M·E·M·O

Date: **6 January 2004**

To: **DOMESTIC/EXPORT SALES/WORKSHOP/ENGINEERING**
LIQUIP DISTRIBUTORS

From: **DAVID GREGORY**
ENGINEERING MANAGER

Subject: **TECH TALK NO: 55**

MESH – USES & CHARACTERISTICS

Mesh, or gauze, is woven wire, generally stainless steel or brass, used for flame suppression or as a strainer to filter out impurities from liquids.

1 **AS FLAME SUPPRESSOR** ("Anti-flash")

Referenced in AS2809.2

Any opening from a tanker interior to the exterior, except for internal valves, vapour couplings and emergency vents, must be fitted with an anti-flash gauze of not coarser than 600 micron (30 mesh).

(The mesh extinguishes a flame front travelling through a flammable mixture by cooling the flame when it hits the mesh by the simple fact that the wire conducts the heat away so quickly the flame cannot sustain itself).

Why the exemptions? Some parts of the world do require mesh on vapour vents, vapour couplers and internal valves but none require on emergency vents. Just ensure you know, and follow, the Standards for each country.

2 AS STRAINER

Size of Particle to be removed

This is specified by us or the customer and depends simply on the application.

eg. ILS400 standard is what we call a "nut and bolt" stopper, it only removes particles larger than 1.5mm (1500 micron) in diameter.

On the other hand, a strainer fitted in front of a precision instrument such as a PD meter must protect it from relatively fine particles. Typically the mesh will be 80 mesh, equal to removing any particle larger than 200 microns (0.2mm diameter).

Pressure Drop

Remember the maximum pressure drop on the suction side of a pump is 1 atmosphere (100kPa), in practice it must be far less than this. Therefore never use anything other than a coarse bolt-stopper on a suction strainer, unless the flow area is at least five times the nominal pipe bore.

Finer meshes can be used on the pressure side of the pump, but the specification must consider pressure drop when new plus the increase in pressure drop as the strainer starts to clog.

Open Area through the Mesh

All meshes are specified not just by the aperture size but also by the % of its area which is open for liquid flow. Ideally this strainer open area should be at least five times the area of the pipe bore to allow for blockages and flow rate losses. In practice this rule can be "bent" by the designer, for example a coarse bolt-stopper mesh will effectively never clog up, and the flow losses through the large holes are almost negligible.

Strength of Basket

Having a pressure drop across a strainer effectively means that there is a force on the basket equivalent to that pressure drop times the area.

As the pressure drop increases (eg the mesh gets more clogged) there comes the time when the strainer basket disappears down the pipeline as it simply breaks away from its support.

It is common, with a fine mesh to insert it into a supporting basket of perforated metal which is there simply to offer physical support. ILS400 baskets provide an option of steel body instead of the standard aluminium. These are essential when used in pressure applications.

Size of Basket

As noted above, baskets should have a minimum open area of five times the pipeline unless it is a coarse mesh only.

ILS400 was designed as a suction strainer. If put in to a pressure line with a fine strainer, the liquid must be clean and the strainer used only for occasional bits of contaminant. It cannot be used in dirty situations; the slightest clogging starts to restrict the flow.

Similarly it should not be used at flows of more than say 1,000 l/min in these circumstances as there is insufficient open flow area.

Specification

Attached lists the gauze specifications in Micron
(Micron = Millionth of a Metre
= Thousandth of a mm)
which is the smallest particle size which can travel through.

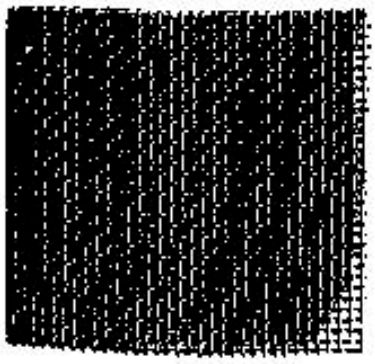
If there is such a thing as an average for Liquip use, it would be stainless steel mesh, 600 micron (equivalent to the old imperial 30 mesh) and 40% open area.

David Gregory
6 January 2004

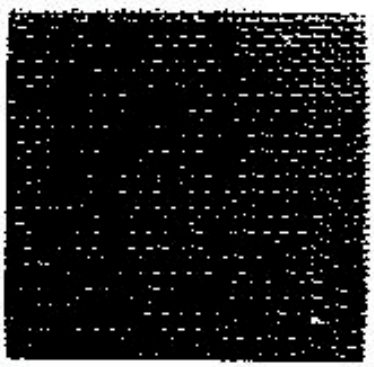
FOR INDUSTRIAL USE

Aperture Microns	Wire Diameter MM	% Open Area	Nearest Imperial Specifications	
			Mesh	S.W.G.
900	.71	31	16	22
890	.37	50	20	28
810	.45	41	20	26
745	.31	49	24	30
710	.56	31	20	24
570	.27	46	30	32
530	.31	38	30	30
400	.23	40	40	34
315	.19	38	50	36
250	.17	34	60	37
210	.15	34	70	38
185	.13	34	80	39
142	.11	31	100	41
130	.08	37	120	44
110	.07	36	140	45
100	.07	34	150	45
76	.05	36	200	47
61	.04	36	250	48
53	.03	41	300	49
40	.03	32	350	49
38	.025	36	400	50

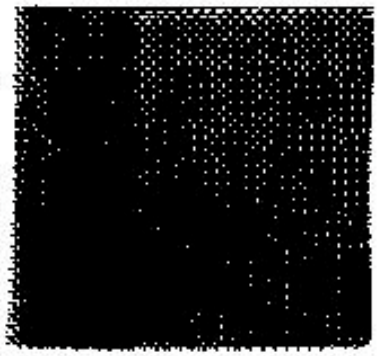
MESH SIZES GIVEN ARE NUMBER OF HOLES PER LINEAR INCH



APERTURE 900 μ WIRE DIA. .71mm



APERTURE 810 μ WIRE DIA .45mm

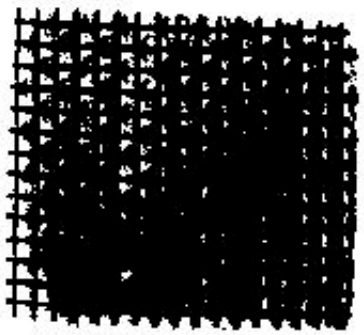


APERTURE 570 μ WIRE DIA. .27mm

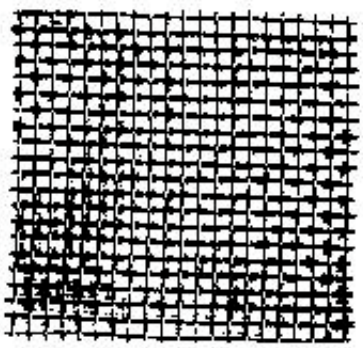
STAINLESS STEEL WIRE GAUZE

Aperture MM	Wire Diameter MM	% Open Area	Nearest Imperial Specification	
			Mesh	S.W.G.
11.2	1.5	77	2	16
6.9	1.5	67	3	16
5.3	1	71	4	19
4.8	1.5	57	4	16
3.5	1.5	49	5	16
3.3	.91	61	6	20
3	1.2	51	6	18
2.7	1.5	41	6	16
2.4	.71	60	8	22
2.2	.91	51	8	20
2.0	.45	67	10	26
1.9	1.2	38	8	18
1.9	.61	58	10	23
1.6	.91	41	10	20
1.6	.50	58	12	25
1.4	.71	44	12	22
1.3	.50	51	14	25
1.25	.90	34	12	20
1.1	.45	51	16	26
1	.56	41	16	24

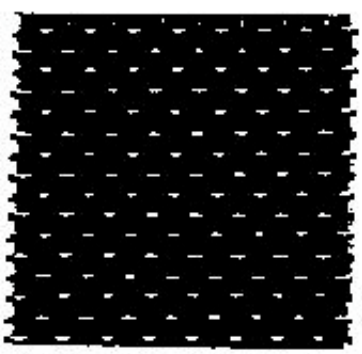
TYPE 304 STAINLESS STEEL NORMALLY AVAILABLE
SOME SPECIFICATIONS ARE AVAILABLE IN TYPE 316 STAINLESS STEEL



APERTURE 2.4mm WIRE DIA. .71mm



APERTURE 2mm WIRE DIA. .45mm



APERTURE 1.9mm WIRE DIA. 1.2mm