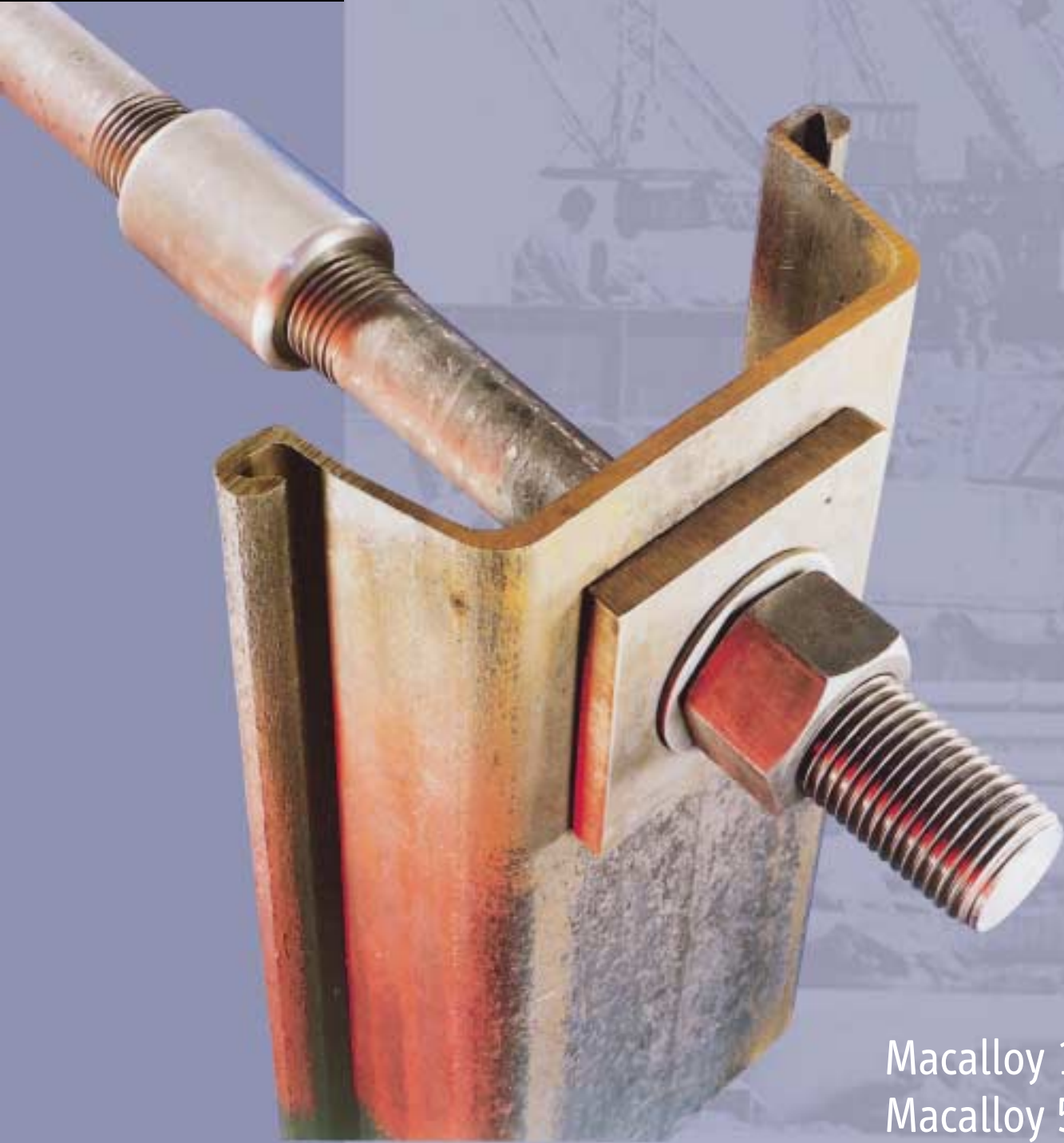


# Macalloy



GROUND ENGINEERING

PILING TIE BAR SYSTEMS



Macalloy 17MHS  
Macalloy 500  
Tie Bar Systems



# Macalloy tie bar system

McCalls Special Products tie bars have been used in sheet piling and general tying applications for over 40 years. Development has been continuous, and the most recent refinement provides M105 bars with a rolled thread giving a yield of 3519kN. Macalloy 17MHS or Macalloy 500 may be used, depending on the tying application. Macalloy 17MHS is used for sheet piling ties and Macalloy 500 is used in temporary works.

In marine applications corrosion protection must be considered. Should you require more information on the design or applications for Macalloy 17MHS or Macalloy 500 tie bars, please contact MSP's Technical Sales Department.

Tel +44 (0)114 242 6704

Fax +44 (0)114 243 1324

## Macalloy 17MHS

### Macalloy 17MHS load properties

Thread type	Nominal bar dia (mm)	Nominal bar area (mm <sup>2</sup> )	Nominal weight per metre (kg/m)	Thread pitch (mm)	Ultimate tensile load (kN)	Yield load (kN)	Permanent working load 0.5 Py (kN)	Temporary working load 0.625 Py (kN)
M42	39	1195	9.4	4.5	665	501	251	313
M48	45	1590	12.5	5	875	660	330	412
M56	52	2124	16.7	5.5	1209	912	456	570
M64	60	2827	22.2	6	1596	1204	602	752
M76	72	4072	32.0	6	2329	1756	878	1098
M85	82	5281	41.5	6	2969	2239	1120	1399
M90	87	5945	46.7	6	3358	2533	1267	1583
M100	97	7390	58.0	6	4206	3172	1586	1982
M105	102	8171	64.1	6	4667	3519	1759	2199

### Macalloy 17MHS and Macalloy 500 mechanical properties

Bar type	Ultimate tensile stress (N/mm <sup>2</sup> )	Min. yield stress (N/mm <sup>2</sup> )	Min. elongation %	Young's modulus (kN/mm <sup>2</sup> )	Standard bar length (m)
Macalloy 17MHS	610	460	19	205	12
Macalloy 500	550**	500**	12	205	12

\*\*63mm Macalloy 500 has a minimum UTS of 710 N/mm<sup>2</sup>, a minimum yield of 565 N/mm<sup>2</sup> and a modulus of 170 kN/m<sup>2</sup>.

### Macalloy 17MHS washer plates

Nom. bar diameter	Thread size	LARSSEN PILES				FRODINGHAM PILES (All Sizes)
		LX 8	LX 12, L6-122	LX 16	LX 20, 25, 32, 38, L6-42	Tie bar steel grade
		200 x 200	310 x 310	300 x 300	270 x 270	17MHS
		Thickness				
39	M42	25	25	25	25	180 x 100 x 30
45	M48	25	25	25	25	180 x 100 x 30
52	M56	25	25	25	25	180 x 100 x 30
60	M64	30	30	30	30	180 x 130 x 30
72	M76	30	30	30	30	180 x 130 x 30
82	M85	35	35	35	35	200 x 150 x 30
87	M90	35	35	35	35	Bridging washer
97	M100	40	40	40	40	Bridging washer
102	M105	40	40	40	40	Bridging washer

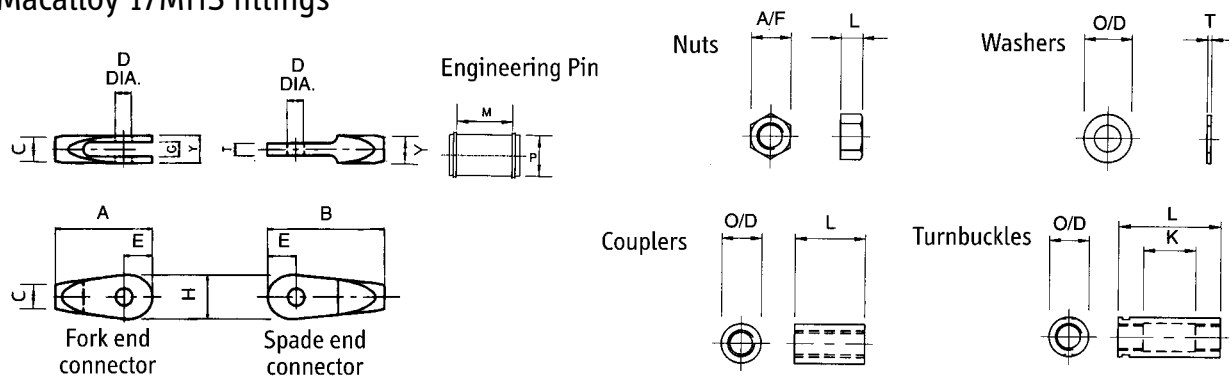
### Macalloy 17MHS bearing and anchor plates

Nom. bar diameter	Thread size	17MHS	
		Bearing plate	Anchor plate
39	M42	180 x 180 x 30	225 x 225 x 25
45	M48	180 x 180 x 30	275 x 275 x 25
52	M56	180 x 180 x 30	300 x 300 x 25
60	M64	180 x 180 x 30	350 x 350 x 30
72	M76	200 x 200 x 40	425 x 425 x 40
82	M85	200 x 200 x 40	500 x 500 x 40
87	M90	250 x 250 x 40	525 x 525 x 50
97	M100	250 x 250 x 40	575 x 575 x 50
102	M105	250 x 250 x 40	600 x 600 x 50

NOTE: Anchor plates bearing load based on concrete cube strength/3 (30 N/mm<sup>2</sup> concrete assumed)

# Macalloy tie bar system

## Macalloy 17MHS fittings



Bar diameter	Thread	Fork end			Spade end			Common dimensions				Pin				
		Ref. No.	A	G	Y	Ref. No.	B	T	Y	C.Dia	D.Dia	E	H	Ref. No.	P.Dia	M
39	M42x4.5	FE42	232	40	75	SE42	284	35	77	60	43	69	107	PE42	42	81
45	M48x5	FE48	266	45	87	SE48	321	40	88	69	49	80	121	PE48	48	94
52	M56x5.5	FE56	314	50	97	SE56	364	45	99	80	57	96	145	PE56	56	103
60	M64x6	CF64	368	62	121	CS64	428	56	121	91	65	111	169	PE64	64	130
72	M76x6	CF76	386	77	148	CS76	446	71	148	109	78	132	201	PE76	76	158
82	M85x6	CF85	454	83	162	CS85	489	77	140	121	91	153	236	PE85	90	171
87	M90x6	CF90	478	87	170	CS90	476	81	150	127	96	156	242	PE90	95	182
97	M100x6	CF100	555	87	170	CS100	625	81	160	143	115	189	289	PE100	110	182

Bar diameter	Thread	Nuts		Washers			Couplers			Turnbuckles				
		Ref. No.	A/F	L	Ref. No.	O/D	T	Ref. No.	O/D	L	Ref. No.	O/D	L	K
39	M42x4.5	NM42	65	34	WM42	78	7	CE/42	63	89	TE/42	63	184	100
45	M48x5	NM48	75	38	WM48	92	8	CE/48	71	101	TE/48	71	196	100
52	M56x5.5	NM56	85	45	WM56	105	9	CE/56	80	117	TE/56	80	212	100
60	M64x6	NM64	95	51	WM64	115	9	CE/64	95	133	TE/64	95	228	100
72	M76x6	NM76	110	61	WM76	135	10	CE/76	112	157	TE/76	112	252	100
82	M85x6	NM85	120	68	WM85	145	12	CE/85	122	175	TE/85	125	270	100
87	M90x6	NM90	130	72	WM90	160	12	CE/90	132	185	TE/90	132	280	100
97	M100x6	NM100	145	80	WM100	175	14	CE/100	148	205	TE/100	148	300	100

Other fittings are available on request (taper washers, bridging plates, etc.)

## Macalloy 500 bar system

### Macalloy 500 load properties

Diameter	Bar ref.	Bar area	Weight per metre (kg/m)	Pitch (mm)	Ultimate tensile stress (kN)	Yield load (kN)	Permanent working load 0.5 Py (kN)	Temporary working load 0.625 Py (kN)
40	40	1256	9.87	16	691	628	314	393
50	50	1963	15.4	20	1080	981	490	613
63	63	3117	24.5	8	2217	1758	879	1099

Further details of the Macalloy 500 bar system are contained in the Macalloy 500 brochure. For copies contact MSP's Sales Department.

## Corrosion Protection

Steel sheet piling is used in many aggressive environments and consequently the corrosion protection, or factors effecting the life of the tie bar, must be considered. The most commonly used protection is to wrap the bar with a protective barrier containing oxygen scavengers, such as the Denso range of products. However, for

exceptionally long life (up to 120 years) it is necessary to have a system which prevents the ingress of moisture, for this the specially developed Macalloy Tape system is required. Further details of the suitability of the various corrosion protection systems are available from the MSP Technical Department.

# Macalloy tie bar system

## **Macalloy**<sub>17MHS</sub>

Bars for use as ties in marine sheet piling.

**MACALLOY 17MHS** is a weldable carbon steel  
Maximum carbon equivalent = 0.56%

### Material Properties

Ultimate tensile stress	610 N/mm <sup>2</sup>
Minimum yield stress	460 N/mm <sup>2</sup>
Minimum elongation	19%
Young's modulus	205 kN/mm <sup>2</sup>



**Karachi Port**

Photograph courtesy of STFA Temel Kazıklari Insaati AS

**Karachi Port, Pakistan.** A major rebuilding programme for Pakistan's premier port involved the construction of new harbour walls for Wharves 5 - 10. The walls are supported by approximately 700 tonnes of M105 Macalloy 17MHS tie bars and fittings, wrapped with Macalloy Tape for long term protection.

**Client:** Karachi Port Trust  
**Consultant Engineer:** Scott Wilson Kirkpatrick  
**Contractor:** STFA Temel Kazıklari Insaati AS

**Cardiff Bay Barrage, U.K.** The embankment and the lock and sluice gate structures of the 1.1km barrage across Cardiff Bay were tied with over 600 tonnes of Macalloy 17MHS bars, spades and forks, 100mm and 76mm diameter.

**Client:** Cardiff Bay Development Corporation  
**Consultant Engineer:** Sir Alexander Gibb  
**Contractor:** Costain/Balfour Beatty J.V.

**River Tees Barrage, Teesdale, U.K.** Macalloy 17MHS tie bars were used in the sheet pile wall built to control the flow of tidal water to 22km of the River Tees.

**Client:** Teesdale Development Corporation  
**Structural Engineer:** Montgomery Watson  
**Contractor:** Tarmac Construction (Major Projects Division)



**Cardiff Bay Barrage**

Photograph courtesy of Balfour Beatty/Costain



**River Tees Barrage**

Photograph courtesy of Tarmac Construction

This publication provides the technical details currently used by McCall's Special Products Ltd in the manufacture of its components. The company reserves the right

to amend technical details as and where necessary in line with its policy of continuous development.

For any further technical information on the Macalloy system or any other MSP products, please contact our Technical Sales Department.

Macalloy, P.O. Box 71, Hawke Street, Sheffield S9 2LN, UK. Tel: +44(0) 114 242 6704. Fax +44(0) 114 243 1324  
Website: [www.macalloy.com](http://www.macalloy.com) E-mail: [sales@macalloy.com](mailto:sales@macalloy.com)



is a registered trade mark of McCall's Special Products Ltd.  
is a trading name of McCall's Special Products Ltd.