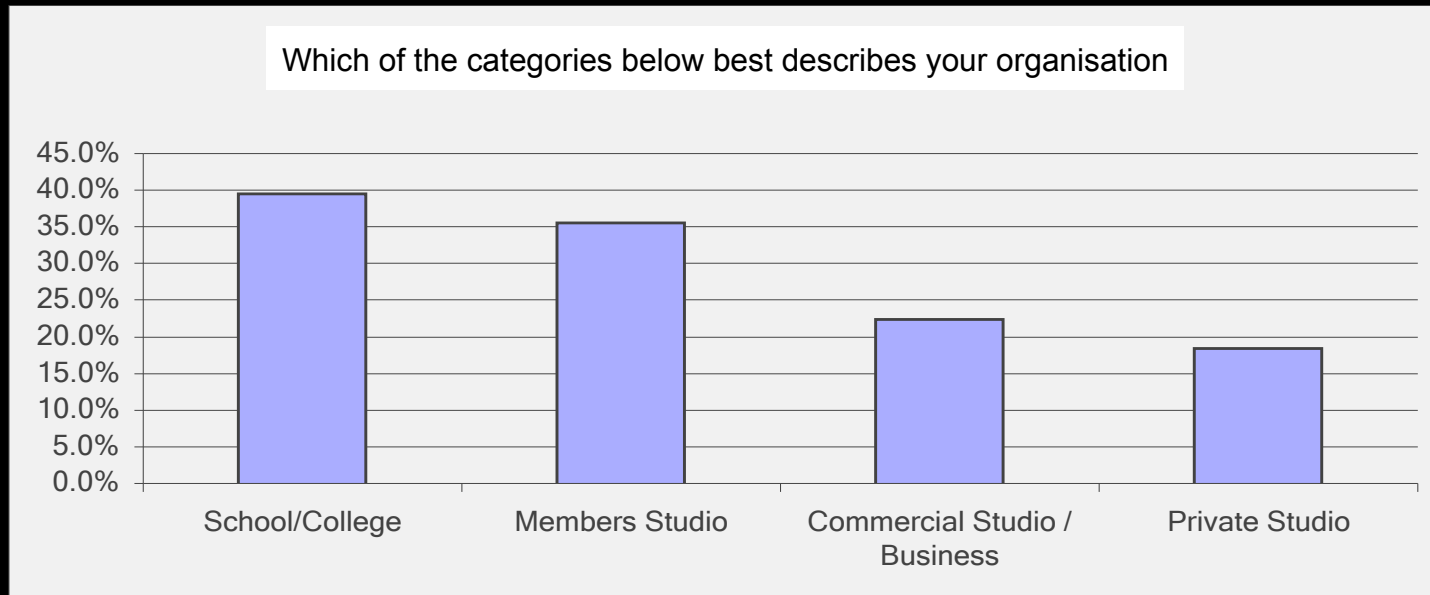


# **THE SUSTAINABILITY SURVEY**

# Sustainability Survey Respondents

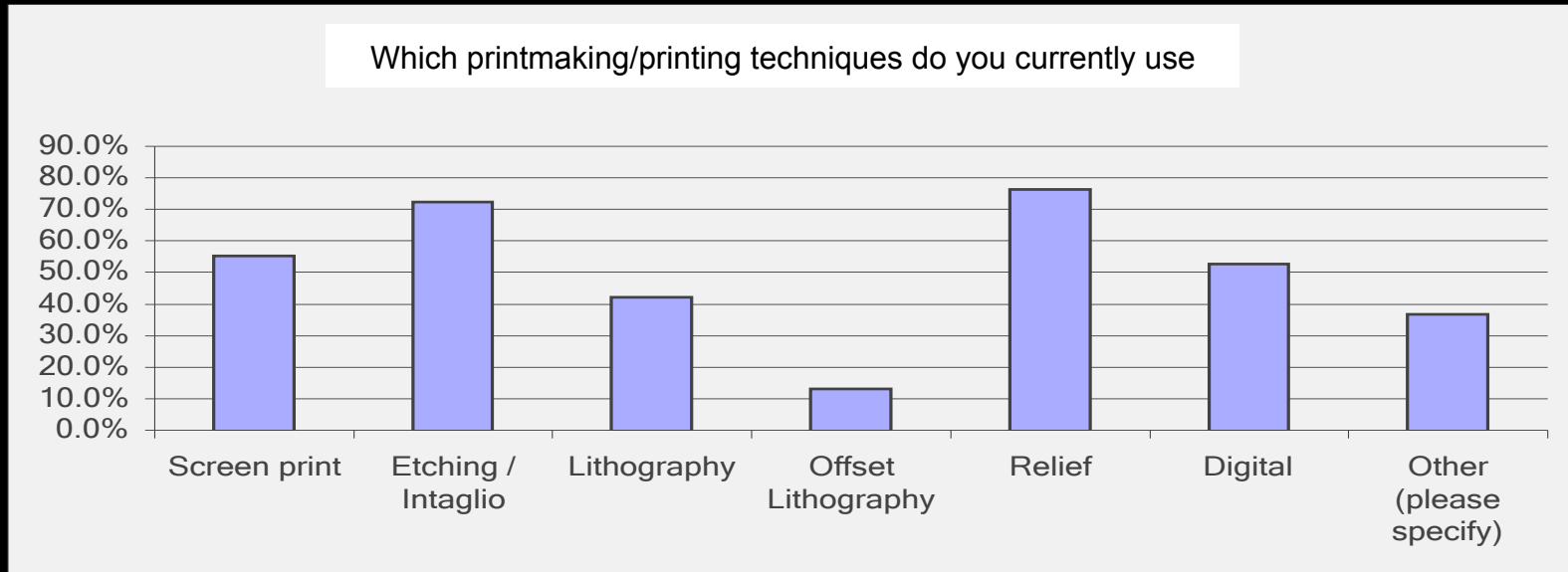
United Kingdom	35
United States	31
Ireland	2
Netherlands	1
New Zealand	1
Canada	1
South Africa	1
Italy	1
Finland	1
Australia	1
Israel	1

Over 50% of respondents have 100 or more users of their studios



# Print Media of Respondents

intaglio	71 %
relief	71%
screenprint	52%
digital printing	50%
lithography	40%
offset lithography	13%
letterpress	13%
monoprint	9.5%
collagraph	5%
photography	3%

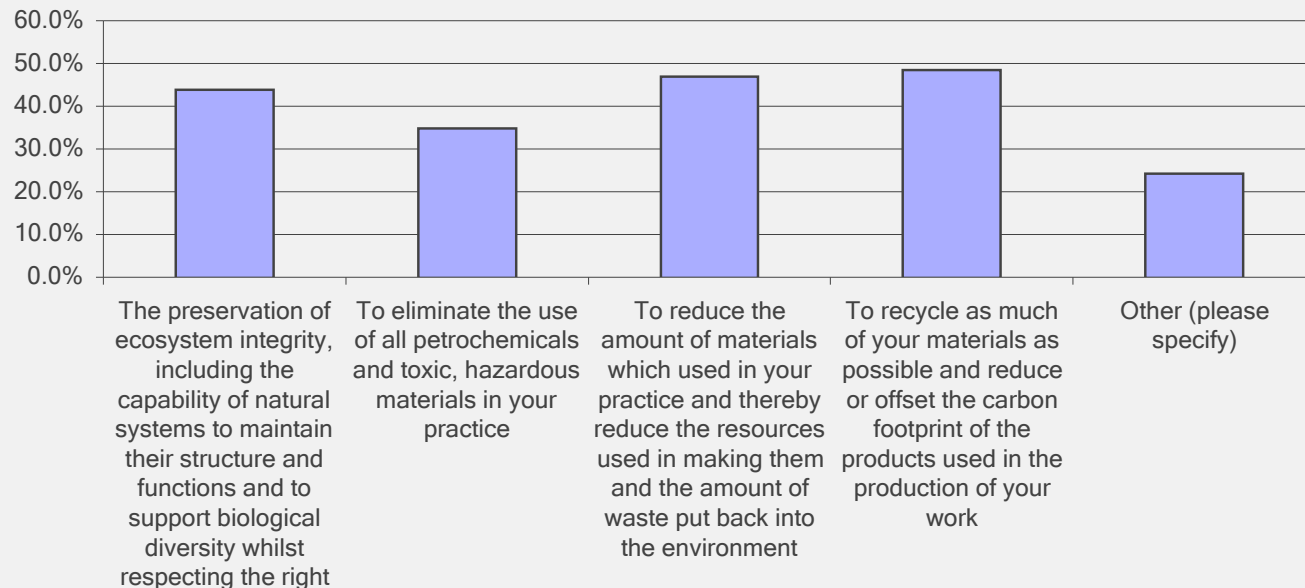


# What do you believe is your level of understanding of sustainability in printmaking?

Using a scale of 1-10, where 1 = Very Poor and 10 = Very Good

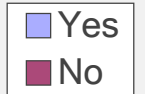
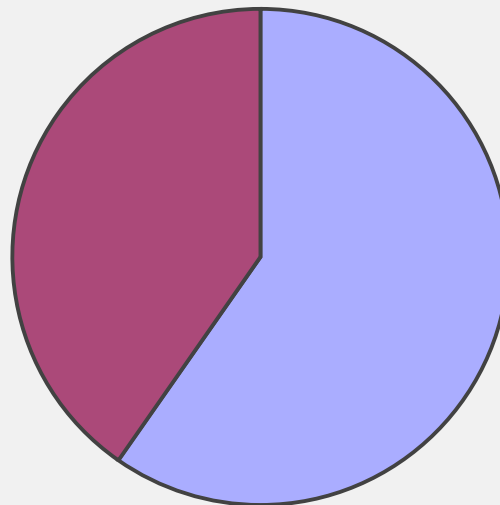
1	0.0%
2	3.0%
3	3.0%
4	4.5%
5	16.7%
6	13.6%
7	13.6%
8	18.2%
9	18.2%
10	9.1%

Which of the definitions of sustainability listed below best describes how you view sustainability in printmaking/printing? Sustainability means:



## Question 11: Have you changed your practice for sustainability?

Have you changed a significant area of your practice for sustainability reasons?



## Question 15:

### Are there any reasons you might need to adopt different, more sustainable practices in the near future?

“Only that we would like to. We would be required to if our school policies changed in the future.”

“when governmental regulations require”

“If those new products reach a professionally sustainable standard, I'd be willing to look at it. But the product still needs to hold up under editing, and be cost effective.”

“I think eventually we won't have a choice and will have to be sustainable or stop printing, so may as well get in early and enjoy the ride!”

“my main concern is for health reasons. in many cases using "greener" products is more expensive.”

“not as far as I can see at this point.”

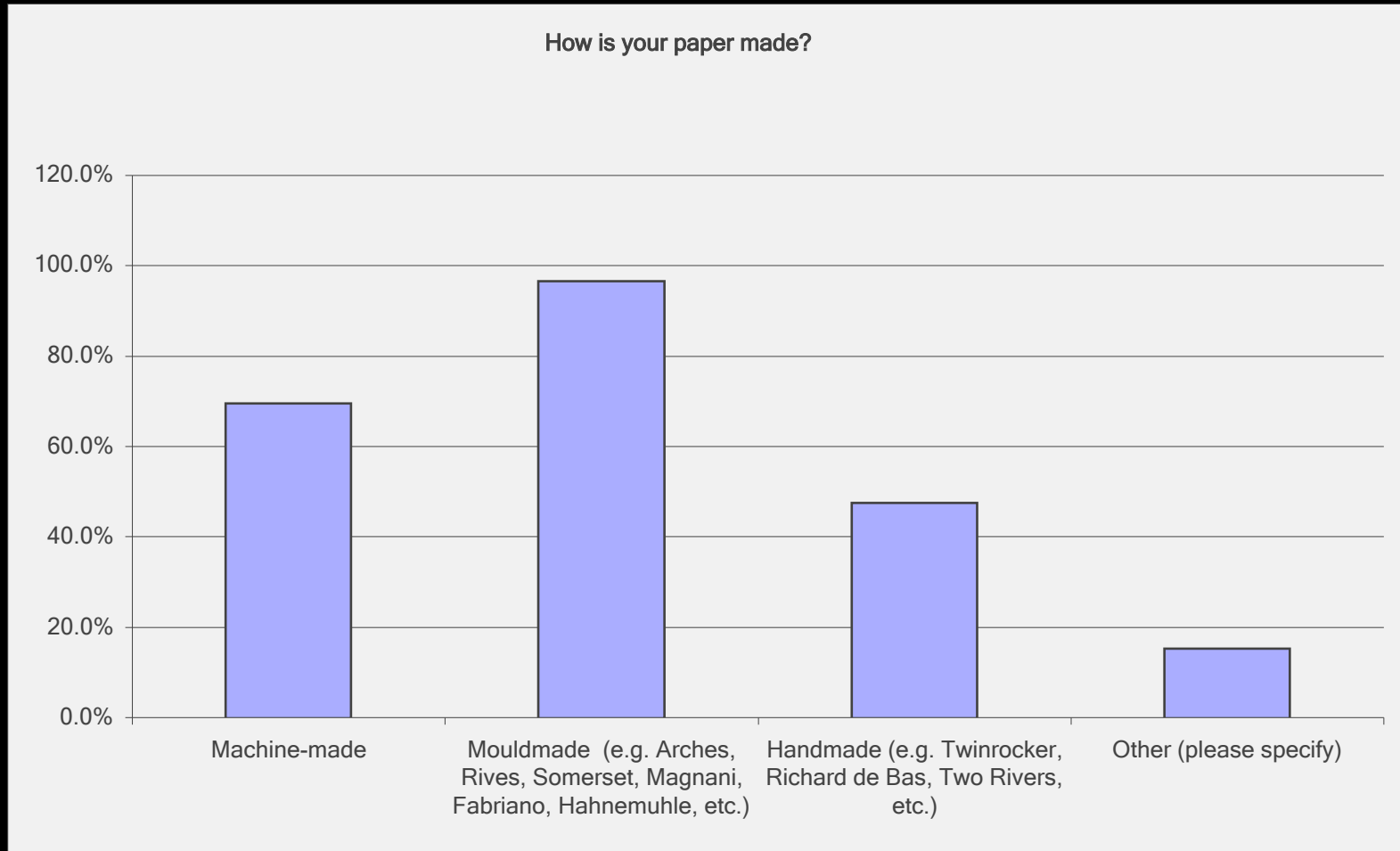
“As new information comes to my awareness.”

“No.”

“when I retire and move into a smaller private studio”

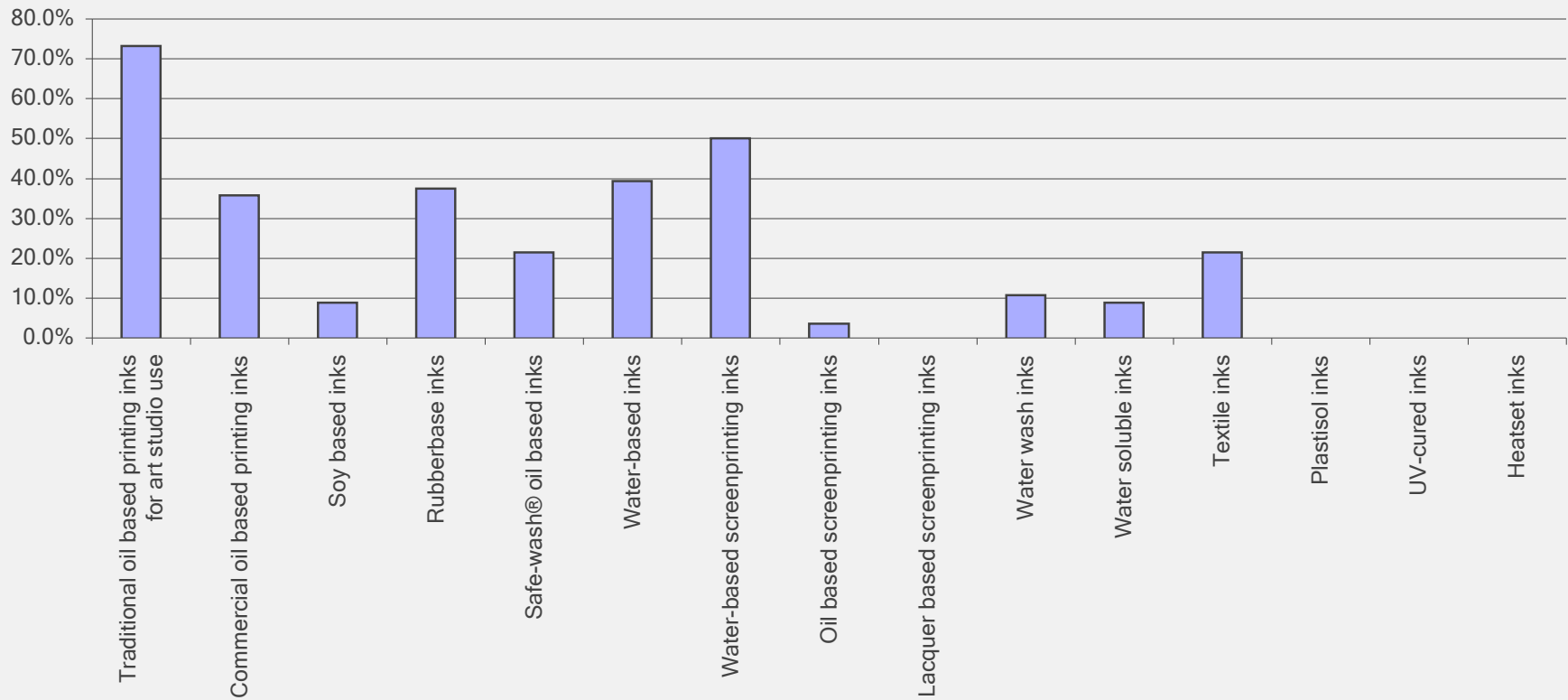
“Global apocalypse?”

# Question 19: How is your paper made?



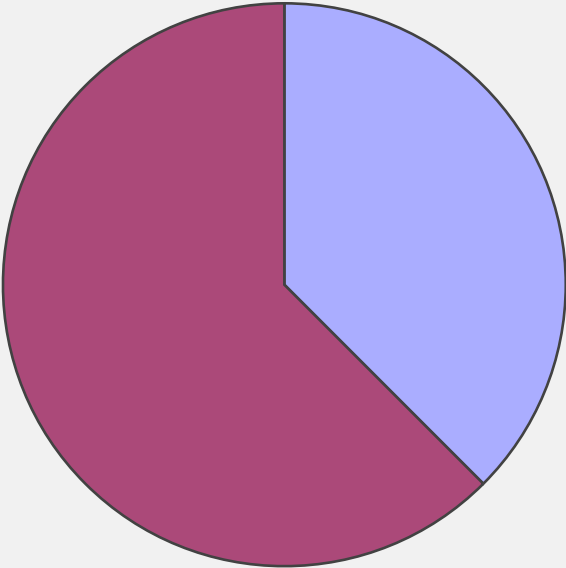
## Question 23: Which inks do you currently use?

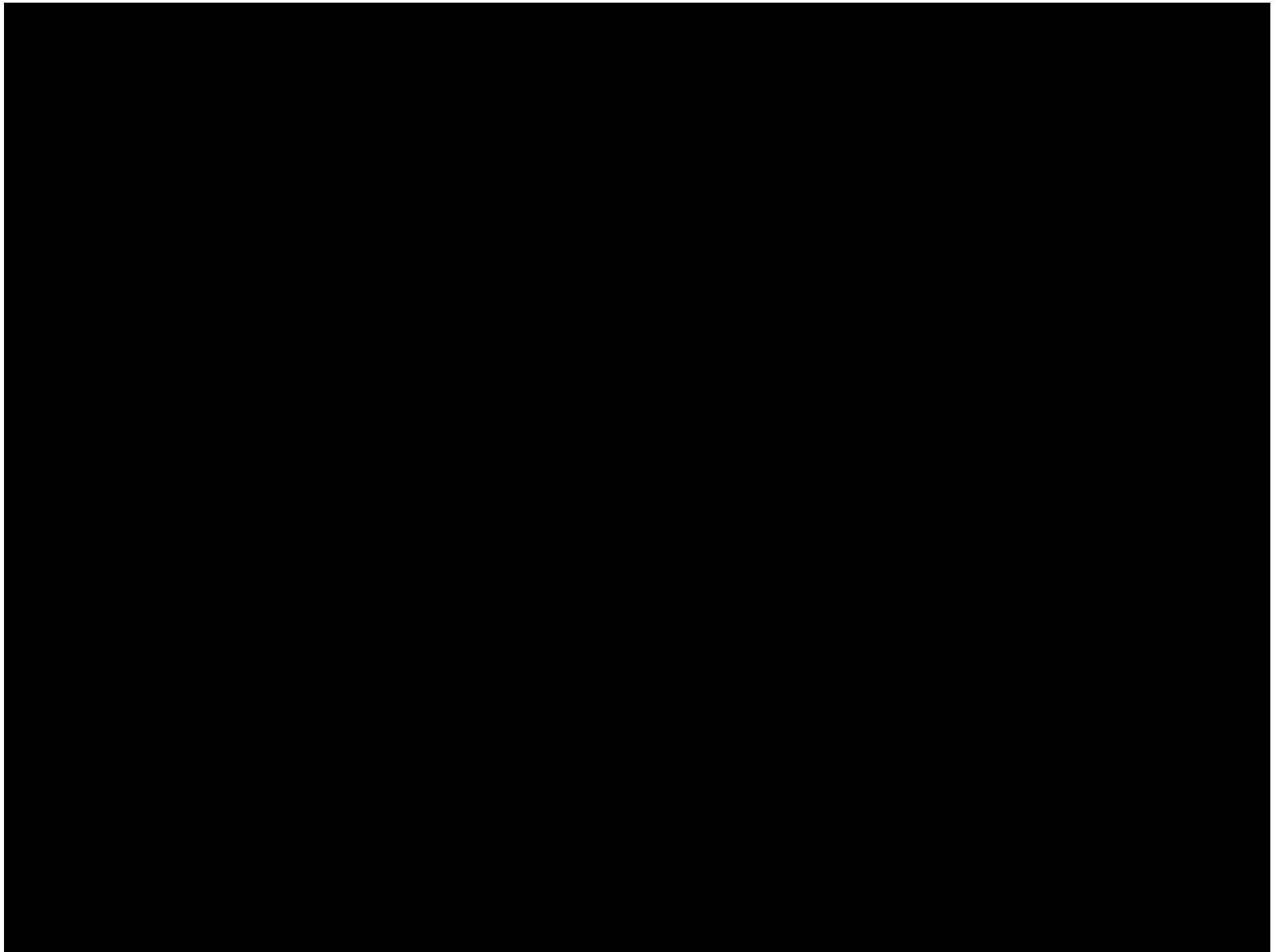
Please tell us below which inks you currently use (Please tick all that apply)



# Question 31: Have digital processes saved you money?

Have digital design and preparation processes saved your organisation money ?





# Sustainability

“development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”



1987 Brundtland Commission report

# The “Five Pillar” theory of Sustainability

These “pillars” of understanding are recognized to be interconnected and interdependent

- Ecological
- Social
- Economic
- Cultural
- Political

See Canadian Environmental Assessment Agency web pages authored by Robert B. Gibson:  
[http://www.ceaa.gc.ca/015/001/009/1\\_e.htm](http://www.ceaa.gc.ca/015/001/009/1_e.htm)

Or, *Sustainability Assessment: Criteria, Processes and Applications*, by Robert B. Gibson, Selma Hassan, Susan Holtz, James Tansey, and Graham Whitelaw, Earthscan, London, 2005



Leonard Baskin, *Hydrogen Man*, woodcut, 1952



Antonio Frasconi, *Viet Nam!*, 1967, artist's book



## What art is worth it?

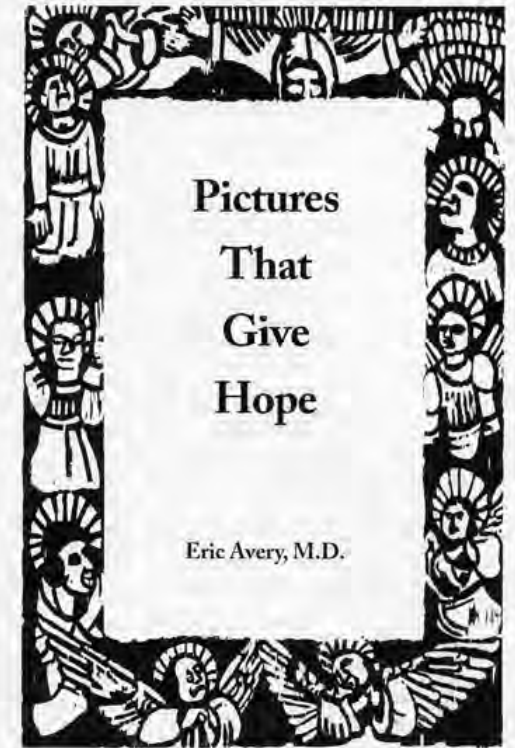
Eric Avery

*Pictures That Give Hope*, 2003

(explanations of blood-borne diseases)

Offset litho revision of 2001 a limited relief edition from an SGC conference for distribution in the Texas State Prison System. Edition 10,000.

Spanish translation edition 6,000.



Thomas Kinkadee  
*Nature's Paradise*, 2010  
Glicée on canvas, ed. 595



Photo courtesy of the National Institute for Biological Standards and Control.

HIV enters the CD4 cell in a process called FUSION. This allows HIV's genetic material, called RNA, and its proteins, called enzymes, to enter the white blood cell. Now, once the RNA and enzymes are inside, the infected cell can become a factory for making more HIV. In this picture, the tiny round balls on the infected CD4 cell are HIV attached to or budding out of the surface of the infected cell.



Copyright Boehringer Ingelheim Pharma KG, photo Lenhart Nilsson/Albert Bonnier Verlag AG.

Here is an even closer view of HIV on the CD4 cell surface. In a silent battle, your body makes billions of new CD4 cells a day just to replace the ones killed by HIV. The body can keep this up for years, but it eventually starts to lose the fight and can no longer replace them. When this happens, the CD4 count we talked about earlier drops, the immune system is weakened, and with time, AIDS develops. You start to feel sick and get opportunistic infections, which are illnesses that can also move you into the AIDS category.

# Comments that raise good questions

We use wind electricity for heat and light

Neutralisation of chemicals and safe disposal/recycling

Now treat used (oil and ink soaked) rags with an enzyme that eats hydrocarbons before putting them in the landfill

The volumes of Solvent are relatively small (about 50 litres a year) If I drive to ... and back I use 50 litres of petrol in one trip, so even if I could reduce our solvent use by 50% I would get better benefit by reducing my driving.

Air sourced heat pump for heating system

Changed our etching baths from Nitric to Ferric

No such thing as non-toxic

We have moved to using less and repurposing. We organise off-cuts for reuse and repurpose a lot of furniture and equipment

Having this belief for the environment and practicing putting it into use is hard in a professional Studio. I can't grow cotton and cultivate my own paper. But I can try and use the materials wisely And recycle when I can.

# Comments that cause concern !!

Acrylic resists to eliminate the use of solvents

Soy based inks. Use of soy based clean up products, vegetable oil based inks

Vegetable oil for cleaning (many vegetable oils used for cooking are derived from soy)

Use of as many non-toxic products as possible in the production process

We got rid of ammonia replacing with household degreasing agents

I am beginning to experiment with imageOn HD

Water etched solar intaglio process

Cupric Chloride as an etchant this is more acidic than copper sulphate

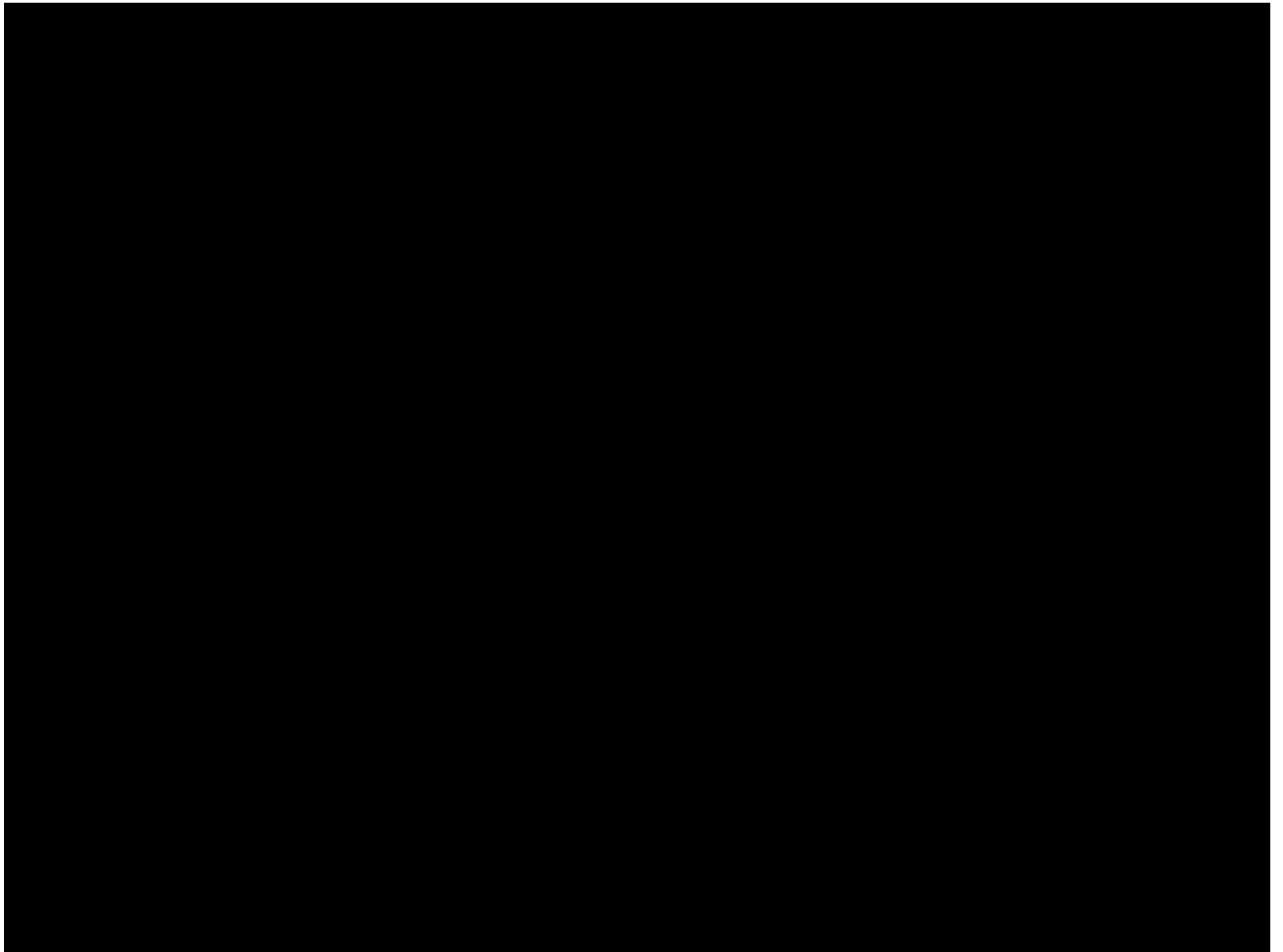
We use old rubber based inks

We are looking for a gradual change for our etching from traditional to acrylic based techniques

We select the safest pigments possible to ensure that the more hazardous pigments that are known to contain heavy metals such as lead, cadmium, nickel and cobalt are not used

**We would like to you to remember  
that most of us in this audience  
are supposed to be academics.**

**Therefore we owe it to our students  
to give them properly researched  
and correct information,  
  
not supposition or  
just what we have been told by others!**



*WBS000*  
*WHISKEY*

*HR: 3*

**Toxicity of whiskey**

**PROP:** Light yellow-amber liquid. Pleasant to fruity odor. D: 0.923-0.935 @ 15.56°; 47%-53% of ethanol, by volume, flash p: 80.0°F (CC). Made by distillation of fermented malted grains, i.e., corn, rye, or barley. After distillation, whiskey is aged in wooden containers for up to several years. The aging extracts such components as acids and esters from the wood and promotes oxidation of components of raw whiskey and some reactions between organic components to form new flavors.

**SAFETY PROFILE:** The carcinogen urethane is sometimes found in whiskey. The whiskey equivalent of 1 ounce of pure ethanol per capita per day has been cited as healthful to adults to relieve stress and promote relaxation. However, it is often abused which can lead to habituation with consequent liver damage, malnutrition, and a wide variety of other physical and mental problems, including the development of cancer. A fire hazard when exposed to heat or flame. To fight fire, use water, water spray, alcohol foam, CO<sub>2</sub>, dry chemical. See also ETHANOL and URETHANE.

## **“Ethanol is toxic.”**

(University of Wisconsin-Madison Chemistry Professor Bassam Z. Shakhashiri)

### **A 1-ounce shot of 100-proof whiskey contains 0.5 fluid ounces of ethanol (about 15 mL)**

Ethanol is a sedative-hypnotic drug and exerts its primary effects on the central nervous system (CNS). Patients can present with altered consciousness, agitation, euphoria, slurred speech, ataxia, stupor, and coma. Awareness of the environment [e.g., heat or cold exposure] and perception of pain are diminished. Ethanol may depress the respiratory center and lead to hyperventilation and respiratory arrest. Although seizures are more common in alcohol withdrawal, they may also occur with acute intoxication.

Intoxication with ethanol depends on the rate of rise of the blood alcohol level and the length of time the level is maintained. Blood alcohol levels of 20 to 30 mg/dL are often associated with a mild euphoria, delayed reaction time, decreased inhibition, and alteration in judgment. Most people exhibit gross intoxication at levels above 150 mg/dL, and death may result from respiratory depression, aspiration, or cardio-vascular collapse when levels exceed 400 to 500 mg/dL.

from *Civetta, Taylor and Kirby's Critical Care* by Andrea Gabrielli, A. Joseph Layon, Mihae Yu, 4<sup>th</sup> Edition, 2008



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# What is it?

## TOXICITY DATA with REFERENCE

- orl-man TDLo:42.86 g/kg:CNS JPETAB 29,135,26
- orl-inf TDLo:333 g/kg:CNS,GIT,MET ADCHAK 54,551,79
- rec-wmn LDLo:180 g/kg/28H JAMAAP 104,1569,35
- ipr-mus LD50:190 g/kg NTIS\*\* QD628-313
- ivn-mus LD50:25 g/kg MIVRA6 8,320,74
- orl-dog LDLo:629 g/kg JPETAB 29,135,26
- orl-cat LDLo:320 g/kg JPETAB 29,135,26
- orl-rbt LDLo:368 g/kg JPETAB 29,135,26
- ivn-rbt LDLo:13 g/kg JPETAB 29,135,26
- rec-rbt LDLo:450 g/kg JAMAAP 104,1569,35
- orl-gpg LDLo:429 g/kg JPETAB 29,135,26
- ipr-mus LD50:25 g/kg MIVRA6 8,320,74

CONSENSUS REPORTS: EPA Genetic Toxicology Program. Reported in EPA TSCA Inventory.

SAFETY PROFILE: Human systemic effects by ingestion of very large amounts: convulsions, tremors, muscle contractions or spasticity; hypermotility, diarrhea; fever. Human and experimental death reported by various routes at sufficiently large doses.



WAT259 WATER

WAT259 CAS:7732-18-5 HR: 1  
WATER

mf: H<sub>2</sub>O mw: 18.02

PROP: Odorless, colorless, tasteless liquid. Allotropic forms are ice (solid) and steam (vapor). D: (at atmospheric pressure) 1.00 (4°C), fp: 0°C (32°F) with 10% expansion, viscosity: 0.01002 poise (20°C), sp heat: 1 calorie/g, vap press: 760 mm (100°C), surface tension: 73 dynes/cm @ 20°C, latent heat of fusion (ice): 80 cal/g, latent heat of condensation (steam): 540 cal/g, bulk d: 8.337 lbs/gal (62.3/lb/cu ft), refr index: 1.333. Water is a polar liquid with high dielectric constant (81 @ 17°C) which largely accounts for its solvent power.

SYN: DIHYDROGEN OXIDE

TOXICITY DATA with REFERENCE

orl-man TDLo:42.86 g/kg:CNS JPETAB 29,135,26  
orl-inf TDLo:333 g/kg:CNS,GIT,MET ADCHAK  
54,551,79

rec-wmn LDLo:180 g/kg/28H JAMAAP 104,1569,35  
ipr-mus LD50:190 g/kg NTIS\*\* QD628-313  
ivn-mus LD50:25 g/kg MIVRA6 8,320,74  
orl-dog LDLo:629 g/kg JPETAB 29,135,26  
orl-cat LDLo:320 g/kg JPETAB 29,135,26  
orl-rbt LDLo:368 g/kg JPETAB 29,135,26  
ivn-rbt LDLo:13 g/kg JPETAB 29,135,26  
rec-rbt LDLo:450 g/kg JAMAAP 104,1569,35  
orl-gpg LDLo:429 g/kg JPETAB 29,135,26  
ipr-mus LD50:25 g/kg MIVRA6 8,320,74

CONSENSUS REPORTS: EPA Genetic Toxicology Program. Reported in EPA TSCA Inventory.

SAFETY PROFILE: Human systemic effects by ingestion of very large amounts: convulsions, tremors, muscle contractions or spasticity; hypermotility, diarrhea; fever. Human and experimental death reported by various routes at sufficiently large doses.

Water



**Recognize that virtually any chemical (substance) has inherent hazards that can cause harm under the right conditions. Water can drown you, pure oxygen can cause deadly fires, and consuming an entire bottle of whiskey in one minute will cause fatal poisoning.**

**"Natural" products are not necessarily any safer or less toxic than "synthetic" or "artificial" chemicals. Sewage is natural, but it's not very good for you. Conversely, cis-platin is not natural, but it cures cancer.**

**Chemistry definitions** from The Safety Emporium, MSDS Hyper Glossary  
<http://www.ilpi.com/msds/ref/chemical.html>

**WBS675**

CAS:63394-00-3

**HR: 1**

**WHITE SPIRIT**

SYN: SKDN

TOXICITY DATA with REFERENCE

ihl-rat TCLo:950 ppm/6H (female 3-20D post):TER

TJADAB 34,415,86

ihl-hmn TCLo:600 mg/m<sup>3</sup>/8H:EYE,PUL,GIT TPK-

VAL 10,116,68

ihl-mus LCLo:50000 mg/m<sup>3</sup> TPKVAL 10,116,68

**SAFETY PROFILE:** Slightly toxic by inhalation. An experimental teratogen. Human systemic effects by inhalation: conjunctive eye irritation, cough, and gastrointestinal changes. When heated to decomposition it emits acrid smoke and irritating fumes.

**WBS700**

**HR: 1**

**WHITE SPIRIT, DILUTINE 5**

TOXICITY DATA with REFERENCE

skn-rbt 500 mg MLD FCTOD7 20,563,82

eye-rbt 100 mg MLD FCTOD7 20,573,82

eye-rbt 100 mg/30S rns MLD FCTOD7 20,573,82

**SAFETY PROFILE:** A skin and eye irritant. When heated to decomposition it emits acrid smoke and irritating fumes.

## **Cadmium, lead, heavy metals in inks and paints:**

Unless the source is very old or they have come from unknown sources such as China or Russian watercolours made up until the 1990's, inks are not allowed to contain heavy metals. Only paints for restoration and usually sold only to those qualified to use them still contain lead or cobalt and cadmium. These will be phased out in the next few years as the suppliers of raw materials cannot afford to pay for getting these products through legislation for the tiny number of users.

Therefore, fears of cadmium, lead, and heavy metals in ink pigments are unfounded and remote.

## Turpentine and Petroleum Distillates

**Turpentine** is a distillation of pine-tree sap. Before the mid-twentieth century, turpentine was widely used as a thinner and clean-up solvent for oil paint and varnish and also as an oil, grease and wax remover.

Chronic skin exposure to turpentine may produce a hypersensitivity reaction, with bullous dermatitis and/or eczema. A case-control study of workers in particle-board, plywood, sawmill, and formaldehyde glue factories demonstrated a statistically significant association between chronic exposure (longer than 5 years) to terpenes (the principal component of turpentine) and the development of respiratory tract cancers.

**Petroleum distillates** are distillations of petroleum. They include **mineral spirits** (informally referred to as “paint thinner”), **naphtha**, **toluene**, **xylene** and some “turpentine substitutes” such as turpentine.

To produce solvents from petroleum, the liquid is heated and gases are taken off and condensed as the temperature increases. The process is called distillation—and thus, petroleum distillates. The first gas to come off is methane, which doesn’t condense at room temperature, only at much colder temperatures. Then there’s ethane, propane, butane, etc. Heptane and octane are used to make gasoline, a liquid that evaporates very rapidly. Gasoline is sometimes used as a cleaner, but it is very dangerous because it is explosive. Don’t use gasoline.

## Petroleum distillate solvents

**Mineral Spirits** is a petroleum distillate commonly used as a paint thinner and mild solvent. Outside of the United States and Canada, it is referred to as **white spirit**.

**Odorless Mineral Spirits** are mineral spirits that have been further refined to remove the more toxic aromatic compounds (xylene, toluene), and are recommended for applications such as oil painting, where humans have close contact with the solvent.

Forms of **naphtha** may be carcinogenic, and frequently products sold as naphtha contain some impurities which may also have harmful properties of their own.

**Xylene** or xylol is a mixture of three structural isomers of the aromatic hydrocarbon dimethylbenzene. Xylene exhibits neurological effects. High levels from exposure for acute (14 days or less) or chronic periods (more than 1 year) can cause headaches, lack of muscle coordination, dizziness, confusion, and alterations in body balance[citation needed] . Exposure of people to high levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat, difficulty in breathing and other problems with the lungs, delayed reaction time, memory difficulties, stomach discomfort, and possibly adverse effects on the liver and kidneys. It can cause unconsciousness and even death at very high levels (see inhalants). Xylene or products containing Xylene should not be used indoors or around food.

**Toluene**, formerly known as toluol, is an aromatic hydrocarbon that is a mono-substituted benzene derivative, widely used as a solvent. Toluene should not be inhaled due to its health effects. Low to moderate levels can cause tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, loss of appetite, and hearing and color vision loss. These symptoms usually disappear when exposure is stopped. Inhaling high levels of toluene in a short time may cause light-headedness, nausea, or sleepiness. It can also cause unconsciousness, and even death.

**Xylene and toluene** are relatively toxic. They will affect your nervous system causing irritability and drunkenness, and in large doses could cause serious health problems. You should never use them in any sizeable quantity in a room without good exhaust.

**Lacquer thinner** is a mixture of 4-5 solvents that varies greatly with the manufacturer. Mixtures often contain acetone, xylene, and/or toluene, and may also contain naphtha, methanol, butanone, isopropanol, MEK, ethyl acetate, and other distillate solvents. Xylene, toluene, and MEK are especially hazardous to humans.

Both **acetone** and **methyl ethyl ketone** (MEK) are very strong (high solvent strength) and fast evaporating solvents. Acetone is relatively safe for use and is unique in that it is the only common solvent that is exempt as a VOC. MEK is an identified carcinogen and should be avoided.