CONSTRUCTION MATERIALS - ASAH

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WHAT IS "ASAH®"

Conditionaire began in business in 1952 manufacturing fibreglass fume cupboards similar to other fibreglass fume cupboards currently offered in the marketplace today.

In 1965 the Commonwealth Fire Board issued Circular # 40 expressing concern over two fires in fibreglass fume cupboards at the AAEC research establishment, and in response to this, **Conditionaire** initiated a project involving the CSIRO to develop "**ASAH**®": a material, exclusive to **Conditionaire**, that first became a commercial reality in 1968.

Since then it has been upgraded as improved technology and materials have become available.

There were two major factors behind the development of "**ASAH**®"-

1. Addressing the ever-present concern of the possibility of fires in fume cupboards.
2. The absence of a versatile fume cupboard material resistant to all of acids, solvents, alkalis and heat.

Reduce the risk of a fire in the laboratory - specify "ASAH®."

While fibreglass may have a fire retardant added to diminish its flammability, the higher the fire retardant content, the lower the chemical resistance of the fibreglass.

"**ASAH**®" material has been extensively tested with commonly used chemicals and results indicate that "**ASAH**®" is the most suitable material for the majority of chemicals used in laboratory fume cupboards

WHAT IS "ASAH®" *continued*

The selection of "ASAH®" for fume cupboard construction offers a proven product with safety, durability, performance, versatility and appearance.

Whilst acknowledging the fact that no single material is suitable for all chemicals used, "**ASAH**®" is the most versatile and offers other significant advantages:

a) It may be restored in situ to original condition should the surface become damaged or a) stained after a prolonged period of use.

b) It has a significant capability to contain a fire within the cupboard and prevent the spread b) of fire within the laboratory.

c) "**ASAH**®" returns outstanding results, compared to other fume cupboard construction materials, when tested to AS1530.3 - Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release:

Fume Cupboard Material	Ignitability Index Range 0-20	Spread of Flame Index Range 0-10	Heat Evolved Index Range 0-10	Smoke Developed Range 0-10
PVC	13	2	1	8
Fire Guard Board	10	0	2	4
Fire Resistant Fibreglass ESCON-ACH	16	9	10	9
Fire Resistant Fibreglass ANZOPOL-ATH10%	15	8	8	8
Fire Resistant Fibreglass ANZOPOL-ATH20%	15	7	7	8
F.R.Polypropylene	9	0	2	6
ASAH	0	0	0	4

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WHY ASAH ?

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In fact there were two major factors behind the development of ASAH®

3. Addressing the ever-present concern of the possibility of fires in fume cupboards.
4. The absence of a versatile fume cupboard material resistant to all of acids, solvents, alkalis and heat.

Fire tests on **ASAH®** demonstrate the safety performance relative to fibreglass and other vinyl and olefin plastics. **ASAH®** contains the fire and doesn't burn whereas with the exception of PTFE, other common plastics and fibreglass contribute to the combustion process and quickly spread the fire to the building structure.

The test illustrated shows common plastic with added fire retardant compared to **ASAH®** just 90 seconds into a simulated fire. Apart from the propagation of the fire, there is zero smoke emission from the **ASAH®** .

The other advantage of **ASAH®** over conventional plastics and fibreglass in fume cupboards is that even after damage, provided there is not significant physical damage to the surface of the **ASAH®** , the surface can be repaired in-situ. The test units after the fire are shown across. The unit on the left is a fibreglass shell & the unit on the right is the **ASAH®** . The **ASAH®** is shown "post-test" to the right of the white area with the lens cap and "as-restored" to the left of the lens cap.

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WHY ASAH ?

The table below shows actual fire-related indices of various fume cupboard construction materials as tested by CSIRO. The photo on the right shows the aftermath of a single fibreglass fume cupboard fire at Charles Sturt University.

Material	Ignitability	Flame	Heat	Smoke
PVC	13	2	1	8
Fireboard	10	0	2	4
FR Fibreglass	16	9	10	9
FRF 10%	15	8	8	8
FRF 25%	15	7	7	8
P propylene	9	0	2	6
ASAH	0	0	0	4

The other notable feature of **ASAH®** is its resistance to a wide range of chemicals and solvents. **ASAH®** is an acronym for Acid Solvent Alkali & Heat-resistant. Full test plates made over a range of chemicals and solvents with tests carried out by the University of Wollongong illustrate the resistance of **ASAH®**. The sample on the left is fibreglass and the one on the right is **ASAH®** , both exposed to a central pool of concentrated sulphuric acid for 15 minutes. No material is completely resistant to all chemicals (eg dark colour stains such as potassium permanganate, iodine or ferric chloride). None-the-less, as with the fire damage example above, **ASAH®** can be fully restored in-situ in a stained fume cupboard whereas this is not possible with other plastics.

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ASAH CSIRO TEST REPORT 1974

Conditionaire International Pty. Limited

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GE 52.5

TE 1.6.74

During the past 2 years we received various requests for fire rating figures as against the material known as "Asah Board" which is the main component used in the manufacture of Safe-tee Cross Flow Fume Chambers, and in February, 1974, these tests were completed by the correct authority. These were strictly in accordance with the standard "test for Early Fire Hazard Properties of Materials of Australian Standard A30 No. 3 1970".

The Asah board material tested was nominally 12.5mm thick and 1325 kg/m3 nominal density with one face coated with white epoxy and the other face with a water and oil base paint, which is our standard finish.

This material was tested under the following four indexes:-

1. Ignitability Index: which has a scale from 0-20
2. Spread of Flame Index: which has a scale from 0-10
3. Heat Evolved Index: which has a scale from 0-10
4. Smoke Developed Index: which has a scale from 0-10

The results of these tests under the above indexes were as follows:-

1. Ignitability Index: reading 0
2. Spread of Flame Index: reading 0
3. Heat Evolved In ex; reading 0
4. Smoke Developed Index; reading 4

As can be seen from the figures, this material came through most satisfactorily and clearly indicates the safe working conditions as far as fire properties are concerned in any type of laboratory.

— Scientific and Technical application of Air to Industry —

ASAH CSIRO TEST REPORT 1974

CONDITIONAIRE ENGINEERING PTY. LTD.

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ASAH CSIRO TEST REPORT 1974

TABLE 1: TYPICAL RESULTS: EARLY FIRE HAZARD TESTS TO AS A30 PART 1.

Material and nominal size*	Ignitability Index (0-20)	Spread of Flame Index (0-10)	Heat Evolved Index (0-10)	Smoke Developed Index (0-10)
An Australian hardboard (4.8 mm)				
Bare	14	6	7	3
Impregnated with fire retardent	0	0	0	7
An Australian softboard (13 mm)				
Bare	16	9	7	3
Impregnated with fire retardant	4	0	0	7
Plywood, coachwood veneer (4 mm)				
Bare	15	7	7	4
Impregnated with fire retardant	12	0	3	5
T & G Boarding (100 mm x 25 mm)				
Baltic pine	12	7	5	3
Oregon	13	6	5	3
Hardwood	13	5	4	2
Particle Board	14	5	5	3
Acrylic Sheet (3 mm), standard grade	16	7	9	5
Melamine laminated board				
A standard grade	15	5	4	6
A retarded grade	10	0	0	3
Polyester sheet (1.6 mm)				
A standard grade	16	4	5	9
A retarded grade	15	0	1	9
Polystyrene sheet (3 mm), standard grade	15	8	10	5
Polyurethene foam				
A particular retarded grade	18	9	5	9
A special retarded grade	18	3	0	7
PVC sheet (3 mm), standard grade	13	0	0	7
PVC floor coverings				
Standard (2.5 mm) tiles	14	0	1	5
High impact (2 mm) tiles	15	2	4	5
Acrylic carpet				
Tufted contract quality	14	8	10	7
Carpet tiles				
100% nylon, latex-backed	15	7	8	8
100% wool	13	0	0	5
80% wool, 20% nylon, latex-backed	13	0	0	5
Woollen carpet				
100% wool, short pile, light duty	15	3	2	5
100% wool, contract quality	13	0	0	5
Rubber flooring	13	5	5	8
Linoleum, typical quality	16	9	10	6

* The results tabulated were obtained for the respective materials manufactured to imperial sizes. Where possible, reationalised preferred metric sizes have been substituted.

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