

Construction of metal-wire mesh

Metal-wire mesh (wire cloths) are produced on weaving machines (looms) where it is possible to make various sizes of openings and types of weaves of metal-wire mesh, which are individually described in the text and tables below.

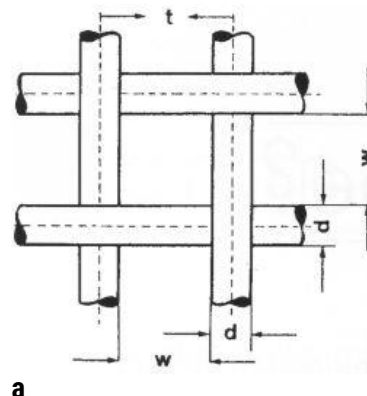
Basic characteristics of metal-wire mesh

The metal-wire mesh consists of two sets of parallel wires, warp and weft, which are interlaced at a 90° angle.

w = opening size in mm
 d = wire diameter in mm
 t = pitch ($w + d$) in mm

Warp = length direction

Weft = cross direction



w = opening size: the distance between two adjacent wires, both in the warp direction and in the weft direction (see picture a).

d = thickness of wire: diameter of the weaver's wire

t = pitch: distance from center to center of two adjacent wires; also the sum of $w + d$ (see picture a).

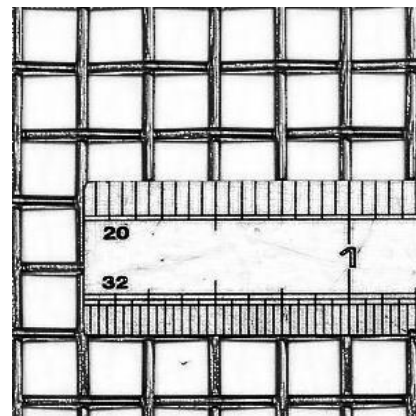
A_o = open area of the mesh: percentage of holes (openings) on the area of the mesh.

$$A_o = \frac{w^2}{(w + d)^2} \times 100$$

(rounded to whole percentages)

Determining the number of holes with a ruler or with a yardstick(caliper) especially coarse metal-wire meshes (see picture b).

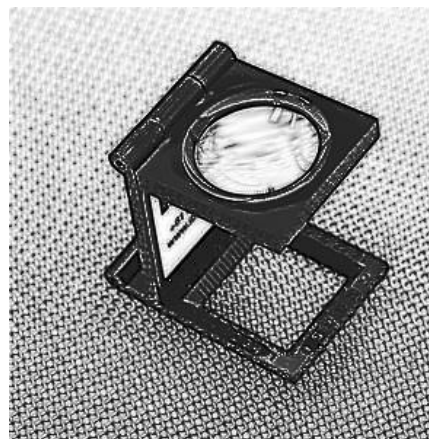
b



Size of opening:

Number of openings per length unit. In the metal-wire mesh industry, different units of length are used. In order to get a simplification and a good overview, we have adjusted our tables to the length unit cm/linear.

Finding the number of opening using a counter (for fine wire meshes, see picture c)



c

However, so that you can make comparisons with other length units, we will then provide you with the corresponding coefficient:

Number Mesh - indicates the number of wires per inch.

English inch 25,4 mm

Formula

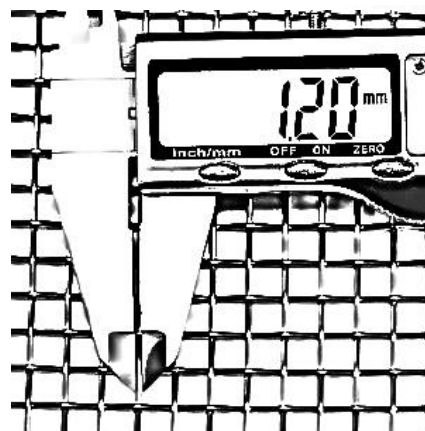
$$\text{Mesh} = \frac{25,4}{w + d}$$

Weight:

Weight per m² with calculation based on the density of steel = 7 850 kg/m³. Coefficients for other materials:

Finding wire diameters using a caliper (see picture).

Stainless steel	x 1,01
Bronze	x 1,12
Brass	x 1,09
Nickel	x 1,13
Copper	x 1,14
Aluminium	x 0,35



Formula for determining the weight of wire mesh (steel):

$$G = \frac{12,7 \times d^2}{t} \quad \begin{array}{l} d = \text{wire diameter} \\ t = \text{pitch (w + d)} \end{array}$$

For the finest metal-wire meshes, it is necessary to determine the parameters using a microscope.

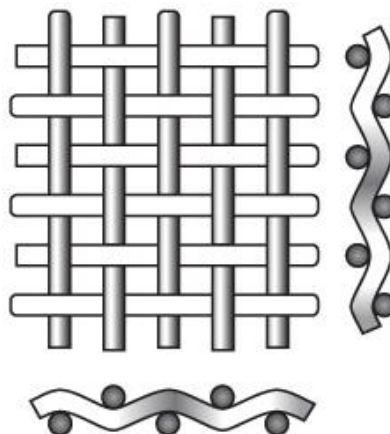
Weaving types of metal-wire meshes

Weave of metal-wire mesh is a method of interlacing warp and weft wires.

The possible weaving types of metal-wire meshes can be defined into two main groups :

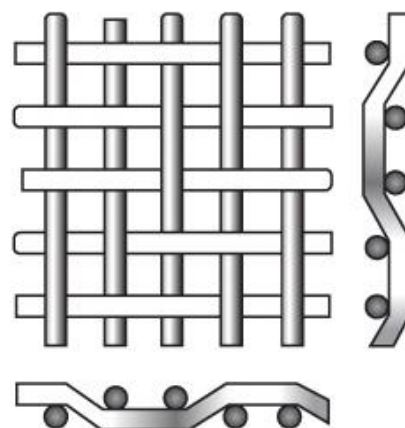
Plain Weave

- So-called Linen Weave
- The warp wire is tied respectively over the weft wire and conversely
- The most rigid form of weaving
- The most accurate opening size
- Standard wire mesh for general use



Twilled weave

- The warp wire is tied over two or more weft wires respectively and conversely
- The weave is not so stiff, so this type is particularly suitable for molding
- Thicker wires can be processed, resulting in stiffer wire meshes



Below in the text, the individual types of weave are shown separately according to the two main types of metal-wire meshes, i.e. for wire meshes with square openings and for metal filter meshes.



Filtrtechnik 2F s.r.o. Standard types of wire mesh

Standard Specification for Metal Wire Mesh with Square Opening

Opening sizes in mm	Wire diameter in mm	Open area in %	Number of holes per cm ²	Mesh (number of wires per English inch)	Weight (steel) kg/m ²
0,025	0,025	25	40.000	500	0,16
0,033	0,300	24	25.195	400	0,16
0,040	0,035	28	17.777	325	0,21
0,050	0,040	31	12.343	280	0,23
0,063	0,040	37	9.428	250	0,20
0,075	0,050	30	6.400	200	0,25
0,100	0,063	38	3.758	155	0,31
0,125	0,080	37	2.381	120	0,40
0,150	0,100	36	1.600	100	0,51
0,180	0,140	31	977	79	0,83
0,200	0,125	38	949	80	0,61
0,250	0,160	37	595	60	0,79
0,315	0,160	44	445	53	0,69
0,315	0,200	37	376	50	0,99
0,400	0,250	39	237	40	1,22
0,500	0,210	49	198	35	0,79
0,500	0,320	37	149	31	1,59
0,550	0,300	42	139	30	1,55
0,630	0,400	37	94	25	1,97
0,710	0,350	44	88	24	1,47
0,800	0,400	44	69	21	1,72
0,800	0,500	38	59	20	2,44
0,870	0,400	47	62	20	1,55
1,000	0,300	59	59	20	0,85
1,000	0,400	51	51	18	1,45
1,000	0,500	44	45	17	2,12
1,000	0,630	38	37	16	3,10
1,250	0,630	44	28	13,5	2,73
1,600	0,500	58	23	12	1,51
2,000	0,500	64	16	10	1,25
2,000	0,600	59	14	10	1,75
2,000	1,000	44	11	8	4,35
2,500	1,000	51	8	7	3,63
3,000	1,000	56	2,5	6	3,18
4,000	1,000	64	2,5	5	2,54

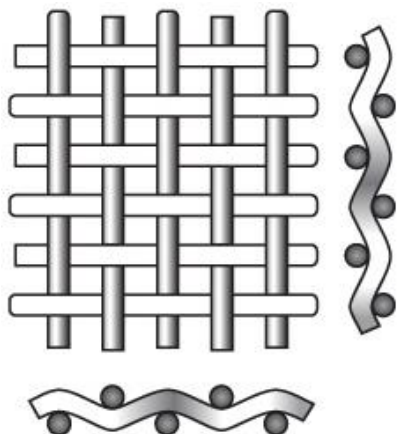
Metal-wire meshes with square openings are produced in plain and twill weave.

Twill weave are mainly produced with a permeability of 25 microns to 63 microns.

For filtration from 63 microns and above, wire mesh with a plain weave prevail.

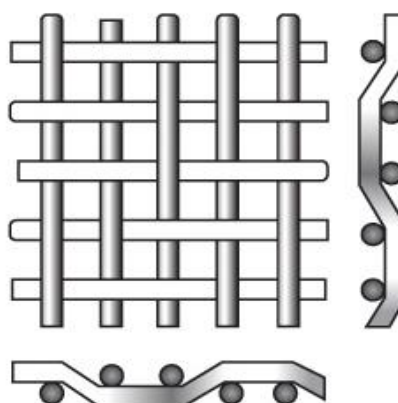
Plain Weave

Wire Mesh with Square Opening



Twill Weave

Wire Mesh with Square Opening





Filtrtechnik 2F s.r.o. Standard types of wire mesh

Standard Specification for Filter Metal-Wire Mesh

Weaving type of metal-wire mesh	Mesh (number of wires per English inch)	Wire diameter in mm (warp/weft)	Permeability μm
Twilled	200x1400	0,07/0,04	10
Twilled	165x800	0,07/0,05	20
Multipore	80x705	0,13/0,04	34
Plain	80x330	0,13/0,09	42
Plain	50x250	0,14/0,11	65
Plain	40x200	0,18/0,14	80
Plain	30x150	0,22/0,18	100
Plain	24x110	0,35/0,25	125
Plain	14x88	0,50/0,33	250
Plain	12x64	0,60/0,40	300

Multipore is a specific type of plain weave of filter metal-wire mesh, characterized by a large difference between the diameter of the warp wire and the weft wire

Metal filter meshes are produced using the wire-to-wire weaving technique (Dutch Weave), see examples of weave types below.

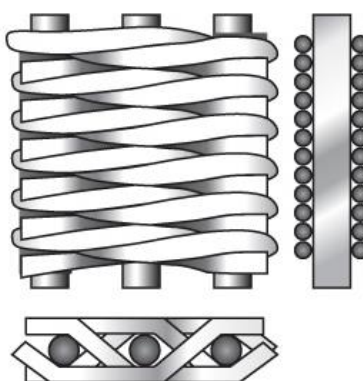
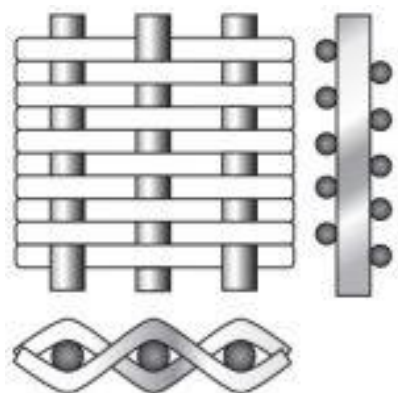
Metal filter meshes are standardly manufactured with permeability from 10 microns to 300 microns.

Plain Weave

Twilled Weave

Plain Dutch Weave Wire Mesh

Twilled Dutch Weave Wire Mesh





Materials used for the production of metal-wire meshes

The standard materials of metal-wire meshes used in Filtrtechnik 2F s.r.o.

Steel:

Non-alloy steel with low carbon content (low carbon steel) is a cost-effective material for the production of wire mesh.

Stainless steel:

Stainless steel wires have the greatest use in the production of wire mesh,

The most common used grades for the production of metal mesh are AISI 304 (1.4301) and AISI 316 (1.4401).