PRODUCT DATA SHEET

QD

QuicDiamond™ Plate Dowel

BoMetals, inc.®
concrete and masonry accessories

QUICDIAMOND™ SYSTEM INFORMATION

QD-025	**1/4"**	1/4" x 4-1/2" x 4-1/2"
QD-038	**3/8"**	3/8" x 4-1/2" x 4-1/2"
QD-075	**3/4"**	3/4" x 4-1/2" x 4-1/2"
Sleeve Material: ABS		
Plate: A-36 Steel - meets ACI 330.2 R-17 requirements		

INSTALLATION

Preparation

During progress of work all QuicDiamonds shall be protected from damage and should be free of oil, dirt and concrete spatter.

Location & Placement of QuicDiamonds

1. Set up formwork.
2. Locate and mark with chalk line at specified location, usually at center of slab but at least 2 1/4" from top of slab.
3. Align QuicDiamond™ Sleeve at specified location.
4. Use preset nails to attach QuicDiamond™ Sleeve to formwork.

5. Install any reinforcement needed.
6. Place and finish concrete per ACI specification. Pour at least 18 inches from QuicDiamond™ System.
7. Consolidate the concrete around the QuicDiamond™ System, vibrate & finish concrete.
8. After concrete cures, remove formwork with base & bend nails away from plate.
9. For subsequent ajoining slabs repeat steps 1-5.

10. Place plate into sleeve.
11. Repeat steps 6-8.

DOWEL SIZE AND SPACING FOR CONSTRUCTION JOINTS

Slab Depth	Dowel Dimensions*			On-Center Dowel Spacing			Sheer Strength @ joint center
	Round	Square	QuicDiamond™**	Round	Square	QuicDiamond™	
5" to 6" 130 - 150 mm	3/4" x 14" 19 x 360 mm	3/4" x 14" 19 x 360 mm	1/4" x 4-1/2" x 4-1/2" 6 x 110 x 110 mm	12" 300 mm	14" 360 mm	18" - 24" 460 - 610mm	34,560 lbs 34.6 Kips
7" to 9" 180 - 230 mm	1" x 16" 25 x 410 mm	1" x 16" 25 x 410 mm	3/8" x 4-1/2" x 4-1/2" 9 x 110 x 110 mm	12" 300 mm	14" 360 mm	18" - 24" 460 - 610mm	51,840 lbs 51.8 Kips
9" to 12" 230 - 280 mm	1-1/4" x 18" 32 x 460 mm	1-1/4" x 18" 32 x 460 mm	3/4" x 4-1/2" x 4-1/2" 19 x 110 x 110 mm	12" 300 mm	12" 300 mm	18" - 24" 460 - 610mm	103,680 lbs 103.7 Kips

Source Material: ACI 360R-10, ***Design of Slabs-on-Ground***, Table 6.1;
ACI 302.IR-04, ***Guide for Concrete Floor and Slab Construction***, Table 3.2
PCA 4th Edition, Table 6.2

* Total dowel length includes allowance made for joint opening and minor errors in positioning dowels.

** Construction tolerances required make it impractical to use diamond-shaped load plates in saw-cut contraction joints. Note: Table values based on maximum opening of .2 in. (5 mm). Dowels must be carefully aligned and supported during concrete operations. Misaligned dowels may lead to cracking.

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Founded in 1989, BoMetals has become an industry leader in the design and manufacture of concrete and masonry accessories.

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RESISTANCE

The resistances of the OuicDiamond dowels are determined based on AC/ 302.1R-15 and AC/ 318-19 for U.S. applications, as well as TR34.4 (UK Concrete Society, August 2013) for European standards.

All calculated design resistances apply to single plate dowels and assume plain concrete without additional reinforcement. The same approach can be extended to steel and macro-synthetic fiber reinforced concrete, but final performance must be verified by a qualified engineer. Design resistance of single dowel in shear Psh and bearing/bending Pmax, plate

These calculations are for reference only and should not replace site-specific structural engineering analysis. Actual performance may vary based on concrete properties, construction methods, and applied loads. It is the responsibility of the designer or engineer to verify all calculations and ensure compliance with local building codes and project-specific requirements.

Dowel Type	Joint Opening x	Shear Psh	P Max Plate
QD-025	.75"	22,553 lbf / 100.3kN	5,290 lbf / 23.5 kN
QD-038	.75"	33,829 lbf / 150.5 kN	7,935 lbf / 35.3 kN
QD-075	.75"	67,658 lbf / 301.0 kN	15,870 lbf / 70.6 kN

PUNCHING SHEAR RESISTANCE

Punching shear resistances are calculated based on AC/ 302. 1 R-15 and TR34.4, assuming plain concrete without additional reinforcement. The values provided apply to slabs using .375 QuicDiamond dowels with a . 75” joint opening. These calculations serve as a reference and should be verified by a qualified engineer to ensure compliance with project-specific requirements and local building codes. Actual performance may vary based on construction methods, joint openings, and applied loads.

Slab Thickness	**5,000 psi concrete** Punching Resistance (lbf)	**5,000 psi concrete** Punching Resistance (kN)	**4,000 psi concrete** Punching Resistance (lbf)	**4,000 psi concrete** Punching Resistance (kN)
6 in	3,641 lbf	16.2 kN	3,257 lbf	14.5 kN
8 in	4,854 lbf	21.6 kN	4,344 lbf	19.3 kN
10 in	6,068 lbf	27.0 kN	5,431 lbf	24.1 kN
12 in	7,282 lbf	32.4 kN	6,518 lbf	29.0 kN