MIC-C120-DH-L
2174683 - 87

Hilti North America
Installation Technical Manual
Technical Data
MI System

Version 1.2 **08.2017**

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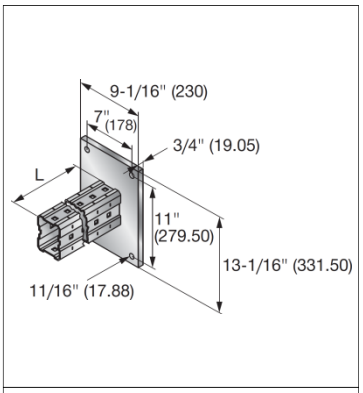
The product technical data published in these Technical Data Sheets are only valid for the mentioned codes or technical data generation methods and the defined application conditions (e.g. ambient temperature load capacity not valid in case of fire, data not valid in support structures when mixed with third party products, values only apply to static loading conditions). Technical data applies to the component only -- suitability and capacity of all other components must be checked separately by the responsible engineer (e.g., other assembly components, attachments, base materials, and building structures).
Suitability of structures combining different products for specific applications needs to be verified by conducting a system design and calculation, using for example Hilti PROFIS software. In addition, it is crucial to fully respect the Instructions for Use and to assure clean, unaltered and undamaged state of all products at any time in order to achieve optimum performance (e.g. avoid misuse, modification, overload, corrosion).
As products but also technical data generation methodologies evolve over time, technical data might change at any time without prior notice. We recommend to use the latest technical data sheets published by Hilti.

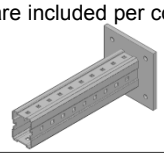
In any case the suitability of structures combining different products for specific applications need to be checked and cleared by an expert, particularly with regard to compliance with applicable norms, codes, and project specific requirements, prior to using them for any specific facility. This book only serves as an aid to interpret the capacity of the components listed, without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application. User must take all necessary and reasonable steps to prevent or limit damage. The suitability of structures combining different products for specific applications need to be confirmed with a professional designer and/or structural engineers to ensure compliance with User`s specific jurisdiction and project requirements.

MIC-C120-DH-L (500 - 2000) Bracket - Concrete

Designation	Item number
MIC-C120-DH-500	**2174683**
MIC-C120-DH-750	**2174684**
MIC-C120-DH-1000	**2174685**
MIC-C120-DH-1500	**2174686**
MIC-C120-DH-2000	**2174687**



Hardware included per connector



Corrosion protection:
Hot dipped galvanized per ASTM A123
Girder - 2.95 mils (75 µm) minimum
Plate - 3.94 mils (100 µm) minimum

Weight:

MIC-C120-DH-500	38.58 lb (17500g)
MIC-C120-DH-750	45.53 lb (20650g)
MIC-C120-DH-1000	52.47 lb (23800g)
MIC-C120-DH-1500	66.36 lb (30100g)
MIC-C120-DH-2000	80.25 lb (36400g)

Description:
Hilti Hot-dipped galvanized bracket used as fixed to concrete. Four round anchor holes in baseplate for attachment to concrete and girder is welded on the baseplate.

Material properties

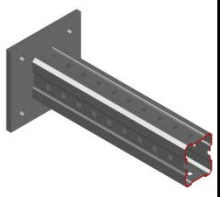
Material	**Yield strength**	**Ultimate strength**	**E-modulus**	**Shear modulus**
Bracket:				
ASTM A36 / A36M - 2014	**f_y = 36 ksi** (250 $\frac{N}{mm^2}$)	**f_u = 58 ksi** (400 $\frac{N}{mm^2}$)	**29000 ksi** (200000 $\frac{N}{mm^2}$)	**11000 ksi** (**75845** $\frac{N}{mm^2}$)

Instruction For Use:

No IFU attached to the packaging

Respect IFU from the used anchor

MIC-C120-DH-L (500 - 2000) Bracket - Concrete

Approved loading cases		
Standard		
		

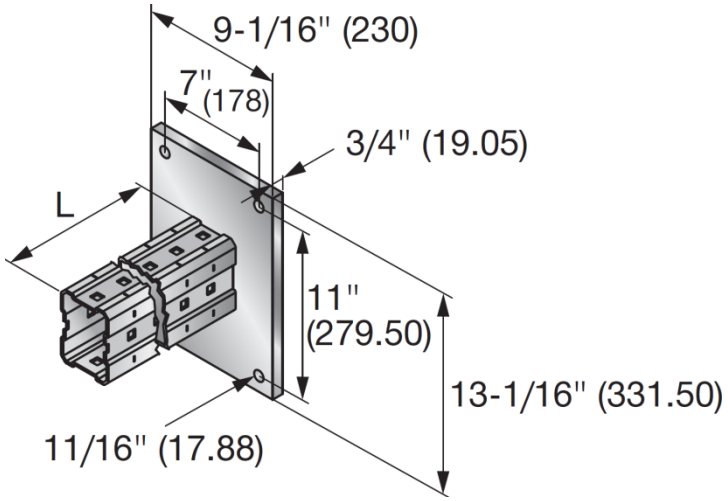
Governing Conditions

Methodology:
Connection strength values are determined with a combination of simulation (ANSYS®), calculation (Microsoft Excel and Mathcad) and testing.

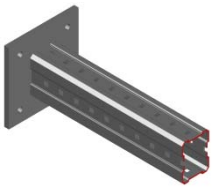
Standards and codes:

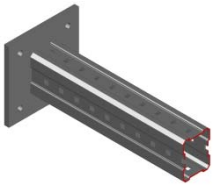
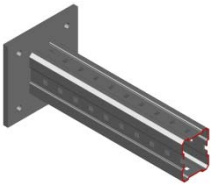
• ANSI/AISC 360-10	Specification for Structural Steel Buildings	
• AISC Steel Design	Guide Series 1 Column Base Plates	
• AISI S100-2007/2010	North American Specification for the Design of cold-formed Steel Structural Members	
• ACI 318-08/11	Building Code Requirement for Structural Concrete	
• EN 1993-1-1	Eurocode 3: Design of steel structures – Part 1-1: General rules and rules for buildings	03.2012
• EN 1993-1-8	Eurocode 3: Design of steel structures – Part 1-8: Design of joints	03.2012
• EN 10025-2	Hot rolled products of structural steels- Part 2: technical delivery conditions for non-alloy structural steels	02-2005

Validity:
Temperature limits: -22°F (-30°C) to 200°F (+93°C).
Published allowable loads for applications are based on static loading conditions. Non-static forces, including those resulting from thermal or other expansion must be taken into account during design.



MIC-C120-DH-L (500 - 2000) Bracket - Concrete

Standard		
		

Loading case: Standard	Combinations covered by loading case
Bill of Material for this loading case: Bracket **MIC-C120-DH-500 2174683** **MIC-C120-DH-750 2174684** **MIC-C120-DH-1000 2174685** **MIC-C120-DH-1500 2174686** **MIC-C120-DH-2000 2174687** 	Pre-fab bracket for perpendicular connection to concrete 

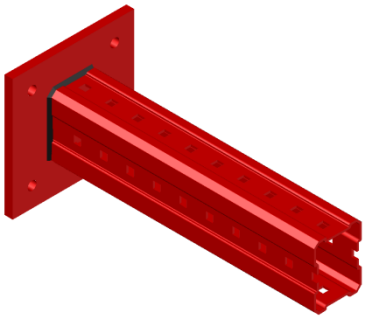
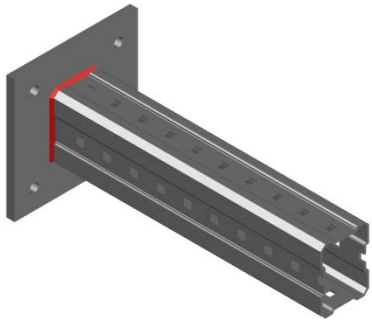
Usage of Values for Design Strength and Allowable Strength

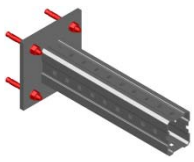
The Design Strength and Allowable Strength tables on the following pages include strength reduction factors:

1. **ASD:** Safety Factor (omega) > 1.0 as per AISC specifications.
2. **LRFD:** Strength Reduction Factor (phi) < 1.0 as per AISC specifications. $\Omega = \frac{1.5}{\phi}$ (Reference AISC 360 C-B3-5)

Factored loads are required for input to the given interaction equations. Factored loads are the responsibility of the user. Factored loads are noted as P, V and M

Limiting components of capacity evaluated in following tables:

1. Base plate and profile of MI-120 girder, per FEA simulation	2. Welds – per analytical calculation
	



Anchor strength must be calculated separately using PROFIS ANCHOR.

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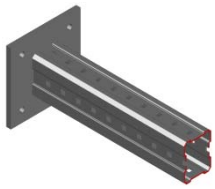
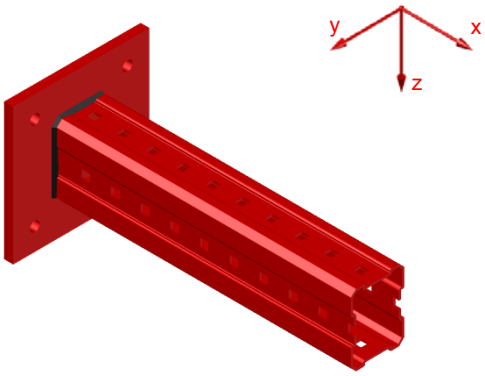
Standard		
		

Values for Design Strength and Allowable Strength 1/2

NOTE: Calculate interaction separately for each group only using values from that group. Limiter is defined by highest interaction. Use absolute values. Values refer to the coordinate system shown.

1. Base plate and profile of MI-120 girder, per FEA simulation



	+Fx [kip]	-Fx [kip]	+Fy [kip]	-Fy [kip]	+Fz [kip]	-Fz [kip]
LRFD*	26.42	30.73	12.66	12.66	19.24	19.24
	+Mx [kip*ft]	-Mx [kip*ft]	+My [kip*ft]	-My [kip*ft]	+Mz [kip*ft]	-Mz [kip*ft]
	4.61	4.61	7.23	7.23	6.27	6.27

	+Fx [kip]	-Fx [kip]	+Fy [kip]	-Fy [kip]	+Fz [kip]	-Fz [kip]
ASD*	17.57	20.45	8.42	8.42	12.80	12.80
	+Mx [kip*ft]	-Mx [kip*ft]	+My [kip*ft]	-My [kip*ft]	+Mz [kip*ft]	-Mz [kip*ft]
	3.07	3.07	4.81	4.81	4.17	4.17

Interaction for LRFD

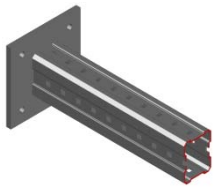
$$\frac{P_{ux}}{F_x} + \frac{V_{uy}}{F_y} + \frac{V_{uz}}{F_z} + \frac{M_{ux}}{M_x} + \frac{M_{uy}}{M_y} + \frac{M_{uz}}{M_z} \leq 1$$

Interaction for ASD:

$$\frac{P_{ax}}{F_x} + \frac{V_{ay}}{F_y} + \frac{V_{az}}{F_z} + \frac{M_{ax}}{M_x} + \frac{M_{ay}}{M_y} + \frac{M_{az}}{M_z} \leq 1$$

*Values already include LRFD strength reduction (Φ) or ASD safety (Ω) factors in accordance with AISC, and are based on nominal geometry.

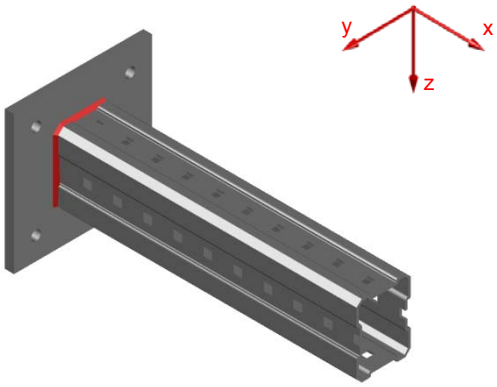
MIC-C120-DH-L (500 - 2000) Bracket - Concrete

Standard		
		

Values for Design Strength and Allowable Strength 2/2

NOTE: Calculate interaction separately for each group only using values from that group. Limiter is defined by highest interaction. Use absolute values. Values refer to the coordinate system shown.

2. Welds – per analytical calculation



	+Fx [kip]	-Fx [kip]	+Fy [kip]	-Fy [kip]	+Fz [kip]	-Fz [kip]
LRFD*	70.43	70.43	27.34	27.34	39.06	39.06
	+Mx [kip*ft]	-Mx [kip*ft]	+My [kip*ft]	-My [kip*ft]	+Mz [kip*ft]	-Mz [kip*ft]
	10.28	10.28	7.95	7.95	6.86	6.86

	+Fx [kip]	-Fx [kip]	+Fy [kip]	-Fy [kip]	+Fz [kip]	-Fz [kip]
ASD*	46.95	46.95	18.23	18.23	26.04	26.04
	+Mx [kip*ft]	-Mx [kip*ft]	+My [kip*ft]	-My [kip*ft]	+Mz [kip*ft]	-Mz [kip*ft]
	6.85	6.85	5.30	5.30	4.57	4.57

Interaction for LRFD

$$\frac{P_{ux}}{F_x} + \frac{V_{uy}}{F_y} + \frac{V_{uz}}{F_z} + \frac{M_{ux}}{M_x} + \frac{M_{uy}}{M_y} + \frac{M_{uz}}{M_z} \leq 1$$

Interaction for ASD:

$$\frac{P_{ax}}{F_x} + \frac{V_{ay}}{F_y} + \frac{V_{az}}{F_z} + \frac{M_{ax}}{M_x} + \frac{M_{ay}}{M_y} + \frac{M_{az}}{M_z} \leq 1$$

*Values already include LRFD strength reduction (Φ) or ASD safety (Ω) factors in accordance with AISC, and are based on nominal geometry.

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