.

**3. YOU SAVE MONEY IN REDUCED DOWNTIME AND LOSS OF PRODUCTION**

UNBRAKO pull-out dowel pins speed up die servicing and reworking. You can remove them without turning the die over, and you can take out individual sections of the die for rework or service without removing entire die assembly from the press.

**4. YOU SAVE MODIFICATIONS COSTS, YOU AVOID HEADACHES AND YOU SAVE YOUR SKILLED PEOPLE FOR PROFITABLE WORK.**

UNBRAKO pull-out dowel pins have tapped holes and relief grooves built in. Time-consuming "do-it-yourself" modification of standard pin eliminated. No need for annealing (to make pins soft enough to drill and tap) and re-hardening, which can result in damage to finish, and in inaccuracies and distortion.

**5. YOU SAVE TIME AND MONEY BECAUSE OF THIS QUALITY "REPEATABILITY." NO SPECIAL PREPARATION OF INDIVIDUAL HOLES NEEDED-YOU CAN BE SURE OF ACCURATE FIT EVERY TIME.**

UNBRAKO pull-out dowel pins are identical and inter-changeable with standard UNBRAKO dowels. They have the same physical, finish, accuracy and tolerances. And they are consistently uniform. Their exclusive spiral relief grooves provide more uniform relief than other types of removable pins, assuring more uniform pull-out values.

You don't need any special tools to remove UNBRAKO pull-out dowels-just an ordinary die hook and a socket head cap or button head socket screw.