

# Double Expansion Shields

## Description

Double Expansion Shields are a corrosion resistant anchor that is designed to be used with a machine bolt in concrete, brick, block, and stone. The anchor comes pre-assembled and consists of a zamac alloy anchor body, two expansion cones (one at each end of the anchor), and a wire expanding ring that holds the entire anchor together. The expansion cones are drawn in at each end of the anchor as the machine bolt is tightened into the anchor – ensuring consistent and even expansion along the entire anchor body. Recommended for anchoring into base materials of questionable strength.



## Key Features & Benefits

- ▶ Eliminates high stress points that can be detrimental in fastening into materials of medium hardness
- ▶ Expands fully to provide high gripping power
- ▶ Ideal for shear loads where joint is subject to side pressure or vibration
- ▶ Performs in a variety of materials:
  - Normal weight concrete
  - Solid masonry
  - May be suitable for lightweight concrete
- ▶ Corrosion resistant body
- ▶ Good for static and vibratory loads
- ▶ Internally threaded anchor allows easy bolt removability and service work

## Applications

- ▶ Removable Applications
- ▶ Outdoor Applications
- ▶ Service Work
- ▶ Door Frames

## Specifications, Listings and Approvals

**Anchor Thread Diameters:** 1/4" - 5/8"

**Anchor Shield and Cone Material:**  
Zamac Alloy

**Federal Specifications:**  
GSA FF-S-325, Group II, Type 2,  
Class 2, Style 2

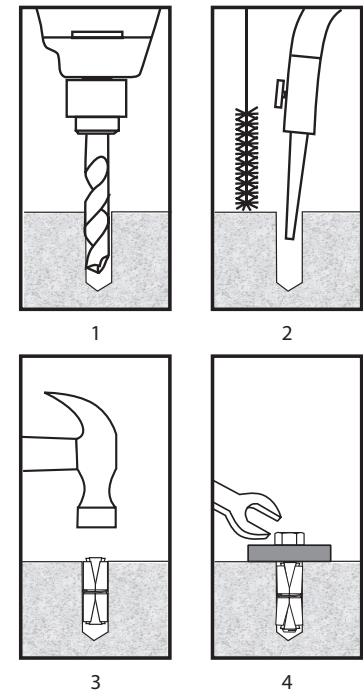
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## Installation Information

### Instructions

1. Drill the hole perpendicular to the work surface. To assure full holding power, do not ream the hole or allow the drill to wobble. Drill the hole at least one anchor diameter deeper than the intended embedment, but not closer than two diameters to the bottom (opposite) surface of the concrete.
2. Clean the hole using compressed air and a nylon brush.
3. Gently tap anchor into pre drilled hole. The anchor should be flush to slightly below the work surface.
4. Position fixture and insert machine screw through fixture into shield and tighten.



**Note:** A deep setting increases holding power of masonry. If desired, place a pipe sleeve between shield and fixture being attached.

**Always wear safety glasses.** Follow the drill manufacturer's safety instructions. Use only solid carbide-tipped drill bits meeting ANSI B212.15 diameter standards.

## Installation Data

Catalog No.	Anchor Thread Dia. (in.)	Drill Bit Dia. (in.)	Thread Size (UNC)	Sleeve Length (in.)	Overall Anchor Length (in.)	Thread Length In Cone (in.)	Installation Torque Approx. (ft.-lbs.)
DES14	1/4	1/2	1/4-20	1	1-3/8	1/2	5
DES56	5/16	5/8	5/16-18	1-3/16	1-5/8	1/2	7
DES38	3/8	3/4	3/8-16	1-9/16	2	5/8	10
DES12	1/2	7/8	1/2-13	2	2-1/2	3/4	20
DES58	5/8	1	5/8-11	2-1/4	2-3/4	7/8	30

## Performance Data

### Ultimate and Allowable Loads (lbs.) – Normal-Weight Concrete

Anchor Thread Dia. (in.)	Min. Embed. Depth (in.)	Allowable						Ultimate					
		2,000 psi		4,000 psi		6,000 psi		2,000 psi		4,000 psi		6,000 psi	
		Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
1/4	1-1/4	200	300	248	308	328	358	800	1200	990	1230	1310	1430
5/16	1-1/2	305	458	398	528	563	563	1220	1830	1590	2110	2250	2250
3/8	1-3/4	365	695	523	773	795	1030	1460	2780	2090	3090	3180	4120
1/2	2-1/4	670	958	910	1100	1185	1780	2680	3830	3640	4400	4740	7120
5/8	2-1/2	1095	2433	1560	2590	1745	2918	4380	9730	6240	10360	6980	11670

\*Allowable load capacities are calculated using an applied safety factor of 4:1

### Ultimate and Allowable Loads (lbs.) Hollow Concrete Masonry

Anchor Thread Dia. (in.)	Min. Embed. Depth (in.)	1,500 psi			
		Allowable		Ultimate	
		Tension	Shear	Tension	Shear
1/4	1-1/4	178	270	710	1080
5/16	1-1/2	260	328	1040	1310
3/8	1-1/2	315	433	1260	1730
1/2	1-1/2	543	628	2170	2510

\*Allowable load capacities are calculated using an applied safety factor of 4:1

### Ultimate and Allowable Loads (lbs.) Clay Brick Masonry

Anchor Thread Dia. (in.)	Min Embed. Depth (in.)	1,500 psi			
		Allowable		Ultimate	
		Tension	Shear	Tension	Shear
1/4	1-1/4	235	318	940	1270
5/16	1-1/2	318	410	1270	1640
3/8	1-3/4	368	720	1470	2880
1/2	2-1/4	685	1038	2740	4150
5/8	2-1/2	893	1213	3570	4850

\*Allowable load capacities are calculated using an applied safety factor of 4:1

## Load Adjustment Factors

### Spacing – Tension & Shear

Anchor Thread Dia.	1/4	5/16	3/8	1/2	5/8	
Critical Spacing $S_{cr}$	2-1/2	3-1/8	3-3/4	5	6-1/4	
Min. Spacing $S_{min}$	1-1/4	1-9/16	1-7/8	2-1/2	3-1/8	
Actual Spacing $S_{act}$	1-1/4	0.50	-	-	-	-
	1-9/16	0.63	0.50	-	-	-
	1-7/8	0.75	0.60	0.50	-	-
	2-1/2	1.00	0.80	0.67	0.50	-
	3-1/8	-	1.00	0.83	0.63	0.50
	3-3/4	-	-	1.00	0.75	0.60
	5	-	-	-	1.00	0.80
6-1/4	-	-	-	-	1.00	

For tension and shear anchor loads, the critical spacing ( $S_{cr}$ ) is equal to 10 anchor diameters at which the anchor achieves 100% of load. Minimum spacing ( $S_{min}$ ) is equal to 5 anchor diameters at which the anchor achieves 50% of load.

### Edge Distance – Tension

Anchor Thread Dia.	1/4	5/16	3/8	1/2	5/8	
Critical Edge Dist. $C_{cr}$	3	3-3/4	4-1/2	6	7-1/2	
Min. Edge Dist. $C_{min}$	2	2-1/2	3	4	5	
Actual Edge Dist. $C_{act}$	2	0.75	-	-	-	-
	2-1/2	0.88	0.75	-	-	-
	3	1.00	0.85	0.75	-	-
	3-3/4	-	1.00	0.87	-	-
	4	-	-	0.90	0.75	-
	4-1/2	-	-	1.00	0.82	-
	5	-	-	-	0.87	0.75
	6	-	-	-	1.00	0.85
7-1/2	-	-	-	-	1.00	

For tension anchor loads, the critical edge distance ( $C_{cr}$ ) is equal to 12 anchor diameters at which the anchor achieves 100% of load. Minimum edge distance ( $C_{min}$ ) is equal to 8 anchor diameters at which the anchor achieves 75% of load.

### Edge Distance – Shear

Anchor Thread Dia.	1/4	5/16	3/8	1/2	5/8	
Critical Edge Dist. $C_{cr}$	3	3-3/4	4-1/2	6	7-1/2	
Min. Edge Dist. $C_{min}$	2	2-1/2	3	4	5	
Actual Edge Dist. $C_{act}$	2	0.45	-	-	-	-
	2-1/2	0.71	0.45	-	-	-
	3	1.00	0.67	0.45	-	-
	3-3/4	-	1.00	0.70	-	-
	4	-	-	0.78	0.45	-
	4-1/2	-	-	1.00	0.58	-
	5	-	-	-	0.71	0.45
	6	-	-	-	1.00	0.64
7-1/2	-	-	-	-	1.00	

For shear anchor loads, the critical edge distance ( $C_{cr}$ ) is equal to 12 anchor diameters at which the anchor achieves 100% of load. Minimum edge distance ( $C_{min}$ ) is equal to 8 anchor diameters at which the anchor achieves 45% of load.

# Double Expansion Shields



## Order Information



### Double Expansion Shields: Zamac Alloy

Catalog No.	Drill Bit Dia. (in.)	Thread Size (UNC)	Sleeve Length (in.)	Box Quantity	Carton Quantity
DES14	1/2	1/4 - 20	1	100	1000
DES56	5/8	5/16 - 18	1-3/16	50	500
DES38	3/4	3/8 - 16	1-9/16	50	400
DES12	7/8	1/2 - 13	2	25	200
DES58	1	5/8 - 11	2-1/4	25	200

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