

Multi-Set II[®] Drop-In Anchors

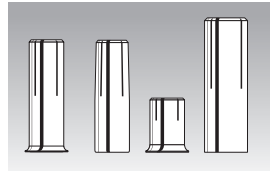
Internally Threaded Heavy- Duty Anchoring Systems

DESCRIPTION/SUGGESTED SPECIFICATIONS

Drop-In, Shell-Type Anchors—

SPECIFIED FOR ANCHORAGE INTO CONCRETE

Drop-In, shell-type anchors feature an internally threaded, all-steel shell with expansion cone insert and flush embedment lip. Anchors are manufactured from zinc-plated carbon steel, 18-8 stainless steel and 316 stainless steel.



Multi-Set II Drop-In Anchors

Anchors should be installed with carbide tipped hammer drill bits made in accordance to ANSI B212.15-1994 specifications.

The minimum concrete thickness for an anchor is 1-1/2 times the embedment depth – or the embedment depth plus three times the anchor diameter – whichever is greater.

Anchors should be tested to ASTM E488 criteria.

ADVANTAGES

Short Drop-In (RX) Anchors

Ideal for Hollow-Core, Pre-Cast Plank and Post Tension Slabs



- Optimized for use in hollow-core, pre-cast plank and post-tension slabs
- Lip keeps anchor flush during installation
- Shallow drilling—fast installation



RX Drop-In Anchor



RM Drop-In Anchor



- Lipped anchor body keeps anchor flush
- Easy installation
- Keeps all rods same length
- Easy inspection
- Available in carbon steel, 18-8 and 316 stainless steel

RL Drop-In Anchor



- Below surface setting for easy patch work

Coil Thread Anchor

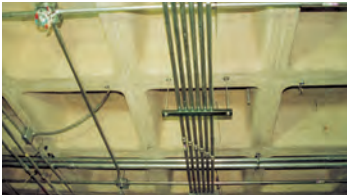


- Quick thread attachment—ideal for 1 sided forming
- Use coil rod on job
- 2 diameters (1/2" and 3/4")

APPLICATIONS



Pumps and heavy piping are common applications for larger diameter Multi-Set Drop-In Anchors.

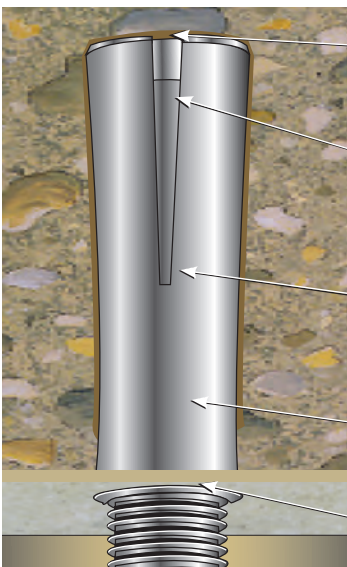


Cable tray and strut suspended from concrete ceilings are ideal Multi-Set applications. In post-tension or hollow-core slabs use the RX-38.



The Multi-Set Anchor is the standard for pipe-hanging. The RM version has a retainer lip to keep all anchors flush at the surface, keeping all your threaded rod the same length.

FEATURES



Expander Slots—allow for easy setting and superior performance

Cone Insert—that expands the anchor when driven with setting tool and hammer

Body—available in zinc-plated steel, 18-8 stainless steel, and 316 stainless steel

Easy Depth Inspection—keeps threaded rod drop lengths consistent

Retainer Lip—to keep anchor flush with surface

For use with threaded rods or headed bolts (supplied by contractor)

APPROVALS/LISTINGS

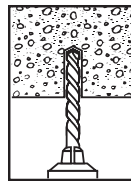
Meets or exceeds U.S. Government G.S.A. Specification A-A-55614 Type 1 (Formerly GSA: FF-S-325 Group VIII)

Multi-Set II Drop-in anchors may be covered by one or more of the following approvals/listings:

- Underwriters Laboratories
- Factory Mutual
- Caltrans

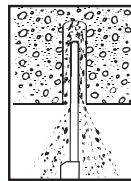
See Selection Chart next page.

INSTALLATION STEPS



To set anchor flush with surface:

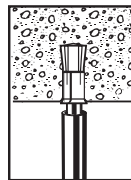
1. Drill hole to required embedment (see Table on page 82).



2. Clean hole with pressurized air.



3. Drive anchor flush with surface of concrete.



4. Expand anchor with setting tool provided (see chart on page 82). Anchor is properly expanded when shoulder of setting tool is flush with top of anchor.

SELECTION CHART

Bits for RX-38 and RX-12 Short Drop-Ins

BIT NO.	DESCRIPTION	DRILLING DEPTH
DCX-138	3/8" Depth Charge Stop Drill (RX-38)	3/4"
DCX-112	1/2" Depth Charge Stop Drill (RX-12)	1"



- Shoulder prevents over drilling. Less likely to hit reinforcing steel or post-tension cable in concrete



- No wasted time or energy drilling deeper than necessary
- Prevents anchor from dropping too far into hole below work surface



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SELECTION CHARTS

Multi-Set II Drop-In Anchors



PART NUMBER RTX-138
For use with RX-38 only.



PART NUMBER RTX-112
For use with RX-12 only.

USER TYPE / APPLICATION	BASE MATERIAL	DROP-IN ANCHOR TYPE	APPROVALS	PART NO.	SETTING TOOL PART NO.*	BOLT SIZE/ THREADS PER INCH	DRILL BIT DIAM.		THREAD DEPTH		EMBEDMENT MIN. HOLE DEPTH***		QTY/WT PER BOX qty / lbs.	QTY/ WT PER MASTER CARTON qty / lbs.
							in.	(mm)	in.	(mm)	in.	(mm)		
HVAC/Fire Sprinkler Plumber (Pipe-fitter)	Solid concrete/lightweight fill deck	RM	Caltrans	RM-14	RT-114	1/4" / 20	3/8	(9.5)	3/8	(9.5)	1	(25.4)	100 / 2.6	1000 / 28
			UL, FM	RM-38	RT-138	3/8" / 16	1/2	(12.7)	1/2	(12.7)	1-5/8	(41.3)	50 / 3.4	500 / 36
			UL, FM Caltrans	RM-12	RT-112	1/2" / 13	5/8	(15.9)	3/4	(19.1)	2	(50.8)	50 / 5.8	400 / 49
			UL, FM	RM-58	RT-158	5/8" / 11	7/8	(22.2)	1	(25.4)	2-1/2	(63.5)	25 / 7.8	125 / 41
			UL, FM Caltrans	RM-34	RT-134	3/4" / 10	1	(25.4)	1-1/4	(31.8)	3-3/16	(81.0)	25 / 11.9	100 / 49
Hollow-core pre-cast or Post tension	RX	N/A	RX-38	RTX-138	3/8" / 16	1/2	(12.7)	3/8	(9.5)	3/4	(19.1)	100 / 3.5	1000 / 36	
		N/A	RX-12	RTX-112	1/2" / 13	5/8	(15.9)	1/2	(12.7)	1	(25.4)	50 / 3.0	500 / 31	
Solid concrete/lightweight fill deck	SRM** 18-8 S.S.	N/A	SRM-14	RT-114	1/4" / 20	3/8	(9.5)	3/8	(9.5)	1	(25.4)	100 / 2.7	1000 / 28	
		UL, FM	SRM-38	RT-138	3/8" / 16	1/2	(12.7)	1/2	(12.7)	1-5/8	(41.3)	50 / 3.4	500 / 36	
		UL, FM	SRM-12	RT-112	1/2" / 13	5/8	(15.9)	3/4	(19.1)	2	(50.8)	50 / 6.0	400 / 50	
		UL, FM	SRM-58	RT-158	5/8" / 11	7/8	(22.2)	1	(25.4)	2-1/2	(63.5)	25 / 7.9	125 / 42	
		N/A	SRM-34	RT-134	3/4" / 10	1	(25.4)	1-1/4	(31.8)	3-3/16	(81.0)	25 / 12.0	100 / 50	
Solid concrete	SSRM** 316 S.S.	N/A	SSRM-12	RT-112	1/2" / 13	5/8	(15.9)	3/4	(19.1)	2	(50.8)	50 / 6.0	400 / 50	
Concrete Contractor, General Contractor	Solid concrete	CL Coil Threaded	N/A	CL-12	RT-112	1/2" / 6	5/8	(15.9)	3/4	(19.1)	2	(50.8)	50 / 5.7	400 / 47
			N/A	CL-34	RT-134	3/4" / 4.5	1	(25.4)	1-1/4	(31.8)	3-3/16	(81.0)	25 / 11.9	100 / 49
Concrete Cutting/Sawing Contractor/Misc. Metal	Solid concrete/lightweight fill deck	RL (w/o lip)	N/A	RL-14	RT-114	1/4" / 20	3/8	(9.5)	3/8	(9.5)	1	(25.4)	100 / 2.6	1000 / 28
			N/A	RL-38	RT-138	3/8" / 16	1/2	(12.7)	1/2	(12.7)	1-5/8	(41.3)	50 / 3.4	500 / 36
			N/A	RL-12	RT-112	1/2" / 13	5/8	(15.9)	3/4	(19.1)	2	(50.8)	50 / 5.8	400 / 49
			N/A	RL-58	RT-158	5/8" / 11	7/8	(22.2)	1	(25.4)	2-1/2	(63.5)	25 / 7.8	125 / 41
			N/A	RL-34	RT-134	3/4" / 10	1	(25.4)	1-1/4	(31.8)	3-3/16	(81.0)	25 / 11.9	100 / 49

* 1 setting tool per master carton. ** For continuous extreme low temperature, use stainless steel. *** Embedment is equal to overall length of Drop-In Anchor

RX-38 and RX-12 Short Drop-In Kits

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
RX-38	3/8" drop-in	RX-12	1/2" drop-in
RTX-138	Setting Tool for RX-38	RTX-112	Setting Tool for RX-12
DCX-138	Depth Charge Stop Drill – 1/2"	DCX-112	Depth Charge Stop Drill – 5/8"

PERFORMANCE TABLE

Multi-Set II Drop-In Anchors

Ultimate Tension and Shear Values (lbs/kN) in Solid Concrete*

BOLT DIAM.		DRILL BIT SIZE		MIN. EMBEDMENT DEPTH		ANCHOR TYPE	TENSION lbs. (kN)						SHEAR lbs. (kN)	
in.	(mm)	in.	(mm)	in.	(mm)		$f'_c = 2000$ PSI	(13.8 MPa)	$f'_c = 4000$ PSI	(27.6 MPa)	$f'_c = 6000$ PSI	(41.4 MPa)	$f'_c \geq 2000$ PSI	(13.8 MPa)
1/4	(6.4)	3/8	(9.5)	1	(25.4)		RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM-316 S.S.	1,680	(7.5)	2,360	(10.5)	2,980	(13.3)	1,080
3/8	(9.5)	1/2	(12.7)	1-5/8	(41.3)	2,980		(13.3)	3,800	(16.9)	6,240	(27.8)	3,160	(14.1)
1/2	(12.7)	5/8	(15.9)	2	(50.8)	3,300		(14.7)	5,840	(26.0)	8,300	(36.9)	4,580	(20.4)
5/8	(15.9)	7/8	(22.2)	2-1/2	(63.5)	5,500		(24.5)	8,640	(38.4)	11,020	(49.0)	7,440	(33.1)
3/4	(19.1)	1	(25.4)	3-3/16	(81.0)	8,280		(36.8)	9,480	(42.2)	12,260	(54.5)	10,480	(46.6)

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4.

* For continuous extreme low temperature applications, use stainless steel.

PERFORMANCE TABLE

Multi-Set II Drop-In Anchors

Ultimate Tension and Shear Values (lbs/kN) in Lightweight Concrete*

BOLT DIAMETER		DRILL BIT SIZE		MINIMUM EMBEDMENT DEPTH		ANCHOR TYPE	LIGHTWEIGHT CONCRETE $f'_c = 3000$ PSI (20.7 MPa)				LOWER FLUTE OF STEEL DECK WITH LIGHTWEIGHT CONCRETE FILL $f'_c = 3000$ PSI (20.7 MPa)			
in.	(mm)	in.	(mm)	in.	(mm)		TENSION		SHEAR		TENSION		SHEAR	
lbs.	(kN)	lbs.	(kN)	lbs.	(kN)		lbs.	(kN)	lbs.	(kN)	lbs.	(kN)	lbs.	(kN)
3/8	(9.5)	1/2	(12.7)	1-5/8	(39.7)	RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM-316 S.S.	2,035	(9.1)	1,895	(8.4)	3,340	(14.9)	4,420	(19.6)
1/2	(12.7)	5/8	(15.9)	2	(50.8)		2,740	(12.2)	2,750	(12.2)	3,200	(14.2)	4,940	(22.0)
5/8	(15.9)	7/8	(22.2)	2-1/2	(63.5)		4,240	(18.9)	4,465	(19.9)	5,960	(26.5)	5,840	(26.0)
3/4	(19.1)	1	(25.4)	3-3/16	(81.0)		5,330	(23.7)	6,290	(28.0)	8,180	(36.4)	9,120	(40.6)

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4.

PERFORMANCE TABLE

Multi-Set II Drop-In Anchors

Recommended Edge and Spacing Distance Requirements*

BOLT DIAMETER		DRILL BIT SIZE		EMBEDMENT DEPTH		ANCHOR TYPE	EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD		MIN. EDGE DISTANCE AT WHICH LOAD FACTOR APPLIED =.80 FOR TENSION =.70 FOR SHEAR		SPACING REQUIRED TO OBTAIN MAX. WORKING LOAD		MIN. ALLOWABLE SPACING BETWEEN ANCHORS LOAD FACTOR APPLIED =.80 FOR TENSION =.55 FOR SHEAR	
in.	(mm)	in.	(mm)	in.	(mm)		in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
1/4	(6.4)	3/8	(9.5)	1	(25.4)		RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM-316 S.S.	1-3/4	(44.5)	7/8	(22.2)	3-1/2	(88.9)	1-3/4
3/8	(9.5)	1/2	(12.7)	1-5/8	(41.3)	2-7/8		(73.0)	1-7/16	(36.5)	5-11/16	(144.5)	2-7/8	(73.0)
1/2	(12.7)	5/8	(15.9)	2	(50.8)	3-1/2		(88.9)	1-3/4	(44.5)	7	(177.8)	3-1/2	(88.9)
5/8	(15.9)	7/8	(22.2)	2-1/2	(63.5)	4-3/8		(111.1)	2-3/16	(55.6)	8-3/4	(222.3)	4-3/8	(111.1)
3/4	(19.1)	1	(25.4)	3-3/16	(81.0)	5-5/8		(142.9)	2-13/16	(71.4)	11-3/16	(284.2)	5-5/8	(142.9)

* Spacing and edge distances shall be divided by 0.75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.



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PERFORMANCE TABLE

Multi-Set II Drop-In Anchors

Ultimate Tension and Shear Values (lbs/kN) for RX-series (3/4" and 1" Embedment)*

BOLT DIAMETER in. (mm)		DRILL BIT SIZE in. (mm)		EMBEDMENT in. (mm)		2500 PSI (17.2 MPa) CONCRETE				4000 PSI (27.6 MPa) CONCRETE				HOLLOW CORE			
						TENSION lbs. (kN)		SHEAR lbs. (kN)		TENSION lbs. (kN)		SHEAR lbs. (kN)		TENSION lbs. (kN)		SHEAR lbs. (kN)	
3/8	(9.5)	1/2	(12.7)	3/4	(19.1)	1,571	(7.0)	2,295	(10.2)	1,987	(8.8)	2,903	(12.9)	1,908	(8.5)	2,401	(10.7)
1/2	(12.7)	5/8	(15.9)	1	(25.4)	2,113	(9.4)	2,585	(11.5)	2,673	(11.9)	3,270	(14.5)	2,462	(11.0)	2,401	(10.7)

* The tabulated values are for RX anchors installed at a minimum of 12 diameters on center and minimum edge distance of 6 diameters for 100 percent anchor efficiency. Spacing and edge distance may be reduced to 6 diameters spacing and 3 diameter edge distance provided the values are reduced 50 percent. Linear Interpolation may be used for intermediate spacings and edge margins.

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4

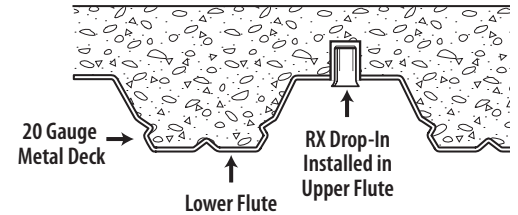
PERFORMANCE TABLE

Multi-Set II Drop-In Anchors

Anchoring Overhead in 3,000 PSI Lightweight Concrete on Metal Deck*

ANCHOR	DRILL HOLE DIAMETER in. (mm)		EMBEDMENT in. (mm)		3000 PSI (20.7 MPa) CONCRETE				
					ULTIMATE TENSION LOAD lbs. (kN)		ALLOWABLE WORKING LOAD lbs. (kN)		
RX-38 Drop-In	1/2	(12.7)	3/4	(19.1)	Upper Flute	1,410	(6.3)	353	(1.6)
					Lower Flute	1,206	(5.4)	301	(1.3)

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4



Combined Tension and Shear Loading—for Multi-Set Anchors

Allowable loads for anchors subjected to combined shear and tension forces are determined by the following equation:

$$(P_s/P_t)^{5/3} + (V_s/V_t)^{5/3} \leq 1$$

P_s = Applied tension load

V_s = Applied shear load

P_t = Allowable tension load

V_t = Allowable shear load