



**METEXSTEEL™**

# Metex MESH

▶ Standard & Cut to Size Steel Fabric



MS 145:2006  
Cert.: PC000717

MS 144:2006  
Cert.: PC000712

# Metex

## Standard & Cut to Size Steel Fabric

Metex Fabric comes in both Standard & Cut to Size Fabric.

The term 'Standard Fabric' refers to the specific spacing and diameter of wires as shown in Metex Standard Fabric Specification Table. From the table, it should be noted that the alphabet A, B, C, & DA denotes the main and cross wire spacing while the digit after the alphabet denote the main wire diameter.

The term 'Special Fabric' refers to the various combination of wire spacing and diameter for the main and cross wires. These special fabrics are made available to specific steel area requirements in both directions in order to avoid over provision of steel. Please refer to Metex Standard Fabric Specification Table for examples of special fabric reference.





## Quality Control

Welcome to a company that is truly committed to its customers' goal of higher quality, productivity and profitability. We believe that the best way of working for you is working with you. We do so through commitment and partnership.

## Our Quality Policy Statement

Metex aims to be the leading steel company in Malaysia by:

- Setting customer satisfaction as our highest priority.
- Seeking continuous improvement through staff development, innovation and new technology.
- Building the highest standards of quality, integrity and efficiency into all our operations.

# Benefits of Using Metex Fabric

Metex Fabric provides designers, engineers and contractors with a reliable, convenient and economical reinforcement for modern concrete structures.

## ➤ Controlled Manufacturer

The biggest advantage in using Metex Fabric is the superior and consistent quality that is assured for the designer, owner and contractor compared with other types of reinforcement. As all wires are carefully cold drawn and tested, the quality of the material used is assured. The wire drawing process will produce a wire with uniform properties and accurate diameter. This same uniformity is not possible with hot rolled bars.

## ➤ Designed Reinforcement

Metex Fabric provides proper distribution of steel reinforcement throughout the concrete slab. The greater number of smaller diameter wires that are closely and more uniformly spaced distribute the load widely and the stress equally throughout the concrete slab.

From the standpoint of efficiency, Metex Fabric is the preferred reinforcement for concrete.

Whereas steel bars must rely entirely on adhesion of the concrete to the bar surface to provide bond for anchorage, Metex Fabric provides positive mechanical anchorage by utilising the rigidly connected cross wires welded at each intersection. The shear developed by each weld makes it possible for the yield stress of the wire to be developed by two welds.

By specifying Metex Fabric, the designer is assured of obtaining the required area of reinforcement at the correct spacing, and so on-site supervision and checking time is reduced.

## ➤ Easily Handled and Placed

Metex Fabric is simple to fix and when properly supported will remain in position during concreting.

## ➤ Adaptable for Forming and Shaping

Metex Fabric possesses the right degree of ductility to allow it to be bent, shaped, or fashioned readily on the job yet is sufficiently rigid to maintain its shape after bending.

## ➤ Crack Control

Metex Fabric controls the cracking in concrete slabs. The high efficiency of the small closely spaced wires distribute and equalize the stresses that occur at or near any cracks that may form.

Research into crack widths and the width prediction formula being adopted by building codes shows that maximum crack widths are proportional to the distance from the surface to the closest reinforcement i.e. to bar spacing and concrete over.

The mechanical anchorage derived by the cross-wire welds makes Metex Fabric the ideal reinforcement for slabs on the ground. The main purpose of reinforcement in these slabs is to prevent any cracks which may form from opening to excessive widths with subsequent loss of load transfer ability. With Metex Fabric, stresses in the order of 250 N/mm<sup>2</sup> can be developed at each cross-wire weld. This means that all movement is transferred to the designed joints where load can be transferred by dowel action.



## ► Speed and Economy

Metex Fabric permits maximum construction speed and economy while retaining full design strength in the concrete structure.

The high quality of Metex Fabric that enables it to meet MS 145: 2006 Standard results in significant cost savings. By using the recommended characteristic yield strength of  $485 \text{ N/mm}^2$  a saving of up to 40% on the quantity of mild steel bar reinforcement is possible. After allowing for the higher cost per tonne for Metex Fabric, significant cost saving is usually achieved for most projects.

In addition to the material saving, fixing and transport costs are reduced. Fixing time is also saved, as Metex Fabric is delivered to the construction site with the wires welded at the specified spacing in two directions. Whilst Metex Fabric in rolls is suitable for ground slabs, sheets are recommended for suspended slabs to ensure that the effective depth is maintained.

As well as providing these economies Metex Fabric does not have the scrap and waste during processing compared with mild steel bars. The actual quantity of steel bar purchased is usually at least 5% more than that used and this factor should be taken into account in any cost comparison. The general elimination of bar hooks with fabric provides a further saving which is noted in the section on "Crack Control".

The direct saving in time is becoming increasingly important under modern construction methods and the use of "Critical Path Planning". In many cases, the time and labour required to place

reinforcement can be considerably reduced.

To obtain the maximum benefits from the use of Metex Fabric, the members of the structure should be designed from the beginning using the higher allowable stresses.

However when a design is prepared using mild steel bars, a conversion chart may be used to compare the difference in quantities for Metex Fabric used at an allowable stress of  $230 \text{ N/mm}^2$  (approx. 20,000psi) against the quantities of mild steel bar designed at  $140 \text{ N/mm}^2$  (approx. 20,000psi). For more accurate conversion, the calculated steel area should be used.

Our staff will be pleased to discuss the details of any comparison with you and provide current cost.

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# Material Specifications

The Standards & Industrial Research Institute of Malaysia (SIRIM) publishes specifications for steel and welded steel fabric.

The appropriate Malaysian and also British Standards are given in the tables beside :

Standard	Title
MS 144 : 2006 BS 4482 : 2005	Specification for Cold Reduced Mild Steel Wire for The Reinforcement of Concrete
MS 145 : 2006 BS 4483 : 2005	Specification for Welded Steel Fabric for The Reinforcement of Concrete

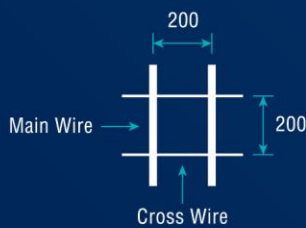
# Characteristic Strength

MS 144 and MS 145 stipulate the minimum requirement for characteristic yield strength of welded fabric :

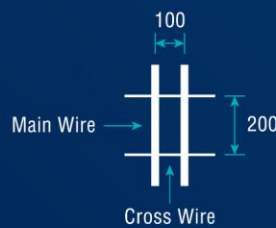
Grade	Min. Characteristic Strength (N/mm <sup>2</sup> )
485	485
500	500

# Mesh Orientation

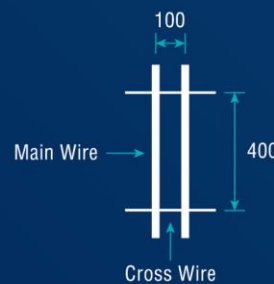
Mesh "A" Type



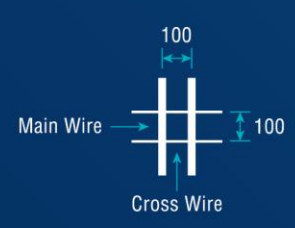
Mesh "B" Type



Mesh "C" Type

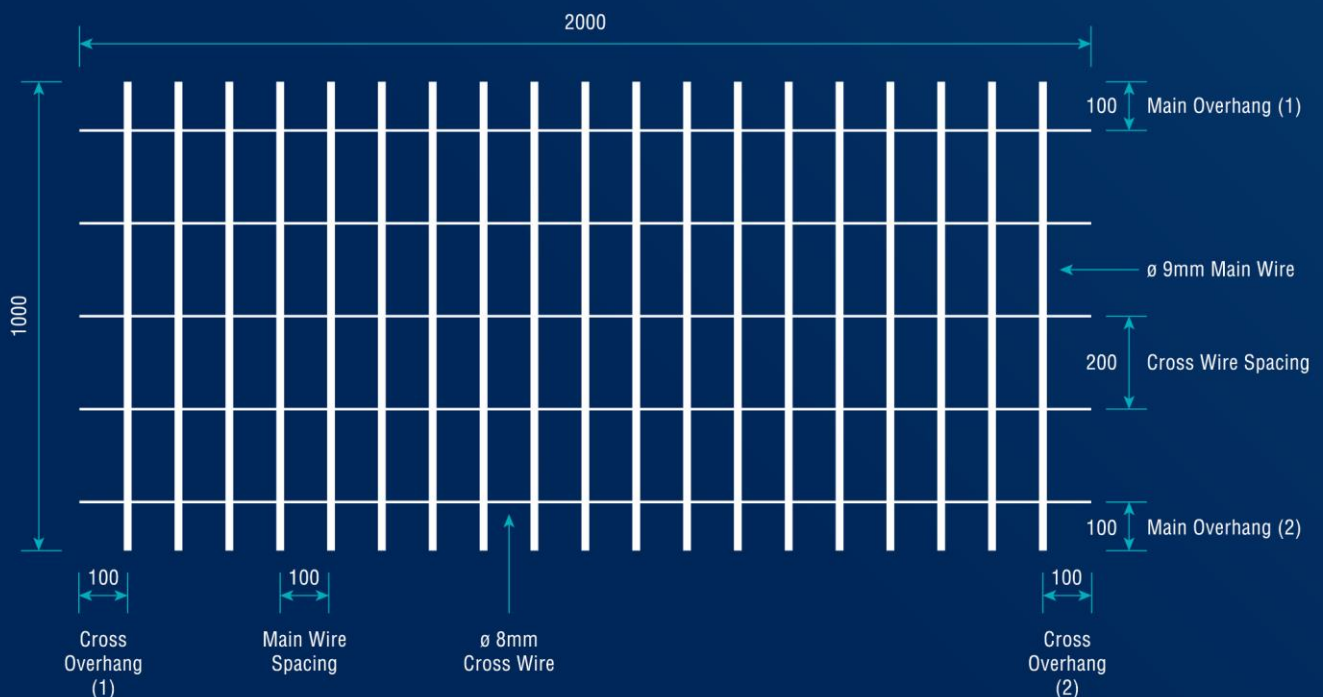


Mesh "DA" Type



E.g: Mesh "B" Type

Mesh Size: B9 = 1.00m x 2.00m



# Ribbed Fabric

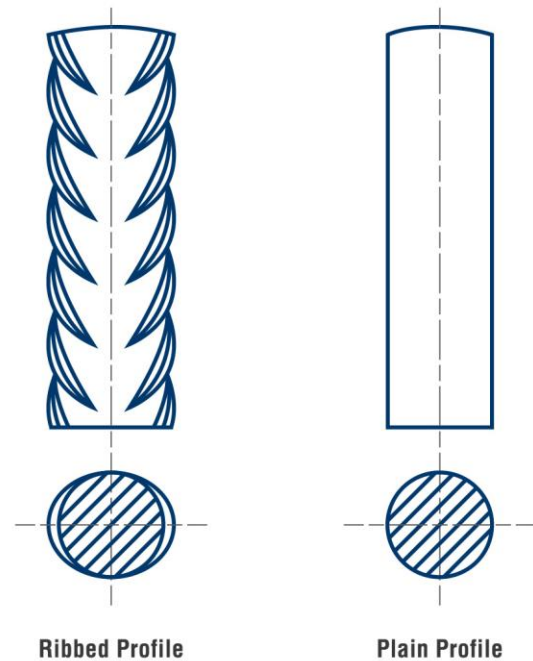
Ribbed Fabric has been widely used as reinforcement for concrete structures in Malaysia and many developed countries.

## Advantages of ribbed fabric are :

- Higher bond and anchorage characteristics of its ribbed wire.
- Ribbed wire is cold-rolled produced - the rolling process give rise to uniform plastic flow in the material.

*The results - more consistent properties and better ductility.*

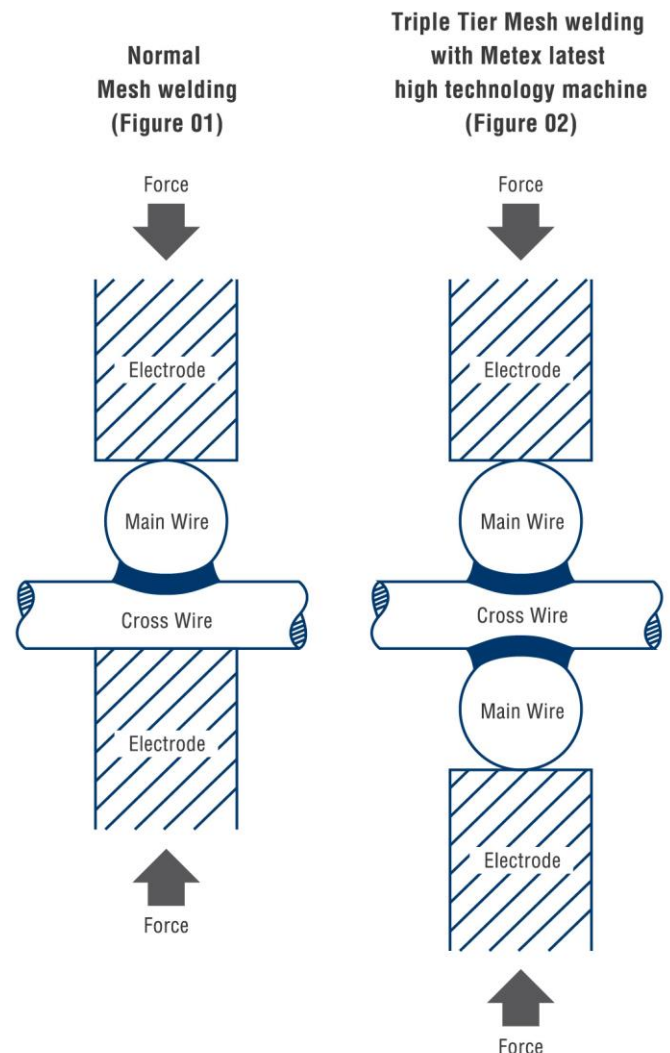
- Crack widths in concrete elements are controlled to the minimum because force is well distributed through bond effect of ribbed wire as compared to plain wire.



# Anchorage & Weld

Metex Steel Fabric is manufactured with automatic welding machines to develop a weld shear stress of 250 N/mm<sup>2</sup>. This weld is achieved by a controlled combination of pressure, electric current and time to develop a fusion of wires without reducing tensile properties of the wire. Our latest high technology mesh welding machine is capable of doing triple tier welding as shown in the Figure 02.

Once Metex Fabric is embedded in concrete, the anchorage of the fabric necessary to develop tensile stresses within the wire is achieved by the embedded of the cross wire. With the weld shear stress referred to above, one weld will achieve at least half of the specified characteristic yield stress of the wire. Hence the bond between the wire surface and the concrete can be regarded as additional anchorage and the tensile stresses can be developed in shorter lengths than those required by smooth bars. An embedded of two welds will develop at least the yield strength of the wire.



# Laps

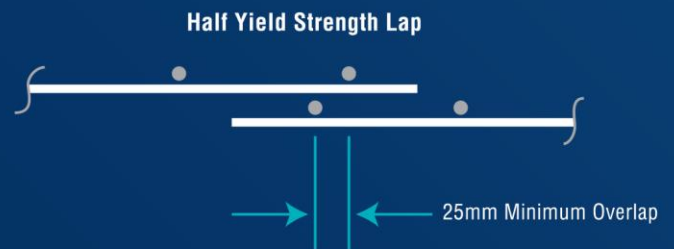
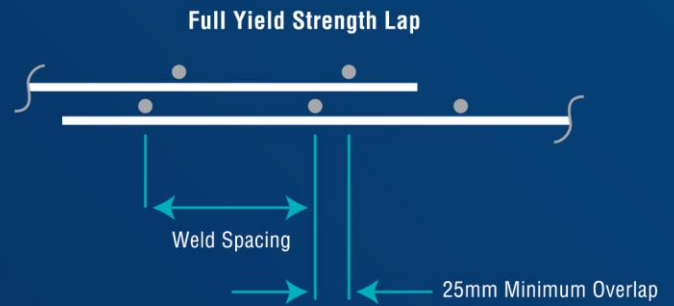
## › Tension laps

Tension lap length should be at least equal to the design tension anchorage length necessary to develop the required stress in the reinforcement.

## › Compression laps

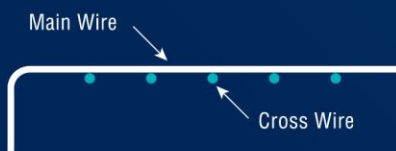
The length should be at least 25% more than the compression anchorage length. In the detailing of steel fabric, two cross welds are provided to transfer the stresses. In sidelaps of one-way slabs, half yield strength laps with overlap of only one cross weld are acceptable. This is commonly used in top (negative) reinforcement.

Full yield strength lap should always be provided when lap length is not specified.



# Bend

End anchorage in the form of hooks and bends should only be used to meet specific design requirements.



Single Bend



Double Bend

# Rust

BS 8110 Clause 7.4 Surface Condition states:

Reinforcement should not be surrounded by concrete unless it is free from mud, oil, paint, retarders, loose rust, loose mill scale, snow, ice, grease or any other substance which can be shown to affect adversely the steel or concrete chemically, or reduce the bond. Normal handling prior to embedment in the concrete is usually sufficient for the removal of loose rust and scale from reinforcement.

Loose rust is removed during handling and shaking of reinforcement. It is not advisable to strike the reinforcement.

Any surface rust which remains on the fabric is not harmful and will increase the bond and anchorage properties of fabric. Wire brushing is unnecessary and may reduce the bond on plain steel wire.



# Overhang

Overhang refers to the distance between the tip of the wire and the first weld joint. Overall dimensions, spacing of the wires and where the usage of the fabric will determine the overhang provided.

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## Application of Metex Fabric

The uses of Metex Fabric may be applied with advantage including almost any purpose where a load is to be carried, where material is to be contained, or where a surface is required to be fire-resisting or waterproof.

### Examples are :

Piles	Columns	Foundations	Roofs and Floors
Beams	Lintels	Partitions	Bins and Bunkers
Slabs	Bridges	Staircases	Colliery Structures
Walls	Tanks	Reservoirs	Swimming Pools
Silos	Culverts	Chimneys	Retaining Walls
Roads	Sewers	Dock Walls	Wharves and Jetties

Our technical staff will be pleased to discuss your particular application with you.

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## Placing Fabric

The following points will be of assistance when placing Metex Fabric:

1. For rectangular meshes, make sure that the Fabric is placed with the main wires in the correct direction, normally in the direction of the shorter span. On some occasions, they are placed in the directions of the longer span, therefore the drawings should be followed exactly.
2. It is important that the Fabric is given the correct cover as shown on the plan. Any increase in the cover decreases the effective depth of the slab and reduces its strength. Insufficient cover will not protect the reinforcement from rusting.
3. As the final strength of a slab is determined to a major degree by the correct location of the reinforcement it is advisable to position the Fabric on supports. Small pre-cast concrete blocks are suitable as spacers under the bottom layer in suspended slabs or in ground slabs where only one layer of fabric is used. Where Fabric is to be placed in the top of the slab for cantilever reinforcement, or to provide against negative moments, bar chairs of wire or plastic, or short lengths of bar of Fabric bent into a hurdle shape should be used to support the top layer.
4. When using Metex Fabric in rolls for ground slabs, secure the free end of the roll by dog spikes or weighting.
5. When the unrolling has been carried out sufficiently far enough for cutting, place a plank lightly against the unrolled portion to spikes or weighing.
6. Cutting is easily done by using bolt cutters.

# Standard Fabric

The preferred fabrics are categorised as follows :

Type A	Square Fabric	200 x 200mm spacing
Type B	Rectangular Fabric	100mm main wire spacing, 200mm cross wire spacing
Type C	Long Fabric	100mm main wire spacing, 400mm cross wire spacing
Type DA	Small Square Fabric	100 x 100mm spacing

Metex Standard Fabrics could be selected from the table below.

### Example :

Area of steel required in a slab design		Specify B10
Main direction	751mm <sup>2</sup> /m	785mm <sup>2</sup> /m
Distribution direction	185mm <sup>2</sup> /m	252mm <sup>2</sup> /m

## Metex Standard Fabric Specification

Metex Ref No.	Cross - Sectional area (mm <sup>2</sup> /m)		Wire Diameter (mm)		Wire Spacing (mm)		Nominal Mass (kg/m <sup>2</sup> )
	Main	Cross	Main	Cross	Main	Cross	
<b>SQUARE FABRIC</b>							
A 13	664	664	13	13	200	200	10.43
A 12	566	566	12	12			8.89
A 11	475	475	11	11			7.46
A 10	393	393	10	10			6.16
A 9	318	318	9	9			4.99
A 8	252	252	8	8			3.95
A 7	193	193	7	7			3.02
A 6	142	142	6	6			2.22
A 5	98	98	5	5			1.54
A 4	63	63	4	4			0.99

# Metex Standard Fabric Specification

Metex Ref No.	Cross - Sectional area (mm <sup>2</sup> /m)		Wire Diameter (mm)		Wire Spacing (mm)		Nominal Mass (kg/m <sup>2</sup> )
	Main	Cross	Main	Cross	Main	Cross	

RECTANGULAR FABRIC							
B 13	1328	393	13	10	100	200	13.50
B 12	1131	252	12	8			10.90
B 11	950	252	11	8			9.43
B 10	785	252	10	8			8.14
B 9	636	252	9	8			6.97
B 8	503	252	8	8			5.93
B 7	385	193	7	7			4.53
B 6	283	193	6	7			3.73
B 5	196	193	5	7			3.05

LONG FABRIC							
C 12	1131	126	12	8	100	400	9.87
C 11	950	126	11	8			8.44
C 10	785	71	10	6			6.72
C 9	635	71	9	6			5.55
C 8	503	49	8	5			4.34
C 7	385	49	7	5			3.41
C 6	283	49	6	5			2.61

SMALL SQUARE FABRIC							
DA 13	1327	1327	13	13	100	100	20.86
DA 12	1131	1131	12	12			17.75
DA 11	950	950	11	11			14.91
DA 10	785	785	10	10			12.32
DA 9	636	636	9	9			9.98
DA 8	503	503	8	8			7.90
DA 7	385	385	7	7			6.04
DA 6	283	283	6	6			4.44
DA 5	196	196	5	5			3.08

# Special Fabric

Metex Special Fabric offers designer a wider range of fabric selection to match closely to area of steel required in design, hence provides a more economical solutions.

Metex Special Fabric gives the combinations of wire diameter and spacing which are not in the range of standard fabric table.

## ➤ Notation for Special Fabric

Spacing code - Main wire diameter / Cross wire diameter.

Spacing Code	Wire Spacing (mm)	
	Main	Cross
A	200	200
B	100	200
DA	100	100

For example : **B8/7** denotes special fabric of:

- diameter 8mm wire at 100mm spacing (main direction.)
- diameter 7mm wire at 200mm spacing (cross direction.)

Where standard fabric could not provide an economical design, the designer should specify special fabric.

## ➤ How to select Special Fabric

Using similar example as in Standard Fabric.

Area of steel required in a slab design	B10	B10/7
Main direction (mm <sup>2</sup> /m)	751	785
Distribution direction (mm <sup>2</sup> /m)	185	192

Designer should specify **B10/7 (7.68 kg/m<sup>2</sup>)** from Standard Fabric, which is **more economical than B10 (8.14 kg/m<sup>2</sup>)**.

# Metex Special Fabric Specification - A Series

Metex Ref No.	Cross - Sectional area (mm <sup>2</sup> /m)		Wire Diameter (mm)		Wire Spacing (mm)		Nominal Mass (kg/m <sup>2</sup> )
	Main	Cross	Main	Cross	Main	Cross	
<b>SQUARE FABRIC</b>							
A 13/12	664	565	13	12	200	200	9.65
A 13/11		475		11			8.94
A 13/10		393		10			8.30
A 13/9		318		9			7.71
A 13/8		251		8			7.19
A 12/11	565	475	12	11	200	200	8.17
A 12/10		393		10			7.53
A 12/9		318		9			6.94
A 12/8		251		8			6.42
A 12/7		192		7			5.95
A 11/10	475	393	11	10	200	200	6.82
A 11/9		318		9			6.23
A 11/8		251		8			5.17
A 11/7		192		7			5.24
A 11/6		141		6			4.84
A 10/9	393	318	10	9	200	200	5.58
A 10/8		251		8			5.06
A 10/7		192		7			4.60
A 10/6		141		6			4.19
A 9/8	318	251	9	8	200	200	4.47
A 9/7		192		7			4.01
A 9/6		141		6			3.61
A 8/7	251	192	8	7	200	200	3.49
A 8/6		141		6			3.08
A 7/6	192	141	7	6	200	200	2.62

# Metex Special Fabric Specification - B Series

Metex Ref No.	Cross - Sectional area (mm <sup>2</sup> /m)		Wire Diameter (mm)		Wire Spacing (mm)		Nominal Mass (kg/m <sup>2</sup> )
	Main	Cross	Main	Cross	Main	Cross	
<b>RECTANGULAR FABRIC</b>							
B 13/13	1327	664	13	13	100	200	15.64
B 13/12		565		12			14.87
B 13/11		475		11			14.16
B 13/10		393		10			13.51
B 13/9		318		9			12.92
B 12/12	1131	565	12	12	100	200	13.32
B 12/11		475		11			12.61
B 12/10		393		10			11.97
B 12/9		318		9			11.38
B 12/7		192		7			10.39
B 11/11	950	475	11	11	100	200	11.20
B 11/10		393		10			10.55
B 11/9		318		9			9.96
B 11/7		192		7			8.98
B 11/6		141		6			8.57
B 10/10	785	393	10	10	100	200	9.25
B 10/9		318		9			8.67
B 10/7		192		7			7.68
B 10/6		141		6			7.28
B 9/9	636	318	9	9	100	200	7.49
B 9/7		192		7			6.51
B 9/6		141		6			6.11
B 8/7	503	192	8	7	100	200	5.46
B 8/6		141		6			5.06
B 7/6	385	141	7	6	100	200	4.13
B 7/6	283	141	6	6	100	200	3.33

# Metex Special Fabric Specification - DA Series

Metex Ref No.	Cross - Sectional area (mm <sup>2</sup> /m)		Wire Diameter (mm)		Wire Spacing (mm)		Nominal Mass (kg/m <sup>2</sup> )
	Main	Cross	Main	Cross	Main	Cross	
<b>SMALL SQUARE FABRIC</b>							
DA 13/12	1327	1131	13	12	100	100	19.31
DA 13/11		950		11			17.89
DA 13/10		785		10			16.59
DA 13/9		636		9			15.42
DA 13/8		503		8			14.37
DA 12/11	1131	950	12	11	100	100	16.35
DA 12/10		785		10			15.05
DA 12/9		636		9			13.88
DA 12/8		503		8			12.83
DA 12/7		385		7			11.91
DA 11/10	950	785	11	10	100	100	13.63
DA 11/9		636		9			12.46
DA 11/8		503		8			11.41
DA 11/7		385		7			10.49
DA 11/6		283		6			9.68
DA 10/9	785	636	10	9	100	100	11.17
DA 10/8		503		8			10.12
DA 10/7		385		7			9.19
DA 10/6		283		6			8.39
DA 9/8	636	503	9	8	100	100	8.94
DA 9/7		385		7			8.02
DA 9/6		283		6			7.22
DA 8/7	503	385	8	7	100	100	6.97
DA 8/6		283		6			6.17
DA 7/6	385	283	7	6	100	100	5.24

# Production Process

**Wire Rod**

**Cold Rolling Process**

**Wire Straightening & Cutting**

**Welding**

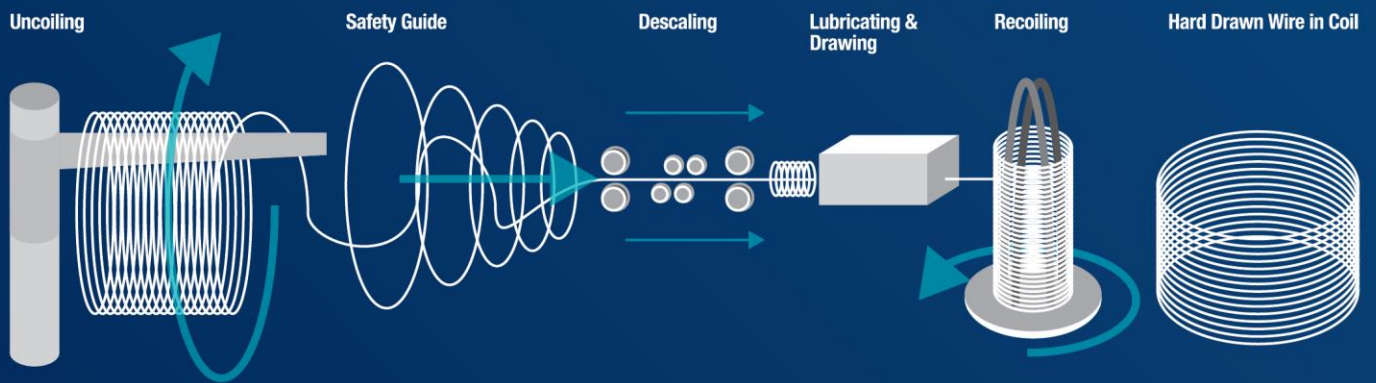
**Bending & Cutting Process**

**Finished Mesh**

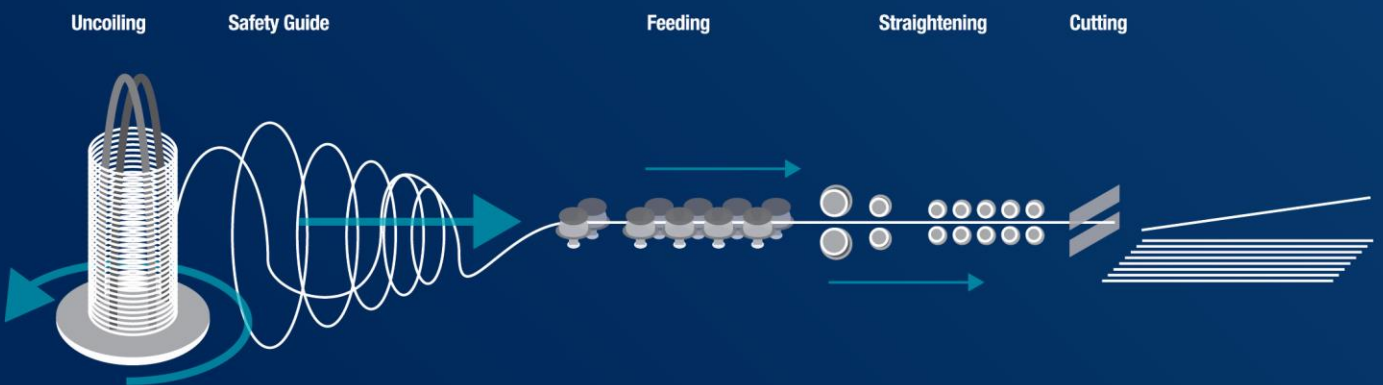
One Time Process by EVG Hightech Machineries.



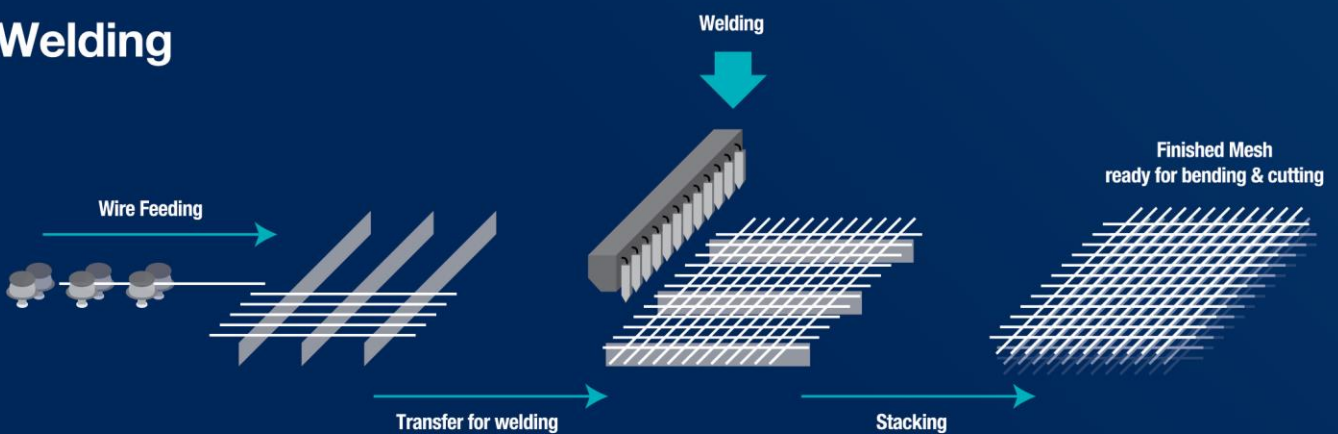
# Cold Rolling Process



# Wire Straightening & Cutting



# Welding





**General View**



**Line Wire Feeding**



**Welding Unit**



**Sheet Stacker**



**METEX STEEL SDN BHD (957930-X)**  
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