Devoran Metals Guide to Reinforcing Steel

Our simple guide will ensure you understand your customer's requirements and optimise your sales potential.

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Rebar? Mesh?

First things first, is the customer asking for reinforcing bar, reinforcing mesh, or both?

It is easy for someone experienced in buying or selling these goods to assume that their supplier or customer knows as much as they do, but that is not always the case.

Reinforcing bar (rebar) is a ribbed, high-tensile bar used to reinforce concrete, and it can be cut and bent to various shapes and sizes.

Reinforcing mesh (or fabric) is a large sheet of reinforcing bars welded together to form a grid, and it is often used in concrete slabs and walls. Mesh can also be cut and bent but in most cases it is supplied flat.

Specifying Rebar

If a customer needs cut and bent reinforcing bar, they will usually have a bar bending schedule, drawn up by a structural engineer. At first glance this can look like a terrifying jumble of numbers, but once you become more familiar with it you will see it lists each bar and describes its diameter, the quantity required, the overall length of the bar before it is bent, the shape it needs to be bent to, and the dimensions of the bends. Our shape code list overleaf details all the current BS 8666:2005 shape codes.

H? T? Y? What?!

You will often hear people ask for H12, T10, Y16, or some other combination of letters and numbers! The reason for this is that the letter refers the grade of rebar and the number refers the diameter (in mm). Y and T are old references for rebar, H is the letter used since 2005. So unless a customer is asking for any other letter, they are asking you for rebar in that particular diameter.

We can supply rebar in diameters from 8mm up to 40mm.

Mesh - A, B or C?

Your customer may know which type of reinforcing mesh they need and how much of it is required. Great! Again, these are referenced by letters and numbers, perhaps not quiet so obvious as the rebar, but there is a logic to it.

There are A, B, C & D meshes. A meshes are 200mm x 200mm apertures, B meshes are 200mm x 100mm, C meshes are 400mm x 100mm, and the D mesh is 100mm x 100mm.

The number actually refers to the cross-sectional area (but I doubt there are many people ordering the stuff that actually know that!) The breakdown of types and bar sizes they are made up of can be seen below:

If a customer is unsure which mesh (or rebar) they need, check the engineers details. Please do not try to advise them unless you are a qualified structural engineer!

Occasionally a bar bending schedule will also tell you how many sheets of reinforcing mesh are required but generally this needs to be taken off a drawing. We can do this for you if you are unsure what to do.

Your customer may tell you they need a certain mesh type and the area they need to cover. Mesh sheets are usually 4.8m x 2.4m (covering an area of 11.52m²) but please do allow for the fact that they will need to overlap the sheets, so the general rule of thumb is allow one full sheet per 10m².

Builders merchants often stock smaller sheets of the A393 and A142 which are 3.6m x 2m, in which case allow one of these merchant sheets per 6m².

CARES

Devoran Metals steel is fully CARES approved to ISO9001 which means it is traceable back to the mill that produced it, and we can supply certificates showing the chemical composition of each batch.

Mesh:	Bar Sizes (Main wire/cross wire):	Mesh:	Bar Sizes (Main wire/cross wire):
A393	10/10	B283	6/7
A252	8/8	B196	5/7
A193	7/7	C785	10/6
A142	6/6	C636	9/6
A98	5/5	C503	8/6
B1131	12/8	C385	7/6
B785	10/8	C283	6/6
B503	8/8	D49	2.5/2.5

Spacers — What for, how many, what size?

Seems a simple request from your customer until you open up a catalogue of reinforcement accessories and more than likely go pale when you see the huge range available. It can seem daunting but hopefully this guide will explain which are the main types used in reinforced concrete, when they are used and how you can calculate the size and quantity required.

The main purpose of a rebar or mesh spacer is to keep the steel a certain distance away from the edge of the concrete once it has been poured.

Rebar spacers come in many shapes and sizes, but the main types are individual spacers (clip-on or tie-on) or line spacers (a continuous length which the steel sits on or is tied to). These can all be used in ground beams or similar applications.

Tufblocks	Styrofix	Square Bar	Ufix

The individual tie-on spacers are 'Tufblocks' - small concrete blocks with a hole through the middle for a wire tie to go through. The individual clip-on spacers are 'Styrofix', a plastic flat based spacer which clips on to the bar. The Tufblocks are stronger but can be more time consuming to use because of having to tie on each block. The Styrofix aren't as strong (so more suited to lightweight steel jobs) but they are quick to fix on to the bar. Both can be used underneath ground beams or along the sides, and are both suitable for placing on top of a damp proof membrane.

The line spacers often used with rebar are 'Square Bar' and 'Ufix'. These are often used underneath ground beams where the contractor may be placing a long run of steel. The Square Bar is a 1m long concrete strip which can be placed as a full length or snapped into shorter pieces to suit. The Ufix is a 2m long plastic strip which can be used in the same way as the Square Bar (although you wouldn't be able to snap it) and they are often also used along the sides of a ground beam as they are light enough to tie on. The Square Bar can be used on a membrane but the Ufix tends to have some sharp edges so it less suitable.

Mesh spacers also come as individual spacers or line spacers, and some can be used for both rebar and mesh. There are two main requirements for mesh spacers; either to lift the mesh off the ground or, where two layers of mesh have been specified, to separate the top and bottom layer.

Individual spacers suitable for using under the bottom layer of mesh are 'Meshmen' - a concrete castle-shaped block with a flat base that the mesh sits on top of, and the 'Styrofix' (but remember these aren't as sturdy as concrete spacers). Both are suitable for using on a damp proof membrane.

Line spacers can also be used under the bottom layer of mesh, and those suited to the job are the 'Square Bar', 'Ufix' and also wire spacers called 'Hystools' and 'Circular Wire Spacers' (Hystools come as a 2m length, ready to place. Circular Wire Spacers come as a 3m length with which you tie one end to the other to form a circle). As with the rebar, the concrete Square Bar is fine to use on a membrane, the Ufix, Hystools and Circular Wire Spacers less so as they can have sharp edges.

If you need spacers to separate a bottom and top layer of mesh, it needs to be a line spacer so it doesn't fall through the mesh holes. The Square Bar, Hystools and Circular Wire Spacers are all suitable for the job. The Ufix is not recommended as the ridges in the bottom would stop it from sitting well on the mesh bars.
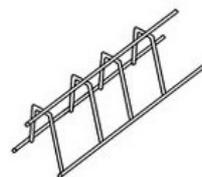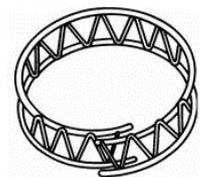
| Meshmen	Styrofix	Square Bar	Ufix	Hystool	Circular Wire Spacer

Spacer Sizes

If your customer doesn't know the size of spacer required, check the drawings and it should tell you '40mm concrete cover required' or something similar. This means the space required between the steel and the edge of the concrete. So you would need a 40mm spacer in this case.

If a customer is using mesh in a concrete slab, check if there are one or two layers of mesh. If there is only one, use the method above. If there are two, you need to work out how far apart the sheets need to be. As an example, the slab is 200mm thick, there are 2 layers of A393 mesh, and the customer tells you that they need 40mm cover top and bottom.
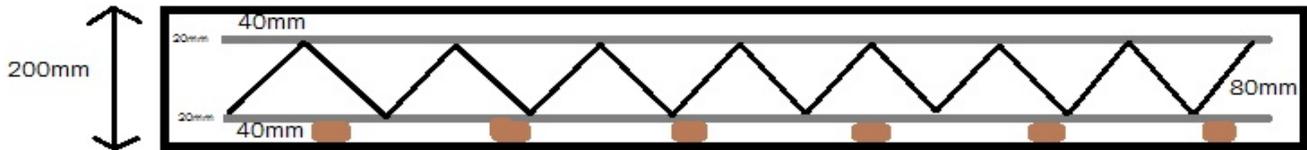
To calculate: Overall slab depth – top and bottom cover – total thickness of mesh sheets = spacing required between the two sheets.

So, 200mm (slab)– 40 mm (top cover) – 40mm (bottom cover) – 20mm (2 x 10mm bars in sheet of A393) – 20mm (as previous) = 80mm

Spacer Quantities

When working out how many spacers a customer needs for their reinforcing mesh, use the following guidelines (for a 4.8m x 2.4m sheet):

Meshmen – 20 per sheet

Styrofix – 20 per sheet

Square bar – 10 per sheet

Ufix - 5 per sheet

Hystools – 5 per sheet

Circular wire spacers – 4 per sheet

It is not so easy to calculate the number of spacers needed for use with reinforcing bar as it depends how the reinforcement is set out as to how many they will use. It is best to contact us for advice or let your customer tell you how many they think they will need.

Tying Systems

The following products are available for tying rebar and mesh

Tying Wire & Nips	Loop Ties & Tying Tools
Tying Wire available in rolls of either 2kg or 15kg	150mm Double Loop Ties (bundle of 1000)
Steel Fixers Nips	Tying Tool (wire twister)

Reelfix Reel Holder, Nip Frog, Belt & Comfort Pad (to suit 2kg Reelfix wire rolls)

Reinforcing Bar Shape Codes to BS8666:2005

L=A **SHAPE CODE 00**	L=A **SHAPE CODE 01**	L=A + (B) - 0.5r-d **SHAPE CODE 11**	L=A + (b) -0.43R -1.2d **SHAPE CODE 12**	L=A + 0.57B + (C) - 1.6d **SHAPE CODE 13**
L=A + (C) -4d **SHAPE CODE 14**	L=A + (C) **SHAPE CODE 15**	L=A + b + (C) -r - 2d **SHAPE CODE 21**	L=A + B + C = (D) -1.5r -3d **SHAPE CODE 22**	L=A + B + (C) -r - 2d **SHAPE CODE 23**
L=A +B + (C) **SHAPE CODE 24**	L=A + B + (E) **SHAPE CODE 25**	L=A + B + (C) **SHAPE CODE 26**	L=A + B + (C) -0.5r - d **SHAPE CODE 27**	L=A + B + (C) - 0.5r -d **SHAPE CODE 28**
L=A + B + (C) -r -2d **SHAPE CODE 29**	L=A + B +C +(D) -1.5r -3d **SHAPE CODE 31**	L=A + B + C + (D) -1.5r - 3d **SHAPE CODE 32**	L=2A + 1.7B + 2(C) - 4d **SHAPE CODE 33**	L=A + B + C + (E) -0.5r - d **SHAPE CODE 34**
L=A + B + C + (E) - 0.5r - d **SHAPE CODE 35**	L=A + B + C + (D) -r -2d **SHAPE CODE 36**	L=A + B + C + D + (E) -2r -4d **SHAPE CODE 41**	L=A + B + C + D + (E) -2r - 4d **SHAPE CODE 44**	L=A + 2B + C + (E) **SHAPE CODE 46**
L=2A + B + 2(C) + 1.5r -3d **SHAPE CODE 47**	L=2(A + B +(C)) -2.5r - 5d **SHAPE CODE 51**	L=A +B +C +D +2(E) -2.5r -5d **SHAPE CODE 56**	L=2A + 3B +2(C) -3r -6d **SHAPE CODE 63**	L=A +B +C +2D +E +(F) -3r -6d **SHAPE CODE 64**
L=A **SHAPE CODE 67**	L= n (A-d) + B **SHAPE CODE 75**	L= Cn (A - d) **SHAPE CODE 77**	L=A + 2B + C + (D) -2r - 4d **SHAPE CODE 98**	All other shapes are Shape Code 99 and require fully dimensioned sketches.
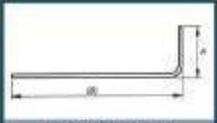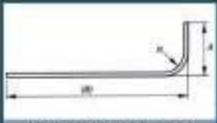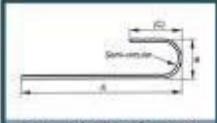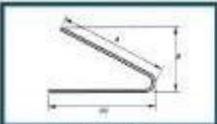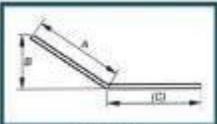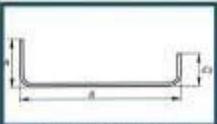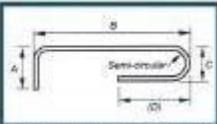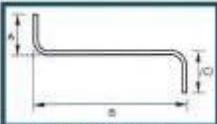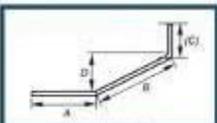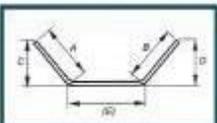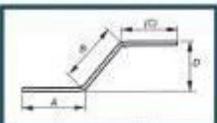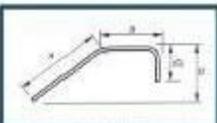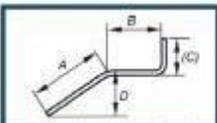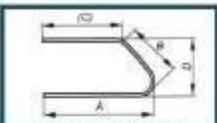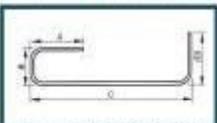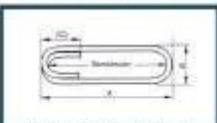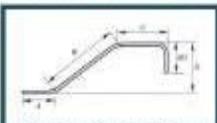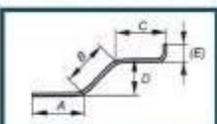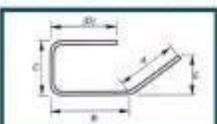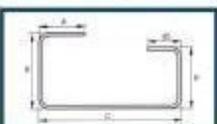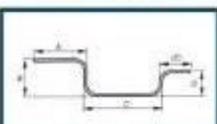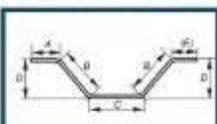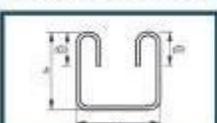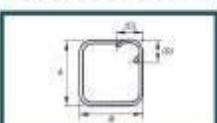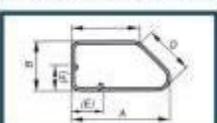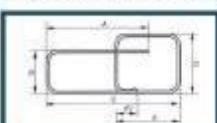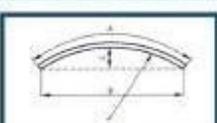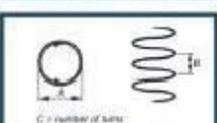
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Your customer may ask you if you can supply their reinforcing bar prefabricated, which is an in-house service we can offer you.

We can tie or weld the steel in our workshop and deliver to site ready to place straight into the ground. This is great for customers who are short on time or space, and also for customers who may not use reinforcement on a regular basis and are unfamiliar with the layout drawings.

Please feel free to send us the bending schedules and drawings for a quote.