



LINKAGES



**Rod Ends and Spherical Plain Bearings**



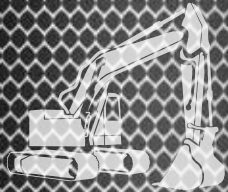
### Dunlop BTL Ltd - Ashford European Distribution Centre

MPT House, Brunswick Road  
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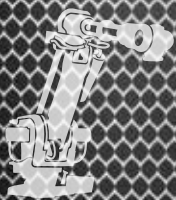
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### Manufacturing Facilities

- UNITED KINGDOM
- FRANCE
- GERMANY
- ITALY
- SPAIN
- POLAND
- CZECH REPUBLIC
- SLOVAKIA
- SERBIA
- CHINA
- USA



### Dunlop BTL Ltd - Consett UK Manufacturing Centre

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English



Español



Italiano



Deutsch



Français



Nederlands



Polskie

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## About us

From UK origins, more than 100 years ago, the **DUNLOP** brand name has established itself with an enviable reputation for high quality products.

This catalogue illustrates our standard range of products manufactured for commercial applications, 40% of our total production is for specialist items to suit individual customer requirements, so please do not hesitate to contact us to discuss your own application.

These products are now at the forefront of a highly competitive and specialist industry, covering a vast spectrum of applications such as automotive, agricultural, construction, industrial, medical and recreational.

## Quality

The reputable standard of our products is the result of a consistently pursued quality policy influencing every area of our company. Not only from the arrival of raw materials through to the delivery of the finished products, but also from the receipt of your enquiry through to invoicing. Our staff are experts in their field and will assist in every way possible to meet your full requirements, deadlines and expectations.

Our products are manufactured to internationally recognised standards and tolerances using top quality materials and workmanship.

We are a UKAS approved manufacturer and international distributor to ISO 9001:2008 and ISO 14001:2004.

## Facility

Our headquarters based in Ashford, Kent, UK, extends to over 66,000 square feet (6,131 square meters), comprising of administration, warehousing and production facilities. Our stock range of products is now one of the largest found anywhere in Europe and covers more than 100 product lines and over 50,000 individual components.

Our manufacturing capacity consists of some of the latest hi-tech multi-head CNC machine tools, 6 spindle auto lathes, pneumatic presses and many purpose built auto-loading machines, giving us high volume precision component capabilities.

## Environment

As a leading manufacturer we take our environmental responsibility very seriously. We are a socially responsible manufacturer, promoting waste recycling, energy efficiency and supporting local businesses wherever possible to help reduce our impact on the environment.

Our factory aims to eliminate pollution releases and promote high standards of energy and waste management. Standard product ranges are designed for maximum energy efficiency and are Trivalent plated, that is kind to both the human body and the environment. This level of environmental commitment remains ahead of the industry trend. We are UKAS approved to ISO 14001:2004.

## Customer Commitment

Our entire product range is backed with a comprehensive line of support services, including on-going product application research and development, full technical and customer service support, the latest in lean manufacturing techniques and scheduling, state of the art production machinery and quality control procedures, with an intense focus on the requirements and expectation of our customers.



“ We are proud to be a European manufacturer, it is a privilege to supply our products to many of the World’s most prestigious companies and brand names. ”

Ray Mifsud, Managing Director

“ Our commitment to our staff, our customers and the environment is of paramount importance to our company, we will continue to develop our organisational skills to further enhance our companies potential, to engage in sustainable practices and anticipate the needs and expectations of our customers. ”

Ray Mifsud, Managing Director



### **Manufacturing Facilities, Consett, Co. Durham UK**

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“We are proud to be a European manufacturer; it is a privilege to supply our products to some of the world’s most prestigious original equipment manufacturers in the Agricultural, Automotive, Construction, Industrial and Motor Sport sectors”.

“Our distributor network is vital to the continued global growth of the DUNLOP brand and our valued distributor partners form the perfect link between manufacturer and end user”.

“Our commitment to our staff, our customers and the environment is of paramount importance to our company, we will continue to develop our organisational skills to further enhance our company’s potential, to engage in sustainable practices and anticipate the needs and expectations of our customers”.

**“At Dunlop BTL we love our products”.**

**Ray Mifsud, *Managing Director.***

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## Application

There are several factors that need to be addressed to ensure the maximum performance and safe working of all **DUNLOP** rod ends, spherical bearings, ball joints and clevises.

- Rod ends and ball joints should where possible be mounted vertically, i.e. the housing member to the top, this will give maximum efficiency and life of the product.
- Cyclic motion in contaminated conditions can lead to premature failure, every effort should be taken to keep the unit clean, nylon and PTFE raced products have self-cleaning tendencies which can prove beneficial in contaminated environments.
- When mounting ball studs the hex should be properly tightened and flush to its mating surface. Adequate countersinks, counter bores or washers may be necessary to achieve acceptable assembly.
- Self-locking nuts or washers should be used in applications involving vibration and shock loads.
- It is recommended that separate stops should be mounted into the assembly to eliminate the possibility of over articulation of the rod end or ball joint over a maximum cone angle of 55°.
- Clamping forces can cause distortion of the ball and lead to a loss in internal tolerance, maximum torque values are shown below.
- All applications vary and so will product life, samples can be supplied for testing to help determine the suitability in actual operating conditions.
- Products listed in this catalogue are made to commercial standards, if you have any questions concerning a particular product or application please consult with our sales and engineering staff.

Bore Size Metric (mm)	Bore Size Imperial (inches)	Clamping Torque (Newton Metres) Bronze	Clamping Torque (Newton Metres) Steel
3		N/A	1.5
	0.1250	N/A	1.5
	0.1900	1.6	5.6
5		1.6	5.6
6		2.2	19.6
	0.2500	2.5	22.5
	0.3125	6.8	28.0
8		6.8	28.0
	0.3750	9.5	56.4
10		10.6	65.0
	0.4375	13.5	79.0
12		14.0	93.0
	0.5000	14.7	104.0
14		15.8	167.0
	0.6250	18.0	203.0
16		18.0	203.0
18		19.0	234.0
	0.7500	20.3	259.0
20		21.0	272.0



## Materials

**DUNLOP** rod ends, spherical bearings, ball joints and clevises are available in a wide range of materials, steel, stainless steel and aluminium housings, nylon, PTFE and bronze races and steel, stainless steel and Bronze balls. Please refer to table below.

### Housings

- Steel 230M07PB is used for all general purpose applications and are zinc plated and white-blue passivate (silver/clear finish) that conforms with RoHS directives on banned substances and ELV 2000/53/EC and are trivalent. Other plating colours and options are available, please refer to our 'Plating options section on page 14.
- Alloy steel, gives extreme load carrying capacity, extended wear life and high shock load resistance.
- Stainless steel 303L offers excellent corrosion resistance, other stainless steel materials such as 304 and 316 are available to order, please discuss with our sales or engineering departments.
- Aluminium A6026 also has corrosion resistance and weight reduction for lighter applications.

### Races

- Nylon races are glass fibre reinforced and are suitable for extended high cycling use in heavy applications, also excellent in damp or wet environments.
- PTFE races provide zero backlash, smooth movement and can withstand extreme temperature conditions -200°C to + 260°C, and are suitable for use in high cycling use in heavy applications.
- Bronze design races SAE660 are suitable for low speed high duty loading, general purpose applications.

### Spherical balls

- Steel 100Cr6 spherical balls are produced from high quality bearing steel and are heat treated and hardened to HRC 58-62 and electroless nickel plated.
- Stainless steel 440C spherical balls offer excellent corrosion resistance.
- Alloy steel, gives extreme load carrying capacity, extended wear life and high shock load resistance.
- Bronze SAE660 spherical balls are suitable for applications that require the pin or shaft fitted through the bore to rotate.

We reserve the right to vary the materials shown in the interest of product replacement or improvement.

Product Series	Housing Material	Housing Plating	Race Material	Ball/Ball Stud material	Ball Plating
MP / FP	230M07PB	ZINC WHITE/BLUE PASSIVATE	GR-NYLON	100CR6	ELECTROLESS NICKEL
MP-SS / FP-SS	303L	NOT PLATED	GR-NYLON	440C	NOT PLATED
MB / FB	230M07PB	ZINC WHITE/BLUE PASSIVATE	SAE660	100CR6	ELECTROLESS NICKEL
MB-SS / FB-SS	303L	NOT PLATED	SAE660	440C	NOT PLATED
MH / FH	230M07PB	ZINC WHITE/BLUE PASSIVATE	POLYURETHANE	230M07PB	NITROTEC
MH-SS / FH-SS	303L	NOT PLATED	POLYURETHANE	440C	NOT PLATED
MS / FS	230M07PB	ZINC WHITE/BLUE PASSIVATE	230M07PB / PTFE FABRIC	100CR6	ELECTROLESS NICKEL
MS-SS / FS-SS	303L	NOT PLATED	304L / PTFE FABRIC	440C	NOT PLATED
MSX / FSX	708M40	ZINC WHITE/BLUE PASSIVATE	230M07PB / PTFE MESH	100Cr6	ELECTROLESS NICKEL
MSX-MS / FSX-MS	17-4PH	N/A	17-4PH	440C	N/A
MX / FX	817M40	PHOSPHATED	N/A	100Cr6	PHOSPHATED

Product Series	Housing Material	Housing Plating	Race Material	Ball/Ball Stud material	Ball Plating
RM	230M07PB	ZINC WHITE/BLUE PASSIVATE	NYLON 66	100CR6	ELECTROLESS NICKEL
RM-SS	303L	NOT PLATED	NYLON 66	440C	NOT PLATED
GAR / GIR	080M46	ZINC WHITE/BLUE PASSIVATE	080M46 / PTFE FABRIC	100CR6	ELECTROLESS NICKEL
DB	230M07PB	ZINC WHITE/BLUE PASSIVATE	GR-NYLON	100CR6	ELECTROLESS NICKEL
AL	A6026	BLACK ANODISED	GR-NYLON	100CR6	ELECTROLESS NICKEL
SP	230M07PB	CHEMI-BLACKED	GR-NYLON	100CR6	ELECTROLESS NICKEL
SPH	230M07PB	ZINC WHITE/BLUE PASSIVATE	GRILAMID	230M07PB	NITROTEC
GE-ES	100CR6	MANGANESE PHOSPHATED	N/A	100CR6	MANGANESE PHOSPHATED
GEZ-ES	100CR6	MANGANESE PHOSPHATED	N/A	100CR6	MANGANESE PHOSPHATED
GE-UK	100CR6	NOT PLATED	PTFE FABRIC	100CR6	ELECTROLESS NICKEL
GE-FW	100CR6	NOT PLATED	PTFE FABRIC	100CR6	ELECTROLESS NICKEL
COM	100CR6	NOT PLATED	PTFE FABRIC	100CR6	ELECTROLESS NICKEL
SX	100CR6	PHOSPHATED	N/A	100CR6	PHOSPHATED
A	230M07PB	ZINC WHITE/BLUE PASSIVATE	NYLON 6	230M07PB	ZINC WHITE/BLUE PASSIVATE
BL	DIE CAST ZINC ALLOY	NOT PLATED	N/A	100CR6 / 535C	ZINC WHITE/BLUE PASSIVATE
BM	NYLON 12	NOT PLATED	N/A	230M07PB	ZINC WHITE/BLUE PASSIVATE
C	230M07PB	ZINC WHITE/BLUE PASSIVATE	N/A	212A42	ZINC WHITE/BLUE PASSIVATE
D	230M07PB	ZINC WHITE/BLUE PASSIVATE	N/A	230M07PB	ZINC WHITE/BLUE PASSIVATE
F	230M07PB	ZINC WHITE/BLUE PASSIVATE	N/A	230M07PB	ZINC WHITE/BLUE PASSIVATE
I	230M07PB	ZINC WHITE/BLUE PASSIVATE	NYLON 6	230M07PB	ZINC WHITE/BLUE PASSIVATE
P	230M07PB	ZINC WHITE/BLUE PASSIVATE	N/A	230M07PB	ZINC WHITE/BLUE PASSIVATE
Q	230M07PB	ZINC WHITE/BLUE PASSIVATE	N/A	230M07PB	ZINC WHITE/BLUE PASSIVATE
M	NYLON PA6.6	NOT PLATED	N/A	230M07PB	ZINC WHITE/BLUE PASSIVATE
G	080M46	ZINC WHITE/BLUE PASSIVATE	N/A	N/A	N/A

## Load Capacity

### Rod ends and spherical bearings

- The static load ratings listed are based on the yield strength of the race material and define the maximum gradually applied load.
- Radial load which the rod end or spherical bearing assembly can withstand, without significant permanent deformation.

- The steel housing provides a backup so that the product can sustain loading in excess of the listed values without collapsing.
- For highly stressed cyclic applications or those involving impact loads a safety factor of two or three should be applied to arrive at a safe working load.
- Although rod ends and spherical bearings are not recommended for use in applications involving axial loads, the construction is such that they can sustain axial loads up to 15% of the actual applied radial static load ratings without distress, but should not exceed 25% of the listed values.
- For extended life the recommended normally applied loads should be 25% - 50% of the static load ratings.
- All load ratings listed are presented for design guidance only and do not imply or constitute a warranty claim of any type.
- All applications vary and so will product life, samples can be supplied for testing to help determine the suitability in actual operating conditions.

### Studs

- In applications using studded rod ends or spherical bearings the capacity of the product is limited by that of the stud to withstand sheer loading.
- Table below lists the expected minimum load capacities based on the use of studs made from carbon steel, please consult our sales and engineering departments where the applied loads exceed 50% of the listed values.

### Ball joints

- The capacities listed are based on either the maximum tensile strength of the female body or the maximum shear strength of the ball stud, whichever is the lower. Suitable safety factors should be applied depending on the nature of the loading. Pull out force is the minimum required, when applied axially along the stud to cause complete disengagement of the stud from the housing.

Bore Size Metric (mm)	Bore Size Imperial (inches)	Ultimate Radial Loads (Newton)
	0.1900	1,200
5		1,200
6		1,930
	0.2500	1,930
	0.3125	3,190
8		3,190
	0.3750	4,240
10		4,240
	0.4375	5,720
12		5,720
	0.5000	7,200
14		7,200
	0.6250	9,000
16		9,000

## Temperature ranges

- The operating temperature range of rod ends and spherical bearings with a GR-nylon or nylon 66 race is limited by the thermal characteristics of the race material, this is -35°C to +170°C and -30°C to +120°C respectively. However in temperatures in excess of 80°C there may be a loss of load carrying capacity, e.g at 170°C an applied load equal to 20% of the static load rating can result in a compression set of .025mm.
- For application requiring extreme temperature ranges we recommend our liner, rod ends and spherical bearings can safely operate within a temperature range of -200°C to +260°C.
- Ball joints are generally temperature limited by the type of lubricant employed.

## Specification

- Metric rod ends and spherical bearings are based on DIN 648.
- Imperial rod ends and spherical bearings are based on SAEJ1120.
- Metric ball joints are based on DIN71802 and DIN 71803.
- Imperial ball joints are based on SAEJ490.
- Metric clevises are based on DIN71752
- Imperial clevises are based on DIN71802
- All items are manufactured to commercial standards and tolerances, these tolerances are shown below.

Dimension	Metric (mm)	Imperial (inches)
<b>Rod end bearings:</b>		
Bore (Steel)	+0.064 - 0.013	+0.0025 - 0.0005
Bore (Bronze)	+0.038 - 0.013	+0.0015 - 0.0005
W	+0.000 - 0.0150	+0.000 - 0.0050
H	+0.050 - 0.050	+0.0030 - 0.0030
D	+0.130 - 0.130	+0.0050 - 0.0050
L1	+0.000 - 1.000	+0.0000 - 0.0620
L2	+0.250 - 0.250	+0.0320 - 0.0320
O	+0.050 - 0.050	+0.0030 - 0.0030
A	+0.130 - 0.130	+0.0050 - 0.0050
B	+0.250 - 0.250	+0.0320 - 0.0320
C	+0.050 - 0.050	+0.0030 - 0.0030
K	+0.130 - 0.130	+0.0050 - 0.0050
<b>Spherical bearings:</b>		
Bore (Steel)	+0.064 - 0.013	+0.0025 - 0.0005
Bore (Bronze)	+0.038 - 0.013	+0.0015 - 0.0005
D	+0.000 - 0.130	+0.0000 - 0.0050
H	+0.000 - 0.100	+0.0050 - 0.0050
W	+0.000 - 0.150	+0.0050 - 0.0050
<b>Ball joints:</b>		
Ball Ø	+0.064 - 0.013	+0.0025 - 0.0005

Table continued from over page:

Dimension	Metric (mm)	Imperial (inches)
L1	+0.000 - 1.000	+0.0000 - 0.0620
L2	+0.250 - 0.250	+0.0320 - 0.0320
STUD A/F	+0.130 - 0.130	+0.0050 - 0.0050
A	+0.130 - 0.130	+0.0050 - 0.0050
B	+0.250 - 0.250	+0.0320 - 0.0320
C	+0.050 - 0.050	+0.0030 - 0.0030
D1	+0.050 - 0.050	+0.0030 - 0.0030
D2	+0.050 - 0.050	+0.0030 - 0.0030
bore	+0.060 - 0.000	+0.0020 - 0.0000
G	+0.300 - 0.300	+0.0118 - 0.0118
A1	+0.300 - 0.160	+0.0118 - 0.0062
A2	+0.300 - 0.160	+0.0118 - 0.0062
B1	+0.150 - 0.000	+0.0060 - 0.0000
D3	+0.130 - 0.130	+0.0050 - 0.0050
L1	+0.500 - 0.500	+0.0196 - 0.0196
L2	+0.300 - 0.300	+0.0118 - 0.0118
L3	+0.300 - 0.300	+0.0118 - 0.0118
<b>Ball studs:</b>		
BALL Ø	+0.064 - 0.013	+0.0025 - 0.0005
A	+0.130 - 0.130	+0.0050 - 0.0050
B	+0.250 - 0.250	+0.0320 - 0.0320
C	+0.050 - 0.050	+0.0030 - 0.0030
K	+0.130 - 0.130	+0.0050 - 0.0050
<b>Threads:</b>		
Male	ISO 6G	Class 2A
Female	ISO 6H	Class 2B



**ISO 9001:2008**

Our commitment is to quality, to continuously improve in every aspect of the companies activities. In 2006, we successfully passed UKAS quality assurance inspection to ISO 9001:2008 for the manufacture and distribution of bearings, power transmission and motion transfer linkages.

**ISO 14001:2004**

As a responsible European manufacturer, we take our environmental responsibility extremely seriously. In 2012, we successfully passed UKAS quality assurance inspection to ISO14001:2004 for the manufacture and distribution of bearings, power transmission and motion transfer linkages.

## Plating Options

**DUNLOP** rod ends, spherical bearings, ball joints and clevises are available in a wide range of plating options. Our standard catalogue and stock specification is trivalent F39, zinc and white/blue passivate, (zinc and clear), that conforms with RoHS directives on banned substances and is ELV 2000/S3/EC compliant.

Table below shows our suffix designations, other available plating options may not be RoHS and ELV compliant, please enquire for availability. For a full list of options, please refer to table below.

### BRITISH PLATING STANDARDS

BS3382 – Zinc plating of all steel parts with external threads

Basic major diameter of thread  
 0.127"-0.250" (3-6mm)  
 0.251"-0.500" (6-12mm)  
 0.501"-0.750" (12-19mm)  
 0.751" and over (19mm)

Average plating thickness  
 5.0 to 6.4 µm  
 6.4 to 7.6 µm  
 7.6 to 8.9 µm  
 8.9 to 12.7 µm

Finish Code	Finish Description
F0	SELF COLOUR
F1	ZINC PLATE & YELLOW PASSIVATE (CONTAINS HEXAVALENT CHROMIUM)
F2	ZINC PLATE & CLEAR PASSIVATE (CONTAINS HEXAVALENT CHROMIUM)
F3	PHOSPHATE, DE-EMBRITTLE & OIL
F4	ZINC NICKEL ALLOY & BLACK PASSIVATE 8 microns (2000 hours salt spray resistance)
F5	CHEMI-BLACK
F6	AS SPECIFIED ON CUSTOMERS DRAWING
F7	ZINC PLATE & BLUE PASSIVATE
F8	ZINC PLATE & OLIVE DRAB PASSIVATE TO ACCO CABLES (TRIDENT) SPEC. FS.25
F9	COPPER PLATE 0.0127/0.0203mm THICK
F10	DACROMET (REPLACED BY GEOMET F54)
F11	ZINC PLATE, DE-EMBRITTLE & YELLOW PASSIVATE (CONTAINS HEXAVALENT CHROMIUM)
F12	ZINC PLATE, DE-EMBRITTLE & CLEAR PASSIVATE
F13	ZINC PLATE, DE-EMBRITTLE & BLUE PASSIVATE
F14	ZINC PLATE, DE-EMBRITTLE & OLIVE DRAB PASSIVATE
F15	PHOSPHATE & OIL
F16	MECHANICAL ZINC PLATE & YELLOW PASSIVATE
F17	CATHODIC BLACK
F18	XYLON XL BLACK
F19	PHOSPHATE, DE-EMBRITTLE & OIL DRY TO TOUCH
F20	PARKERISE
F21	ZINC PLATE & BLACK PASSIVATE (CONTAINS HEXAVALENT CHROMIUM)
F22	PAINT TO IRR NATO GREEN – DEF STD 80-41
F23	ZINC PLATE & BRONZE PASSIVATE FORD WSD-M1P85-A2+WSB-M10P10-A4

Table continued from over page:

Finish Code	Finish Description
F24	RED OXIDE PAINT AND SPRAY BLACK GLOSS TO S/A SPEC 1000-SEDDON
F25	BLACK FURALON B5514 FORD SPEC WSK-M2P153-A3
F26	BRIGHT NICKEL FLASH (PLATING DEPOSIT 0.0025/0.0051mm)
F27	POWDER COAT PAINT
F28	OIL
F29	ZINC PLATE, DE-EMBRITTLE & BLACK PASSIVATE (CONTAINS HEXAVALENT CHROMIUM)
F30	BLACKODIZE
F31	BLACK PAINT TO AULTRAFast SPEC AF1
F32	NITROTEC TO SPECIFICATION NQ40
F33	NITROTEC TO SPECIFICATION NQ3
F34	ZINC PLATE TO JS 500 (NO COLOUR)
F35	FERRITIC NITROCARBURISE
F36	ZINC NICKEL ALLOY & CLEAR PASSIVATE
F37	ZINC NICKEL ALLOY & YELLOW PASSIVATE
F38	ZINC PLATE & YELLOW TRIVALENT PASSIVATE (COLOUR DIE)
F39	ZINC PLATE & CLEAR TRIVALENT PASSIVATE
F40	DELTATONE & DELTASEAL BLACK (FREE FROM HEXAVALENT CHROMIUM)
F41	ZINC NICKEL PLATE, DE-EMBRITTLE & BLACK TRIVALENT PASSIVATE
F42	ZINC NICKEL PLATE & BLACK TRIVALENT PASSIVATE
F43	ZINC IRON PLATE & BLACK TRIVALENT PASSIVATE
F44	ZINC PLATE & BLACK TRIVALENT PASSIVATE
F45	ZINC NICKEL PLATE & CLEAR TRIVALENT PASSIVATE (BRIGHT FINISH)
F46	ZINC NICKEL PLATE, DE-EMBRITTLE & CLEAR TRIVALENT PASSIVATE
F47	ZINC PLATE, DE-EMBRITTLE & CLEAR TRIVALENT PASSIVATE WITHOUT SEALER
F48	ZINC PLATE, CLEAR TRIVALENT PASSIVATE AND SEAL (ZINKLAD 250)
F49	ZINC PLATE, DE-EMBRITTLE, CLEAR TRIVALENT PASSIVATE & SEAL (ZINKLAD 250)
F50	ZINC PLATE, THICK FILM PASSIVATE AND ADDITIONALLY SEAL / SST
F51	ZINC PLATE, DE-EMBRITTLE & YELLOW TRIVALENT PASSIVATE
F52	ZINC PLATE & TRIPASS CORROBLUE ELV
F53	ZINC PLATE, DE-EMBRITTLE & TRIPASS CORROBLUE ELV
F54	GEOMET 500 (REPLACES DACROMET A) F10
F55	SALT BATH NITRIDE TO AMS 2753B COMPOUND DEPTH .0003/.0010" SURFACE FILE HARD TO RC58.
F56	ZINC IRON PLATE, DE-EMBRITTLE & BLACK TRIVALENT PASSIVATE
F57	GEOMET 321 PLUS 10 VW 137 50, T602
F58	ELECTROLESS NICKEL PLATE
F59	CADMIUM PLATE TO DEF 03-19 AND CHROMATE PASSIVATE TO DEF 130
F60	BLACK PHOSPHATE DEF STAN 3-11 ROHS AND ELV COMPLIANT
F61	BLACK ANODISE ROHS & ELV COMPLIANT
F62	ZINC FLAKE COATING TO VW SPEC T630 TL233 SILVER
F63	BRIGHT NICKEL PLATE
F64	MANGANESE PHOSPHATE AND OIL
F65	ZINC NICKEL PLATE, DE-EMBRITTLE & Cr3 PASSIVATE TO KA SPEC PS224500
F66	ZINC NICKEL PLATE AND Cr3 PASSIVATE.
F67	ZINC PLATE, DE-EMBRITTLE & THICK FILM PASSIVATE AND ADDITIONALLY SEAL
F68	BLACK ON STAINLESS STEEL, STAY BLACK.



English



Español



Italiano



Deutsch



Français



Nederlands



Polskie

### A series

Serie A • Serie A • A-Serie

Série A • A-serie • seria A

90

### BL series

Serie BL • Serie BL • BL-Serie

Série BL • BL-serie • seria BL

92

### BM series

Serie BM • Serie BM • BM-Serie

Série BM • BM-serie • seria BM

93

### C series

Serie C • Serie C • C-Serie

Série C • C-serie • seria C

94

### D series

Serie D • Serie D • D-Serie

Série D • D-serie • seria D

95

### F series

Serie F • Serie F • F-Serie

Série F • F-serie • seria F

96

### I series

Serie I • Serie I • I-Serie

Série I • I-serie • seria I

98

### M series

Serie M • Serie M • M-Serie

Série M • M-serie • seria M

99

### P series

Serie P • Serie P • P-Serie

Série P • P-serie • seria P

100

### Q series

Serie Q • Serie Q • Q-Serie

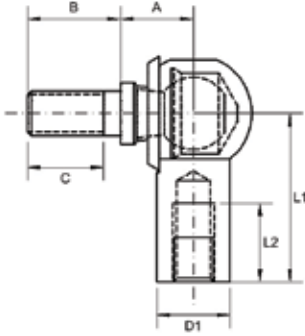
Série Q • Q-serie • seria Q

102





BALL JOINTS



**A SERIES: AMG - AIG**

**Description:**

A-Series is our 4-piece standard range of nylon lined ball joints suitable for light to medium industrial/mechanical load applications requiring smooth action and good wear resistance. Available in both metric and imperial thread sizes. A-Series ball joints are also available without the ball stud allowing for assembly on to a pre-positioned stud. Please refer to compatible ball stud options in our miscellaneous product section. Neoprene gaiter helps resist dirt contamination, if gaiter is not required, please remove the letter G from the part number.

**Material Specifications:**

Body: Steel 230M07PB zinc plated and clear trivalent passivate.  
 Ball stud: Steel 230M07PB zinc plated and clear trivalent passivate.  
 Liner: Nylon 6 white. 300L Stainless Steel. Gaiter: Neoprene.

**Features**

- Metric & imperial thread sizes
- Ultra smooth action
- Can be assembled in situ
- Good wear resistance
- Lubricated

**Possible Applications**

- Industrial equipment
- Construction equipment
- Agricultural equipment
- Lawn & garden equipment

**Temperature Range**

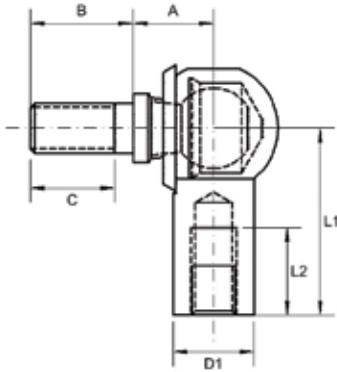
-30°C to +120°C

**Specification**

ELV & RoHS compliant



**AMG SERIES: LINER RETAINED BALL JOINTS (METRIC)**

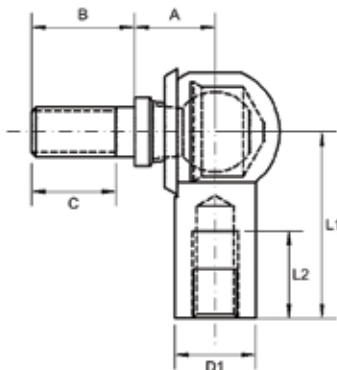


- Body:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate OR Zinc Plated and Yellow Hexavalent Passivate
- Liner:** Nylon 6
- Ball Stud:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate
- Dust Seal:** Neoprene Rubber
- Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
AMG6	AMG6LH	M6X1.00	M6X1.00	10	25.0	11.5	8	11.0	12.5	10.0	10
AMG6/2	AMG6/LH	M6X1.00	M8X1.25	10	25.0	11.5	8	11.0	12.5	10.0	10
AMG8	AMG8LH	M8X1.25	M8X1.25	13	30.0	14.0	11	13.0	16.5	13.5	13
AMG8/1	AMG8/1LH	M8X1.25	M8X1.25	13	41.0	25.0	11	13.0	16.5	13.5	13
AMG8/6	AMG8/6LH	M8X1.25	M8X1.25	13	41.0	25.0	11	13.0	20.0	13.5	13
AMG8/7	AMG8/7LH	M8X1.25	M8X1.25	13	30.0	14.0	11	13.0	20.0	17.5	13
AMG8/8	AMG8/8LH	M6X1.00	M8X1.25	13	30.0	14.0	11	13.0	16.5	13.5	13
AMG8/10	AMG8/10LH	M8X1.25	M8X1.25	13	30.0	14.0	11	13.0	18.5	15.5	13
AMG8/11	AMG8/11LH	M6X1.00	M8X1.25	13	51.0	25.0	11	13.0	16.5	13.5	13
AMG8/13	AMG8/13LH	M10X1.50	M8X1.25	13	30.0	15.0	11	13.0	16.5	13.5	13
AMG8/14	AMG8/14LH	M8X1.00	M8X1.25	13	25.0	12.0	11	13.0	16.5	13.5	13
AMG10	AMG10LH	M10X1.50	M10X1.50	16	35.0	15.5	13	16.0	20.0	15.0	16
AMG10/1	AMG10/1LH	M12X1.75	M10X1.50	16	45.0	25.5	13	16.0	20.0	15.0	16
AMG10/2	AMG10/2LH	M6X1.00	M10X1.50	16	30.0	10.5	13	14.5	19.0	11.1	16
AMG10/3	AMG10/3LH	M10X1.50	M10X1.50	16	35.0	15.5	13	16.0	25.0	20.0	16
AMG10/5	AMG10/5LH	M10X1.50	M10X1.50	16	35.0	15.5	13	16.0	20.0	15.0	16
AMG12	AMG12LH	M12X1.75	M12X1.75	16	45.0	25.5	13	16.0	20.0	17.0	16
AMG12/1	AMG12/1LH	M16X2.00	M12X1.75	16	45.0	30.0	13	16.0	20.0	17.0	16

**AIG SERIES: LINER RETAINED BALL JOINTS (IMPERIAL)**



- Body:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate OR Zinc Plated and Yellow Hexavalent Passivate
- Liner:** Nylon 6
- Ball Stud:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate
- Dust Seal:** Neoprene Rubber
- Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
AIG312	AIG312LH	5/16 UNF	5/16 UNF	0.512	1.181	0.555	0.433	0.512	0.650	0.512	0.512
AIG312/1	AIG312/1LH	5/16 UNF	5/16 UNF	0.512	1.181	0.555	0.433	0.512	0.827	0.750	0.512

For stainless steel add 'SS' to part no. For example 'AMG6 SS'



BALL JOINTS

### BL SERIES

**Description:**

BL-Series is our 4-piece standard range of die cast zinc alloy ball joints suitable for medium industrial/mechanical load applications requiring smooth action and good wear resistance. The body is die cast around the ball giving an ultra smooth surface contact area, the ball stud is hardened and friction welded to the ball. The neoprene gaiter helps resist dirt contamination.

**Material Specifications:**

Body: Die cast zinc alloy. Ball: 100Cr6 bearing steel. Ball stud: Steel S35C hardened zinc plated and clear trivalent passivated. Gaiter: Neoprene.

**Features**

Metric thread sizes Ultra smooth action Strong & cost effective High pull out load axial & radial. Good wear resistance. Lubricated

**Possible Applications**

Industrial equipment Construction equipment Agricultural equipment Lawn & garden equipment

**Temperature Range**

-30°C to +120°C

**Specification**

ELV & RoHS compliant

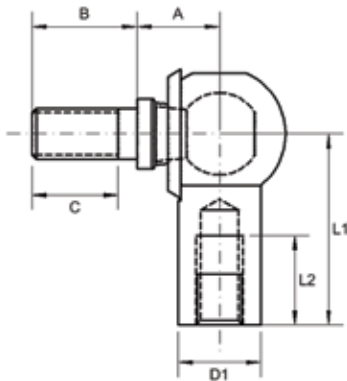


### Interchange table

Dunlop	IKO	THK	Alinabal	SKF	Asahi	Rose
BL (metric)	LHSA	BL-D	-	-	-	-

Note: Manufacturers part numbers are used for descriptive purposes only and may not be direct equivalent products.

### BL SERIES: DIE CAST BALL JOINTS (METRIC)



- Body:** Die Cast Zinc Alloy
- Ball:** Bearing Steel 100Cr6
- Ball Stud:** S35C, Hardened, Zinc Plated and Clear Trivalent Passivate
- Dust Seal:** Neoprene Rubber
- Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
BL6D	BL6DL	M6X1.00	M10X1.25	8	30	16	10	11.0	15.0	11.0	11
BL8D	BL8DL	M8X1.25	M8X1.25	8	36	19	12	14.0	17.0	12.0	14
BL10BD	BL10BDL	M10X1.50	M10X1.50	10	43	23	14	17.0	26.0	21.0	17
BL10D	BL10DL	M10X1.25	M10X1.25	13	43	23	14	17.0	20.0	15.0	17
BL12BD	BL12BDL	M12X1.75	M12X1.75	13	50	26	17	19.0	30.0	24.0	19
BL12D	BL12DL	M12X1.25	M12X1.25	13	50	26	17	19.0	23.0	17.0	19
BL14BD	BL14BDL	M14X2.00	M14X2.00	13	57	30	19	21.5	40.5	28.0	22
BL14D	BL14DL	M14X1.50	M14X1.50	13	57	30	19	21.5	34.5	22.0	22
BL16BD	BL16BDL	M16X2.00	M16X2.00	13	64	34	22	23.5	42.5	29.0	24
BL16D	BL16DL	M16X1.50	M16X1.50	13	64	34	22	23.5	36.5	23.0	24



BALL JOINTS



**BM SERIES**

**Description:**

BM-Series is our 3-piece range of light weight nylon bodied ball joints, suitable for light industrial/mechanical load applications requiring smooth action and good wear resistance. BMG-Series ball joints are also available without the ball stud allowing for assembly on to a pre-positioned stud. Please refer to compatible ball stud options in our miscellaneous product section. BMG-Series ball joints can be moulded directly onto a linkage rod etc. Neoprene gaiter helps resist dirt contamination. If gaiter is not required please remove the letter G from the part number.

**Material Specifications:**

Body: Nylon 12 grey with graphite additive. Ball stud: Steel 230M07PB zinc plated and clear trivalent passivate. 303L Stainless Steel. Gaiter: Neoprene.

**Features**

Metric thread sizes  
Smooth action. Can be assembled in situ  
Good wear resistance  
Light weight. Economical  
Lubricated

**Possible Applications**

Light industrial equipment. Light agricultural equipment  
Lawn & garden equipment  
Engine controls

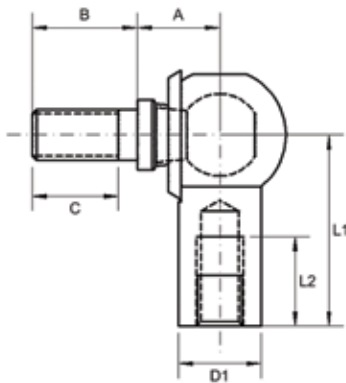
**Temperature Range**

-30°C to +120°C

**Specification**

ELV & RoHS compliant

**BMG SERIES: LIGHT WEIGHT NYLON BODIED BALL JOINTS (METRIC)**



- Body:** Nylon 12 with Graphite Trace
- Ball Stud:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate
- Dust Seal:** Neoprene Rubber
- Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
BM5	BM5LH	M5X0.80	M5X0.80	8	20	12	7	9.0	10.2	8.6	10.0
BMG5	BMG5LH	M5X0.80	M5X0.80	8	20	12	7	9.0	10.2	8.6	10.0
BM5/6*	BM5/6LH*	M5X0.80	M5X0.80	8	20	12	7	9.0	10.2	8.6	10.0
BMG5/6*	BMG5/6LH*	M5X0.80	M5X0.80	8	20	12	7	9.0	10.2	8.6	10.0
BM6	BM6LH	M6X1.00	M6X1.00	10	24	14	8	11.0	12.5	10	12.0
BMG6	BMG6LH	M6X1.00	M6X1.00	10	24	14	8	11.0	12.5	10	12.0
BM8	BM8LH	M8X1.25	M8X1.25	13	30	17	11	13.0	16.5	13.5	15.0
BMG8	BMG8LH	M8X1.25	M8X1.25	13	30	17	11	13.0	16.5	13.5	15.0

BMG5/6\* Cross hole for locking pin.

For stainless steel add 'SS' to part no. For example 'BM5 SS'



BALL JOINTS



**C SERIES: CMG**

**Description:**

C-Series is our 5-piece range of spring retained and lockable ball joints suitable for medium industrial/mechanical load applications, inner ring retains the ball stud while the safety clip prevents the ball stud from being removed. CMG/1-Series ball joints are also available without the ball stud allowing for assembly on to a pre-positioned stud, please refer to compatible ball stud options in our miscellaneous product section.

**Material Specifications:**

Body: Steel 230M07PB zinc plated and clear trivalent passivate. Ball stud: Steel 212A42 hardened and zinc plated and clear trivalent passivate. Inner ring and safety clip: Spring steel to BS5216. Gaiter: Neoprene.

**Features**

- Metric thread sizes
- Lubricated
- Can be assembled in situ
- Good wear resistance
- Medium duty
- Safety features

**Possible Applications**

- Industrial equipment
- Construction equipment
- Agricultural equipment
- Lawn & garden equipment

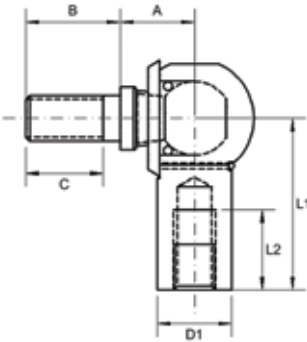
**Temperature Range**

-30°C to +90°C

**Specification**

ELV & RoHS compliant

**CMG SERIES: DIN STANDARD BALL JOINTS (METRIC)**



- Body:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate
- Ball Stud:** Steel 212A42, Hardened, Zinc Plated and Clear Trivalent Passivate
- Safety Clip:** Spring Steel
- Outer Clip:** Spring Steel
- Dust Seal:** Neoprene Rubber
- Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	Body Flats	L1	L2 Min	Stud A/F	A	B	C Min	D1
CM5/1	CM5/1LH	M5X0.80	M5X0.80	8	7	22	10	7	9.0	10.2	7.7	8.0
CMG5/1	CMG5/1LH	M5X0.80	M5X0.80	8	7	22	10	7	9.0	10.2	7.7	8.0
CM6/1	CM6/1LH	M6X1.00	M6X1.00	10	9	25	11.5	8	11.0	12.5	10.0	10.0
CMG6/1	CMG6/1LH	M6X1.00	M6X1.00	10	9	25	11.5	8	11.0	12.5	10.0	10.0
CM8/1	CM8/1LH	M8X1.25	M8X1.25	13	11	30	14	11	13.0	16.5	14.0	13.0
CMG8/1	CMG8/1LH	M8X1.25	M8X1.25	13	11	30	14	11	13.0	16.5	14.0	13.0
CM10/1	CM10/1LH	M10X1.50	M10X1.50	16	13	35	15	13	16.0	20.0	17.5	16.0
CMG10/1	CMG10/1LH	M10X1.50	M10X1.50	16	13	35	15	13	16.0	20.0	17.5	16.0
CM12/1	CM12/1LH	M12x1.75	M12x1.75	16	14	35	15	13	16.0	20.0	17.5	16.0
CMG12/1	CMG12/1LH	M12x1.75	M12x1.75	16	14	35	15	13	16.0	20.0	17.5	16.0
CM14/1	CM14/1LH	M14X2.00	M14X2.00	19	19	45	21	16	20.0	28.0	22.0	22.0
CMG14/1	CMG14/1LH	M14X2.00	M14X2.00	19	19	45	21	16	20.0	28.0	22.0	22.0
CM14C/1	CM14C/1LH	M14X1.50	M14X1.50	19	19	45	21	16	20.0	28.0	22.0	22.0
CMG14C/1	CMG14C/1LH	M14X1.50	M14X1.50	19	19	45	21	16	20.0	28.0	22.0	22.0
CM16/1	CM16/1LH	M16X2.00	M16X2.00	19	-	45	21	16	20.0	28.0	22.0	22.0
CMG16/1	CMG16/1LH	M16X2.00	M16X2.00	19	-	45	21	16	20.0	28.0	22.0	22.0



BALL JOINTS



**D SERIES: DMG - DIG**

**Description:**

D-Series is our 3-piece range of swaged design ball joints, suitable for medium industrial/mechanical load applications. The swaging of the body produces a permanent assembly with the ball stud. Available in both metric and imperial thread sizes. Neoprene gaiter helps resist dirt contamination. If gaiter is not required please remove the letter G from the part number.

**Material Specifications:**

Body: Steel 230M07PB zinc plated and clear trivalent passivate. Ball stud: Steel 230M07PB hardened and zinc plated and clear trivalent passivate. Gaiter: Neoprene

**Features**

Metric & imperial thread  
Permanent assembly  
High pull out load  
Good wear resistance  
Lubricated

**Possible Applications**

Industrial equipment  
Construction equipment  
Agricultural equipment  
Lawn & garden equipment

**Temperature Range**

-30°C to +120°C

**Specification**

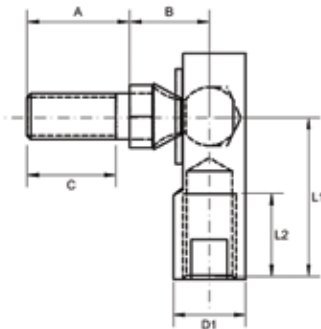
ELV & RoHS compliant

**Interchange table**

Dunlop	Tuthill	Dunlop	Tuthill
DMG (metric)	SPG-M	DIG (imperial)	SPG

*Note: Part numbers used for descriptive purposes only, may not be direct equivalent products.*

**DMG SERIES: SWAGED RETAINED BALL JOINTS (METRIC)**



**Body:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate

**Ball Stud:** Steel 230M07Pb, Hardened, Zinc Plated and Clear Trivalent Passivate

**Dust Seal:** Neoprene Rubber

**Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
DMG6	DMG6LH	M6X1.00	M6X1.00	8.8	24.6	13.5	10	14.0	11.8	11.9	11.0
DMG6/1	DMG6/1LH	M6X1.00	M6X1.00	7.7	30.7	14.0	10	14.3	11.8	11.9	11.1
DMG6/2	DMG6/2LH	M6x1.00	M6X1.00	7.7	30.7	16.0	10	14.3	11.8	11.9	11.1
DMG8	DMG8LH	M8X1.25	M8X1.25	10.3	28.6	15.0	11	18.0	13.6	15.6	13.0
DMG8/1	DMG8/1LH	M8X1.25	M8X1.25	10.3	28.6	15.0	13	20.0	16.1	17.6	13.0
DMG10	DMG10LH	M10X1.50	M10X1.50	12.4	35.0	20.6	13	22.0	18.0	19.6	16.0

**DIG SERIES: SWAGED RETAINED BALL JOINTS (IMPERIAL)**

Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
DIG250	DIG250LH	1/4 UNF	1/4 UNF	0.347	0.969	0.531	0.375	0.562	0.466	0.468	0.437
DIG250/1	DIG250/1LH	1/4 BSF	M6x1.0	0.347	0.969	0.531	0.375	0.551	0.466	0.450	0.437
DIG250/2	DIG250/2LH	1/4 BSF	1/4 BSF	0.347	0.969	0.531	0.375	0.562	0.466	0.468	0.437
DIG312	DIG312LH	5/16 UNF	5/16 UNF	0.405	1.125	0.594	0.437	0.688	0.517	0.588	0.500
DIG312/1	DIG312/1LH	5/16 UNF	5/16 UNF	0.405	2.187	1.535	0.437	0.688	0.517	0.588	0.500
DIG375	DIG375LH	3/8 UNF	3/8 UNF	0.488	1.375	0.812	0.500	0.875	0.683	0.775	0.625
DIG375/1	DIG375/1LH	3/8 UNF	3/8 UNF	0.488	1.375	0.812	0.500	0.437	0.683	0.337	0.625
DIG375/2	DIG375/2LH	3/8 UNF	3/8 UNF	0.488	1.375	0.812	0.500	0.630	0.683	0.530	0.625
DIG375/3	DIG375/3LH	3/8 UNF	3/8 UNF	0.488	1.375	0.812	0.500	0.590	0.683	0.490	0.625



BALL JOINTS

**F SERIES: FMG - FIG**

**Description:**

F-Series is our 4-piece range of spring retained ball joints suitable for medium industrial/mechanical load applications. Available in both metric and imperial thread sizes. F-Series ball joints are ideal for severe wear conditions and are resistant to vibration and high shock loading. Neoprene gaiter helps resist dirt contamination. If gaiter is not required please remove the letter G from the part number.

**Material Specifications:**

Body: Steel 230M07PB ferritic nitrocarburised and zinc plated and clear trivalent passivate. Ball stud: Steel 230M07PB ferritic nitrocarburised and zinc plated and clear trivalent passivate. Inner ring: Hardened and tempered spring steel to BS5216. Gaiter: Neoprene.

**Features**

Metric & imperial thread sizes  
High pull out load  
High wear conditions  
High shock loads  
Resistant to vibration  
Lubricated

**Possible Applications**

Industrial equipment  
Construction equipment  
Agricultural equipment  
Lawn & garden equipment

**Temperature Range**

-30°C to +120°C

**Specification**

ELV & RoHS compliant



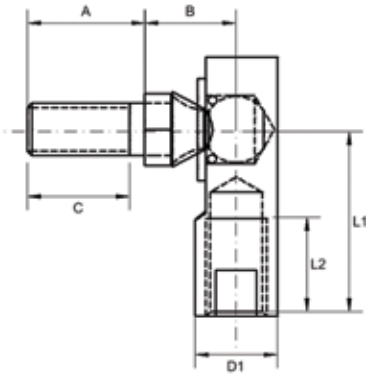
**Interchange table**

Dunlop	Tuthill	THK	Alinabal	SKF	Asahi	Rose
FMG (metric)	SRG-M	-	-	-	-	-
FIG (imperial)	SRG	-	-	-	-	-

*Note: Manufacturers part numbers are used for descriptive purposes only and may not be direct equivalent products.*



**FMG SERIES: SPRING RETAINED BALL JOINTS (METRIC)**



- Body:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate
- Ball Stud:** Steel 230M07Pb, Hardened, Zinc Plated and Clear Trivalent Passivate
- Dust Seal:** Neoprene Rubber
- Spring:** Spring Steel
- Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
FMG5	FMG5LH	M5X0.80	M5X0.80	7.75	24.6	12.7	10.00	14.30	11.90	12.0	11.11
FMG6	FMG6LH	M6X1.00	M6X1.00	7.75	24.6	12.7	10.00	14.30	11.90	12.0	11.11
FMG6/1	FMG6/1LH	M6X1.00	M6X1.00	7.75	19.2	7.3	10.00	14.30	11.90	12.0	11.11
FMG8	FMG8LH	M8X1.25	M8X1.25	8.74	28.4	14.2	13.00	17.45	13.50	15.0	12.70
FMG8/1	FMG8/1LH	M8X1.25	M8X1.25	8.74	41.0	25.0	13.00	17.45	13.50	15.0	12.70
FMG8/2	FMG8/2LH	M8X1.25	M8X1.25	8.74	28.4	14.2	13.00	11.50	13.50	9.0	12.70
FMG8/3	FMG8/3LH	M8X1.25	M6X1.00	8.74	28.4	14.2	10.00	12.70	13.50	10.0	12.70
FMG10	FMG10LH	M10X1.50	M10X1.50	10.59	35.0	19.0	13.00	22.23	17.45	20.0	15.88
FMG10/1	FMG10/1LH	M8X1.25	M10X1.50	10.59	35.0	19.0	13.00	22.23	17.45	20.0	15.88
FMG10/2	FMG10/2LH	M8X1.25	M10X1.50	10.59	35.0	19.0	13.00	12.00	17.45	9.5	15.88
FMG10/4	FMG10/4LH	M12X1.25	M10X1.50	10.59	35.0	19.0	15.88	18.00	17.45	15.5	15.88
FMG12	FMG12LH	M12X1.75	M12X1.75	14.10	49.2	25.4	17.00	28.60	22.20	26.0	19.05
FMG12/1	FMG12/1LH	M12X1.75	M10X1.50	14.10	49.2	25.4	17.00	28.60	22.20	26.0	19.05

**FIG SERIES: SPRING RETAINED BALL JOINTS (IMPERIAL)**

Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
FIG250	FIG250LH	1/4 UNF	1/4 UNF	0.306	0.969	0.500	0.375	0.562	0.469	0.370	0.437
FIG312	FIG312LH	5/16 UNF	5/16 UNF	0.344	1.125	0.562	0.437	0.687	0.531	0.580	0.500
FIG312/1	FIG312/1LH	BLANK0.312	5/16 UNF	0.344	1.125	0.562	0.437	0.687	0.531	0.580	0.500
FIG312/2	FIG312/2LH	5/16 UNF	5/16 UNF	0.344	1.120	0.562	0.437	0.687	0.531	0.580	0.500
FIG375	FIG375LH	3/8 UNF	3/8 UNF	0.416	1.375	0.750	0.500	0.875	0.687	0.770	0.625
FIG375/1	FIG375/1LH	3/8 UNF	3/8 UNF	0.416	1.772	1.181	0.500	0.787	0.866	0.680	0.625
FIG375/2	FIG375/2LH	3/8 BSF	3/8 UNF	0.416	1.375	0.750	0.500	0.787	0.866	0.680	0.625
FIG375/3	FIG375/3LH	3/8 UNF	3/8 UNF	0.416	1.375	0.750	0.500	0.620	0.688	0.520	0.625
FIG375/4	FIG375/4LH	7/16 UNF	3/8 UNF	0.416	1.375	0.750	0.500	0.620	0.688	0.520	0.625
FIG437/1	FIG437/1LH	7/16 UNEF	7/16 UNF	0.416	1.375	0.750	0.625	0.875	0.687	0.770	0.625
FIG500	FIG500LH	1/2 UNF	1/2 UNF	0.555	1.937	1.000	0.625	1.125	0.875	1.000	0.750





BALL JOINTS

**I SERIES: IMG**

**Description:**

I-Series is our 5-piece range of inline nylon lined ball joints suitable for medium industrial/mechanical load applications. IMG has an inner ring that retains the ball stud and has no nylon liner. Available in both metric and imperial thread sizes.

**Material Specifications:**

Body: Steel 230M07PB case hardened and zinc plated and clear trivalent passivate. IL - Ball stud: Steel 230M07PB zinc plated and clear trivalent passivate. IMG - ball stud: Steel 212A42 induction hardened. Liner: Nylon 6 white (No liner in IMG range). Inner ring and safety clip: Spring steel to BS5216. Gaiter: Neoprene

**Features**

Metric & imperial thread sizes. Ultra smooth action. High pull out loads. Good wear resistance. Push & pull applications Lubricated. Male to male option

**Possible Applications**

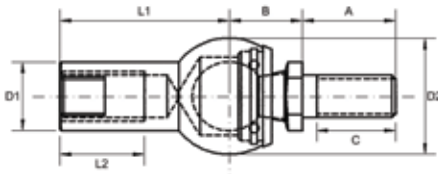
Industrial equipment  
Construction equipment  
Agricultural equipment  
Lawn & garden equipment

**Temperature Range**

-40°C to +80°C

**Specification**

ELV & RoHS compliant



**IMG SERIES: IN-LINE FEMALE-MALE BALL JOINTS (METRIC)**

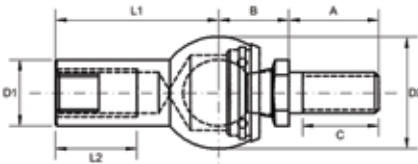
**Body:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate

**Ball Stud:** Steel 212A42, Hardened, Zinc Plated and Clear Trivalent Passivate

**Clip:** Spring Steel

**Dust Seal:** Neoprene Rubber

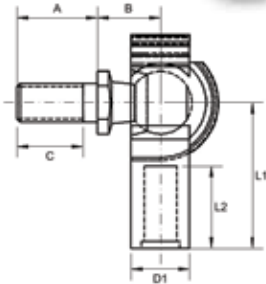
**Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	Body Flats	L1	L2 Min	Stud A/F	A	B	C Min	D1	D2
IM5	IM5LH	M5X0.80	M5X0.80	8	7	22	10.2	7	10.2	9.0	8.0	8.0	12.8
IMG5	IMG5LH	M5X0.80	M5X0.80	8	7	22	10.2	7	10.2	9.0	8.0	8.0	12.8
IM6	IM6LH	M6X1.00	M6X1.00	10	9	25	11.5	8	12.5	11.0	10.0	10.0	14.8
IMG6	IMG6LH	M6X1.00	M6X1.00	10	9	25	11.5	8	12.5	11.0	10.0	10.0	14.8
IM8	IM8LH	M8X1.25	M8X1.25	13	11	30	14.0	11	16.5	13.0	14.0	13.0	19.3
IMG8	IMG8LH	M8X1.25	M8X1.25	13	11	30	14.0	11	16.5	13.0	14.0	13.0	19.3
IM10	IM10LH	M10X1.50	M10X1.50	16	13	35	15.5	13	20.0	16.0	17.5	16.0	24.0
IMG10	IMG10LH	M10X1.50	M10X1.50	16	13	35	15.5	13	20.0	16.0	17.5	16.0	24.0
IM12	IM12LH	M12X1.75	M12X1.75	16	13	35	15.5	13	20.0	16.0	17.5	16.0	24.0
IMG12	IMG12LH	M12X1.75	M12X1.75	16	13	35	15.5	13	20.0	16.0	17.5	16.0	24.0
IM14	IM14LH	M14X1.50	M14X1.50	19	19	45	21.5	17	28.0	20.0	25.5	22.0	30.0
IMG14	IMG14LH	M14X1.50	M14X1.50	19	19	45	21.5	17	28.0	20.0	25.5	22.0	30.0
IM14/1	IM14/1LH	M14X2.00	M14X2.00	19	19	45	21.5	17	28.0	20.0	25.5	22.0	30.0
IMG14/1	IMG14/1LH	M14X2.00	M14X2.00	19	19	45	21.5	17	28.0	20.0	25.5	22.0	30.0



BALL JOINTS



**M SERIES**

**Description:**

M-Series is our 2-piece range of light weight nylon bodied lockable ball joints, suitable for light industrial/mechanical load applications requiring smooth action and good wear resistance. M-Series ball joints are also available without the ball stud, allowing for assembly on to a pre-positioned stud. Please refer to compatible ball stud options in our miscellaneous product section. M-Series ball joints have a unique locking clip incorporated into the one piece body, that when closed increases axial pull out and reduces backlash.

**Materials:**

Body: Nylon PA 6.6 black. Ball stud: Steel 230M07PB zinc plated and clear trivalent passivate.

**Features**

- Metric thread sizes
- Smooth action
- Can be assembled in situ
- Economical
- Light weight

**Possible Applications**

- Light industrial equipment
- Light agricultural equip.
- Lawn & garden equipment
- Engine controls

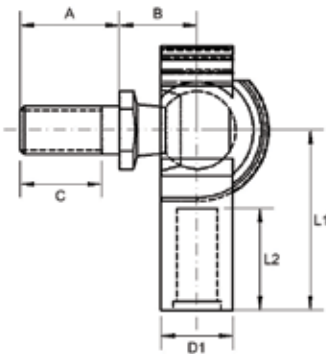
**Temperature Range**

-40°C to +80°C

**Specification**

ELV & RoHS compliant

**M SERIES: SELF RETAINED BALL JOINTS (METRIC)**



**Body:** PA 6.6

**Ball Stud:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate

**Specification:** ELV and RoHS Compliant



Part No. Right Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
M6008	M4X0.70	M4X0.70	6	17	10	5	6.5	8.5	5.5	8.0
M6010	M5X0.80	M5X0.80	8	22	12	7	10.2	9.0	8.6	9.5
M6012	M6X1.00	M6X1.00	10	25	14	8	12.5	11.0	10.0	12.0
M6014	M8X1.25	M8X1.25	13	30	17	11	16.5	13.0	13.5	15.0





BALL JOINTS

**P SERIES: PM - PI**

**Description:**

P-Series is our 3-piece range of quick release ball joints, suitable for light industrial/mechanical load applications requiring good wear resistance. Available in both metric and imperial thread sizes. Easily disconnected or re-assembled during installation. P-Series ball joints are also available without the ball stud allowing for assembly on to a pre-positioned stud. Please refer to compatible ball stud options in our miscellaneous product section.

**Material Specifications:**

Body: Steel 230M07PB hardened and zinc plated and clear trivalent passivate  
Ball stud: Steel 230M07PB hardened and zinc plated and clear trivalent passivate  
Clip: CS70 carbon steel, hardened and tempered and geomet finish.



**Features**

Metric & imperial thread  
Easily disconnected or re-assembled during installation  
Can be assembled in situ  
Good wear resistance

Lubricated. Light weight

**Possible Applications**

Light industrial  
Light construction  
Light agricultural  
Lawn & garden  
Automotive

**Temperature Range**

-30°C to +120°C

**Specification**

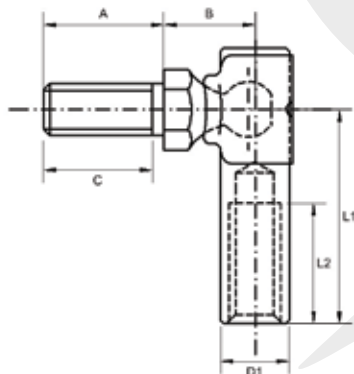
ELV & RoHS compliant

**Interchange table**

Dunlop	Tuthill	THK	Alinabal	SKF	Asahi	Rose
PM (metric)	SC-M	-	-	-	-	-
PI (imperial)	SC	-	-	-	-	-

*Note: Manufacturers part numbers are used for descriptive purposes only and may not be direct equivalent products.*

**PM SERIES: CLIP RETAINED BALL JOINTS (METRIC)**



**Body:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate

**Ball Stud:** Steel 230M07Pb, Hardened, Zinc Plated and Clear Trivalent Passivate

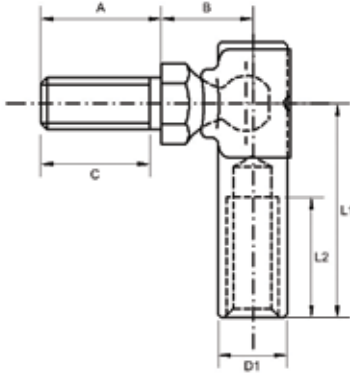
**Clip:** CS 70 Carbon Steel

**Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
PM4	PM4LH	M4X0.70	M4X0.70	4.75	17	10	7	8.0	7.25	6.0	6.0
PM5	PM5LH	M5X0.80	M5X0.80	6.35	22	12	8	11.0	10.63	9.0	8.0
PM5/1	PM5/1LH	M6X1.00	M6X1.00	6.35	22	12	8	14.0	10.63	12.0	8.0
PM6	PM6LH	M6X1.00	M6X1.00	6.35	25	14	8	14.0	10.63	12.0	8.0
PM6/1	PM6/1LH	M6X1.00	M6X1.00	6.35	25	14	8	11.0	10.63	9.0	8.0
PM8	PM8LH	M8X1.25	M8X1.25	8.00	22	12	11	14.0	13.35	12.0	10.0

**PI SERIES: CLIP RETAINED BALL JOINTS (IMPERIAL)**



**Body:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate

**Ball Stud:** Steel 230M07Pb, Hardened, Zinc Plated and Clear Trivalent Passivate

**Clip:** CS 70 Carbon Steel

**Specification:** ELV and RoHS Compliant

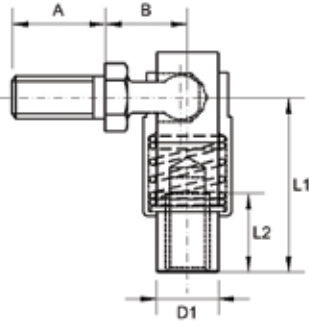


Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C Min	D1
PI187	PI187LH	10-32 UNF	10-32 UNF	0.250	0.875	0.484	0.312	0.437	0.420	0.337	0.312
PI187/1	PI187/1LH	10-32 UNF	1/4 UNF	0.250	0.875	0.484	0.312	0.562	0.420	0.462	0.312
PI187/2	PI187/2LH	10-32 UNF	10-32 UNF	0.250	0.969	0.531	0.312	0.438	0.420	0.375	0.312
PI187/3	PI187/3LH	10-32 UNF	M6 X 1.00	0.250	0.875	0.484	0.312	0.551	0.420	0.489	0.312
PI187/4	PI187/4LH	0.080 dia	N/A	N/A	0.719	0.390	N/A	N/A	N/A	N/A	0.312
PI187/5	PI187/5LH	0.074 dia	N/A	N/A	0.875	0.250	N/A	N/A	N/A	N/A	0.312
PI250	PI250LH	1/4 UNF	1/4 UNF	0.250	0.970	0.531	0.312	0.562	0.420	0.460	0.312
PI250/1	PI250/1LH	1/4 UNF	10-32 UNF	0.250	0.970	0.531	0.312	0.437	0.420	0.330	0.312
PI250/2	PI250/2LH	0.228 dia	1/4 UNF	0.250	0.970	0.500	0.312	0.562	0.420	0.460	0.312
PI250/3	PI250/3LH	10-32 UNF	10-32 UNF	0.250	0.875	0.484	0.312	0.438	0.420	0.390	0.312
PI312	PI312LH	5/16 UNF	5/16 UNF	0.312	0.875	0.484	0.437	0.562	0.553	0.460	0.394





BALL JOINTS



**Q SERIES: QM - QI**

**Description:**

Q-Series is our 4-piece range of quick release, spring loaded ball joints, suitable for medium industrial/mechanical load applications. Available in both metric and imperial thread sizes. Q-Series ball joints are also available without the ball stud allowing for assembly on to a pre-positioned stud. Please refer to compatible ball stud options in our miscellaneous product section. Q-Series ball joints are ideal for severe wear conditions and are resistant to vibration and high shock loading.

**Material Specifications:**

Body: Steel 230M07PB hardened and zinc plated and clear trivalent passivate.  
 Ball stud: Steel 230M07PB hardened and zinc plated and clear trivalent passivate.  
 Shield: Steel 230M07PB zinc plated and clear trivalent passivate  
 Spring: Stainless steel.

**Features**

- Metric & imperial thread
- High pull out load
- High wear conditions
- High shock loads
- Resistant to vibration
- Lubricated
- Knurl aids assembly

**Possible Applications**

- Industrial equipment
- Construction equipment
- Agricultural equipment
- Lawn & garden equipment

**Temperature Range**

-30°C to +120°C

**Specification**

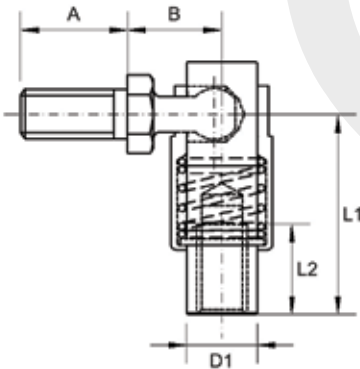
ELV & RoHS compliant

**Interchange table**

Dunlop	Tuthill	THK	Alinabal	SKF	Asahi	Rose
QM (metric)	S-M	-	-	-	-	-
QI (imperial)	S	-	-	-	-	-

*Note: Manufacturers part numbers are used for descriptive purposes only and may not be direct equivalent products.*

**QM SERIES: QUICK RELEASE BALL JOINTS (METRIC)**



**Body:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate

**Ball Stud:** Steel 230M07Pb, Hardened, Zinc Plated and Clear Trivalent Passivate

**Shield:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate

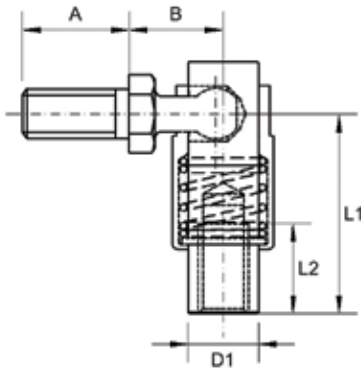
**Spring:** 302S 26 Stainless Steel

**Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	Length L1	Length L2	Stud A/F	A	B	C	D1
QM5	QM5LH	M5X0.80	M5X0.80	6.4	23.0	11.1	8	11.1	11.9	9.0	7.9
QM6	QM6LH	M6X1.00	M6X1.00	7.9	24.6	13.0	10	14.3	12.6	12.8	9.4
QM6/1	QM6/1LH	M6X1.00	M6X1.00	7.9	24.6	13.0	10	14.3	12.7	12.8	9.4
QM6/2	QM6/2LH	M6X1.00	M6X1.00	7.9	24.6	13.0	10	11.0	12.7	9.5	9.4
QM6/3	QM6/3LH	10-32 UNF	M6X1.00	7.9	24.6	13.0	10	14.3	12.7	12.8	9.4
QM6/4SS	QM6/4SSLH	M6X1.00	M6X1.00	7.9	24.6	13.0	10	14.3	12.7	12.8	9.4
QM8	QM8LH	M8X1.25	M8X1.25	8.6	31.7	14.3	11	17.5	14.0	15.5	11.1
QM8/1	QM8/1LH	M8X1.25	M6X1.00	8.6	31.7	14.3	11	17.5	14.0	15.5	11.1
QM8/2	QM8/2LH	M8X1.25	M8X1.25	8.6	31.7	14.3	11	11.0	14.0	9.0	11.1
QM8/3	QM8/3LH	M8X1.25	M8X1.25	8.6	31.7	14.3	11	10.0	15.2	8.0	11.1
QM8/4SS	QM8/4SSLH	M8X1.25	M6X1.00	8.6	31.7	14.3	11	17.5	15.2	15.5	11.1
QM10	QM10LH	M10X1.50	M10X1.50	10.7	39.7	27.0	13	22.2	19.8	20.0	14.1

**QI SERIES: QUICK RELEASE BALL JOINTS (IMPERIAL)**



- Body:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate
- Ball Stud:** Steel 230M07Pb, Hardened, Zinc Plated and Clear Trivalent Passivate
- Shield:** Steel 230M07Pb, Zinc Plated and Clear Trivalent Passivate
- Spring:** 302S 26 Stainless Steel
- Specification:** ELV and RoHS Compliant



Part No. Right Hand	Part No. Left Hand	Body Thread	Stud Thread	Ball Dia	L1	L2 Min	Stud A/F	A	B	C	D1
QI187	QI187LH	10-32 UNF	10-32 UNF	0.250	0.906	0.437	0.312	0.437	0.468	0.330	0.310
QI187/2	QI1872LH	10-32 UNF	1/4" UNF	0.250	0.906	0.437	0.312	0.562	0.468	0.500	0.310
QI187/3	QI1873LH	10-32 UNF	M5 x 0.80	0.250	0.906	0.437	0.315	0.437	0.468	0.375	0.310
QI187/5	QI1875LH	10-32 UNF	M6 x 1.00	0.250	0.906	0.437	0.315	0.551	0.421	0.490	0.310
QI250	QI250LH	1/4" UNF	1/4" UNF	0.311	0.969	0.500	0.375	0.562	0.500	0.490	0.370
QI250/1	QI250/1LH	10-32 UNF	1/4" UNF	0.311	0.969	0.500	0.375	0.562	0.500	0.500	0.370
QI250/2	QI250/2LH	1/4" UNF	M6 x 1.00	0.311	0.969	0.500	0.394	0.562	0.500	0.500	0.370
QI250/4	QI250/4LH	1/4" BSF	1/4" BSF	0.311	0.969	0.500	0.375	0.562	0.500	0.500	0.370
QI250/5	QI250/5LH	1/4" UNF	5/16" UNF	0.311	0.969	0.500	0.375	0.882	0.449	0.820	0.370
QI250/6	QI250/6LH	1/4" UNF	1/4" UNF	0.311	0.969	0.500	0.375	0.875	0.449	0.812	0.370
QI312	QI312LH	5/16" UNF	5/16" UNF	0.339	1.250	0.562	0.437	0.687	0.594	0.580	0.439
QI312/1	QI312/1LH	5/16" BSF	5/16" BSF	0.339	1.250	0.562	0.437	0.687	0.594	0.625	0.439
QI312/2	QI312/2LH	1/4" UNF	5/16" UNF	0.339	1.250	0.562	0.437	0.882	0.594	0.820	0.439
QI312/3	QI312/3LH	5/16" UNF	5/16" UNF	0.339	1.250	0.562	0.437	0.882	0.594	0.820	0.439
QI312/4	QI312/4LH	10-32 UNF	5/16" UNF	0.339	1.250	0.562	0.437	0.882	0.594	0.820	0.439
QI375	QI375LH	3/8" UNF	3/8" UNF	0.421	1.562	1.062	0.500	0.875	0.719	0.770	0.556

“We are proud to be a European manufacturer; it is a privilege to supply our products to some of the world’s most prestigious original equipment manufacturers in the Agricultural, Automotive, Construction, Industrial and Motor Sport sectors”.



“Our distributor network is vital to the continued global growth of the DUNLOP brand and our valued distributor partners form the perfect link between manufacturer and end user”.



“Our commitment to our staff, our customers and the environment is of paramount importance to our company, we will continue to develop our organisational skills to further enhance our company’s potential, to engage in sustainable practices and anticipate the needs and expectations of our customers”.



“We love our products”.

Ray Mifsud, Managing Director.

A handwritten signature in black ink, appearing to read 'R. Mifsud'.

**#WeLoveOurProducts**





LINKAGES

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