



## We deliver:

- **Electrical solutions** that use less energy, improve power reliability and make the places we live and work safer and more comfortable
- **Hydraulic and electrical solutions** that enable machines to deliver more productivity without wasting power
- **Aerospace solutions** that make aircraft lighter, safer and less costly to operate, and help airports operate more efficiently
- **Vehicle drivetrain and powertrain solutions** that deliver more power to cars, trucks and buses, while reducing fuel consumption and emissions

We provide integrated solutions that help make energy, in all its forms, more practical and accessible.

With 2015 sales of \$20.9 billion, Eaton has approximately 100,000 employees around the world and sells products in more than 175 countries.



## Eaton's electrical business

### Eaton is a global leader with expertise in:


- Power distribution and circuit protection
- Backup power protection
- Solutions for harsh and hazardous environments
- Lighting and security
- Structural solutions and wiring devices
- Control and automation
- Engineering services

Eaton is positioned through its global solutions to answer today's most critical electrical power management challenges. With 100 years of electrical experience behind us, we're energized by the challenge of powering up a world that demands twice as much energy as today. We're anticipating needs, engineering products and creating solutions to energize our markets today and in the future.

We are dedicated to ensuring that reliable, efficient and safe power is available when it's needed most.

**[Eaton.com](http://Eaton.com)**

# Table of Contents

	<b>Introduction</b>	3
	<b>Pictorial Index</b>	4 - 16
	<b>Strut Systems Information</b>	17 - 18
	<b>Technical Data</b>	
	Materials & Corrosion	19
	Finishes & General Information	19 - 20
	Recommended Specifications	21 - 26
	<b>Beam Clamps</b>	
	C-Clamps	28 - 31
	Reversible Beam Clamps	32 - 34
	Reversible Stainless Steel Beam Clamps	35
	Bottom Beam Clamps	36 - 43
	Retaining Straps	37 - 38
	Top Beam Clamps	44
	Side Beam Clamps	44
	Bar Joist Hanger	45
	Trus Joist Beam Clamps	46
	<b>Pipe Hangers</b>	
	Clevis Hangers	48 - 58
	'J' Hangers	54
	Band Hangers	59 - 61
	Split Clamps & Hangers, Rings	62 - 64, 70
	Wall Mount Lay-In Hangers	65
	Retrofit Wrap Around 'U' Hanger Clamp	66
	Wire Hangers	67 - 68
	Spring Hangers	69
	<b>Pipe Clamps</b>	
	Risers	72 - 73
	Underground Clamps	74 - 75
	Pipe Clamps	76 - 86
	Pipe Straps	87 - 90
	VibraClamp™	91 - 92
	Armafix™ Inserts, Clamps & Isolation Tape	93
	Vibra Cushion™	94
	ISO-Tape™	94
	CPVC Hangers	95 - 104
	Plastic KWIK-CLIP™	105 - 106
	<b>Pipe Rollers &amp; Roller Supports</b>	
	Roller Hangers	108 - 109
	Roller Supports	110 - 118
	Roller Stands	119 - 121
	Spring Cushion Roller Hanger	122
	Rollers	123 - 124
	<b>Pipe Supports, Guides, Shields &amp; Saddles</b>	
	Calcium Silicate Shields	126
	Stands & Supports	127 - 141
	Isolators, Guides & Anchors	142 - 148
	Pipe Slides	149 - 156
	Pipe Saddles	157 - 162
	Pipe Shields	163 - 165
	Snap 'N Shield™ Clevis	166
	Universal Snap-N-Shield™	167 - 168
	Snap-N-Shield™ Shields	169 - 170
	<b>TOLCO™ Seismic Bracing</b>	
	Sway Bracing Pipe Clamps	172 - 176
	Sway Bracing Attachments	177 - 187
	Mechanical Fast Clamps	188
	Pre-Stretched Aircraft Cable	189
	Cable Sway Brace Attachments	190 - 191
	Sway Brace Main Pipe Attachments	192 - 194
	<b>Concrete Inserts</b>	
	Concrete Deck Inserts	196 - 198
	Spot Inserts & Insert Nuts	196, 199 - 202
	Continuous Concrete Inserts	203 - 205
	Anchor Clips	206

## Brackets

Light Duty .....	208 - 210
Medium Duty .....	211
Heavy Duty .....	212
Brackets w/ U-Bolts .....	213

## Upper Attachments

Ceiling Flange .....	216
Angle Supports .....	217 - 220
Swivel Attachment .....	221
Bolted & Welded .....	222 - 224
Concrete Plates .....	225 - 227
Rod Beam Attachments .....	228

## Threaded Accessories

Eye Sockets & Nuts .....	230 - 231
U-Bolts .....	232 - 234
Miscellaneous Accessories .....	235 - 237
Rods, Couplings, Washers & Hardware .....	238 - 248
Toggle Bolts & Wedge Anchors .....	249

## Vibration Isolation

Vibration Pads .....	254 - 257
Vibra Strip™ .....	258
Neoprene Mounts .....	259
Steel Spring Isolator Restraints .....	260 - 264
Neoprene Isolator Restraints .....	265 - 266
Neoprene Mounts with Integrak Seismic Restraints .....	267 - 268
Neoprene Hangers .....	269
Spring Hanger with Seismic Cushion Stops .....	270 - 273
Spring & Neoprene Hanger with Seismic Cushion Stops .....	274 - 277

## DURA-BLOK™ Rooftop Supports

Base .....	280
Base & Channel .....	281 - 283
Base & Hinged Clamp Riser .....	284
Base & Harness .....	285 - 286
Base & Rollers .....	287 - 288
Base Stand .....	288
Load Distribution Plate .....	289

## KwikWire™ System

Clamps .....	294
Wire Rope .....	294
KwikPak™ Kits .....	295
Cable Cutter .....	295
KwikWire Hangers .....	296
Accessories (Loop, Hook, Bracket Termination) .....	297 - 302

## Anchor Load Charts AL-1 thru AL-21

## Reference Data

Metric Conversions .....	303
Miscellaneous Charts – Piping, Tubing, Threaded Rod, etc. ....	304 - 313
Miscellaneous Charts – ‘S’, ‘C’, & Wide Flange I-Beams .....	314 - 316
Trapeze Hanger Chart .....	317 - 318
MSS & Federal Specifications to – B-Line series Cross References .....	319 - 320
B-Line series Compliances & Approvals .....	321 - 322
Cross References	
B-Line series to TOLCO .....	323 - 324
TOLCO to B-Line series .....	325 - 326
Anvil/Grinnell to B-Line series/TOLCO .....	327
Erico to B-Line series/TOLCO .....	328
PHD to B-Line series/TOLCO .....	329
Super Strut to B-Line series/TOLCO .....	330
C & P* to B-Line series/TOLCO .....	331
Empire to B-Line series/TOLCO .....	332

<b>Index</b> .....	333 - 336
--------------------	-----------

\* C & P is Carpenter & Paterson



# Introduction

Eaton is a leading manufacturer and fabricator of B-Line series metal products used in the support of pipe and equipment for industrial, residential, commercial, utility, and OEM installations. Eaton is proud of the exacting standards of research, design, engineering, and manufacturing that go into each and every product that comprise our pipe hanger product line. Our customers have access to one of the most complete support systems offered in the industry, including pipe hangers, strut system, cable tray, slotted angle, seismic bracing, fasteners, communications, enclosures and anchors.

Many of Eaton B-Line series products are listed by Underwriters' Laboratories, Inc. and FM Global approved for fire sprinkler system installations. All Eaton B-Line series products are manufactured to meet or exceed industry standards.

Eaton B-Line series products are produced in plants consisting of over 1,000,000 square feet. These facilities are located in Highland, Illinois; Troy, Illinois; Reno, Nevada; and Sherman, Texas. Regional sales and distribution centers are located throughout the United States and stock standard B-Line series products for quick service and delivery.

This catalog is designed to help engineers and contractors in the application and selection of pipe hangers, supports and seismic bracing for construction and maintenance.

If a unique application requires a special product not included in this catalog, Eaton engineering personnel are ready to furnish design consultation and material estimates. In addition, engineering sales representatives are located throughout the United States and abroad for your convenience.



## WARNING

All hanger products in this catalog should be installed and serviced only as illustrated or described. Do not use them for any purpose other than those described in this catalog. Products that are used for unintended purposes could fail, resulting in severe personal injury or death.

Examples of misapplications which could cause severe personal injury or death include, but are not limited to:

- Using a beam clamp on a beam other than those described in the catalog;
- Using concrete inserts as anchors for pulling pipe up to the required elevation;
- Suspending clevis hangers, one under another, which could result in an accumulative load that is greater than that which the pipe hanger will support.

Eaton B-Line series pipe hanger and support products are manufactured in accordance with industry standards. Our customers should exercise care in using these products properly as to avoid potential damage or injury. Contact us if you have any questions about proper installation and use of the products in this catalog.

## NOTICE

*Eaton reserves the right to change the specifications, materials, equipment, prices or the availability of products at any time without prior notice. While every effort has been made to assure the accuracy of information contained in this catalog at the time of publication, Eaton is not responsible for inaccuracies resulting from undetected errors or omissions.*



Manufacturers Standardization Society  
of the  
Valve and Fitting Industry, Inc.



ISO 9001:2008



**B-Line Division**  
**509 West Monroe Street**  
**Highland, Illinois 62249-0326**  
**Phone: 800-851-7415**

[www.eaton.com/b-lineseries](http://www.eaton.com/b-lineseries)

## Beam Clamps



**B351L**  
Steel C-Clamp  
With Locknut  
Page 28



**B3036L**  
Malleable Iron  
C-Clamp  
With Locknut  
Page 28



**B3362 thru B3365**  
Retaining Strap  
Page 29



**B3037**  
Z-Purlin Beam Clamp  
Page 29



**B3031-3/8**  
Light Duty  
Malleable C-Clamp  
Page 30



**B3033**  
Wide Jaw  
Top Flange  
C-Clamp  
Page 30



**B3034**  
Top Flange  
C-Clamp  
Page 31



**Fig. 68S**  
(3/4" Throat)  
**Fig. 68W**  
(1 1/4" Throat)  
Malleable,  
Reversible Beam  
Clamps  
Page 32



**Fig. 65**  
Reversible  
Steel C-Clamp  
With Locknut  
3/4" Throat  
Page 33



**Fig. 65XT-3/8**  
Reversible  
Steel C-Clamp  
With Locknut  
3/4" Throat  
Page 33



**Fig. 66**  
Reversible  
Steel C-Clamp  
With Locknut  
1 1/4" Throat  
Page 34



**Fig. 67SS**  
(3/4" Throat)  
**Fig. 68SS**  
(1 1/4" Throat)  
Reversible  
Stainless Steel  
C-Clamp  
With Locknut  
Page 35



**B303-B309**  
Beam Clamp  
Page 36



**B321 Series**  
Beam Clamp  
Page 36



**Fig. 69**  
Retaining Strap  
Page 37



**Fig. 69R**  
Retrofit  
Retaining Strap  
Page 38



**B3040**  
Adjustable Beam Clamp  
Page 39



**B312**  
Retaining Strap  
Page 39



**B3050**  
Beam Clamp  
Page 40



**B3055**  
Steel Beam Clamp  
Page 41



**B3054**  
Malleable Iron  
Beam Clamp  
Page 42



**B3291 thru B3298**  
UFS Forged Steel  
Beam Clamp  
Page 43



**B3042**  
Top Beam Clamp  
Page 44



**B3045**  
Side Beam Clamp  
Page 44



**B3042T**  
Bar Joist Hanger  
Page 45



**Fig. 130**  
Truss Joist  
Beam Clamp  
Page 46

## Pipe Hangers



**Fig. 1CBS**  
Clevis Pipe Spacer  
Page 48



**B3100**  
Standard  
Clevis Hanger  
Pages 49 & 50 ★



**B3100C**  
Plastic Coated  
Standard  
Clevis Hanger  
Page 51



**B3100F**  
Felt Lined  
Standard  
Clevis Hanger  
Page 51



**B3102**  
AWWA  
Clevis Hanger  
Page 52



**B3108**  
Extended  
Clevis Hanger  
Page 53



**B3690**  
Adjustable 'J'  
Hanger  
Page 54



**B3690F**  
Felt Lined  
Adjustable 'J' Hanger  
Page 54



**B3690C**  
Plastic Coated  
Adjustable 'J' Hanger  
Page 54



**B3109**  
Flat Top Clevis  
Hanger  
Page 55



**B3106**  
Vee Bottom  
Clevis Hanger  
Page 56



**B3106V**  
Plastic Pipe  
Support Channel  
Page 56



**B3104**  
Light Duty  
Clevis Hanger  
Page 57 ★



**B3104F**  
Felt Lined  
Light Duty  
Clevis Hanger  
Page 57



**B3104C**  
Plastic Coated  
Light Duty  
Clevis Hanger  
Page 57



**B3104CT**  
Copper Tubing  
Light Duty Clevis  
Hanger  
Page 58 ◆



**B3104CTC**  
Plastic Coated  
Copper Tubing  
Light Duty Clevis  
Hanger  
Page 58 ◆



**B3170CT**  
Copper Tubing  
Adjustable Swivel Ring  
Page 59 ◆



**B3170CTC**  
Copper Tubing  
Plastic Coated  
Adjustable Swivel Ring  
Page 59 ◆

◆ **DURA-COPPER™ Finish**

★ **Available in DURA GREEN™ Finish** (Other hangers may be available with the DURA-GREEN finish, contact factory)

## Pipe Hangers (Continued)



**Fig. 200**  
Trimline Adjustable  
Band Hanger  
Page 60



**Fig. 200 H**  
Heavy Duty  
Band Hanger  
Page 61



**B3198R**  
Extension  
Split Pipe Clamp  
Page 62



**B3198RCT**  
Copper Tubing  
Extension  
Split Pipe Clamp  
Page 63 ♦



**Fig. 200F**  
Felt Lined  
Trimline Adjustable  
Band Hanger  
Page 60

**B3198H**  
Hinged Extension  
Split Pipe Clamp  
Page 62



**B3198HCT**  
Copper Tubing  
Hinged Extension  
Split Pipe Clamp  
Page 63 ♦



**Fig. 200C**  
Plastic Coated  
Trimline Adjustable  
Band Hanger  
Page 60



**B3175**  
Ring and Bolt Hanger  
Page 64



**B3175CT**  
Copper Tubing  
Ring and Bolt Hanger  
Page 64 ♦



**B3190**  
Offset 'J' Hook  
Page 65



**B3191**  
Straight 'J' Hook  
Page 65



**Fig. 120RWA**  
Retrofit Wrap Around  
"U" Hanger Clamp  
Page 66



**Fig. 120**  
'U' Hanger  
Page 67



**Fig. 120MJ**  
Mutt & Jeff  
'U' Hanger  
Page 68



**Fig. 120W**  
Wrap Around  
'U' Hanger  
Page 68



**B3262**  
Light Duty  
Spring Hanger  
Page 69



**BH-2-4  
BH-5-8  
BH-9-12**  
Parallel Strap Hanger  
Page 70



**BH-2-4-R  
BH-5-8-R  
BH-9-12-R**  
Right Angle Strap Hanger  
Page 70



**BL1400 thru  
BL1490**  
Hanger  
Page 70

♦ **DURA-COPPER™ Finish**



## Pipe Clamps



**B3373**  
Standard Riser Clamp  
Page 72



**B3373C**  
Plastic Coated  
Standard Riser Clamp  
Page 72



**B3373F**  
Felt Lined  
Standard Riser Clamp  
Page 72



**B3373CT**  
Copper Tubing  
Riser Clamp  
Page 73 ♦



**B3373CTC**  
Copper Tubing  
Plastic Coated  
Riser Clamp  
Page 73 ♦



**B3132**  
Two-Bolt  
Underground Clamp  
Page 74



**B3134**  
Four-Bolt  
Underground Clamp  
Page 75



**Fig. 4A**  
Pipe Clamp for  
Sway Bracing  
Page 76



**B3140**  
Standard Pipe Clamp  
Pages 77-78



**B3140C**  
Plastic Coated  
Standard Pipe Clamp  
Pages 77-78



**B3132W**  
Lug Washer  
Page 74



**B3134W**  
Washer  
Page 75



**B3141**  
A.W.W.A. Pipe Clamp  
Page 79



**B3142**  
Heavy Duty Pipe Clamp  
Page 80



**B3144**  
Double Bolt Pipe Clamp  
Pages 81 & 82



**B3140F**  
Felt Lined  
Standard Pipe  
Clamp  
Pages 77-78



**B3146**  
Heavy Duty Double  
Bolt Pipe Clamp  
Page 83



**Fig. 4B**  
Pipe Clamp For  
Sway Bracing  
Page 84



**B3148**  
Offset Pipe Clamp  
Page 85



**B3149**  
Marine Hanger  
Page 86



**B3180FL**  
Flush Mount  
Pipe Strap  
Page 87



**B3180**  
Extended Leg Pipe Strap  
Page 88



**B2400**  
Standard Pipe Strap  
Pages 89-90



**BVT**  
VibraClamp  
Tubing Sizes  
Page 91

**BVP**  
VibraClamp  
Pipe Sizes  
Page 92



**IPH Series**  
Armafix™ Inserts & Insulation Tape  
Page 93

♦ **DURA-COPPER™ Finish**



## Pipe Clamps (Continued)



**B1999**  
Vibra Cushion  
Page 94



**ISO**  
ISO-PIPE™  
Page 94



**Fig. 22**  
Single Fastener  
CPVC Strap  
Page 95



**Fig. 22L2**  
One Hole Hanger/Restraint  
For CPVC & Steel Pipe  
Page 96



**Fig. 23**  
Double Fastener  
CPVC Strap  
Page 97



**Fig. 24**  
Double Fastener  
Side Mounted  
CPVC Strap  
Page 98



**Fig. 25**  
Surge Restrainer  
Page 99



**Fig. 27**  
Speed Nut  
Page 100



**Fig. 28**  
Stand-Off Hanger &  
Restrainer for  
CPVC Pipe  
Page 101



**Fig. 28M**  
Offset Hanger &  
Restrainer for  
CPVC & IPS Pipe  
Page 102



**Fig. 29**  
Double Offset  
Hanger & Restrainer  
for CPVC Pipe  
Page 103



**B3184**  
Light Duty  
Offset Hanger &  
Restrainer for  
CPVC & IPS Pipe  
Page 104



**BPRC Series**  
Rod Mount  
KWIK-CLIP  
Page 105



**BPIC Series**  
**BPSC Series**  
Channel Mount  
KWIK-CLIP  
Page 106

## Pipe Rollers & Roller Supports



**B3110**  
Adjustable Steel  
Yoke Pipe Roll  
Page 108 \*



**B3114**  
Pipe Roll With Sockets  
Page 109



**B3122**  
Adjustable Roller Support  
Page 110



**B3122A**  
Adjustable Double  
Roller Guide  
Page 111

\* Available in DURA GREEN™ Finish

## Pipe Rollers & Roller Supports (Continued)



**B3120**  
Roller Chair  
Page 112



**B3124**  
Roller Support  
Page 113



**B3126**  
Roller Support  
Page 114



**B218**  
Pipe Rollers  
Page 115



**B219**  
Pipe Rollers  
Page 116



**B379**  
Pipe Rollers  
Page 117



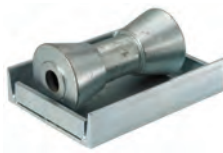
**B479**  
Pipe Rollers  
Page 118



**B3117SL**  
Steel Roller Stand  
Page 119



**B3118SL**  
Adjustable Roller Stand  
With Base Plate  
Page 120



**B3119SL**  
Roller With Steel  
Base Plate  
Page 121



**B3264**  
Spring Cushion Hanger  
Page 122



**B3114R**  
Long Pipe Roll Only  
Page 123



**B3117R**  
Short Pipe Roll Only  
Page 124

## Pipe Supports, Guides, Shields & Saddles



**B3380  
thru B3384**  
360° Calcium  
Silicate Shield  
Page 126



**B3088**  
Base Stand  
**B3088S**  
Seismic Base Stand  
Pages 127 & 128



**B3088T**  
Threaded Base Stand  
**B3088ST**  
Seismic Threaded  
Base Stand  
Pages 127 & 128



**B3096**  
Adjustable Pipe  
Saddle Support  
Page 129



**B3089**  
Pipe Support  
Adjuster  
Page 130



**B3090**  
Pipe Saddle  
Support  
With U-Bolt  
Pages 131 & 132



**B3095**  
Pipe Saddle Support  
Pages 133 & 134



**B3092**  
Adjustable Pipe Saddle  
Support With Yoke  
Pages 135 & 136



**B3093**  
Adjustable Pipe  
Saddle Support  
Pages 137 & 138



**B3097**  
Pipe Saddle  
With Strap  
Page 139



**B3098**  
Adjustable Pipe  
Support w/U-Bolt  
Page 140



**B3094**  
Flange Support  
Page 141

## Pipe Supports, Guides, Shields & Saddles (Continued)



**B3195**  
I.P.S. Isolator  
**B3195CT**  
Copper Tubing  
Isolator  
Page 142



**B3281 thru  
B3287**  
Pipe Alignment  
Guide  
Pages  
143 & 144



**B2417**  
Pipe Guides  
Page 145



**B3147A  
B3147B**  
Anchor Chairs  
Pages 145 & 146



**B3160 thru B3165**  
Pipe Covering  
Protection Saddle  
Pages 157 - 162



**B3256**  
Hold-Down  
Anchor Clamp  
Page 147



**B3257**  
Base Plate  
Page 148



**B3891 thru B3897**  
Pipe Slides  
Pages 149 - 152



**B3991 thru B3993**  
Pipe Slides  
Pages 153 - 156



**B3151**  
Insulation  
Protection Shield  
Page 164



**B3153**  
Insulation Protection  
Shield With Tabs  
Page 164



**BPH Series**  
Snap N' Shield  
Clevis  
Page 166



**BPU Series**  
Universal  
Snap N' Shield  
Pages 167 & 168



**BPS Series**  
Snap N' Shield  
Pages 169 & 170



**B3154**  
Short Insulation  
Protection Shield  
Page 165



**B3155**  
Short Insulation  
Protection Shield  
With Tabs  
Page 165

## TOLCO™ Seismic Bracing



**Fig. 4A**  
Pipe Clamp For  
Sway Bracing  
Page 172



**Fig. 4B**  
Pipe Clamp For  
Sway Bracing  
Page 173



**Fig. 4L**  
Longitudinal "In-Line"  
Sway Brace  
Attachment  
Page 174



**Fig. 4LA**  
Longitudinal "In-Line"  
Sway Brace  
Attachment  
Pages 175 & 176



**Fig. 800**  
Adjustable Sway  
Brace Attachment  
To Steel  
Page 177



**Fig. 825**  
Bar Joist Sway  
Brace Attachment  
Page 178



**Fig. 825A**  
Bar Joist Sway  
Brace Attachment  
Page 179



**Fig. 828**  
Universal Sway  
Brace Attachment  
Page 180



**Fig. 906**  
Sway Brace Multi-  
Fastener Adaptor  
Page 181



**Fig. 907**  
4-Way  
Longitudinal Sway  
Brace Attachment  
Page 182



**Fig. 909**  
No-Thread Swivel  
Sway Brace  
Attachment  
Page 183



## TOLCO™ Seismic Bracing (Continued)



**Fig. 910**  
Swivel Sway Brace  
Attachment  
Page 184



**Fig. 980**  
Universal Swivel  
Sway Brace  
Attachment  
Page 186



**Fig. 981**  
Fast-Attach  
Universal Swivel Sway  
Brace Attachment  
Page 187



**Fig. 985**  
Mechanical Fast  
Clamp  
Page 188



**Fig. 986**  
Mechanical Fast  
Clamp  
Page 188



**Fig. 975**  
Straight Sway  
Brace Fitting  
Page 185



**Fig. BRC CABLE**  
Pre-Stretched  
Aircraft Cable  
Page 189



**Fig. 990**  
Cable Sway Brace  
Attachment  
Page 190



**Fig. 991**  
Fast Attach  
Cable Sway Brace  
Attachment  
Page 191



**Fig. 1000**  
Fast Clamp  
Sway Brace  
Attachment  
Page 192



**Fig. 1001**  
Sway Brace  
Attachment  
Page 193



**Fig. 2002**  
Sway Brace  
Attachment  
Page 194

## Concrete Inserts



**B3019**  
Adjustable Metal  
Deck Ceiling Bolt  
Page 196



**B2499**  
Heavy Duty Spot Insert  
Page 196



**Fig. 109A**  
Concrete Deck Insert  
Pages 197



**B2501**  
Light Duty  
Spot Insert  
Pages 198



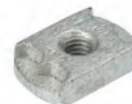
**B2500**  
Light Duty Spot Insert  
Page 199



**N2500**  
Steel Insert Nut  
Page 199



**B3014**  
Malleable Iron  
Spot Insert  
Page 200



**B3014N**  
Malleable Iron Insert Nut  
Page 200



**B2505 thru  
B2508**  
Spot Insert  
Page 201

## Concrete Inserts (Continued)



**B2503**  
Heavy Duty Spot Insert  
Page 202



**B221, B321, B521**  
Continuous Concrete Inserts  
Pages 203 - 205



**BD40**  
Fastener Clip  
Page 206



**BE-5-8**  
**BE-9-12**  
Fastener Clip  
Page 206

## BRACKETS



**B3068**  
Light Duty Welded  
Bracket  
Page 208



**B3064**  
Adjustable Strut  
Bracket  
Page 209



**B3065**  
Light Duty Welded  
Bracket  
Page 210



**B3066**  
Medium Duty  
Welded Bracket  
Page 211



**B3067**  
Heavy Duty  
Welded Bracket  
Page 212



**B3069W**  
Welded Knee Brace  
Page 213



**B3069E**  
"O" Bracket  
Page 213

## Upper Attachments



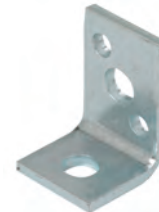
**B3199**  
Ceiling Flange  
Page 216



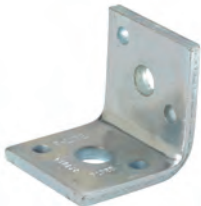
**B3199CT**  
Dura-Copper Coated  
Ceiling Flange  
Page 216 ♦



**Fig. 78**  
All Steel Ceiling Plate  
Page 216



**B3060L**  
Side Beam  
Angle Clip  
Page 217



**B3070**  
Reversible Angle Clip  
Page 217



**B3060**  
Side Beam Angle Clip  
Page 218



**Fig. 51NFPA**  
Side Beam Bracket for  
NFPA Rod  
Page 218



**Fig. 50**  
Side Beam Bracket For NFPA  
Rod & Fastener Sizing  
Page 219



**B3061**  
Angle Bracket  
Page 219

♦ **DURA-COPPER™ Finish**

## Upper Attachments (Continued)



**Fig. 56**  
Tapped Side  
Beam Connector  
Page 219



**Fig. 58**  
Threaded Side  
Beam Bracket  
Page 220



**Fig. 75**  
Swivel Attachment  
Page 221



**B3058**  
Side Beam Connector  
Page 222



**B3062**  
Side Beam Bracket  
Page 222



**B3083**  
**B3083WO**  
Welded  
Beam Attachment  
Page 223



**B3080S (Short)**  
**B3080L (Long)**  
Structural Welding Lug  
Page 224



**B3085**  
Rod Attachment Concrete Plate  
Page 225



**B3086**  
Clevis Concrete Plate  
Page 226



**B3084**  
Single Lug Concrete Plate  
Page 227



**B3082**  
Rod Beam Attachment  
Page 228

## Threaded Accessories



**B3222**  
Eye Socket  
Page 230



**B3200**  
Weldless Eye Nut  
Page 231



**B501**  
Light Weight U-Bolt  
Page 232



**B3188**  
Standard U-Bolt  
Pages 233 & 234



**B3188C**  
Plastic Coated  
Standard U-Bolt  
Pages 233 & 234



**B3201**  
Forged Steel Clevis  
Page 235



**B3203**  
Extension Piece  
Page 236



**B3223**  
Offset Eye Socket  
Page 236



**B3224**  
Hanger Adjuster



**B3224CT**  
Dura-Copper Coated  
Hanger Adjuster  
Page 237



**B3202**  
Turnbuckle  
Page 237

◆ **DURA-COPPER™ Finish** ◆



## Threaded Accessories (Continued)



**B3205**  
Machine Threaded Rod  
Page 238



**ATR**  
All Threaded Rod  
Page 238



**B3214**  
Tie Bolt  
Page 240



**B3210**  
Eye Rod  
Page 241



**B3210X**  
Linked Eye Rod  
Page 242



**Fig. 98**  
Rod Stiffener  
Page 239



**Fig. 98B**  
Rod Stiffener with  
Break Off Bolt Head  
Page 239



**SC228**  
Rod Stiffener  
Page 239



**B3211**  
Welded Eye Rod  
241



**B3211X**  
Linked Welded Eye Rod  
Page 242



**B3212**  
J-Bolt  
Page 243



**B3228**  
Hex Head Lag Bolt  
Page 243



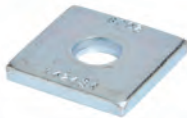
**DS 16 x 2**  
#16 x 2"  
Drive Screw  
Page 243

**B655**  
Steel Rod Coupling  
Page 244

**B656**  
Steel Reducer  
Rod Coupling  
Page 244



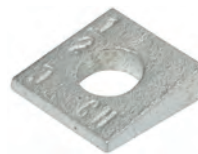
**B3220**  
Malleable Iron  
Rod Coupling  
Page 245



**B200**  
Square Washer  
Page 245



**B3248**  
Steel Washer Plate  
Page 246



**B3234**  
Bevel Washer  
Page 246



**HN** - Hex Nut  
**HHN** - Heavy Hex Nut  
Page 247



**FW**  
Flat Washer  
Page 248



**LW**  
Lock Washer  
Page 248



**FFW**  
Flat Fender Washer  
Page 248



**ATB**  
Toggle Bolt  
Page 249



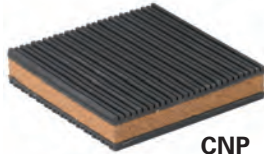
**AWA**  
Wedge Anchor  
Page 249

## VIBRATION ISOLATION



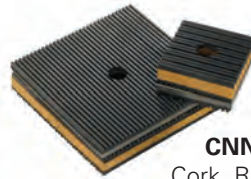
**NNP**

Ribbed Neoprene Pad  
Page 254



**CNP**

Cork and Ribbed  
Neoprene Pad  
Page 255



**CNNK**

Cork, Ribbed  
Neoprene and Steel  
Page 256



**VRP**

Rubber Cube Pad  
Page 257



**BVS Type**

1 5/8" Wide Vibra Strip™  
Page 258



**RM & RM-D Type**

Neoprene Mounts  
Page 259



**OS Type**

Steel Spring Isolator Restraints  
1", 2", & 3" Deflection  
Pages 260 - 261



**JQ Type**

Isolator Restraints w/OPA-0070  
Pre-Approved Seismic Protection  
1", 2", & 3" Deflection  
Pages 262 - 264



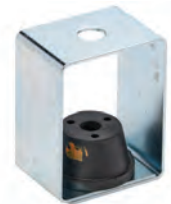
**JQ-TQN Type**

Neoprene Isolator Restraints  
w/OPA-0070  
Pre-Approved Seismic Protection  
1/2" Deflection  
Pages 265 - 266



**RQ & RQD Type**

Neoprene Mount w/Integrak  
Seismic Restraints  
1/4" & 1/2" Deflection  
Pages 267 - 268



**RH & RHD Type**

Neoprene Hanger  
1/4" & 1/2" Deflection  
Page 269



**CHSCS Type**

Spring Hanger  
w/Seismic Cushion Stop  
1" & 2" Deflection  
Pages 270 - 271



**HHSCS Type**

Combination Hanger  
Spring & Neoprene w/  
Seismic Cushion Stop  
1 1/2" & 2 1/2" Deflection  
Pages 274 - 275



**CH30SCS Type**

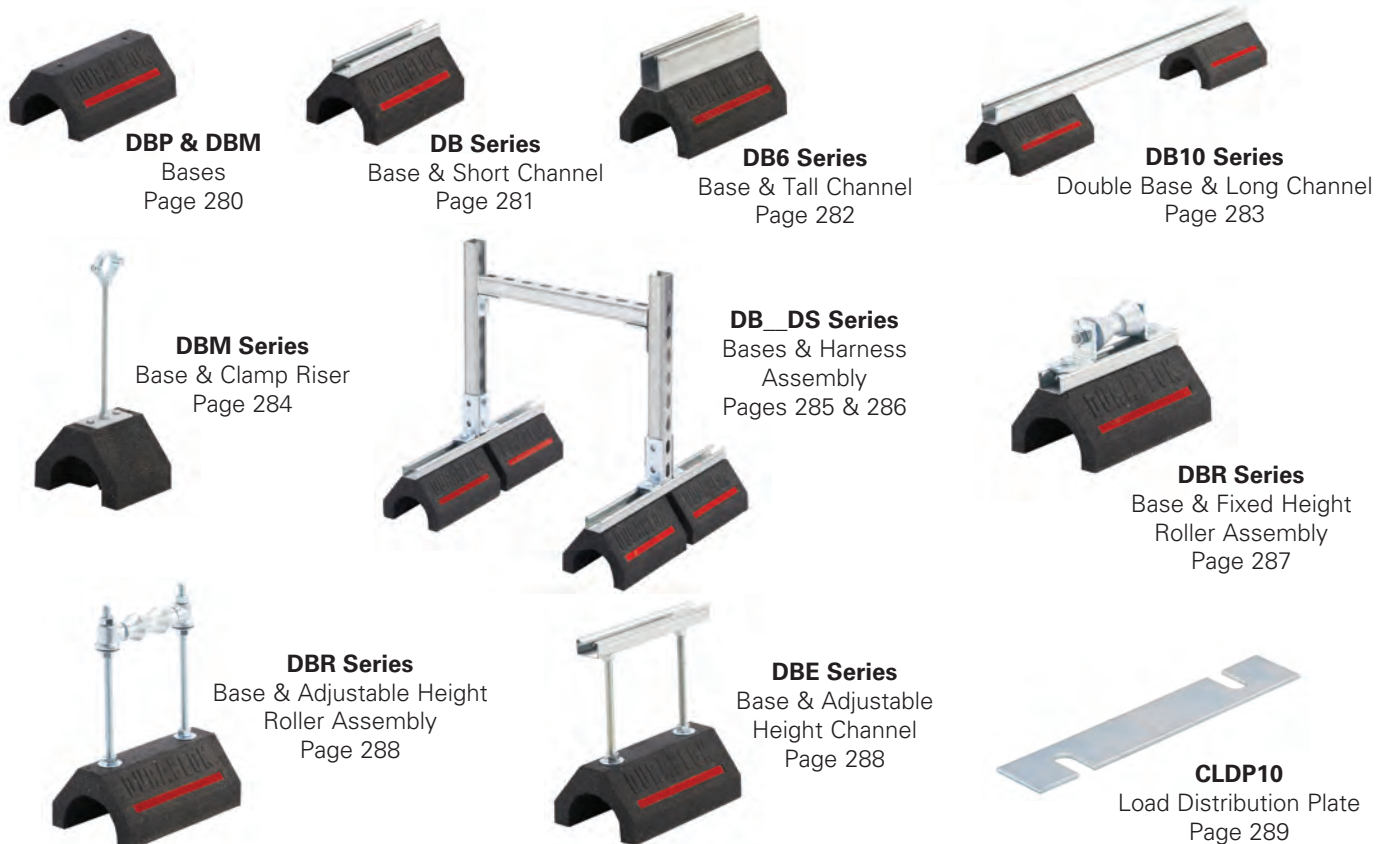
Deflection Combination Hanger  
15° Tilt Spring & Neoprene w/  
Seismic Cushion Stop  
1" & 2" Deflection  
Pages 272 - 273



**HH30SCS Type**

Deflection Combination Hanger  
15° Tilt Spring & Neoprene w/  
Seismic Cushion Stop  
1 1/2" & 2 1/2" Deflection  
Pages 276 - 277

## DURA-BLOK™ Rooftop Supports



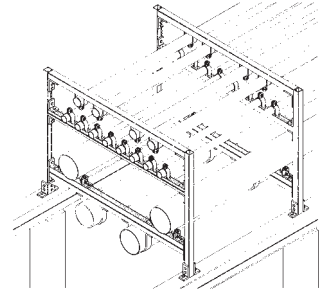
## KwikWire™ System












# Strut Systems

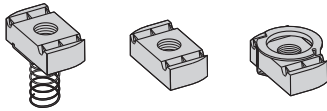
The B-Line series metal framing support system is designed with many time-saving features. Fully adjustable and reusable, with a complete line of channels, fittings, and accessories for multi-purpose applications.



## SELECTION CHART for Channels, Materials and Hole Patterns

Channel Dimensions			Material & Thickness				Channel Hole Pattern				
Channel	Height 	Width 			Stainless Steel		SH 	S 	H17/8 	TH 	KO6 
			Steel 1	Alum. 2	Type 304 3	Type 316 4					
B11	3 1/4" (82.5)	1 5/8" (41.3)	12 Ga.	—	—	—	1	1	1	—	1
B12	2 7/16" (61.9)	1 5/8" (41.3)	12 Ga.	.105	—	—	1 2	1	1 2	—	1 2
B22	1 5/8" (41.3)	1 5/8" (41.3)	12 Ga.	.105	12 Ga.	12 Ga.	1 2 3 4	1	1 2 3 4	1	1 2
B24	1 5/8" (41.3)	1 5/8" (41.3)	14 Ga.	.080	14 Ga.	14 Ga.	1 2 3 4	1	1 2 3 4	—	1 2
B26	1 5/8" (41.3)	1 5/8" (41.3)	16 Ga.	—	—	—	1	1	1	—	1
B32	1 3/8" (34.9)	1 5/8" (41.3)	12 Ga.	—	12 Ga.	—	1 3	1	1 3	—	1
B42	1" (25.4)	1 5/8" (41.3)	12 Ga.	—	12 Ga.	—	1 3	1	1 3	—	1
B52	1 3/16" (20.6)	1 5/8" (41.3)	12 Ga.	—	—	—	1	1	1	—	1
B54	1 3/16" (20.6)	1 5/8" (41.3)	14 Ga.	.080	14 Ga.	14 Ga.	1 2 3 4	1	1 2 3 4	—	1 2
B56	1 3/16" (20.6)	1 5/8" (41.3)	16 Ga.	—	—	—	1	1	1	—	1

### Channel Nuts



#### Size and Part Number

Thread Size	With Spring	Without Spring	Twirl Nut
1/4"-20	N224	N224WO	TN224
3/8"-16	N228	N228WO	TN228
1/2"-13	N225	N225WO	TN225
5/8"-11	N255	N255WO	--
3/4"-10	N275	N275WO	--

Available Finishes: Electro-Galvanized

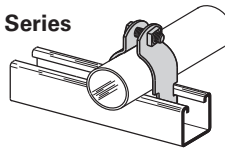
### Combo Nut Washers

Part Number	Thread Size
NW524	1/4"-20
NW528	3/8"-16
NW525	1/2"-13



Available Finishes: Electro-Galvanized

### B2000 Series



### Copper Tubing Clamps DURA-COPPER™

Part No.	Nominal Tubing Size	Mat'l Ga.
B2026DCU	1/2" (15)	16
B2008DCU	3/4" (20)	16
B2030DCU	1" (25)	14
B2032DCU	1 1/4" (32)	14
B2011DCU	1 1/2" (40)	14
B2038DCU	2" (50)	12
B2042DCU	2 1/2" (60)	12
B2046DCU	3" (80)	12
B2050DCU	3 1/2" (90)	12
B2054DCU	4" (100)	11

Available Finishes: Electro-Galvanized, Aluminum, Stainless, DURA-COPPER Painted, Hot-Dip Galvanized and PVC coated.  
Nut and bolts are included with all two-piece clamps.

\*\* Add "PA" to Part No. for Pre-assembled

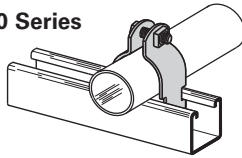
### Schedule 40 Pipe Clamps

Part No.	Nominal Pipe Size	Mat'l Ga.
B2001	3/8" (10)	16
B2008	1/2" (15)	16
B2009	3/4" (20)	14
B2010	1" (25)	14
B2011	1 1/4" (32)	14
B2012	1 1/2" (40)	12
B2013	2" (50)	12
B2014	2 1/2" (60)	12
B2015	3" (80)	12
B2016	3 1/2" (90)	11
B2017	4" (100)	11
B2018	4 1/2" (115)	11
B2019	5" (125)	11
B2020	6" (150)	11
B2021	7" (175)	11
B2022	8" (200)	11

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

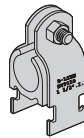
Below are some basic clamp and cushions to be used with a strut system. For the industry's most complete line of strut and strut fittings, refer to B-Line series Strut Systems catalog.

**B2000 Series**



## O.D. Pipe Clamps

Part No.	O.D. Size (Outside Dia.)	Mat'l Ga.
B2023	1/4" (6.3)	16
B2024	3/8" (9.5)	16
B2025	1/2" (12.7)	16
B2026	5/8" (15.9)	16
B2027	3/4" (19.0)	16
B2028	7/8" (22.2)	16
B2029	1" (25.4)	14
B2030	1 1/8" (28.6)	14
B2031	1 1/4" (31.7)	14
B2032	1 3/8" (34.9)	14
B2004	1 1/2" (38.1)	14
B2011	1 5/8" (41.3)	14
B2005	1 3/4" (44.4)	12
B2036	1 7/8" (47.6)	12
B2037	2" (50.8)	12
B2038	2 1/8" (54.0)	12
B2039	2 1/4" (57.1)	12
B2013	2 3/8" (60.3)	12
B2041	2 1/2" (63.5)	12
B2042	2 5/8" (66.7)	12
B2043	2 3/4" (69.8)	12
B2014	2 7/8" (73.0)	12
B2045	3" (76.2)	12
B2046	3 1/8" (79.4)	12
B2047	3 1/4" (82.5)	12
B2048	3 3/8" (85.7)	12
B2015	3 1/2" (88.9)	12
B2050	3 5/8" (92.1)	11
B2051	3 3/4" (95.2)	11
B2016	4" (101.6)	11
B2054	4 1/8" (104.8)	11
B2055	4 1/4" (107.9)	11
B2056	4 3/8" (111.1)	11
B2017	4 1/2" (114.3)	11
B2058	4 5/8" (117.5)	11
B2059	4 3/4" (120.6)	11
B2060	4 7/8" (123.8)	11
B2061	5" (127.0)	11
B2062	5 1/8" (130.2)	11
B2063	5 1/4" (133.3)	11
B2064	5 3/8" (136.5)	11
B2065	5 1/2" (139.7)	11



**BVT & BVP Series Vibra-Clamp™**

## For Copper Tubing & OD Sizes

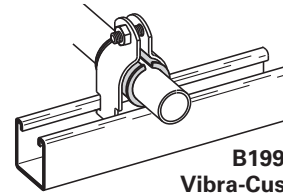
Catalog No.	Copper & Steel OD Tubing Size	Nominal Copper Size
BVT025	1/4" (6.3)	—
BVT037	3/8" (9.5)	1/4" (6)
BVT050	1/2" (12.7)	3/8" (10)
BVT062	5/8" (15.9)	1/2" (15)
BVT075	3/4" (19.0)	5/8" (17)
BVT087	7/8" (22.2)	3/4" (20)
BVT100	1" (25.4)	—
BVT112	1 1/8" (28.6)	1" (25)
BVT125	1 1/4" (31.7)	—
BVT137	1 3/8" (34.9)	1 1/4" (32)
BVT150	1 1/2" (38.1)	—
BVT162	1 5/8" (41.3)	1 1/2" (40)
BVT175	1 3/4" (44.4)	—
BVT187	1 7/8" (47.6)	—
BVT200	2" (50.8)	—
BVT212	2 1/8" (54.0)	2" (50)
BVT225	2 1/4" (57.1)	—
BVT250	2 1/2" (63.5)	—
BVT262	2 5/8" (66.7)	2 1/2" (65)
BVT300	3" (76.2)	—
BVT312	3 1/8" (79.4)	3" (80)
BVT362	3 5/8" (92.1)	3 1/2" (90)
BVT400	4" (101.6)	—
BVT412	4 1/8" (104.8)	4" (100)
BVT612	6 1/8" (155.6)	6" (150)

Available for tubing and pipe sizes 1/4" to 6", OD sizes 1/4" to 6 5/8". Easy one tool installation, dampens vibration and noise, secures tubing firmly, and protects against galvanic reaction.

Stainless Steel available

## For Pipe Sizes

Catalog No.	Nominal Pipe Size
BVP025	1/4" (6)
BVP037	3/8" (10)
BVP050	1/2" (15)
BVP075	3/4" (20)
BVP100	1" (25)
BVP125	1 1/4" (32)
BVP150	1 1/2" (40)
BVP200	2" (50)
BVP250	2 1/2" (65)
BVP300	3" (80)
BVP350	3 1/2" (90)
BVP400	4" (100)
BVP500	5" (125)
BVP600	6" (150)



**B1999 Vibra-Cushion™**

- Inhibits Galvanic Reaction
- Reduces Sound & Vibration
- Used on refrigeration, HVAC, copper tubing, glass pipes & hydraulic lines Available in 20 Ft. rolls.

## For Rigid Conduit or Iron Pipe

Nominal Size	Length of Vibra-Cushion	Use Clamp No.
3/8" (10)	2 1/8" (54.0)	B2002
1/2" (15)	2 5/8" (66.7)	B2009
3/4" (20)	3 1/4" (82.5)	B2031
1" (25)	4 1/8" (104.8)	B2004
1 1/4" (32)	5 3/16" (131.8)	B2012
1 1/2" (40)	5 5/16" (150.8)	B2038
2" (50)	7 1/2" (190.5)	B2042
2 1/2" (65)	9" (228.6)	B2046
3" (80)	11" (279.4)	B2051
3 1/2" (90)	12 1/2" (317.5)	B2055
4" (100)	14 1/2" (368.3)	B2059
5" (125)	17 7/16" (442.9)	B2067
6" (150)	20 3/4" (527.0)	B2116

## For Thinwall (EMT) Conduit

Nominal Size	Length of Vibra-Cushion	Use Clamp No.
3/8" (10)	1 13/16" (46.0)	B2027
1/2" (15)	2 3/16" (58.7)	B2002
3/4" (20)	2 7/8" (73.0)	B2003
1" (25)	3 5/8" (92.1)	B2032
1 1/4" (32)	4 3/8" (120.6)	B2036
1 1/2" (40)	5 7/16" (138.1)	B2012
2" (50)	6 7/8" (174.6)	B2013

## For Thinwall (EMT) Conduit

Nominal Size	Length of Vibra-Cushion	Use Clamp No.
1/4" (6)	1 3/16" (30.2)	B2026
3/8" (10)	1 9/16" (39.7)	B2027
1/2" (15)	1 7/8" (47.6)	B2028
5/8" (17)	2 5/16" (58.7)	B2029
3/4" (20)	2 3/4" (69.8)	B2030
1" (25)	3 1/2" (88.9)	B2032
1 1/4" (32)	4 5/16" (109.5)	B2011
1 1/2" (40)	5 1/8" (130.2)	B2036
2" (50)	6 1/16" (169.9)	B2013
2 1/2" (65)	8 1/4" (209.5)	B2014
3" (80)	9 13/16" (249.2)	B2048
3 1/2" (90)	11 3/8" (288.9)	B2052
4" (100)	12 15/16" (328.6)	B2056
5" (125)	16 1/8" (409.6)	B2064
6" (150)	19 1/4" (488.9)	B2112
8" (200)	25 1/2" (647.7)	B2128

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

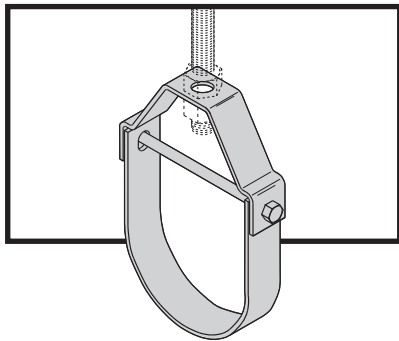
## MATERIALS

### Carbon Steel

Carbon steel is used in the manufacture of B-Line series pipe hangers and supports. Excellent strength characteristics and adaptability to cold forming provide a well engineered design. By cold forming the steel, mechanical properties are increased, adding to the structural integrity of the fabricated hanger.

### Stainless Steel

AISI Type 304 and Type 316 are non-magnetic members of the austenitic stainless steel group. Several conditions make the use of stainless steel ideal. These include reducing long term maintenance costs, high ambient temperatures, appearance, and stable structural properties such as yield strength, and high creep resistance.



## CORROSION

All metal surfaces exposed to the environment are affected by corrosion. Depending on the physical properties of the metal and its proximity to other dissimilar metals, an electrochemical reaction may occur which causes an attack on the metal itself, resulting in corrosion. Chemical corrosion is limited to highly corrosive environments, high temperatures, or a combination of both.

## FINISHES

### Zinc Coatings

Protective zinc coatings are available on a number of pipe hangers and accessories in three basic forms: Electro-galvanized, pre-galvanized, and hot-dip galvanized after fabrication. In all cases, the zinc protects the steel first as a sacrificial anode to repair bare areas on cut edges and gouges.

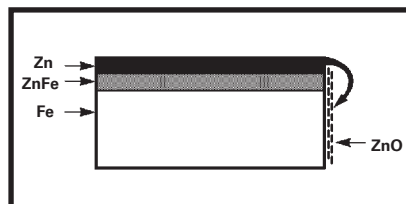
When exposed to air and moisture, zinc forms a tough, adherent protective film consisting of a mixture of zinc oxides, hydroxides, and carbonates. The corrosion resistance of zinc is directly related to its thickness and the environment. For example a 0.2 mil (5  $\mu\text{m}$ ) coating will last twice as long as a 0.1 mil (2.5  $\mu\text{m}$ ) coating in the same environment.

### Electro-Galvanized (ASTM B633 SC1 or SC3)

An electro-galvanized process deposits a coating of zinc on the steel by electrolysis from a bath of zinc salts. This coating is pure zinc and adheres to the steel with a molecular bond. A maximum of 0.5 mils (12.7  $\mu\text{m}$ ) of zinc can be applied by this method. This coating is recommended for in-door use in relatively dry areas.

### Pre-Galvanized Zinc (ASTM A653 Coating Designation G90)

Pre-galvanized zinc is produced by continuously rolling the steel coils or sheets through molten zinc at the steel mills. This is also known as "mill-galvanized" or "hot-dipped mill galvanized". Coils are then slit to size for fabrication of pipe hangers. Coating thicknesses of G90, is 0.90 ounces per square foot (0.27  $\text{kg}/\text{m}^2$ ) of steel surface.



Protection of cut edges with zinc coatings.

Cut edges and welded areas are not zinc coated; however, zinc near the uncoated metal becomes a sacrificial anode which protects the bare areas after a short period of time. Pre-galvanized steel is not generally recommended for use outdoors in industrial environments, but is suitable for extended exposure in dry or mildly corrosive atmospheres.

### Hot-Dip Galvanized After Fabrication (ASTM A123)

After a pipe hanger or fitting has been fabricated, it is completely immersed in a bath of molten zinc. A metallurgical bond is formed, resulting in a zinc coating that completely coats all surfaces, including edges. Zinc coatings of this specification have a minimum thickness of 1.50 ounces per square foot (0.45  $\text{kg}/\text{m}^2$ ) on each side or a total of 3.0 ounces per square foot (0.9  $\text{kg}/\text{m}^2$ ) of steel.

Hot-dip galvanized after fabrication is recommended for outdoor exposure. For best results, a zinc rich paint (available from Eaton) should be applied to field cuts. The zinc rich paint will provide immediate protection for field cuts and eliminate the short time period for galvanic action to "heal" the damaged coating.

### Plastic Coating

Some products offered by Eaton are plastic or vinyl coated for prevention of galvanic reaction between materials or for noise reduction. These coated products can also be used where contact between glass pipe and hanger is not desirable. Felt lined hangers may be substituted for same purpose.

### Red Primer

A corrosion resistant metal primer containing rust inhibitive pigments.



DURA-COPPER and  
DURA GREEN Epoxy Coatings

DURA-COPPER™ and DURA GREEN™ are water borne epoxy coatings applied to B-Line series products by a precisely controlled cathodic electro-deposition process. This process is accomplished using a conveyor to transport parts through several cleaning, phosphatizing and application stages prior to being baked (See diagram below).

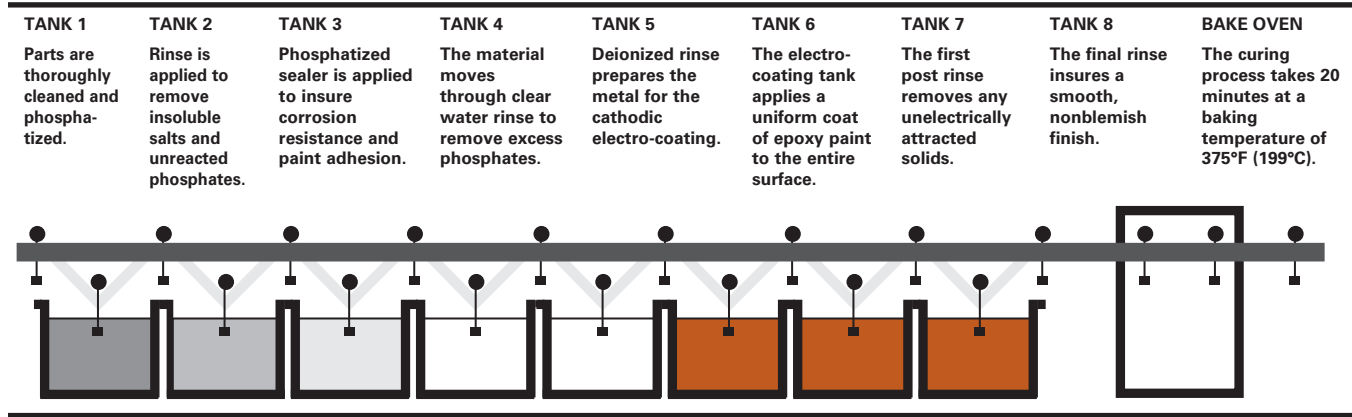
This custom designed paint system is used for painting all copper painted hanger parts and all green channel, slotted angle and fittings.

Samples are selected on a routine basis for Salt Spray (fog) testing to verify the quality of the finish. These tests are performed in accordance with ASTM B117-73 and evaluated and rated according to ASTM D1654-79 (Tables 1 & 2). The DURA-COPPER and DURA GREEN Epoxy coatings have been tested and listed by Underwriters Laboratories in accordance with "Standard for Pipe Hanger Equipment for Fire Protection Service, UL 203" and meet or exceed all requirements of Federal Specification TT-C-490B Paragraph 3.

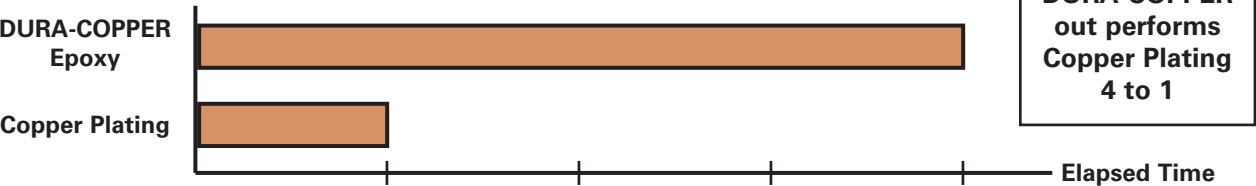
Quality Assurance

Eaton's Quality Assurance Program has been developed and implemented for compliance to various industry standards and specifications.

DURA-COPPER & DURA GREEN EPOXY COATING PROCESS



SALT SPRAY TEST RESULTS



(1) All salt spray (fog) tests conducted in accordance with ASTM B117-73 and evaluated and rated according to ASTM D1654-79 Tables 1 & 2. Tests were performed and certified by an independent testing laboratory.

General Information

Torque

The torque values in this catalog are to be used as a guide only. The relationship between the applied torque or torque wrench reading and the actual tension created in the bolt may be substantially different. Important factors affecting torque-tension relationships include friction under the bolt head or nut, hole tolerances, and torque wrench tolerances. Accuracy of many commercial torque wrenches may vary as much as plus or minus 25%.

Charts and Tables

Charts and tables in this section are compiled from information published by nationally recognized organizations and are intended for use as a guide only. Eaton recommends that users of this information determine the validity of such information as applied to their own applications.

Eaton reserves the right to make specification changes without notice.

## SECTION 15140 - PIPE HANGERS AND SUPPORTS

### Part I - GENERAL

#### 1.01 SECTION INCLUDES

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the pipe hanger and supports as described in this specification.

#### 1.02 REFERENCES

- A. ASTM B633 - Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
- B. ASTM A123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. ASTM A653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- D. ASTM A1011 - Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability.
- E. ANSI/MSS SP-58 - Manufacturers Standardization Society: Pipe Hangers and Supports - Materials, Design, and Manufacture.
- F. ANSI/MSS SP-69 - Manufacturers Standardization Society: Pipe Hangers and Supports - Selection and Application.
- G. NFPA 13 - Installation of Sprinkler Systems.

#### 1.03 QUALITY ASSURANCE

- A. Hangers and supports used in fire protection piping systems shall be listed and labeled by Underwriters Laboratories.
- B. Steel pipe hangers and supports shall have the manufacturers name, part number, and applicable size stamped in the part itself for identification.
- C. Hangers and supports shall be designed and manufactured in conformance with ANSI/MSS SP-58.
- D. Supports for sprinkler piping shall be in conformance with NFPA 13.

#### 1.04 SUBMITTALS

- A. Submit product data on all hanger and support devices, including shields and attachment methods. Product data to include, but not limited to materials, finishes, approvals, load ratings, and dimensional information.

### Part II - PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturer: Subject to compliance with these specifications, pipe hanger and support systems shall be as manufactured by Eaton.

#### 2.02 PIPE HANGERS AND SUPPORTS

- A. Hangers
  - 1. Uninsulated pipes 2 inch and smaller:
    - a. Adjustable steel swivel ring (band type) hanger, B-Line series Fig. 200.
    - b. Adjustable steel swivel J-hanger, B-Line series B3690.
    - c. Malleable iron ring hanger, B-Line series B3198R or hinged ring hanger, B3198H.
    - d. Adjustable steel clevis hanger, B-Line series B3104 or B3100.

2. Uninsulated pipes 2<sup>1</sup>/<sub>2</sub> inch and larger:
    - a. Adjustable steel clevis hanger, B-Line series B3100.
    - b. Pipe roll with sockets, B-Line series B3114.
    - c. Adjustable steel yoke pipe roll, B-Line series B3110.
  3. Insulated pipe - Hot or steam piping:
    - a. 2 inch and smaller pipes: use adjustable steel clevis with galvanized sheet metal shield, B-Line series B3100 with B3151 or B3153 series.
    - b. 2<sup>1</sup>/<sub>2</sub> inch and larger pipes:
      - i. Adjustable steel yoke pipe roll with pipe covering protection saddle, B-Line series B3110 with B3160 - B3165 series.
      - ii. Pipe roll with sockets with pipe covering protection saddle, B-Line series B3114 with B3160 - B3165 series.
  4. Insulated pipe - Cold or chilled water piping:
    - a. 5 inch and smaller pipes: use adjustable steel clevis with galvanized sheet metal shield, B-Line series B3100 with B3151 or B3153 series.
    - b. 6 inch and larger pipes:
      - i. Adjustable steel yoke pipe, B-Line series B3110, with B3380CW - B3384CW calcium silicate shield.
      - ii. Pipe roll with sockets, B-Line series B3114, with B3380CW - B3384CW calcium silicate shield.
- B. PIPE CLAMPS
1. When flexibility in the hanger assembly is required due to horizontal movement, use pipe clamps with weldless eye nuts, B-Line series B3140 or B3142 with B3200. For insulated lines use double bolted pipe clamps, B-Line series B3144 or B3146 with B3200.
- C. MULTIPLE OR TRAPEZE HANGERS
1. Trapeze hangers shall be constructed from 12 gauge roll formed ASTM A1011 SS Gr. 33 structural steel channel, 1<sup>5</sup>/<sub>8</sub>" x 1<sup>5</sup>/<sub>8</sub>" minimum, B-Line series B22 strut or stronger as required.
  2. Mount pipes to trapeze with two piece pipe straps sized for outside diameter of pipe, B-Line series B2000 series.
  3. For pipes subjected to axial movement:
    - a. Strut mounted roller support, B-Line series B3126. Use pipe protection shield or saddles on insulated lines.
    - b. Strut mounted pipe guide, B-Line series B2417.
- D. WALL SUPPORTS
1. Pipes 4 inch and smaller:
    - a. Carbon steel hook, B-Line series B3191.
    - b. Carbon steel J-hanger, B-Line series B3690.
  2. Pipes larger than 4 inch:
    - a. Welded strut bracket and pipe straps, B-Line series B3064 and B2000 series.
    - b. Welded steel brackets, B-Line series B3066 or B3067, with roller chair or adjustable steel yoke pipe roll. B-Line series B3120 or B3110. Use pipe protection shield or saddles on insulated lines.



## E. FLOOR SUPPORTS

1. Hot piping under 6 inch and all cold piping:
  - a. Carbon steel adjustable pipe saddle and nipple attached to steel base stand sized for pipe elevation, B-Line series B3093 and B3088T or B3090 and B3088. Pipe saddle shall be screwed or welded to appropriate base stand.
2. Hot piping 6 inch and larger:
  - a. (Adjustable) Roller stand with base plate, B-Line series B3117SL (or B3118SL).
  - b. Adjustable roller support and steel support sized for elevation, B-Line series B3124

## F. VERTICAL SUPPORTS

1. Steel riser clamp sized to fit outside diameter of pipe, B-Line series B3373.

## G. COPPER TUBING SUPPORTS

1. Hangers shall be sized to fit copper tubing outside diameters.
  - a. Adjustable steel swivel ring (band type) hanger, B-Line series B3170CT.
  - b. Malleable iron ring hanger, B-Line series B3198CT or hinged ring hanger B3198HCT.
  - c. Adjustable steel clevis hanger, B-Line series B3104CT.

## H. PLASTIC PIPE SUPPORTS

1. V-bottom clevis hanger with galvanized 18 gauge continuous support channel, B-Line series B3106 and B3106V, to form a continuous support system for plastic pipe or flexible tubing.

## I. SUPPLEMENTARY STRUCTURAL SUPPORTS

1. Design and fabricate supports using structural quality steel bolted framing materials as manufactured by Eaton. Channels shall be roll formed, 12 gauge ASTM A1011 SS Grade 33 steel, 1<sup>5</sup>/<sub>8</sub>" x 1<sup>5</sup>/<sub>8</sub>" or greater as required by loading conditions. Submit designs for pipe tunnels, pipe galleries, etc., to engineer for approval. Use clamps and fittings designed for use with the strut system.

## 2.04 UPPER ATTACHMENTS

### A. BEAM CLAMPS

1. Beam clamps shall be used where piping is to be suspended from building steel. Clamp type shall be selected on the basis of load to be supported, and load configuration.
2. C-Clamps shall have locknuts and cup point set screws, B-Line series B351L, B3036L or Fig. 65XT Top flange C-clamps shall be used when attaching a hanger rod to the top flange of structural shapes, B-Line series B3034 or B3033. Refer to manufacturers' recommendation for setscrew torque. Retaining straps shall be used to maintain the clamp's position on the beam where required (Fig. 69, Fig. 69R).
3. Center loaded beam clamps shall be used where specified. Steel clamps shall be B-Line series B3050 or B3055. Malleable iron or forged steel beam clamps with cross bolt shall be B-Line series B3054 or B3291 - B3297 series as required to fit beams.

### B. CONCRETE INSERTS

1. Cast in place spot concrete inserts shall be used where applicable, either steel or malleable iron body, B-Line series B2500 or B3014. Spot inserts shall allow for lateral adjustment and have means for attachment to forms. Select insert nuts to suit threaded hanger rod sizes, B-Line series N2500 or B3014N series.

2. Continuous concrete inserts shall be used where applicable. Channels shall be 12 gauge, ASTM A 1011 SS Grade 33 structural quality carbon steel, complete with styrofoam inserts and end caps with nail holes for attachment to forms. The continuous concrete insert shall have a load rating of 2,000 lbs/ft. in concrete, B-Line series B22I, B32I, or B52I (B52I is limited to 1,500 lbs/ft.). Select channel nuts suitable for strut and rod sizes.

## 2.05 VIBRATION ISOLATION AND SUPPORTS

- A. For refrigeration, air conditioning, hydraulic, pneumatic, and other vibrating system applications, use a clamp that has a vibration dampening insert and a nylon inserted locknut. For copper and steel tubing use B-Line series BVT Vibra-Clamp™, for pipe sizes use BVP Vibra-Clamp.
- B. For larger tubing or piping subjected to vibration, use neoprene or spring hangers as required.
- C. For base mounted equipment use vibration pads, molded neoprene mounts, or spring mounts as required.
- D. Vibration isolation products as provided by Eaton's B-Line series.

## 2.06 ACCESSORIES

- A. Hanger rods shall be threaded both ends, B-Line series B3205, or continuous threaded rods of circular cross section. Use adjusting locknuts at upper attachments and hangers. No wire, chain, or perforated straps are allowed.
- B. Shields shall be 180° galvanized sheet metal, 12 inch minimum length, 18 gauge minimum thickness, designed to match outside diameter of the insulated pipe, B-Line series B3151.
- C. Pipe protection saddles shall be formed from carbon steel, 1/8 inch minimum thickness, sized for insulation thickness. Saddles for pipe sizes greater than 12 inch shall have a center support rib.

## 2.07 FINISHES

### INDOOR FINISHES

- A. Hangers and clamps for support of bare copper piping shall be coated with copper colored epoxy paint, B-Line series DURA-COPPER™. Additionally a plastic coating or a felt lining in hanger can be used.
- B. Hangers for other than bare copper pipe shall be zinc plated in accordance with ASTM B633 - SC3 or shall have an electro-deposited green epoxy finish, B-Line series DURA GREEN™.
- C. Strut channels shall be pre-galvanized in accordance with ASTM A653 G90 or have an electro-deposited green epoxy finish, B-Line series DURA GREEN.

### OUTDOOR AND CORROSIVE AREA FINISHES

- D. Hangers and strut located outdoors shall be hot dip galvanized after fabrication in accordance with ASTM A123. All hanger hardware shall be hot-dip galvanized or stainless steel. Zinc plated hardware is not acceptable for outdoor or corrosive use.
- E. Hangers and strut located in corrosive areas shall be Type 304 (316) stainless steel with stainless steel hardware.

## Part III - EXECUTION

### 3.01 PIPE HANGERS AND SUPPORTS

- A. Pipe shall be adequately supported by pipe hanger and supports specified in PART II - PRODUCTS. Hangers for insulated pipes shall be sized to accommodate insulation thickness.
- B. Horizontal steel piping shall be supported in accordance with ANSI/MSS SP-69 & SP-58 Tables 3 and 4, excerpts of which follow below:

NOMINAL PIPE SIZE	ROD DIAMETER	MAXIMUM SPACING
3/8" - 1 1/4"	3/8"	7'-0"
1 1/2"	3/8"	9'-0"
2"	3/8"	10'-0"
2 1/2"	1/2"	11'-0"
3"	1/2"	12'-0"
3 1/2"	1/2"	13'-0"
4"	5/8"	14'-0"
5"	5/8"	16'-0"
6"	3/4"	17'-0"
8"	3/4"	19'-0"
10"	7/8"	22'-0"
12"	7/8"	23'-0"
14"	1"	25'-0"
16"	1"	27'-0"

- C. Horizontal copper tubing shall be supported in accordance with ANSI/MSS SP-69 & SP-58 Tables 3 and 4, excerpts of which follow below:

NOMINAL TUBING SIZE	ROD DIAMETER	MAXIMUM SPACING
1/4" - 3/4"	3/8"	5'-0"
1"	3/8"	6'-0"
1 1/4"	3/8"	7'-0"
1 1/2"	3/8"	8'-0"
2"	3/8"	8'-0"
2 1/2"	1/2"	9'-0"
3"	1/2"	10'-0"
3 1/2"	1/2"	11'-0"
4"	1/2"	12'-0"
5"	1/2"	13'-0"
6"	5/8"	14'-0"
8"	3/4"	16'-0"

- D. Provide means of preventing dissimilar metal contact such as plastic coated hangers, copper colored B-Line series DURA-COPPER™ epoxy paint, or non-adhesive isolation tape (B-Line series Iso-Pipe™). Galvanized felt isolators sized for copper tubing may also be used, B-Line series B3195CT.



- E. Support horizontal cast iron pipe adjacent to each hub, with 10 feet maximum spacing between hangers.
- F. Install hangers to provide a minimum of 1/2 inch space between finished covering and adjacent work.
- G. Place a hanger within 12 inches of each horizontal elbow.
- H. Support vertical piping independently of connected horizontal piping. Support vertical pipes at every (other) floor. Wherever possible, locate riser clamps directly below pipe couplings or shear lugs.
- I. Where several pipes can be installed in parallel and at the same elevation, provide trapeze hangers as specified in Section 2.02 C. Trapeze hangers shall be spaced according to the smallest pipe size, or install intermediate supports according to schedule in Section 3.01 B.
- J. Do not support piping from other pipes, ductwork or other equipment which is not building structure.

## 3.02 CONCRETE INSERTS

- A. Provide inserts for placement in formwork before concrete is poured.
- B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Where concrete slabs form finished ceilings, provide inserts to be flush with slab surface.
- D. For inserts carrying 5" nominal pipe and larger, provide hooked rod to concrete reinforcement.