

# Dodge

## Fastening Solutions for Plastics



**Emhart<sup>®</sup>  
Teknologies**  
DODGE<sup>®</sup>

# Creating the Future Worldwide.



At **Emhart**, creating the future is about growth, about change and about taking risks.

It is who we are and what we do. Our focus is to reduce the overall product assembly costs of our customers by anticipating needs and meeting those needs with technology and market-driven solutions.

Emhart is a global leader in the design and creation of unique assembly technologies, delivering depth and breadth of service and product through a flexible, cross-functional global organization.

### Owning The Customer's Total Experience

We provide every customer with the capability to satisfy every aspect of fastening and assembly technology. From concept through installation, around the corner and around the globe, Emhart develops and delivers solutions for challenging assembly applications.

#### Technology Optimization

Emhart has the ability to objectively match customer priorities, applications and manufacturing environment with the most appropriate assembly technology and fastening systems. We provide this capability through Application Engineers, and Mobile, Stationary and Virtual Innovation Centers located around the world. Each is electronically linked, capable of sharing application data and new design concepts with each other as well as with our customers.

#### System Integration

Emhart provides technological solutions in over 100 different countries. For each of these countries and for every application, we deliver innovative, integrated systems solutions from concept and design through system integration, worldwide.

#### Product Consultancy

Emhart employs Application Analysis and Value Engineering to demonstrate how our technology can enhance the assembly process, and Value Analysis to detail the cost/benefit relationship of applying our technologies.

#### Innovative Services

Emhart is infused with the spirit and culture of innovation. From our Stationary Innovation Centers to our unique Mobile Innovation Centers, Emhart has built a worldwide service and technology infrastructure to support our customers, 24 hours a day, seven days a week.



DODGE GRIPCO HELI-COIL NPR PARKER-KALON POP TUCKER WARREN



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# Dodge

## Fastening Solutions for Plastics

**Dodge**<sup>®</sup> inserts for plastics are widely recognized and highly regarded products in the fastening market. Since the 1950's, Dodge has been identified as the leader in its industry which can largely be attributed to its focus on providing high quality products.

**DODGE** Products are available in various types and styles to suit almost any insert application in plastic. DODGE inserts are designed to provide the high performance strength values of molded-in inserts while still retaining all of the economical advantages of insert installation after molding. In addition to the standard products, **DODGE** has also developed insert types and styles for specific applications.

**DODGE** Sales Engineers have broad experience in insert technology and are available to provide on-the-spot answers to any of your technical questions. Our highly trained Applications Engineering staff in Danbury, Connecticut will be glad to furnish technical assistance, compile test data, prepare samples for your evaluation and make specific recommendations on insert designs, installations and assembly systems. Our fastening experience and expertise is available for designing special inserts for unique or critical applications. Designs such as studs, mold-in inserts, and compression limiters have been developed and supplied by **DODGE**.

**DODGE** products are manufactured to the same exacting quality systems required by the military, aerospace and automotive standards. The Danbury manufacturing facility has been certified ISO 9001, QS 9000 and ISO 14001. We are committed to an ongoing and never ending process of quality improvement and total customer satisfaction.



## Ultrasert I

8 & 9



- Fluted for ultrasonic or heat installation
- Tapered for accurate positioning prior to installation
- Vertical flutes provide high torque resistance
- Stepped inclined ribs provide optimum tensile strength
- Gradual external taper optimizes flow of plastic for rapid and smooth installation

## Ultrasert II & Ultrasert II Screw-Lock

10 – 13



- Most widely accepted and used
- Tapered for easy heat or ultrasonic installation
- Diagonal knurls for optimum torque resistance
- Undercuts for superior tensile strength
- Screw-Lock has unique locking element for vibration applications
- Eliminates need for plastic pellets or patches on screws
- Ideal for adjusting screw applications
- Available in two lengths for design flexibility; Screw-Lock in long length only



## Ultrasert III

14 & 15



- Designed for high volume production
- Can be installed ultrasonically, with heat, or molded in
- Symmetrical design eliminates orientation before installation
- Ideal for automated installation feeders
- Lead-in pilots at both ends assure accurate positioning prior to installation
- Opposing diagonal knurls provide torque resistance
- Undercuts provide tensile strength

## Ultrasert IV

16 & 17



- Designed for installation in straight holes
- Lead-in pilot at end assures accurate positioning prior to installation
- Opposing diagonal knurls provide excellent torque resistance
- Undercuts provide tensile strength

## Ultrasert IV Flange

18 & 19



- Same as Ultrasert IV but with flange on the knurled end
- Flange provides a large bearing surface, an advantage in weaker plastics
- Provides high strength when used in a reverse screw entry where the load is taken up by the flange, i.e. screw entry opposite flange end
- Ideal for use as electrical contact or fastening terminal connectors

## Ultrasert™

20



- Provides positive seal between insert and parent material for use in pressure applications utilizing high temperature O-ring
- Eliminates the need to mold or machine threads
- Easily installs with heat
- Available in 1/8, 1/4, and 3/8 NPTF threads

## Ultra-Mold™

21



- Revolutionary two-piece design allows full thread engagement without the need for extra space
- Controlled minor diameter reduces insert movement during molding assuring accurate alignment
- Unique counterbore accurately positions insert over molding pin and allows for easy bolt entry during assembly
- No machining chips to contaminate final product
- Can also be installed using heat

- 22 Miniature Inserts**
- Available in two styles to accommodate various applications
  - Symmetrical style is designed for high volume production, no special orientation required saving time and lowering overall cost
  - Flanged style provides larger bearing surface which is ideal for electrical contact and provides high strength in reverse screw entry application
  - Either style can be installed with heat



- 23 Compression Limiters**
- Non-threaded bushing to take bolt load instead of the part
  - Eliminates bending or cracking of plastic part due to tightening of bolt
  - Custom designed for each application
  - Can be installed with heat or ultrasonics or by pressing in



- 24 & 25 Standard Expansion**
- Installs without heat or ultrasonics
  - Easy to install, two piece insert for use in blind holes in thermoset or thermoplastic materials
  - Depressing the captivated spreader plate expands the knurled portion, permanently anchoring the insert
  - Can be installed protruding above the surface for use as a locating device



- 26 & 27 Flanged & Clinch Expansion**
- Flanged insert is ideal for electrical contact or fastening terminal connections
  - Can also be used to join mating parts by inserting through mating part and into receiving hole of parent material
  - Clinch insert is same as the Flanged insert but can be clinched over a terminal connector for electrical contact
  - Used extensively in electrical industry
  - Simultaneous installation and clinching operation using simple press-type tool
  - Both styles are excellent for use in thin-section applications since flange absorbs much of the installation force
  - Both styles install by depressing the captive spreader plate which expands the knurled portion, permanently anchoring the insert



- 28 & 29 Self Threading & Flanged Self Threading**
- Internally and externally threaded with two slots which provide cutting edges similar to a tap
  - Insert cuts its own thread when driven into a cored or drilled hole
  - Friction between insert and plastic permanently anchors the insert
  - Can be installed with a tap wrench or drill press with tapping head
  - Available with or without a flange



- 30 Spred-Lok**
- One-piece insert with unique, slotted, expandable outside diameter
  - Can be installed in thermoset or thermoplastic materials
  - No special tooling required — simply press in
  - Mating screw expands the insert locking it in place
  - Use in blind or through holes
  - Available with or without a flange



## Additional Information

	Pages	
6 & 7	34	Typical Applications
31	35	Custom Capabilities Guide
32	36 & 37	Jack Nut Threaded Inserts
33	38 & 39	Well-Nut Threaded Inserts

# Dodge Capabilities



## Customer Service

- Dedicated and caring people trained on sophisticated computerized equipment to ensure...  
*Prompt pricing and accurate delivery information*  
*Work in progress status*  
*J.I.T. scheduling*

## Design & Engineering Support

- Development support includes...  
*Conceptual ideas*  
*Preliminary designs and drawings*  
*Value Engineering*



## Product Development

- Pre-production samples and engineering prototypes are produced on state-of-the-art CNC equipment.
- New products are thoroughly tested before leaving our facility.



## Quality

- ISO 9001 & QS 9000 Certified
- Lot control ensuring product traceability.
- Statistically controlled manufacturing processes.
- Material certification.
- All products manufactured in the U.S.A.

## Production

- 150,000 square foot manufacturing facility.
- Dedicated to delivering high quality products on time.
- Unique machining techniques allow us to be more versatile and efficient.
- Utilize the best machining materials available which meet stringent internal specifications.
- Products controlled through MRP systems to ensure on-time delivery.
- In-House tooling capabilities.



# Dodge Capabilities



## Technical Seminars

- Formal technical seminars offered to engineering, manufacturing, purchasing and quality personnel.
- Instructors include representatives from our marketing and engineering departments.

## Factory Trained Sales & Applications Engineers

- Dodge has over 50 factory-trained sales engineers located throughout North America.
- We provide extensive knowledge and expertise in insert technology.
- Sales engineers will conduct on-site engineering seminars to ensure that your group is aware of the latest developments in plastic fastening technology.

## Inventory

- An extensive inventory is managed for both standard and custom inserts.
- State-of-the-art packaging equipment guarantees that box quantities are exact and finished goods are routed to the warehouse to facilitate just-in-time delivery.
- Broad range of inventory is conveniently located throughout North America.



- Applications engineers are ready to evaluate and recommend insert designs and installation methods. They also furnish samples, conduct product testing and compile test data.

## Insert Cleaning

- Special cleaning systems ensure maximum cleanliness of our inserts.
- Cleaning process eliminates brass chips or oil that may contaminate or damage an entire system.
- Adhesive grid may be added to the shipping container to trap any loose particles created by handling or transportation.





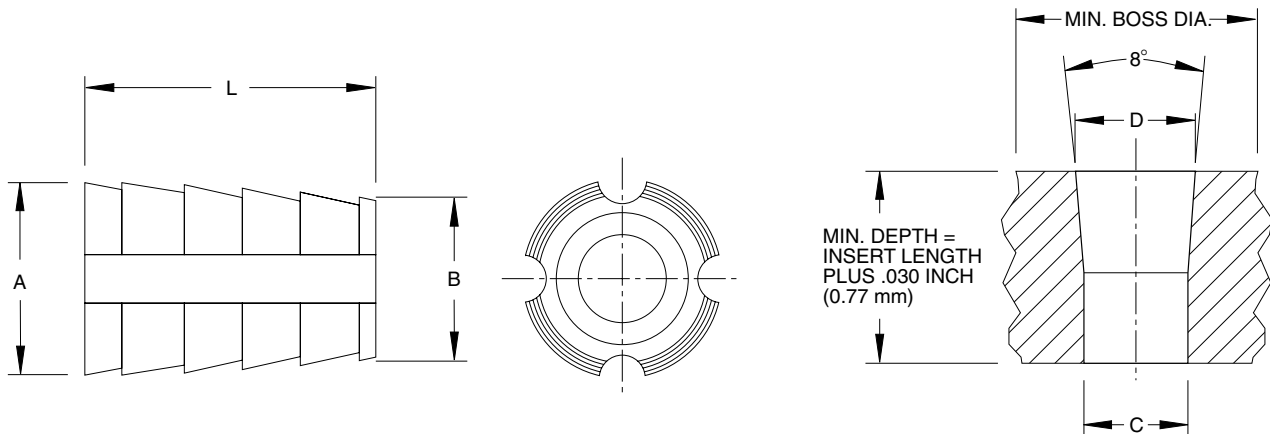
# Ultraser I

- Vertical flutes and horizontal fins provide superior assembly strength
- Tapered design assures rapid and accurate alignment prior to installation
- Flute and fin design provides a chip-free environment

## Ultraser I

The Ultraser I insert is a fluted brass insert designed for ultrasonic or heat installation into thermoplastics. The tapered design allows for accurate positioning in the receiving hole ensuring proper alignment prior to installation. The vertical flutes provide resistance to rotation and the stepped inclined ribs are for

tensile strength. The gradual external taper optimizes the flow of plastic as the insert/plastic interfaces, permitting a smooth and rapid installation.



INCH INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS		
Thread Size	Part Number	Diameter		Length	Diameter		Minimum Boss Diameter
		A ± .005	B ± .005	L ± .004	C ± .001	D ± .001	
4-40	70815-04-250	.173	.145	.250	.141	.154	.346
6-32	70815-06-312	.219	.183	.312	.179	.198	.438
8-32	70815-2-375	.252	.212	.375	.206	.227	.504
10-24	70815-3-438	.297	.249	.438	.243	.268	.594
10-32	70811-3-438	.297	.249	.438	.243	.268	.594
1/4-20	70815-4-562	.383	.323	.562	.320	.350	.766
1/4-28	70811-4-562	.383	.323	.562	.320	.350	.766

METRIC INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS		
Thread Size	Part Number	Diameter		Length	Diameter		Minimum Boss Diameter
		A ± 0.13	B ± 0.13	L ± 0.10	C ± 0.03	D ± 0.03	
M3x0.5	70817-3-079	5.51	4.65	7.92	4.55	5.03	11.02
M3.5x0.6	70817-3.5-079	5.51	4.65	7.92	4.55	5.03	11.02
M4x0.7	70817-4-095	6.35	5.38	9.53	5.23	5.77	12.70
M5x0.8	70817-5-111	7.49	6.32	11.13	6.17	6.81	14.98
M6x1	70817-6-143	9.68	8.20	14.27	8.13	8.89	19.35

# Ultrasert I — Test Data



Inch	ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs
No. 4	14	251	22†	374	23†	229	23†	295
No. 6	26	309	42	453	44†	441	44†	416
No. 8	42	466	81	843	70	660	84	653
No. 10	62	715	115	1245	116	1005	148	874
1/4"	104	1130	202	1820	206	1802	225	1434

Metric	ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
	Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N
M3	2.94	1375	4.75	2015	5.20	1962	4.97	1850
M3.5	2.94	1375	4.75	2015	5.20	1962	4.97	1850
M4	4.75	2073	9.15	3750	7.91	2936	9.49	2905
M5	7.01	3180	12.99	5538	13.11	4470	16.72	3888
M6	11.75	5026	22.82	8096	23.27	8016	25.42	6316

†Screw failed

## NOTE...

The test data should be considered as average values for the general families of plastics indicated. Critical application requirements may necessitate further specific testing.

The plastic material failed in all cases except where noted.

## Ultraserts

Dodge Ultraserts can be installed using ultrasonic equipment (moderate to high production) or thermal installation equipment (prototype work and low quantity production). Thermal equipment can be as simple as a soldering iron held by hand or mounted in an arbor or drill press. More refined equipment is available with adjustments and settings for precise uniform installations.

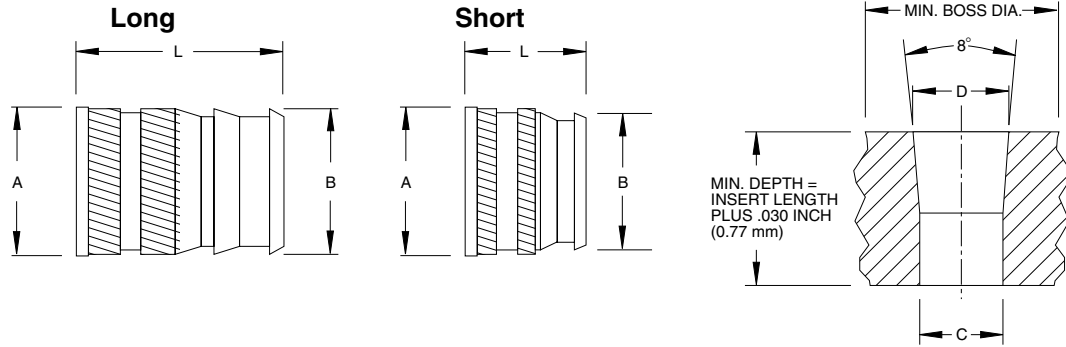


# Ultraser II

- Installed ultrasonically or with heat
- Two lengths to choose from allowing design flexibility
- Diagonal knurls & undercuts provide superior assembly strength
- Excellent design for automated systems

## Insert Specifications...

0-80, 2-56,  
M2 and M2.2  
Ultraser II have a  
single diamond  
knurl.



INCH INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS		
Internal Thread Size	Part Number	Diameter		Length L ± .004	Diameter		Minimum Boss Diameter
		A ± .005	B ± .004		C ± .001	D ± .001	
0-80	6041-0BR115	.141	.123	.115	.118	.129	.282
0-80	6041-0BR188	.141	.112	.188	.107	.123	.282
2-56	6035-02BR115	.141	.123	.115	.118	.129	.282
2-56	6035-02BR188	.141	.112	.188	.107	.123	.282
4-40	6035-04BR135	.172	.157	.135	.153	.163	.344
4-40	6035-04BR219	.172	.146	.219	.141	.159	.344
6-32	6035-06BR150	.219	.203	.150	.199	.209	.438
6-32	6035-06BR250	.219	.190	.250	.185	.206	.438
8-32	6035-2BR185	.250	.230	.185	.226	.236	.500
8-32	6035-2BR312	.250	.213	.312	.208	.234	.500
10-24	6035-3BR225	.297	.272	.225	.267	.278	.594
10-24	6035-3BR375	.297	.251	.375	.246	.277	.594
10-32	6041-3BR225	.297	.272	.225	.267	.278	.594
10-32	6041-3BR375	.297	.251	.375	.246	.277	.594
1/4-20	6035-4BR300	.375	.354	.300	.349	.363	.750
1/4-20	6035-4BR500	.375	.332	.500	.321	.363	.750
1/4-28	6041-4BR300	.375	.354	.300	.349	.363	.750
1/4-28	6041-4BR500	.375	.332	.500	.321	.363	.750
5/16-18	6035-5BR335	.469	.439	.335	.431	.448	.938
5/16-18	6035-5BR562	.469	.406	.562	.401	.448	.938
5/16-24	6041-5BR335	.469	.439	.335	.431	.448	.938
5/16-24	6041-5BR562	.469	.406	.562	.401	.448	.938
3/8-16	6035-6BR375	.563	.532	.375	.523	.540	1.126
3/8-16	6035-6BR625	.563	.493	.625	.488	.540	1.126
3/8-24	6041-6BR375	.563	.532	.375	.523	.540	1.126
3/8-24	6041-6BR625	.563	.493	.625	.488	.540	1.126

METRIC INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS		
Internal Thread Size	Part Number	Diameter (mm)		Length (mm) ± 0.10	Diameter (mm)		Minimum Boss Diameter (mm)
		A ± 0.13	B ± 0.10		C ± .03	D ± .03	
M2x0.4	6075-2BR029	3.58	3.12	2.9	3.00	3.27	7.16
M2x0.4	6075-2BR048	3.58	2.84	4.8	2.72	3.12	7.16
M2.2x0.45	6075-2.2BR029	3.58	3.12	2.9	3.00	3.27	7.16
M2.2x0.45	6075-2.2BR048	3.58	2.84	4.8	2.72	3.12	7.16
M2.5x0.45	6075-2.5BR034	4.37	3.99	3.4	3.89	4.14	8.74
M2.5x0.45	6075-2.5BR056	4.37	3.71	5.6	3.58	4.04	8.74
M3x0.5	6075-3BR038	5.56	5.16	3.8	5.05	5.31	11.13
M3x0.5	6075-3BR064	5.56	4.83	6.4	4.70	5.23	11.13
M3.5x0.6	6075-3.5BR038	5.56	5.16	3.8	5.05	5.31	11.13
M3.5x0.6	6075-3.5BR064	5.56	4.83	6.4	4.70	5.23	11.13
M4x0.7	6075-4BR047	6.35	5.84	4.7	5.74	5.99	12.70
M4x0.7	6075-4BR079	6.35	5.41	7.9	5.28	5.94	12.70
M5x0.8	6075-5BR067	8.33	7.82	6.7	7.70	8.00	16.66
M5x0.8	6075-5BR111	8.33	7.19	11.1	7.06	8.00	16.66
M6x1	6075-6BR076	9.53	8.99	7.6	8.86	9.22	19.06
M6x1	6075-6BR127	9.53	8.43	12.7	8.15	9.22	19.06
M8x1.25	6075-8BR085	11.91	11.15	8.5	10.95	11.38	23.83
M8x1.25	6075-8BR143	11.91	10.31	14.3	10.19	11.38	23.83
M10x1.5	6075-10BR095	14.30	13.51	9.5	13.28	13.71	28.60
M10x1.5	6075-10BR159	14.30	12.52	15.9	12.40	13.71	28.60

# Ultrasert II — Test Data



Inch	Length In.	ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
		Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs
No. 0	.115	50 oz-in.†	79	52 oz-in.†	135	52 oz-in.†	97	58 oz-in.	96
	.188	65 oz-in.†	162	70 oz-in.†	258	70 oz-in.†	224	65 oz-in.	198
No. 2	.115	67.5 oz-in.	79	110 oz-in.	135	90 oz-in.	97	58 oz-in.	96
	.188	81 oz-in.	162	168 oz-in.†	258	93 oz-in.	224	65 oz-in.	198
No. 4	.135	13	147	20*	230	19	187	20	211
	.219	17	258	23*	417	24	393	21	330
No. 6	.150	23	220	33*	341	29	236	33	286
	.250	25	370	45	661	31	487	34	509
No. 8	.185	37	304	52*	538	32	304	60	355
	.312	45	469	88*	910	50	512	66	883
No. 10	.225	51	448	86	773	55	505	70	565
	.375	68	726	125	1388	72	801	133	1310
1/4"	.300	102	700	157	1283	123	769	132	973
	.500	116	1157	231	2073	131	1171	220	1884
5/16"	.335	155	739	259*	1555	167	932	304	1506
	.562	214	1435	345*	3128	196	1767	428	2654
3/8"	.375	220	940	383	2065	246	1356	420	2040
	.625	229	1743	520	3638	297	2100	518	3303

Metric	Length mm	ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
		Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N
M2	2.9	.48	351	.78	601	.63	429	.90	427
	4.8	.57	721	1.19†	1148	.66	995	.90	881
M2.2	2.9	.48	351	.78	601	.63	429	.90	427
	4.8	.57	721	1.19†	1148	.66	995	.90	881
M2.5	3.4	1.47	654	2.26*	1023	2.23	834	2.26	939
	5.6	1.92	1148	2.60*	1855	2.75	1748	2.37	1468
M3 & M3.5	3.8	2.60	979	3.73*	1517	3.35	1048	3.73	1272
	6.4	2.82	1646	5.08	2940	3.54	2164	3.84	2264
M4	4.7	4.18	1352	5.88	2393	3.56	1350	6.78	1579
	7.9	5.08	2086	9.94*	4048	5.65	2279	7.46	3928
M5	6.7	6.78	2260	10.85	4168	6.25	2723	13.55	3777
	11.1	8.81	3599	15.82	6761	8.08	3903	19.54	7037
M6	7.6	11.52	3114	17.74	5707	13.84	3421	14.91	4328
	12.7	13.11	5147	26.10	9221	14.80	5208	24.86	8380
M8	8.5	17.51	3287	29.26	6917	18.81	4146	34.35	6699
	14.3	24.18	6383	38.98	13914	22.10	7860	48.36	11806
M10	9.5	24.90	4181	43.30	9186	27.80	6032	47.45	9074
	15.9	25.90	7753	58.80	16183	33.60	9341	58.53	14692

\*Internal thread stripped †Screw failed

## NOTE...

The test data should be considered as average values for the general families of plastics indicated. Critical application requirements may necessitate further specific testing.

The plastic material failed in all cases except where noted.

## Ultraserts

Dodge Ultraserts can be installed using ultrasonic equipment (moderate to high production) or thermal installation equipment (prototype work and low quantity production). Thermal equipment can be as simple as a soldering iron held by hand or mounted in an arbor or drill press. More refined equipment is available with adjustments and settings for precise uniform installations.



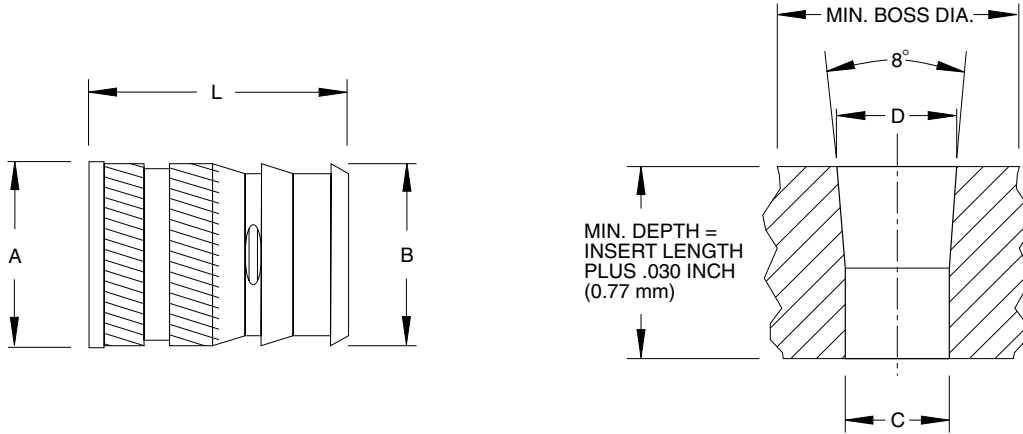
# Ultraser II Screw-Lock

- Unique internal locking element
- Locks screws in place
- Diagonal knurls and undercuts provide superior assembly strength

## Ultraser II Screw-Lock

The Screw-Lock Ultraser II is designed for use in vibration applications or where periodic screw adjustment is required. It features a unique internal locking element that is reusable for many

cycles. Screw-Locking Ultraser II inserts can be installed with either ultrasonics or heat.



INCH INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS		
Internal Thread Size	Part Number	Diameter		Length L ± .004	Diameter		Minimum Boss Diameter
		A ± .005	B ± .004		C ± .001	D ± .001	
4-40	6035L-04BR219	.172	.146	.219	.141	.159	.344
6-32	6035L-06BR250	.219	.190	.250	.185	.206	.438
8-32	6035L-2BR312	.250	.213	.312	.208	.234	.500
10-24	6035L-3BR375	.297	.251	.375	.246	.277	.594
10-32	6041L-3BR375	.297	.251	.375	.246	.277	.594
1/4-20	6035L-4BR500	.375	.332	.500	.321	.363	.750
1/4-28	6041L-4BR500	.375	.332	.500	.321	.363	.750

METRIC INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS		
Internal Thread Size	Part Number	Diameter (mm)		Length (mm) L ± 0.10	Diameter (mm)		Minimum Boss Diameter (mm)
		A ± 0.13	B ± 0.10		C ± 0.03	D ± 0.03	
M2.5x0.45	6075L-2.5BR056	4.37	3.71	5.6	3.58	4.04	8.74
M3x0.5	6075L-3BR064	5.56	4.83	6.4	4.70	5.23	11.13
M3.5x0.6	6075L-3.5BR064	5.56	4.83	6.4	4.70	5.23	11.13
M4x0.7	6075L-4BR079	6.35	5.41	7.9	5.28	5.94	12.70
M5x0.8	6075L-5BR111	8.33	7.19	11.1	7.06	8.00	16.66
M6x1	6075L-6BR127	9.53	8.43	12.7	8.15	9.22	19.06

# Ultrasert II Screw-Lock — Test Data



Inch	Length (In.)	ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.		PREVAILING TORQUE**	
		Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Maximum	Minimum
No. 4	.219	17	258	23*	417	24	393	21	211	112 oz•in.	6.4 oz•in.
No. 6	.250	25	370	45	661	31	487	34	509	192 oz•in.	18 oz•in.
No. 8	.312	45	469	88*	910	50	512	66	883	17 lb•in.	1 lb•in.
No. 10	.375	68	726	125	1388	72	801	133	1310	20 lb•in.	1.5 lb•in.
1/4"	.500	116	1157	231	2073	131	1171	220	1884	32 lb•in.	4.5 lb•in.

Metric	Length (mm)	ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.		PREVAILING TORQUE**	
		Rotation N•m	Tensile N	Rotation N•m	Tensile N	Rotation N•m	Tensile N	Rotation N•m	Tensile N	Maximum	Minimum
M2.5	5.6	1.92	1148	2.60*	1855	2.75	1748	2.37	1468	.79 N•m	.05 N•m
M3 & M3.5	6.4	2.82	1646	5.08	2940	3.54	2164	3.84	2264	1.36 N•m	.12 N•m
M4	7.9	5.08	2086	9.94*	4048	5.65	2279	7.46	3928	1.92 N•m	.11 N•m
M5	11.1	8.81	3599	15.82	6761	8.08	3903	19.54	7037	2.26 N•m	.17 N•m
M6	12.7	13.11	5147	26.10	9221	14.80	5208	24.86	8380	3.62 N•m	.51 N•m

\*Internal thread stripped

\*\*Prevailing torque values are based on the recommended use of cadmium plated screws. Any other types of screws may affect locking torque values and cycles.

## NOTE...

**The test data should be considered as average values for the general families of plastics indicated. Critical application requirements may necessitate further specific testing.**

**The plastic material failed in all cases except where noted.**

## Ultraserts

Dodge Ultraserts can be installed using ultrasonic equipment (moderate to high production) or thermal installation equipment (prototype work and low quantity production). Thermal equipment can be as simple as a soldering iron held by hand or mounted in an arbor or drill press. More refined equipment is available with adjustments and settings for precise uniform installations.



# Ultraser III

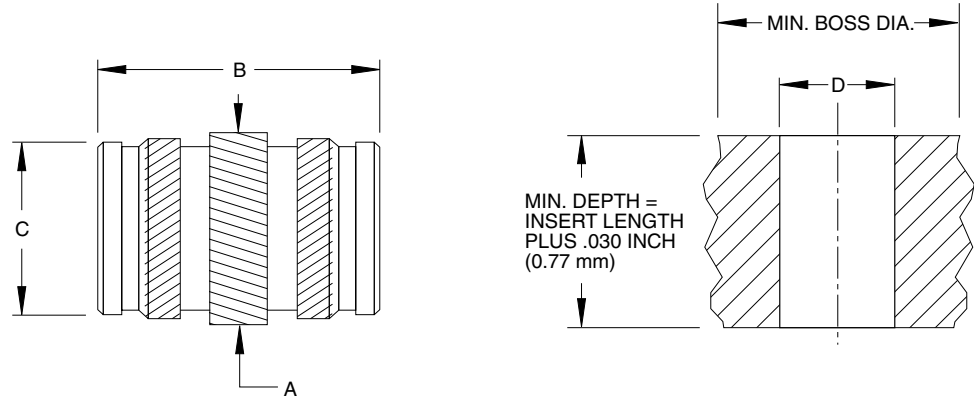
- Symmetrical design for low cost, high volume production
- No orientation required

## Ultraser III

Ultraser III is a symmetrical insert designed for high volume production. The inserts can be loaded into an automatic feeding system without the need for special orientation. The inserts can be installed ultrasonically, with heat or can also be

molded in place. The symmetrical design eliminates the time required for orientation which produces higher production and lower overall cost.

**Insert Specifications...**  
 0-80, 2-56; M2x0.4,  
 M2.2x0.45 & M2.5x0.45  
 Ultraser III have two  
 opposing knurls



INCH INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS	
Internal Thread Size	Part Number	Diameters		Length B ± .004	Hole Size D Diam. + .003 - .000	Minimum Boss Diameter
		A ± .004	C ± .004			
2-56	6635-02BR157	.135	.123	.157	.128	.286
4-40	6635-04BR226	.179	.154	.226	.159	.372
6-32	6635-06BR281	.220	.185	.281	.190	.440
8-32	6635-2BR321	.250	.218	.321	.223	.498
10-24	6635-3BR375	.281	.249	.375	.254	.558
10-32	6641-3BR375	.281	.249	.375	.254	.558
1/4-20	6635-4BR500	.342	.312	.500	.317	.684
1/4-28	6641-4BR500	.342	.312	.500	.317	.684

METRIC INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS	
Internal Thread Size	Part Number	Diameters		Length B ± .010	Hole Size D Diam. + 0.08 - 0.00	Minimum Boss Diameter
		A ± 0.10	C ± 0.10			
M2x0.4	6675-2BR040	3.43	3.12	3.99	3.25	7.26
M2.2x0.45	6675-2.2BR040	3.43	3.12	3.99	3.25	7.26
M2.5x0.45	6675-2.5BR057	4.54	3.91	5.74	4.04	9.44
M3x0.5	6675-3BR057	4.54	3.91	5.74	4.04	9.44
M3.5x0.6	6675-3.5BR071	5.59	4.70	7.13	4.83	11.18
M4x0.7	6675-4BR081	6.35	5.54	8.15	5.67	12.64
M5x0.8	6675-5BR095	7.13	6.32	9.52	6.45	14.18
M6x1	6675-6BR127	8.69	7.92	12.70	8.05	17.38

# Ultrasert III — Test Data



Thread Size	ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs
No. 2	7†	81	7†	163	7†	176	8†	166
No. 4	24†	269	24†	297	24†	321	24†	327
No. 6	35	288	44†	548	44†	518	44†	606
No. 8	43	381	75	804	86	607	83	647
No. 10	58	494	120	1006	93	719	146	654
1/4"	143	869	239	1666	230	1240	248	1362

Thread Size	ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
	Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N
M2 & M2.2	.79†	360	.79†	725	.79†	783	.90†	738
M2.5 & M3	2.71†	1196	2.71†	1321	2.71†	1428	2.71†	1455
M3.5	3.95	1281	4.97†	2438	4.97†	2304	4.97†	2696
M4	4.86	1695	8.47	3576	9.72	2700	9.38	2878
M5	6.55	2197	13.56	4475	10.51	3198	16.50	2909
M6	16.17	3866	27.00	7411	25.99	5515	28.02	6058

†Screw failed

## NOTE...

The test data should be considered as average values for the general families of plastics indicated. Critical application requirements may necessitate further specific testing.

The plastic material failed in all cases except where noted.

## Ultraserts

Dodge Ultraserts can be installed using ultrasonic equipment (moderate to high production) or thermal installation equipment (prototype work and low quantity production). Thermal equipment can be as simple as a soldering iron held by hand or mounted in an arbor or drill press. More refined equipment is available with adjustments and settings for precise uniform installations.



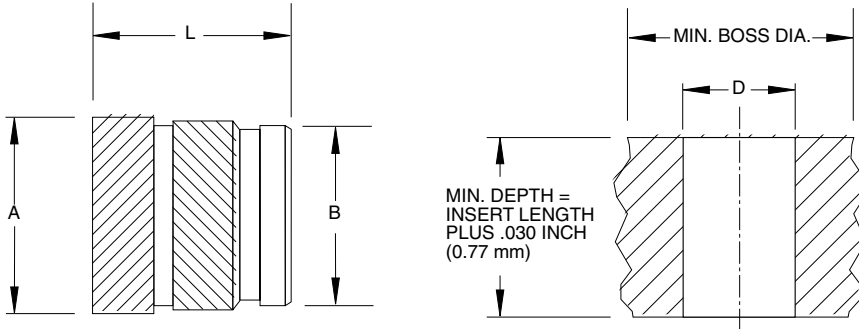
# Ultraser IV

- Provides high tensile and rotational strength
- Two lengths to choose from allowing design flexibility
- Installed ultrasonically or with heat
- Lead-in pilot positions insert for installation
- Parallel sides for installation into straight holes

INCH INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS	
Standard Ultraser IV		Diameter		Length	Hole Size	Minimum Boss Diameter
Internal Thread Size	Part Number	A ± .004	B ± .003	L ± .004	D + .003 - .000	
2-56	UB000256-115	.143	.123	.115	.127	.286
2-56	UB000256	.143	.123	.157	.127	.286
4-40	UB000440-135	.186	.154	.135	.158	.372
4-40	UB000440	.186	.154	.226	.158	.372
6-32	UB000632-150	.217	.185	.150	.189	.434
6-32	UB000440	.217	.185	.281	.189	.434
8-32	UB000832-185	.249	.218	.185	.222	.498
8-32	UB000832	.249	.218	.321	.222	.498
10-24	UB001024-225	.279	.249	.225	.253	.558
10-24	UB001024	.279	.249	.375	.253	.558
10-32	UB001032-225	.279	.249	.225	.253	.558
10-32	UB001032	.279	.249	.375	.253	.558
1/4-20	UB001420-300	.340	.312	.300	.316	.680
1/4-20	UB001420	.340	.312	.500	.316	.680
1/4-28	UB001428-300	.340	.312	.300	.316	.680
1/4-28	UB001428	.340	.312	.500	.316	.680
5/16-18	UB051618-335	.406	.374	.335	.378	.812
5/16-18	UB051618	.406	.374	.500	.378	.812
5/16-24	UB051624-335	.406	.374	.335	.378	.812
5/16-24	UB051624	.406	.374	.500	.378	.812
3/8-16	UB003816-375	.498	.465	.375	.469	.956
3/8-16	UB003816	.498	.465	.500	.469	.956
3/8-24	UB003824-375	.498	.465	.375	.469	.956
3/8-24	UB003824	.498	.465	.500	.469	.956

METRIC INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS	
Standard Ultraser IV		Diameter		Length	Hole Size	Minimum Boss Diameter
Thread Size	Part Number	A ± 0.10	B ± 0.08	L ± 0.10	D + 0.08 - 0.00	
M2x0.4	UMB00204-029	3.64	3.12	2.92	3.23	7.26
M2x0.4	UBM00204	3.64	3.12	3.99	3.23	7.26
M2.2x0.45	UMB22045-029	3.64	3.12	2.92	3.23	7.26
M2.2x0.45	UBM22045	3.64	3.12	3.99	3.23	7.26
M2.5x0.45	UMB25045-034	4.72	3.91	3.43	4.02	9.45
M2.5x0.45	UBM25045	4.72	3.91	5.74	4.02	9.45
M3x0.5	UMB00305-034	4.72	3.91	3.43	4.02	9.45
M3x0.5	UBM00305	4.72	3.91	5.74	4.02	9.45
M3.5x0.6	UMB03506-038	5.51	4.70	3.81	4.81	11.18
M3.5x0.6	UBM03506	5.51	4.70	7.14	4.81	11.18
M4x0.7	UMB00407-047	6.32	5.54	4.70	5.65	12.45
M4x0.7	UBM00407	6.32	5.54	8.15	5.65	12.45
M5x0.8	UMB00508-057	7.09	6.32	5.72	6.43	14.17
M5x0.8	UBM00508	7.09	6.32	9.53	6.43	14.17
M6x1.0	UMB00061-076	8.64	7.92	7.62	8.03	17.37
M6x1	UBM00061	8.64	7.92	12.70	8.03	17.37
M8x1.25	UMB08125-085	10.31	9.50	8.51	9.61	20.62
M8x1.25	UBM08125	10.31	9.50	12.70	9.61	20.62
M10x1.5	UMB01015-095	12.65	11.81	9.53	11.92	24.28
M10x1.5	UBM01015	12.65	11.81	12.70	11.92	24.28

# Ultrasert IV & Test Data



## Ultrasert IV

Ultrasert IV inserts are designed to be installed into straight holes. A lead-in pilot at the front end of the insert accurately positions the insert prior to installation. It is designed with opposing diagonal knurls that provide excellent torque resistance and undercuts for tensile strength. Ultrasert IV inserts are designed for ultrasonic or heat installation into thermoplastics or structural foam materials.

## Ultrasert IV – Test Data

**Note:** Test data should be considered as average values for the general families of plastics indicated. Critical application requirements may necessitate further specific testing. The plastic material failed in all cases except where noted.

Thread Size	Length	ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
		Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs
No. 2	.115	**	**	**	**	**	**	**	**
	.157	6	110	11*	200	10	177	13*	159
No. 4	.135	**	**	**	**	**	**	**	**
	.226	15.8	228	23*	338	23*	329	23*	350
No. 6	.150	**	**	**	**	**	**	**	**
	.281	27	298	45*	598	45*	388	45*	488
No. 8	.185	**	**	**	**	**	**	**	**
	.321	44	440	85*	831	68	567	90*	583
No. 10	.225	**	**	**	**	**	**	**	**
	.375	76	622	120*	1026	99	748	139	862
1/4"	.300	**	**	**	**	**	**	**	**
	.500	118	887	210	1717	171	871	213	1100
5/16"	.335	**	**	**	**	**	**	**	**
	.500	168	980	313*	1840	265	1231	316	1618
3/8"	.375	**	**	**	**	**	**	**	**
	.500	336	1334	534	2306	411	1315	663	2938

Thread Size	Length (mm)	ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
		Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N
M2 & M2.2	2.92	**	**	**	**	**	**	**	**
	3.99	.68	489	1.24	890	1.13	787	1.47*	707
M2.5 & M3	3.43	**	**	**	**	**	**	**	**
	5.74	1.79	1014	2.60*	1503	2.60*	1463	2.60*	1557
M3.5	3.81	**	**	**	**	**	**	**	**
	7.14	3.05	1326	5.08*	2660	5.08*	1726	5.08*	2171
M4	4.70	**	**	**	**	**	**	**	**
	8.15	4.97	1957	9.60*	3696	7.68	2522	10.17*	2593
M5	5.72	**	**	**	**	**	**	**	**
	9.53	8.59	2767	13.56	4564	11.19	3327	15.70	3834
M6	7.62	**	**	**	**	**	**	**	**
	12.70	13.33	3946	23.73	7638	19.32	3874	24.07	4893
M8	8.51	**	**	**	**	**	**	**	**
	12.70	18.98	4359	35.36	8185	29.94	5476	35.70	7197
M10	9.53	**	**	**	**	**	**	**	**
	12.70	37.96	5934	60.33	10258	46.44	5849	74.91	13069

\* Screw failed

\*\* Please contact Applications Engineering/for test data.



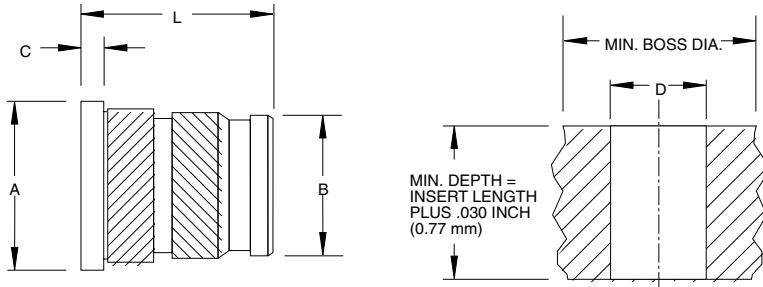
# Ultraser IV Flanged

- Provides high tensile and rotational strength
- Installed ultrasonically or with heat
- Flange provides a large bearing surface
- Ideal for an electrical contact; fastening terminal connectors

INCH INSERT SPECIFICATIONS						HOLE SIZE RECOMMENDATIONS	
Flanged Ultraser IV		Diameter		Length	Flange Thickness	Hole Size	Minimum Boss Diameter
Internal Thread Size	Part Number	A ± .005	B ± .003	L ± .004	C ± .003	D + .003 - .000	
2-56	UFB000256-133	.188	.123	.133	.018	.127	.286
2-56	UFB000256	.188	.123	.175	.018	.127	.286
4-40	UFB000440-156	.219	.154	.156	.021	.158	.372
4-40	UFB000440	.219	.154	.247	.021	.158	.372
6-32	UFB000632-177	.250	.185	.177	.027	.189	.434
6-32	UFB000632	.250	.185	.308	.027	.189	.434
8-32	UFB000832-218	.281	.218	.218	.033	.222	.498
8-32	UFB000832	.281	.218	.354	.033	.222	.498
10-24	UFB001024-265	.313	.249	.265	.040	.253	.558
10-24	UFB001024	.313	.249	.415	.040	.253	.558
10-32	UFB001032-265	.313	.249	.265	.040	.253	.558
10-32	UFB001032	.313	.249	.415	.040	.253	.558
1/4-20	UFB001420-350	.375	.312	.350	.050	.316	.680
1/4-20	UFB001420	.375	.312	.550	.050	.316	.680
1/4-28	UFB00148-350	.375	.312	.350	.050	.316	.680
1/4-28	UFB001428	.375	.312	.550	.050	.316	.680
5/16-18	UFB51618-385	.438	.374	.385	.050	.378	.812
5/16-18	UFB051618	.438	.374	.550	.050	.378	.812
5/16-24	UFB051624-385	.438	.374	.385	.050	.378	.812
5/16-24	UFB051624	.438	.374	.550	.050	.378	.812
3/8-16	UFB003816-440	.550	.465	.440	.065	.469	.956
3/8-16	UFB003816	.550	.465	.565	.065	.469	.956
3/8-24	UFB003824-440	.550	.465	.440	.065	.469	.956
3/8-24	UFB003824	.550	.465	.565	.065	.469	.956

METRIC INSERT SPECIFICATIONS						HOLE SIZE RECOMMENDATIONS	
Flanged Ultraser IV		Diameter		Length	Flange Thickness	Hole Size	Minimum Boss Diameter
Internal Thread Size	Part Number	A ± 0.13	B ± 0.08	L ± 0.10	C ± 0.08	D + 0.08 - 0.00	
M2x0.4	UFBM00204-034	4.78	3.12	3.38	0.46	3.23	7.26
M2x0.4	UFBM00204	4.78	3.12	4.45	0.46	3.23	7.26
M2.2x0.45	UFBM22045-034	4.78	3.12	3.38	0.46	3.23	7.26
M2.2x0.45	UFBM22045	4.78	3.12	4.45	0.46	3.23	7.26
M2.5x0.45	UFBM25045-039	5.56	3.91	3.96	0.53	4.02	9.45
M2.5x0.45	UFBM25045	5.56	3.91	6.27	0.53	4.02	9.45
M3x0.5	UFBM00305-039	5.56	3.91	3.96	0.53	4.02	9.45
M3x0.5	UFBM00305	5.56	3.91	6.27	0.53	4.02	9.45
M3.5x0.6	UFBM03506-045	6.35	4.70	4.50	0.69	4.81	11.18
M3.5x0.6	UFBM03506	6.35	4.70	7.82	0.69	4.81	11.18
M4x0.7	UFBM00407-055	7.14	5.54	5.54	0.84	5.65	12.45
M4x0.7	UFBM00407	7.14	5.54	8.99	0.84	5.65	12.45
M5x0.8	UFBM00508-067	7.95	6.32	6.73	1.02	6.43	14.17
M5x0.8	UFBM00508	7.95	6.32	10.54	1.02	6.43	14.17
M6x1.0	UFBM00061-089	9.53	7.92	8.89	1.27	8.03	17.37
M6x1	UFBM00061	9.53	7.92	13.97	1.27	8.03	17.37
M8x1.25	UFBM08125-098	11.13	9.50	9.78	1.27	9.61	20.62
M8x1.25	UFBM08125	11.13	9.50	13.97	1.27	9.61	20.62
M10x1.5	UFBM01015-111	13.96	11.81	11.18	1.65	11.92	24.28
M10x1.5	UFBM01015	13.96	11.81	14.35	1.65	11.92	24.28

# Ultrasert IV Flanged & Test Data



## Ultrasert IV Flanged

The Flanged Ultrasert IV insert has the same characteristics as the standard Ultrasert IV with the added benefit of a flange. The flange provides a large bearing surface which is advantageous in weaker plastics. For high strength assemblies they can be used in a reverse screw entry.

### TEST DATA FROM FLANGE SIDE

		ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
Thread Size	Length (inch)	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in	Tensile lbs
No. 2	.175	6	110	11	200	10	177	13	159
No. 4	.247	15.8	228	23*	338	23*	329	23*	350
No. 6	.308	27	298	45*	598	45*	388	45*	488
No. 8	.354	44	440	85*	831	68	567	90*	583
No. 10	.415	76	622	120	1026	99	748	139	662
1/4"	.550	118	887	210	1717	171	871	213	1100
5/16"	.550	168	980	313	1840	265	1231	316	1618
3/8"	.565	336	1334	534	2306	411	1315	663	2938

		ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
Thread Size	Length (mm)	Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N
M2 & M2.2	4.45	.68	489	1.24	890	1.13	787	1.47*	707
M2.5 & M3	6.27	1.79	1014	2.60*	1503	2.60*	1463	2.60*	1557
M3.5	7.82	3.05	1326	5.08*	2660	5.08*	1726	5.08*	2171
M4	8.99	4.97	1957	9.60*	3696	7.68	2522	10.17*	2593
M5	10.54	8.59	2767	13.56	4564	11.19	3327	15.70	3834
M6	13.97	13.33	3946	23.73	7638	19.32	3874	24.07	4893
M8	13.97	18.98	4359	35.36	8185	29.94	5476	35.70	7197
M10	14.35	37.96	5934	60.33	10258	46.44	5849	74.91	13069

### TEST DATA FOR LOADS APPLIED FROM OPPOSITE END

		ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
Thread Size	Length (inch)	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in	Tensile lbs
No. 2	.175	6	292	11	359	10	367	13	382
No. 4	.247	15.8	573	23*	827	23*	711	23*	840
No. 6	.308	27	846	45*	1294	46*	966	46*	1329
No. 8	.354	44	1161	85*	1952	68	1310	90*	1939
No. 10	.415	76	1251	120	2159	99	1557	139	2113
1/4"	.550	118	1409	210	2369	171	1800	213	2881
5/16"	.550	168	1759	313	2720	265	2003	316	2925
3/8"	.565	336	2714	534	4904	411	3083	663	5678

		ABS		POLYCARBONATE		STRUCTURAL FOAM		NYLON 6/6 30% G.F.	
Thread Size	Length	Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N
M2 & M2.2	4.45	.68	1299	1.24	1597	1.13	1632	1.47*	1699
M2.5 & M3	6.27	1.79	2549	2.60*	3679	2.60*	3163	2.60*	3737
M3.5	7.82	3.05	3763	5.08*	5756	5.08*	4297	5.08*	5912
M4	8.99	4.97	5164	9.60*	8683	7.68	5827	10.17*	8625
M5	10.54	8.59	5565	13.56	9604	11.19	6976	15.70	9399
M6	13.97	13.33	6268	23.73	10538	19.32	8006	24.07	12815
M8	13.97	18.98	7824	35.36	12099	29.94	8910	35.70	13011
M10	14.35	37.96	12072	60.33	21814	46.44	13714	74.91	25257

\* Screw failed.

NOTE: Test data is for long lengths only. Please contact Applications Engineering for short length test data.



# Ultraseal™ Inserts

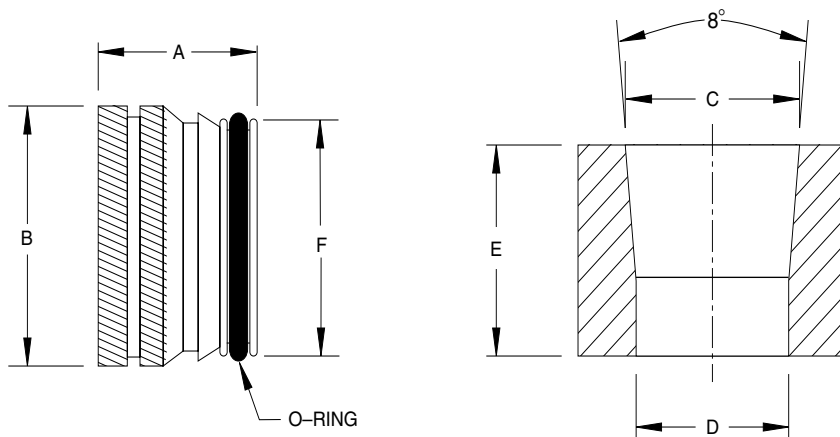
- Provides a pressure tight assembly
- Easy installation and self alignment
- Exceeds rotational and tensile requirements

## Ultraseal™ Pipe Thread Inserts for Plastics

The Ultraseal Pipe Thread Insert is an innovative design that provides a pressure tight seal over a broad range of operating temperatures.

Ultraseal Pipe Thread Inserts are designed to be installed after molding using either ultrasonics or heat. They provide the high performance strength values of molded-in inserts while still retaining all the economical advantages of insert installation after molding.

The O-Ring is the key feature that provides the pressure tight seal. It withstands 600°F installation temperature and will function at operating temperatures up to 400°F. When installed into the recommended hole size it will offer a high performance seal between the plastic and the insert.



INSERT SPECIFICATIONS				HOLE RECOMMENDATION		
Thread Size	Part Number*	Length A	Diameter B	Diameter C	Diameter D	Length Emin
1/8-27	6092-2**BM400	.400	.614	.607	.567	.430
1/4-18	6092-4**BM475	.475	.736	.727	.685	.505
3/8-18	6092-6**BM500	.500	.883	.870	.817	.530

\* Note: To order, complete the part number by adding the code letters which correspond to the type of internal thread required from the chart below. Example: For **1/8-27 NPT brass insert**, the part number will be **6092-2PTBM400**.

THREAD TYPE	
Thread	Code
ANPT	AT
NPT	PT
NPTF	TF
NPSI	SI
NPSF	SF
NPSC	SC

## Assembly Strength Data

Dodge Ultraseal Pipe Thread Inserts provide high tensile and torque loads in addition to their sealing features. The combination of diagonal knurls and undercuts provides a unique anchoring arrangement. Average test values are for reference purposes.

Size	Tensile	Rotational Torque	Recommended Pressure
1/8-27	526 lbs	335 lb.-in	Up to 250 PSI
1/4-18	1000 lbs	575 lb.-in	Up to 250 PSI
3/8-18	1586 lbs	950 lb.-in	Up to 250 PSI

Material: 30% Glass filled nylon 6/6

- Two-piece design allows full thread engagement in minimum space
- Controlled minor diameter assures accurate alignment
- Can be installed with heat as well as molded in

# Ultra-Mold™ Inserts

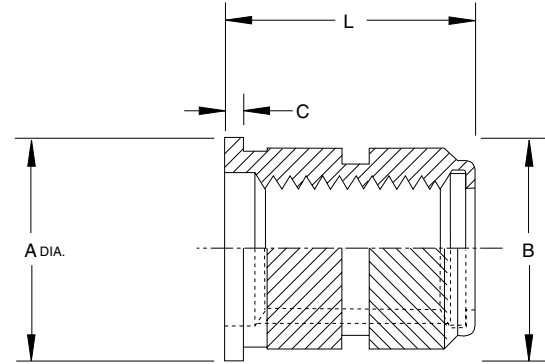


## Ultra-Mold

The Ultra-Mold insert was designed for applications where a molded-in insert is more economical than post molding. The unique two-piece design means that there are full threads throughout the entire length of the insert. No added material is required for imperfect threads and drill point. This saves space and weight. The manufacturing process eliminates machining chips and oil residue that can contaminate plastic molded parts.

The Ultra-Mold insert has a controlled minor diameter which reduces movement during molding and assures accurate alignment of the insert in the part. Ultra-Mold is designed with a unique counterbore that accurately positions the insert over the molding pin and allows easy bolt entry at assembly. The insert design ensures optimum strength performance in a minimum of space.

INCH STANDARD SPECIFICATIONS		Diameter (inches)		Length	Flanged Thickness
Internal Thread Size	Part Number	A ±.008	B ±.010	L ±.005	C ±.005
8-32	6176-2BA297	.281	.250	.297	.020
10-24	6176-3BA347	.312	.280	.347	.025
10-32	6177-3BA347	.312	.280	.347	.025
1/4-20	6176-4BA442	.375	.340	.442	.030
1/4-28	6177-4BA442	.375	.340	.442	.030
5/16-18	6176-5BA556	.438	.405	.556	.035
5/16-24	6177-5BA556	.438	.405	.556	.035
3/8-16	6176-6BA645	.593	.514	.645	.040
3/8-24	6177-6BA645	.593	.514	.645	.040



METRIC STANDARD SPECIFICATIONS		Diameter (mm)		Length	Flanged Thickness
Internal Thread Size	Part Number	A ± 0.13	B ± 0.08	L ± 0.10	C ± 0.08
M4x0.7	6175-4BA075	7.14	6.35	7.55	0.50
M5x0.8	6175-5BA088	7.93	7.12	8.82	0.64
M6x1.0	6175-6BA1123	9.53	8.64	11.23	0.77
M8x1.25	6175-8BA1413	11.13	10.29	14.13	0.89
M10x1.5	6175-10BA1639	15.07	13.06	16.39	1.02

## Ultra-Mold – Test Data

Part Number	Thread Size	ABS		POLYCARBONATE		NYLON 6/6	
		Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs
6176-2BA297	8-32	54	456	69	593	85	813
6176-3BA347	10-24	85	632	107	744	128	1137
6177-3BA347	10-32	85	632	107	744	128	1137
6176-4BA442	1/4-20	170	993	249	1393	230	1454
6177-4BA442	1/4-28	170	993	249	1393	230	1454
6176-5BA556	5/16-18	302	1428	457	2097	389	2957
6177-5BA556	5/16-24	302	1428	457	2097	389	2957
6176-6BA645	3/8-16	538	2138	567	2710	812	4107
6177-6BA645	3/8-24	538	2138	567	2710	812	4107

Part Number	Thread Size	ABS		POLYCARBONATE		NYLON 6/6	
		Rotation N-m	Tensile N	Rotation N-m	Tensile N	Rotation N-m	Tensile N
6175-4BA075	M4x0.7	6.10	2028	7.80	2638	9.60	3616
6175-5BA088	M5x0.8	9.60	2811	12.15	3311	14.46	5057
6175-6BA1123	M6x1	19.21	4417	28.13	6196	25.99	6467
6175-8BS1413	M8x1.25	34.12	6352	51.63	9327	43.95	13153
6175-10BA1639	M10x1.5	60.78	9510	64.06	12054	91.74	18268



Ultra-Mold Conventional

The unique two-piece design allows full and complete threads throughout the entire length of the insert. No extra material is needed for imperfect threads and drill point. This saves space and weight; it also reduces costs.



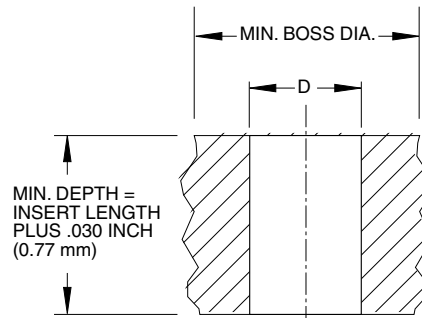
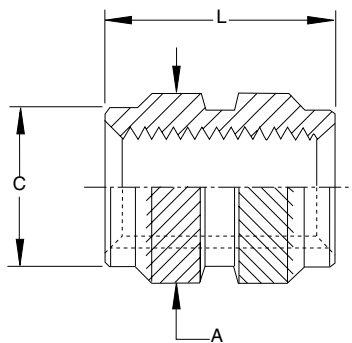
# Miniature Inserts

- Available in flanged and symmetrical styles
- Lead in pilot positions insert for installation
- Designed for installation into straight holes
- Can be molded in or installed with heat

## Miniature Inserts

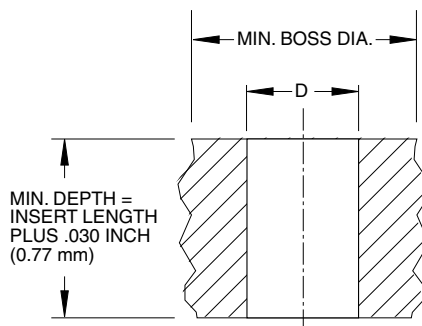
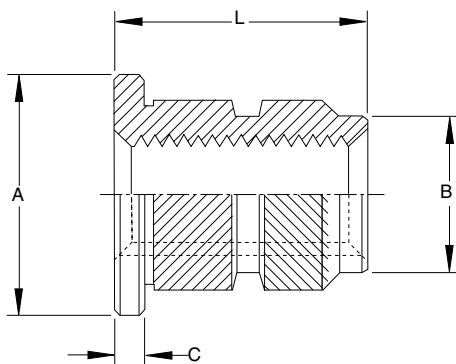
Dodge Miniature Inserts are designed to meet the requirements of today's electronic, telecommunications and computer markets. The trend towards more miniaturized and compact consumer products has necessitated the use of smaller screws which must be reusable without the possibility of thread damage. Dodge Miniature Inserts provide the strong, reusable threads designers need. They are available in two styles. The symmetrical style is designed for high production. They can be loaded and fed through automatic installation equip-

ment without the need for special orientation. This eliminates the time required for orientation, which lowers overall cost by increasing productivity. The flanged style insert provides a larger bearing surface for electrical contact and greater strength in weaker plastics. Both inserts are designed with opposing diagonal knurls and undercuts for exceptional rotational and tensile strength. They can be installed with heat or molded in.



## SYMMETRICAL STYLE INSERT

INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS		
Internal Thread Size	Part Number	Diameters		Length	Diameter D + 0.05 - 0.00	Minimum Boss Diameter	
		A ± 0.10	B ± 0.08	L ± 0.13			
M1.6x0.35	6200-1.6BR030	2.50	2.06	3.00	2.14	4.63	



## FLANGED STYLE INSERT

INSERT SPECIFICATIONS (mm)						HOLE SIZE RECOMMENDATIONS	
Flanged Miniature		Diameter		Length	Flange Thickness	Diameter D + 0.05 - 0.00	Minimum Boss Diameter
Thread Size	Part Number	A ± 0.13	B ± 0.08	L ± 0.13	C ± 0.10		
M1.6x0.35	6201-1.6BR033	3.18	2.06	3.31	0.41	2.14	4.63

# Compression Limiters



## Compression Limiters

Dodge offers compression limiters for applications where the tightening load of the bolt or screw will compress, crack or otherwise damage the plastic component. Compression limiters are non-threaded bushings made of various materials. They are designed with various knurl configurations and undercuts in order to meet the

strength requirements of the specific application. These inserts can be installed with heat or ultrasonics, or they can be pressed in place. Our Dodge Applications Engineers are available and ready to assist you in the design and development of the optimum bushing for your application. We can also provide sample parts and test data.

- Eliminate cracking of plastic parts due to bolt load
- Can be pressed in or installed with heat or ultrasonics
  - Custom designed for each application





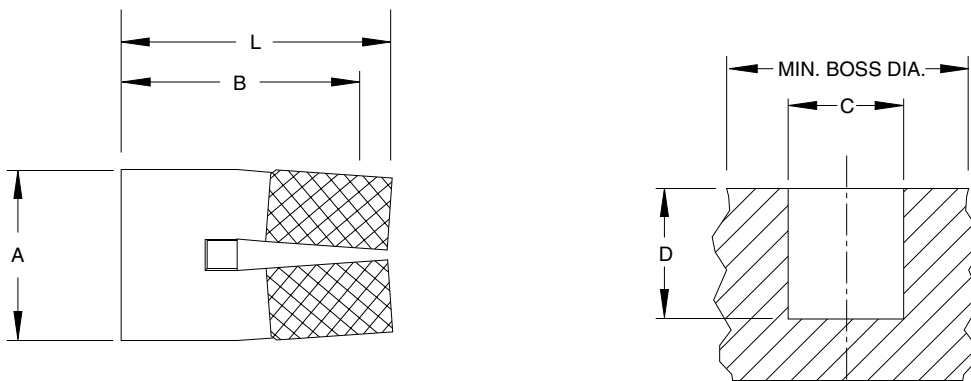
# Standard Expansion

- Versatile — can be used in any type of plastic
- Simple press-in installation

## Standard Expansion Inserts

Standard Expansion Inserts are easy to install, two-piece, brass, expandable inserts for use in blind holes in thermoset or thermoplastic materials. When the captivated spreader plate is depressed, the knurled portion of the insert expands, permanently anchoring the insert in the hole.

If desired, the insert can be installed to protrude above the surface of the part to act as an assembly-locating device.



INCH INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS		
Standard Expansion		Body Diameter	Installed Length	Minimum Threaded Length B	Diameter*	Depth	Minimum Boss Diameter
Thread Size	Part Number	A ± .003	L ± .004		C ± .001	D Ref.	
4-40	70015-04-250	.156	.250	.178	.158	.250	.312
5-40	70015-05-313	.188	.313	.240	.190	.313	.376
6-32	70015-06-313	.188	.313	.240	.190	.313	.376
6-32	70015-06-375	.188	.375	.303	.190	.375	.376
8-32	70015-2-313	.219	.313	.240	.221	.313	.438
8-32	70015-2-375	.219	.375	.303	.221	.375	.438
10-24	70015-3-375	.250	.375	.303	.252	.375	.500
10-24	70015-3-438	.250	.438	.365	.252	.438	.500
10-32	70011-3-313	.250	.313	.240	.252	.313	.500
10-32	70011-3-375	.250	.375	.303	.252	.375	.500
10-32	70011-3-438	.250	.438	.365	.252	.438	.500
1/4-20	70015-4-500	.313	.500	.428	.315	.500	.626
5/16-18	70015-5-625	.438	.625	.537	.440	.625	.876

\*Diameter "C" is for Thermoset Plastics. For Thermoplastic materials, refer to page 25.

METRIC INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS		
Standard Expansion		Body Diameter	Installed Length	Minimum Threaded Length B (mm)	Diameter*	Depth	Minimum Boss Diameter
Thread Size	Part Number	A (mm) ± 0.08	L (mm) ± 0.10		C (mm) ± 0.03	D (mm) Ref.	
M3x0.5	70017-3-064	3.96	6.40	4.52	4.01	6.40	7.92
M3.5x0.6	70017-3.5-080	4.78	8.00	6.10	4.83	8.00	9.56
M4x0.7	70017-4-080	5.56	8.00	6.10	5.61	8.00	11.12
M4x0.7	70017-4-095	5.56	9.50	7.70	5.61	9.50	11.12
M5x0.8	70017-5-080	6.35	8.00	6.10	6.40	8.00	12.70
M5x0.8	70017-5-095	6.35	9.50	7.70	6.40	9.50	12.70
M6x1	70017-6-127	7.95	12.70	10.87	8.00	12.70	15.90

\*Diameter "C" is for Thermoset Plastics. For Thermoplastic materials, refer to page 25.

# Standard Expansion Test Data



## EXPANSION INSERT — TEST DATA\*

EXPANSION INSERTS			ABS		POLYCARBONATE		PHENOLIC	
Inch Size	Metric Size	Insert Length	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs
No. 4	M2.5	.250	13	105	24*	215	24*	171
No. 5	—	.313	21	181	31	239	35*	196
No. 6	M3 & M3.5	.375	22	173	34	231	41*	199
No. 8	M4	.375	44	257	54	317	73*	318
No. 10	M5	.438	55	342	81	354	93	364
1/4	M6	.500	88	436	101	465	97	497
5/16	—	.625	1105	606	133	699	110	600

\*To achieve maximum strength, spreader plate must be pushed to the bottom of the hole as shown in Fig. 2.

## Expansion Principle

- Standard
- Flange
- Clinch Inserts

These inserts are two piece units consisting of threaded insert and a captivated spreader plate. When this spreader plate is depressed, the knurled portion of the insert expands and anchors the insert in the hole.

Expansion inserts must be expanded by depressing the spreader plate prior to insertion of the screw. The screw will not expand the insert and lock it in place.

The Expansion Inserting Tooling shown on page 27 provides an economical and efficient means of installing the inserts.

The Dodge hand tool works best in thermoset materials. Since the receiving hole diameter is .002 larger than the insert diameter, the insert drops freely into the hole and is ready to be expanded using this tool.

Fig. 1

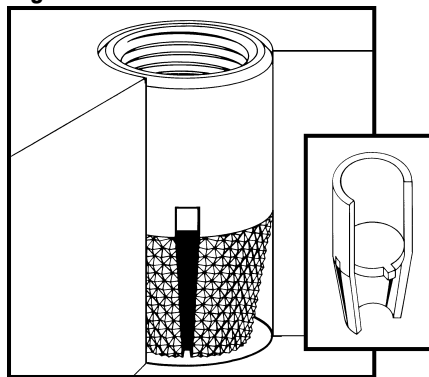
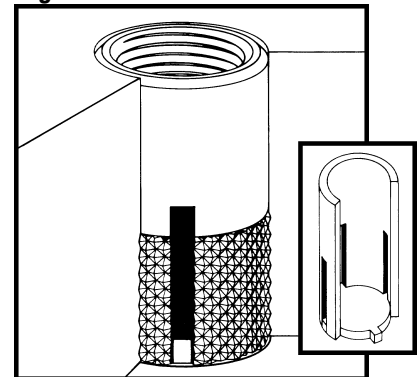


Fig. 2



Expansion inserts are to be used **only** in blind holes.

**For thermoplastic materials, the receiving hole diameter is .003 smaller than the insert diameter.**

Because there is interference, the insert **must** be pressed to the bottom of the hole prior to expanding it. The shoulder on the tool installs the insert. Once it has bottomed, tension on an internal spring is overcome and the punch depresses the spreader plate permanently anchoring the insert in the hole.

**DO NOT push the spreader plate too deep. This will reduce the holding strength of the insert significantly.**

## NOTE...

The test data should be considered as average values for the general families of plastics indicated. Critical application requirements may necessitate further specific testing.

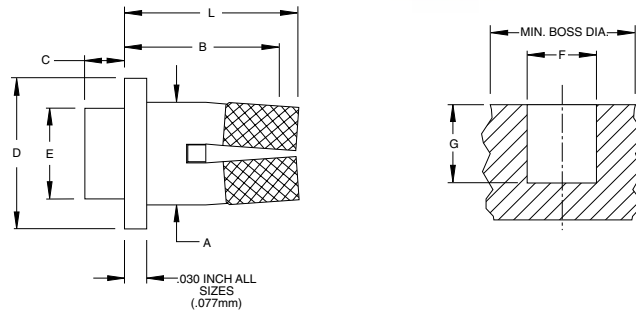
The plastic material failed in all cases except where noted.



# Clinch and Flange Expansion Inserts

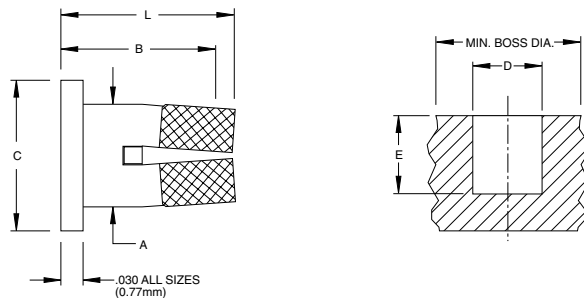


- Same superior design characteristics as Standard Expansion Inserts
- Simple installations



INSERT SPECIFICATIONS							HOLE SIZE RECOMMENDATIONS				
Inch Clinch Expansion		Body Diameter	Installed Length	Minimum Threaded Length B	Clinch Height		Flange Diameter	Clinch O.D.	Diameter*	Depth	Minimum Boss Diameter
Thread Size	Part Number	A ± .003	L ± .004		C +.012 - .000	D ± .003	E ± .002	F ± .001	G Ref.		
4-40	70515-04A250	.156	.250	.178	.040	.219	.138	.158	.250	.312	
4-40	70515-04B226	.156	.226	.154	.064	.219	.138	.158	.226	.312	
6-32	70515-06A313	.188	.313	.240	.040	.250	.164	.190	.313	.376	
6-32	70515-06B289	.188	.289	.216	.064	.250	.164	.190	.289	.376	
8-32	70515-2A375	.219	.375	.303	.040	.281	.190	.221	.375	.438	
8-32	70515-2B351	.219	.351	.279	.064	.281	.190	.221	.351	.438	
**Metric Clinch Expansion		Body Diameter	Installed Length	Minimum Threaded Length B	Clinch Height		Flange Diameter	Clinch O.D.	Diameter*	Depth	Minimum Boss Diameter
Thread Size	Part Number	A ± 0.08	L ± 0.10		C +0.30 - 0.00	D ± 0.08	E ± 0.05	F ± 0.03	G Ref.		
M3x0.5	70517-3A064	3.96	6.40	4.52	1.00	5.56	3.51	4.01	6.40	7.42	
M3.5x0.6	70517-3.5A080	4.78	8.00	6.10	1.00	6.35	4.17	4.82	8.00	9.56	
M4x0.7	70517-4A095	5.56	9.50	7.70	1.00	7.14	4.83	5.61	9.50	11.12	

\*Diameter "F" is for Thermoset Plastics. For Thermoplastic materials, refer to page 25. \*\*Dimensions are in millimeters.



INSERT SPECIFICATIONS						HOLE SIZE RECOMMENDATIONS		
Inch Flange Expansion		Body Diameter	Installed Length	Minimum Threaded Length B	Flange Diameter	Diameter*	Depth	Minimum Boss Diameter
Thread Size	Part Number	A ± .003	L ± .004		C ± .003	D ± .001	E Ref.	
4-40	70315-04-219	.156	.219	.146	.219	.158	.219	.312
6-32	70315-06-281	.188	.281	.209	.250	.190	.281	.376
8-32	70315-2-281	.219	.281	.209	.281	.221	.281	.438
10-24	70315-3-313	.250	.313	.240	.313	.252	.313	.500
10-32	70311-3-313	.250	.313	.240	.313	.252	.313	.500
1/4-20	70315-4-438	.313	.438	.365	.406	.315	.438	.626
**Metric Flange Expansion		Body Diameter	Installed Length	Minimum Threaded Length B	Flange Diameter	Diameter*	Depth	Minimum Boss Diameter
Thread Size	Part Number	A ± 0.08	L ± 0.10		C ± 0.08	D ± 0.03	E Ref.	
M3x0.5	70317-3-056	3.96	5.60	3.71	5.56	4.01	5.60	7.92
M3.5x0.6	70317-3.5-071	4.78	7.10	5.31	6.35	4.82	7.10	9.56
M4x0.7	70317-4-071	5.56	7.10	5.31	7.14	5.61	7.10	11.12
M5x0.8	70317-5-080	6.35	8.00	6.10	7.95	6.40	8.00	12.70
M6x1	70317-6-111	7.95	11.10	9.27	10.31	8.00	11.10	15.90

\*Diameter "D" is for Thermoset Plastics. For Thermoplastic materials, refer to page 25. \*\*Dimensions are in millimeters.



# Clinch and Flange Test Data



## Clinch Insert

Clinch inserts feature a pilot and a flange and have the same design characteristics as Standard Expansion Inserts. The inserts are used extensively in the electrical industry. The pilot can be clinched over a terminal connector with the flange providing a large surface for electrical contact. The installation and clinching operations are simultaneous using a simple press-in type tool. Like the Flange Insert, much of the installation force is absorbed by the flange allowing use in thin-section applications.

## Flange Insert

The Flange Insert in addition to having all of the design features of the Standard Insert, has a flange with a large bearing surface. The flange can be used to make an electrical contact or to fasten a terminal connector. The flange can also be used to join mating parts by inserting the body of the insert through the mating part and into the receiving hole in the parent material. The insert is excellent for use in thin-section applications since the flange absorbs much of the installation force.

## EXPANSION INSERT — TEST DATA\*

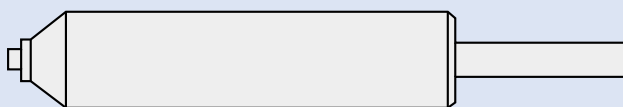
EXPANSION INSERTS			ABS		POLYCARBONATE		PHENOLIC	
Inch Size	Metric Size	Insert Length	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs	Rotation lb-in.	Tensile lbs
No. 4	M2.5	.250	13	105	24*	215	24*	171
No. 5	—	.313	21	181	31	239	35*	196
No. 6	M3 & M3.5	.375	22	173	34	231	41*	199
No. 8	M4	.375	44	257	54	317	73*	318
No. 10	M5	.438	55	342	81	354	93	364
1/4	M6	.500	88	436	101	465	97	497
5/16	—	.625	1105	606	133	699	110	600

\*To achieve maximum strength, spreader plate must be pushed to the bottom of the hole as shown in Fig. 2 on page 25.

## NOTE...

The test data should be considered as average values for the general families of plastics indicated. Critical application requirements may necessitate further specific testing. The values shown are for Standard Expansion Inserts. These values would also apply to Flange and Clinch Inserts of comparable lengths.

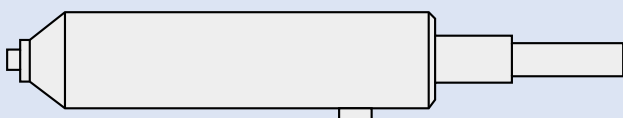
## Expansion Insert Tooling



**Semi-Automatic Model.** May be used to install Dodge Standard Flange and Wedge Inserts. The tool consists essentially of a punch and a spring-loaded sleeve. It **must** be chucked in an arbor press or foot press. It is **not** designed to be driven by a hammer. Basic part number is 79005 for inch and 79027 for metric.



**Hand Tool.** May be used to install Dodge Standard, Flange and Wedge Inserts. The tool may be used with hammer or chuck in an arbor press or foot press. Basic part number is 79015 for inch and 79017 for metric.



**The Clinch Insert Model.** Designed to install and crimp Dodge Clinch Inserts. The tool consists of a punch and a spring-loaded sleeve with a radius section which crimps the eyelet portion of the insert over the mating component. It must be chucked in an arbor press or foot press. Basic part number is 79035 for inch and 79047 for metric.

## Ordering Information

EXPANSION INSERT TOOLING — INCH			
Inch Size	Semi-Automatic	Clinch Tool	Hand Tool*
No. 4	79005-04	79035-04	79015-04***
No. 5	79005-05	—	79015-05***
No. 6	79005-06	79035-06	79015-06***
No. 8	79005-2	79035-2	79015-2***
No. 10	79005-3	—	79015-3***
1/4"	79005-4	—	79015-4***
5/16"	79005-5	—	79015-5***

\*The length of the insert being used must be included in the hand tool part number.

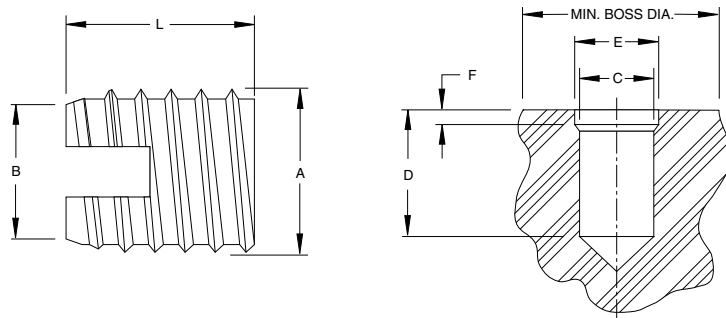
EXPANSION INSERT TOOLING — METRIC			
Metric Size	Semi-Automatic	Clinch Tool	Hand Tool*
M3	79027-3	79047-3	79017-3***
M3.5	79027-3.5	79047-3.5	79017-3.5***
M4	79027-4	79047-4	79017-4***
M5	79027-5	—	79017-5***
M6	79027-6	—	79017-6***

\*The length of the insert being used must be included in the hand tool part number.



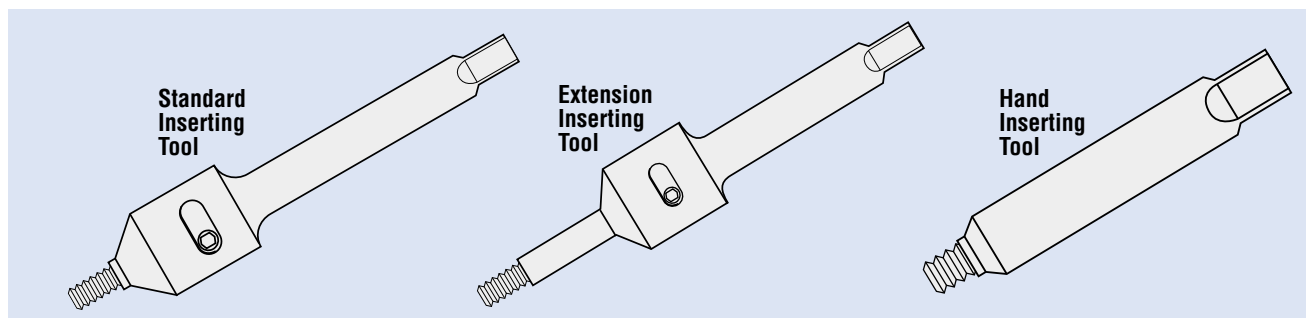
# Self Threading Inserts

- Install easily into thermoset or thermoplastic materials
- Slots provide rapid cutting action



INSERT SPECIFICATIONS					HOLE SIZE RECOMMENDATIONS					
Inch Self Threading Inserts		Body Diameter	Length	Pilot Diameter	Hole Diameter		Hole Depth	Counter Diameter	Bore Depth	Minimum Boss Diameter
Thread Size	Part Number	A ± .006	L ± .010	B Ref.	C Thermoset	C Thermoplastic	D Ref.	E ± .001	F Ref.	
2-56	ST086-56	.141	.187	.122	.129/.127	.124/.127	.225	.141	.032	.280
4-40	ST112-40	.172	.234	.149	.156/.152	.149/.152	.281	.172	.042	.344
6-32	ST138-32	.219	.281	.189	.198/.194	.190/.194	.337	.219	.050	.437
8-32	ST164-32	.250	.328	.219	.230/.226	.222/.226	.394	.250	.050	.500
10-24	ST190-24	.297	.375	.261	.270/.264	.259/.264	.450	.295	.056	.594
10-32	ST190-32	.297	.375	.261	.270/.264	.259/.264	.450	.295	.056	.594
1/4-20	ST250-20	.375	.484	.330	.343/.336	.330/.336	.581	.375	.063	.750
1/4-28	ST250-28	.375	.484	.330	.343/.336	.330/.336	.581	.375	.063	.750
Metric Self *Threading Inserts		Body Diameter	Length	Pilot Diameter	Hole Diameter		Hole Depth	Counter Diameter	Bore Depth	Minimum Boss Diameter
Thread Size	Part Number	A ± 0.15	L ± 0.25	B Ref.	C Thermoset	C Thermoplastic	D Ref.	E ± 0.03	F Ref.	
M2x0.4	STM2x0.4	3.58	4.75	3.10	3.28/3.23	3.17/3.24	5.72	3.58	.81	7.2
M2.2x0.45	STM2.2x0.45	3.58	4.75	3.10	3.28/3.23	3.17/3.24	5.72	3.58	.81	7.2
M2.5x0.45	STM2.5x0.45	4.37	5.94	3.35	3.96/3.86	3.78/3.86	7.14	4.37	1.07	8.7
M3x0.5	STM3x0.5	5.56	7.14	4.32	5.03/4.93	4.83/4.93	8.56	5.56	1.27	11.1
M3.5x0.6	STM3.5x0.6	5.56	7.14	4.32	5.03/4.93	4.83/4.93	8.56	5.56	1.27	11.1
M4x0.7	STM4x0.7	6.35	8.33	4.95	5.84/5.74	5.63/5.74	10.01	6.35	1.27	12.7
M5x0.8	STM5x0.8	7.54	9.53	5.89	6.86/6.71	6.58/6.71	11.43	7.50	1.42	15.1
M6x1	STM6x1	9.53	12.29	7.67	8.71/8.53	8.38/8.58	14.76	9.53	1.60	19.1

\*Dimensions are in millimeters

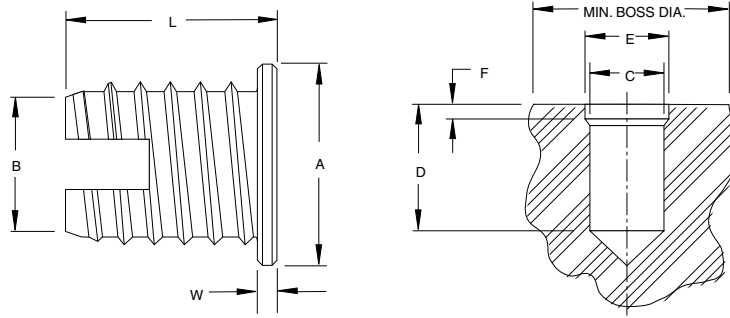


SELF THREADING TOOLING — INCH			
Inch Size	STANDARD Inserting Tool Part No.	EXTENSION Inserting Tool Part No.	HAND Inserting Tool Part No.
2-56	5301-02	5301-02-15	5311-02
4-40	5301-04	5301-04-15	5311-04
6-32	5301-06	5301-06-15	5311-06
8-32	5301-2	5301-2-15	5311-2
10-24	5301-3	5301-3-15	5311-3
10-32	5302-3	5302-3-15	5312-3
1/4-20	5301-4	5301-4-15	5311-4
1/4-28	5302-4	5302-4-15	5312-4

SELF THREADING TOOLING — METRIC			
Metric Size	STANDARD Inserting Tool Part No.	EXTENSION Inserting Tool Part No.	HAND Inserting Tool Part No.
M2x0.4	5370-2	5370-2-15	5380-2
M2.2x0.45	5370-2.2	5370-2.2-15	5380-2.2
M2.5x0.45	5370-2.5	5370-2.5-15	5380-2.5
M3x0.5	5370-3	5370-3-15	5380-3
M3.5x0.6	5370-3.5	5370-3.5-15	5380-3.5
M4x0.7	5370-4	5370-4-15	5380-4
M5x0.8	5370-5	5370-5-15	5380-5
M6x1	5370-6	5370-6-15	5380-6

- Flange provides larger bearing surface
- Slots provide rapid cutting action

# Flanged Self Threading



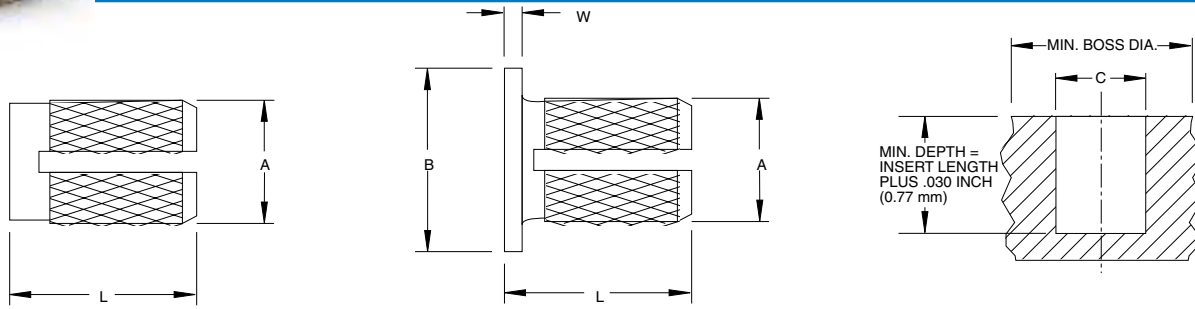
INSERT SPECIFICATIONS						HOLE RECOMMENDATION				
Inch Series Flanged Self-Threading Inserts		Pilot Diameter	Flange Diameter	Flange Thickness	Length	Hole Diameter		Hole Depth	Counterbore	
Thread Size	Part Number	A Ref.	B ± .005	W ± .004	L ± .010	C Thermoset	C Thermoplastic	D Ref.	E Ref.	F Ref.
2-56	STF086-56	.122	.186	.020	.228	.129-.127	.127-.124	.266	.141	.032
4-40	STF112-40	.132	.218	.025	.298	.156-.152	.152-.149	.345	.172	.042
6-32	STF138-32	.170	.250	.030	.355	.198-.194	.194-.190	.412	.219	.050
8-32	STF164-32	.195	.281	.035	.360	.230-.226	.226-.222	.426	.250	.050
10-24	STF190-24	.232	.375	.040	.404	.270-.264	.264-.259	.480	.270	.056
10-32	STF190-32	.232	.375	.040	.404	.270-.264	.264-.259	.480	.270	.056
1/4-20	STF250-20	.302	.438	.045	.460	.343-.336	.336-.330	.557	.375	.063
1/4-28	STF250-28	.302	.438	.045	.460	.343-.336	.336-.330	.557	.375	.063

INSERT SPECIFICATIONS						HOLE RECOMMENDATION				
Metric Series Flanged Self-Threading Inserts		Pilot Diameter	Flange Diameter	Flange Thickness	Length	Hole Diameter		Hole Depth	Counterbore	
Thread Size	Part Number	A Ref.	B ± 0.13	W ± 0.10	L ± 0.25	C Thermoset	C Thermoplastic	D Ref.	E Ref.	F Ref.
M2x0.4	STFM2x0.4	3.10	4.72	.51	5.80	3.28-3.23	3.24-3.17	6.76	3.58	.81
M2.2x0.45	STFM2.2x0.45	3.10	4.72	.51	5.80	3.28-3.23	3.24-3.17	6.76	3.58	.81
M2.5x0.45	STFM2.5x0.45	3.35	5.54	.64	7.57	3.96-3.86	3.86-3.78	8.76	4.37	1.07
M3x0.5	STFM3x0.5	4.32	6.35	.76	9.02	5.03-4.93	4.93-4.83	10.46	5.56	1.27
M3.5x0.6	STFM3.5x0.6	4.32	6.35	.76	9.02	5.03-4.93	4.93-4.83	10.46	5.56	1.27
M3x0.7	STFM4x0.7	4.95	7.14	.89	9.15	5.84-5.74	5.74-5.63	10.82	6.35	1.27
M5x0.8	STFM5x0.8	5.89	9.53	1.02	10.27	6.86-6.71	6.71-6.58	12.19	6.86	1.42
M6x1	STFM6x1	7.67	11.13	1.14	11.69	8.71-8.53	8.58-8.38	14.15	9.53	1.60



# Spred-Lok

- Fast and easy press-in installation into any type of plastic
- Screw expands insert locking it in place permanently



STANDARD INCH SIZES		DIMENSIONS		HOLE SIZE RECOMMENDATIONS	
Thread Size	Part Number	DIA. A ± .005	LENGTH L ± .004	Hole Size Ref. C	Minimum Boss Dia.
4-40	74115-04	.166	.188	.156	.332
6-32	74115-06	.199	.250	.188	.398
8-32	74115-2	.230	.313	.219	.460
10-24	74115-3	.262	.375	.250	.524
10-32	74111-3	.262	.375	.250	.524
1/4-20	74115-4	.326	.500	.313	.652

STANDARD METRIC SIZES		DIMENSIONS		HOLE SIZE RECOMMENDATIONS	
Thread Size	Part Number	DIA. A ± 0.13	LENGTH L ± 0.10	Hole Size Ref. C	Minimum Boss Dia.
M3x0.5	74117-3	4.22	4.78	3.96	8.43
M3.5x0.6	74117-3.5	5.05	6.35	4.78	10.11
M4x0.7	74117-4	5.84	7.95	5.56	11.68
M5x0.8	74117-5	6.65	9.53	6.35	13.31
M6x1	74117-6	8.28	12.70	7.95	16.56

FLANGED INCH SIZES		DIMENSIONS				HOLE SIZE RECOMMENDATIONS	
Thread Size	Part Number	DIA. A ± .005	LENGTH L ± .004	FLANGE DIA. B ± .005	FLANGE WIDTH W ± .004	Hole Size Ref. C	Minimum Boss Dia.
4-40	74215-04	.166	.188	.219	.022	.156	.332
6-32	74215-06	.199	.250	.250	.028	.188	.398
8-32	74215-2	.230	.313	.281	.035	.219	.460
10-24	74215-3	.262	.375	.313	.043	.250	.524
10-32	74211-3	.262	.375	.313	.043	.250	.524
1/4-20	74215-4	.326	.500	.375	.050	.313	.652

FLANGED METRIC SIZES		DIMENSIONS				HOLE SIZE RECOMMENDATIONS	
Thread Size	Part Number	DIA. A ± 0.13	LENGTH L ± 0.10	FLANGE DIA. B ± 0.13	FLANGE WIDTH W ± 0.10	Hole Size Ref. C	Minimum Boss Dia.
M3x0.5	74217-3	4.22	4.78	5.56	.56	3.96	8.43
M3.5x0.6	74217-3.5	5.05	6.35	6.35	.71	4.78	10.11
M4x0.7	74217-4	5.84	7.95	7.14	.89	5.56	11.68
M5x0.8	74217-5	6.65	9.53	7.95	1.09	6.35	13.31
M6x1	74217-6	8.28	12.70	9.53	1.27	7.95	16.56

- Ideal for prototype shops and engineering staff
- Recommended for small jobs or prototype development projects
- Complete size range for most applications

## Ultrasert II Assortment Kits

- Kits provide design flexibility by including two insert lengths for each thread size.



### Ultrasert II Inch Assortment Kit Part No. 6107

Size	Part No.	Qty.	Size	Part No.	Qty.
#2-56	6035-02BR115	300	#8-32	6035-2BR185	150
#2-56	6035-02BR188	300	#8-32	6035-2BR312	150
#4-40	6035-04BR135	250	#10-32	6041-3BR225	100
#4-40	6035-04BR219	250	#10-32	6041-3BR375	100
#6-32	6035-06BR150	200	1/4-20	6035-4BR300	50
#6-32	6035-06BR250	200	1/4-20	6035-4BR500	50

### Ultrasert II Metric Assortment Kit Part No. 6108

Size	Part No.	Qty.	Size	Part No.	Qty.
M2.5x0.45	6075-2.5BR034	250	M4x0.7	6075-4BR047	150
M2.5x0.45	6075-2.5BR056	250	M4x0.7	6075-4BR079	150
M3x0.5	6075-3BR038	200	M5x0.8	6075-5BR067	100
M3x0.5	6075-3BR064	200	M5x0.8	6075-5BR111	100
M3.5x0.6	6075-3.5BR038	200	M6x1	6075-6BR076	50
M3.5x0.6	6075-3.5BR064	200	M6x1	6075-6BR127	50

Each kit contains commonly used thread sizes. Kits are available in both inch and metric inserts. A slide chart containing insert data and instructions for hole preparation is included in each kit.

## Research & Development Kits



- Kits provide design flexibility by including two insert lengths for each thread size.
- Soldering iron and installation tips are included for each thread size.

### Inch Research & Development Kit Part No. 6102

Size	Part No.	Qty.	Size	Part No.	Qty.
#4-40	6035-04BR135	100	#10-24	6035-3BR225	50
#4-40	6035-04BR219	100	#10-24	6035-3BR375	50
#6-32	6035-06BR150	100	#10-32	6041-3BR225	50
#6-32	6035-06BR250	100	#10-32	6041-3BR375	50
#8-32	6035-2BR185	50	1/4-20	6035-4BR300	25
#8-32	6035-2BR312	50	1/4-20	6035-4BR500	25

### Metric Research & Development Kit Part No. 6103

Size	Part No.	Qty.	Size	Part No.	Qty.
M2.5x0.45	6075-2.5BR034	100	M4x0.7	6075-4BR047	50
M2.5x0.45	6075-2.5BR056	100	M4x0.7	6075-4BR079	50
M3x0.5	6075-3BR038	75	M5x0.8	6075-5BR067	35
M3x0.5	6075-3BR064	75	M5x0.8	6075-5BR111	35
M3.5x0.6	6075-3.5BR038	75	M6x1	6075-6BR076	25
M3.5x0.6	6075-3.5BR064	75	M6x1	6075-6BR127	25

# Insert Installation & Troubleshooting

## ULTRASONIC INSTALLATION

Ultrasonic installation is recommended for all but the largest insert sizes. Ultrasonic installation generally results in very consistent, stress free assemblies with very short cycle times. In Ultrasonic insertion, the metal insert is designed to partially enter a cored or drilled hole in the thermoplastic part. The vibrating ultrasonic horn contacts the insert causing the vibration to travel through to the interface of the metal insert and the plastic part. Heat generated as a result of the vibration causes the plastic to effectively mold itself to the knurls and undercuts of the insert permanently locking the insert in place.

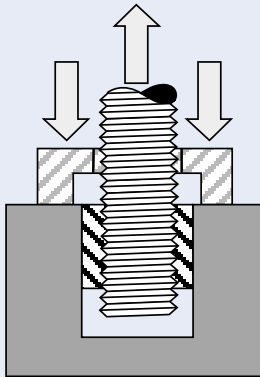
## HEATED INSERT INSTALLATION

Inserts may be installed into thermoplastic materials using various sources of electrically generated energy to heat the insert above the melting point of the thermoplastic part. Inserts may be preheated then pressed into the plastic part or the insert may be piloted into a cored or drilled hole in the plastic part then heated by conduction. Heated insert installation provides a stress free assembly and is recommended for very large insert sizes or when the required fixturing or noise levels associated with ultrasonic installation are prohibitive.

## INSTALLATION OF EXPANSION INSERTS

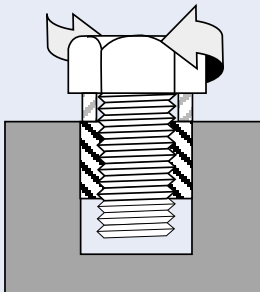
Dodge expansion inserts are easily installed in both high and low production applications. Dodge manufactures hand tools and semi-automatic tools which can be fitted to manual or powered presses. Part numbers and description for installation tools can be found on page 27.

POTENTIAL SOLUTIONS	P R O B L E M									
	Insufficient insert strength (pullout, rotation)	Insert not completely seated	Excessive installation time	Excessive flash on top surface	Excessive flash under insert	Plastic boss bulges or cracks	Welder overloads (cuts out)	Insert damaged (deformed)	Insert raises above top surface after top installation	Installation too noisy
Increase hole diameter										
Increase hole depth										
Increase boss diameter										
Decrease hole diameter										
Verify plastic melt										
Incorrect fixture design										
Countersink/Counterbore hole										
Increase amplitude										
Increase pressure										
Increase weldtime										
Decrease downspeed										
Increase hold time										
Decrease pressure										
Decrease amplitude										
Decrease weld time										
Adjust welder stroke stop										
Pre-trigger ultrasonic energy										
Tune power supply										
Tighten horn, booster, transducer joints										
Use more powerful (wattage) welder										



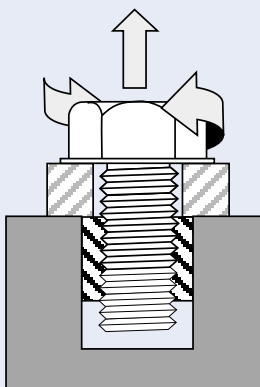
## TENSILE STRENGTH

Axial force required to pull the insert out of the parent material at least .020 inches (.5mm).



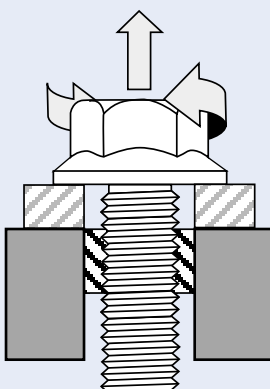
## ROTATIONAL TORQUE

Rotational force required to rotate the insert in the parent material. Note that the hardened steel spacer only hits on the insert. It is a good comparative measure of the overall strength of the assembly.



## CLAMPLOAD TORQUE

Rotational force required to rotate the insert in the parent material. Note that the hardened steel spacer hits both the parent material and the insert. Mainly used as a strength measure for compression limiters.



## JACK-OUT TORQUE

Rotational force required to pull the insert out of the parent material. Note that the hardened steel spacer only hits the parent material. This will allow both rotational and axial forces to be applied simultaneously. The ultimate test of assembly strength. Results may vary depending on the type of bolt used.

- Automotive
- Medical
- Electronics
- Communications

“It’s only the beginning”



## Put DODGE to the test...

Our engineers are fastening specialists who take pride in their ability to ***exceed your performance requirements while minimizing costs***. The DODGE database contains thousands of custom insert designs which may meet your requirements or we can create a new design specifically for your application. Send Dodge your existing insert design and we will refine it to increase performance and reduce your costs.





# JACK NUT® Threaded Inserts

The **JACK NUT** Threaded Insert is an economical blind fastener designed for assembly-line use in thin, soft, or brittle materials. When tightened, the body collapses to form legs which grip the inside of the mounting surface, leaving a permanent, reusable threaded insert. Available in steel, brass, and steel with PVC or Raintite® coating.



Standard **JACK NUT** Threaded Inserts are manufactured of steel with commercial zinc plating. Brass is available upon special request (brass requires a 50,000 piece minimum order).

All **JACK NUT** threaded inserts can be supplied with coated flanges. Two types of coatings are offered. The first, called Raintite®, is used for sealing ambient moisture. The second is a hard plastic coating (PVC) which is used in areas where additional protection is needed against scratching (for example, painted panels). Both can also assist with galvanic corrosion concerns.

## FEATURES

- *Fastens in blind holes*
- *Won't distort or deform soft plastics or thin sheet metals*
- *Fast, inexpensive, and easy to use*
- *Not hole-size sensitive*
- *Fastens securely despite burrs or uneven substrate*
- *Available with "Plastisol" coating for sealing purposes*
- *Suitable for a wide grip range*
- *Can be set with manual or pneumatic tools*
- *Removable*

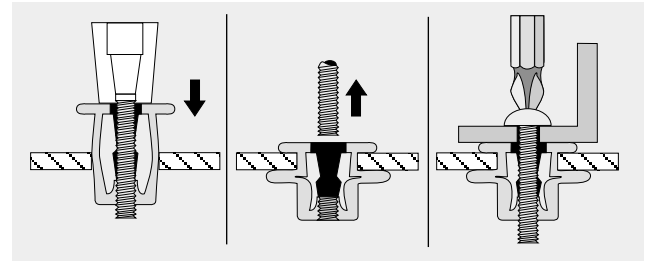
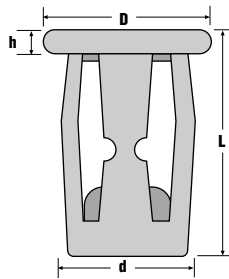
## APPLICATIONS

- *Toys*
- *Plastic furniture*
- *Spoilers and other aerodynamic devices*
- *License plate brackets*
- *High-lamp stop lights*
- *Mirrors*
- *Air-conditioning condensers*
- *Fuse boxes*
- *Glove compartments*
- *Speaker housings*
- *Decorative trim*
- *Latch mountings*
- *Truck utility compartments*
- *Luggage carriers*
- *Resonators*

**AND MUCH MORE!**

# JACK NUT® Threaded Inserts

## HOW TO INSTALL



1. Thread JACK NUT insert onto mandrel of installation tool, then insert all the way into predrilled hole until flange is firmly against mounting surface.
2. Fully collapse insert, then remove installation tool.
3. Pass machine screw through part to be fastened, then tighten until snug.

## DIMENSIONS & SPECIFICATIONS

Part No.	Thread Size	Body Dia. (d)		Hole Size min-max		Grip Range min-max		Length (L)		Head Height (h)		Head Dia. (D)		Catalog No. (Ref.)
		(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	
310000	6-32	0.318	8.08	0.318-0.330	8.08-8.38	0.015-0.187	0.38-4.75	0.653	16.59	0.073	1.85	0.468	11.89	4SJN
310512	M4x0.7	0.318	8.08	0.318-0.330	8.08-8.38	0.015-0.187	0.38-4.75	0.653	16.59	0.073	1.85	0.468	11.89	4SJN
310010	6-32	0.318	8.08	0.318-0.330	8.08-8.38	0.187-0.375	4.75-9.53	0.841	21.36	0.073	1.85	0.468	11.89	4LJN
310516	M4x0.7	0.318	8.08	0.318-0.330	8.08-8.38	0.187-0.375	4.75-9.53	0.841	21.36	0.073	1.85	0.468	11.89	4LJN
310020	10-24	0.382	9.70	0.382-0.400	9.70-10.16	0.015-0.187	0.38-4.75	0.716	18.19	0.073	1.85	0.531	13.49	6SJN
310504	M5x0.8	0.382	9.70	0.382-0.400	9.70-10.16	0.015-0.187	0.38-4.75	0.716	18.19	0.073	1.85	0.531	13.49	6SJN
310030	10-24	0.382	9.70	0.382-0.400	9.70-10.16	0.187-0.375	4.75-9.53	0.888	22.56	0.073	1.85	0.531	13.49	6LJN
310506	M5x0.8	0.382	9.70	0.382-0.400	9.70-10.16	0.187-0.375	4.75-9.53	0.888	22.56	0.073	1.85	0.531	13.49	6LJN
310040	1/4-20	0.438	11.13	0.438-0.450	11.13-11.43	0.015-0.187	0.38-4.75	0.731	18.57	0.073	1.85	0.625	15.88	8SJN
310508	M6x1	0.438	11.13	0.438-0.450	11.13-11.43	0.015-0.187	0.38-4.75	0.731	18.57	0.073	1.85	0.625	15.88	8SJN
310050	1/4-20	0.438	11.13	0.438-0.450	11.13-11.43	0.187-0.375	4.75-9.53	0.919	23.34	0.073	1.85	0.625	15.88	8LJN
310510	M6x1	0.438	11.13	0.438-0.450	11.13-11.43	0.187-0.375	4.75-9.53	0.919	23.34	0.073	1.85	0.625	15.88	8LJN
310070	1/4-20	0.438	11.13	0.438-0.450	11.13-11.43	0.375-0.500	9.53-12.70	1.094	27.79	0.073	1.85	0.625	15.88	8XLJN
310511	M6x1	0.438	11.13	0.438-0.450	11.13-11.43	0.375-0.500	9.53-12.70	1.094	27.79	0.073	1.85	0.625	15.88	8XLJN

## JACK NUT Tools

### “ROTATIONAL” PNEUMATIC JACK NUT TOOLS

For the high-volume setting of all sizes of **JACK NUT** inserts, these tools set the inserts by rotation, automatically compensating for material thickness variations. Reverses for removal.



CAT. NO.	JNT-7530	JNT-7529
Weight	1.7 lbs.	2.0 lbs.
L x H x W	8" x 6.5" x 1.5"	9" x 6.5" x 1.5"
Air Pressure	90 PSI	90 PSI
Speed	2300 RPM	750 RPM
Torque	15 in.-lbs.	50 in.-lbs.

### HEAVY-DUTY JACK NUT HAND TOOL CAT. NO. JNT 2400

Rugged steel tool uses interchangeable screw-rods to set all sizes. Low grip effort is required, and proper stroke is preset for positive setting without overtightening.



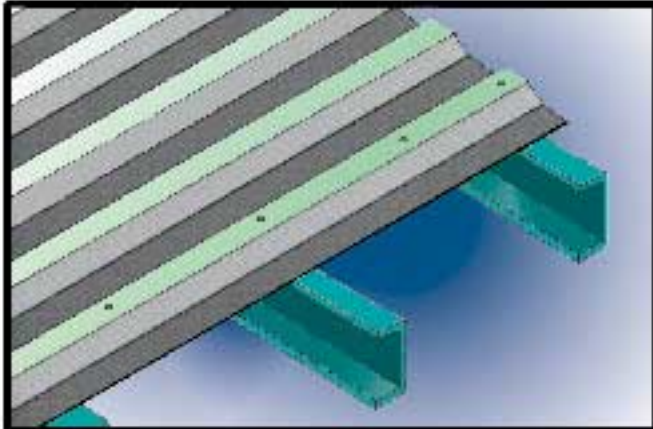
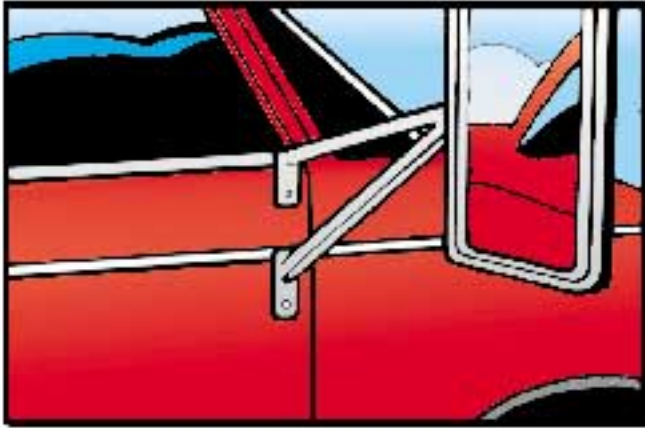
**JNT 2400**  
Weight: 1.3 lbs.  
Dimensions:  
10-1/2" L x 4" H x 3/4" W



# Well-Nut® Threaded Inserts

The **WELL-NUT** Threaded Insert is a flanged neoprene bushing with a brass machine nut molded into one end. Tightening a conventional machine screw thread in the brass nut causes the insert to expand, making a secure fastening. Avail-

able in a variety of rubber compounds for a full range of automotive and industrial environments.



## FEATURES

- *Fastens in blind holes*
- *Helps seal out ambient moisture*
- *Muffles noise*
- *Dampens vibration and shock*
- *Helps prevent galvanic corrosion*
- *Ideal for metal-to-plastic and other mixed material fastenings*
- *Removable*
- *Installs with conventional tools*
- *Snap-in feature available*
- *Available in several compounds*
- *One-step installation*
- *Can be used in closed end holes*

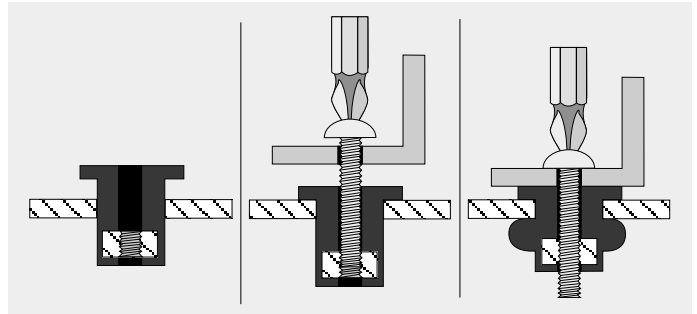
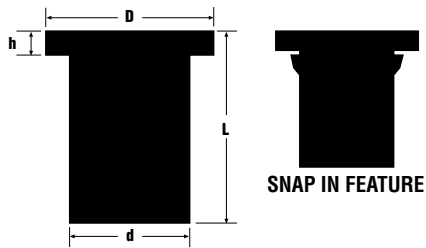
## APPLICATIONS

- *Windshield wiper motors*
- *Electric panels*
- *Remote-type air cleaners*
- *Radiator mountings*
- *Heating fan motors*
- *Luggage carriers*
- *Sirens and horns*
- *Electronic sensors*
- *Control modules*
- *Windshield washer reservoirs*
- *Inner door panels*
- *Solar panels*
- *Fan motor mounts*
- *Garage door openers*
- *Marine accessories*
- *Fiberglass building panels*
- *Skylights*
- *Transformers*

**AND MUCH MORE!**

# Well-Nut® Threaded Inserts

## HOW TO INSTALL



1. Place Well-Nut insert all the way into pre-drilled hole until flange is firmly against mounting surface.
2. Pass machine screw through part to be fastened.
3. Tighten until snug.

## DIMENSIONS & SPECIFICATIONS

Part No.	Thread Size	Body Dia. (d)		Hole Size min-max		Grip Range min-max		Length (L)		Head Height (h)		Head Dia. (D)		Catalog No. (Ref.)
		(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	
347024	6-32	0.240	6.10	0.250	6.35	0.375-0.607	9.53-15.42	0.981	24.92	0.035	0.89	0.554	14.07	C632
347042	6-32	0.312	7.92	0.312	7.92	0.015-0.156	0.38-3.96	0.499	12.67	0.062	1.57	0.452	11.48	E632
347012	8-32	0.312	7.92	0.312	7.92	0.015-0.156	0.38-3.96	0.499	12.67	0.052	1.32	0.438	11.13	B832
347011	M4x0.7	0.312	7.92	0.312	7.92	0.015-0.156	0.38-3.96	0.499	12.67	0.052	1.32	0.438	11.13	B832
347029	8-32	0.310	7.87	0.312	7.92	0.015-0.050	0.38-1.27	0.430	10.92	0.050	1.27	0.500	12.70	2D832
347027	M4x0.7	0.310	7.87	0.312	7.92	0.015-0.050	0.38-1.27	0.430	10.92	0.050	1.27	0.500	12.70	2D832
347004	10-24	0.375	9.53	0.375	9.53	0.015-0.050	0.38-1.27	0.562	14.27	0.125	3.18	0.562	14.27	A1024
347233	10-24	0.375	9.53	0.375	9.53	0.030-0.227	0.76-5.77	0.767	19.48	0.187	4.75	0.562	14.27	L1024
347108	10-32	0.375	9.53	0.375	9.53	0.015-0.192	0.38-4.88	0.554	14.07	0.036	0.91	0.500	12.70	10S
347107	M5x0.8	0.375	9.53	0.375	9.53	0.015-0.192	0.38-4.88	0.554	14.07	0.036	0.91	0.500	12.70	10S
347112	10-32	0.375	9.53	0.375	9.53	0.312-0.643	7.92-16.33	1.051	26.70	0.051	1.30	0.562	14.27	10SL
347048	10-32	0.375	9.53	0.375	9.53	0.030-0.227	0.76-5.77	0.807	20.50	0.187	4.75	0.750	19.05	G1032
347049	M5x0.8	0.375	9.53	0.375	9.53	0.030-0.227	0.76-5.77	0.807	20.50	0.187	4.75	0.750	19.05	G1032
347054	10-32	0.375	9.53	0.375	9.53	0.312-0.450	7.92-11.43	0.847	21.51	0.035	0.89	0.554	14.07	H1032
347064	10-32	0.375	9.53	0.375	9.53	0.030-0.227	0.76-5.77	0.700	17.78	0.080	2.03	0.750	19.05	J1032
347088	10-32	0.375	9.53	0.375	9.53	0.035-0.232	0.89-5.89	0.665	16.89	0.040	1.02	0.562	14.27	Q1032
347102	1/4-20	0.500	12.70	0.500	12.70	0.015-0.111	0.38-2.82	0.630	16.00	0.051	1.30	0.630	16.00	1/4S
347103	M6x1	0.500	12.70	0.500	12.70	0.015-0.111	0.38-2.82	0.630	16.00	0.051	1.30	0.630	16.00	1/4S
347030	1/4-20	0.500	12.70	0.500	12.70	0.031-0.187	0.79-4.75	0.829	21.06	0.187	4.75	0.750	19.05	D1420
347031	M6x1	0.500	12.70	0.500	12.70	0.031-0.187	0.79-4.75	0.829	21.06	0.187	4.75	0.750	19.05	D1420
347068	1/4-20	0.500	12.70	0.500	12.70	0.250-0.457	6.35-11.61	1.051	26.70	0.051	1.30	0.635	16.13	J1420
347095	1/4-20	0.500	12.70	0.500	12.70	0.187-0.343	4.75-8.71	0.801	20.35	0.051	1.30	0.635	16.13	W1420
347034	5/16-18	0.620	15.75	0.625	15.88	0.015-0.156	0.38-3.96	0.725	18.42	0.125	3.18	0.875	22.23	E51618
347008	3/8-16	0.750	19.05	0.750	19.05	0.015-0.437	0.38-11.10	1.062	26.97	0.187	4.75	1.250	31.75	A3816



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