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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION  
AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**Phenoxy Resin OR-961**

This Assessment has been compiled in accordance with the provisions of *the Industrial Chemicals (Notification and Assessment) Act 1989* (the Act), and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by Worksafe Australia which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment, Sport, and Territories and the assessment of public health is conducted by the Department of Health and Family Services

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Director  
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**FULL PUBLIC REPORT****Phenoxy Resin OR-961****1. APPLICANT**

Océ-Reprographics Limited of 89 Tulip Street CHELTENHAM VICTORIA 3192 has submitted a standard notification statement in support of their application for an assessment certificate for Phenoxy Resin OR-961.

**2. IDENTITY OF THE CHEMICAL**

Phenoxy Resin OR-961 is not considered to be hazardous based on the nature of the chemical and the data provided. Therefore the molecular and structural formulae, molecular weight, details of spectral data and information on the composition and nature of the chemical have been exempted from publication in the Full Public Report and the Summary Report

**Chemical name:** phenoxy resin

**Chemical Abstracts Service**

**(CAS) Registry No.:** not available

**Other names:** BM1

**Trade names:** OR-961

**Maximum percentage of low molecular weight species (molecular weight < 1000):** <60%  
**(molecular weight < 500):** <5%

**3. PHYSICAL AND CHEMICAL PROPERTIES**

As the notified polymer is imported for use as a powdered toner formulation, some physical and chemical properties have been determined solely for the toner formulation and not for the polymer. This is indicated below.

**Appearance at 20°C and 101.3 kPa:** white solid

**Odour:** slight odour

**Melting point:** <100°C

**Density:** <1500 kg/m<sup>3</sup> (formulation)

**Vapour pressure:** not determined

<b>Water solubility:</b>	<0.01 g/L at 20°C
<b>Partition co-efficient (n-octanol/water):</b>	$\log P_{ow} > 3$ (estimated)
<b>Hydrolysis as a function of pH:</b>	not determined
<b>Adsorption/desorption:</b>	not determined
<b>Dissociation constant:</b>	not determined
<b>Flash point:</b>	> 100°C (estimated)
<b>Flammability limits:</b>	not determined, combustible but non-flammable LEL $\cong$ 60g/m <sup>3</sup> UEL unknown (formulation)
<b>Combustion products:</b>	CO, CO <sub>2</sub> and H <sub>2</sub> O
<b>Pyrolysis products:</b>	not stated
<b>Decomposition temperature:</b>	ignition temperature $\cong$ 500°C (formulation)
<b>Decomposition products:</b>	does not degrade, decompose or depolymerise under normal conditions of use or storage
<b>Autoignition temperature:</b>	ignition temperature $\cong$ 500°C (formulation)
<b>Explosive properties:</b>	danger of dust explosion when ground to a small particle size
<b>Reactivity/stability:</b>	not reactive, very stable
<b>Particle size distribution:</b>	range (toner formulations)- >5 <100 $\mu$ m

#### **Comments on physico-chemical properties**

The concentration of evaporative monomers is low (max 0.1%) and vapour pressure is expected to be low. The solubility of the polymer has been determined by the column elution method (OECD guideline 105) with the polymer coated onto glass beads. Hydrolysis, partition coefficient, adsorption/desorption and dissociation constant have not been determined due to the moderately low solubility of the polymer. This is acceptable for the following reasons: (i) hydrolysis of the ether linkages of the polymer would not be expected under environmental conditions; (ii) given the expected low solubility in water it is anticipated that the partition coefficient for the polymer would be high; and (iii) on the basis of the polymer's low water solubility it is likely to adsorb to, or be associated with soil/sediment and organic matter and be immobile in soil. The polymer contains no acidic or basic functional groups that dissociate in water.

#### **4. PURITY OF THE CHEMICAL**

**Degree of purity:** <100%

**Toxic or hazardous impurities:** <0.01%

**Non-hazardous impurity  
(> 1% by weight):** none

**Maximum content of residual monomers:** <0.5%

The polymer is only imported as a component of toner formulations. These formulations can contain ingredients with exposure standards, these ingredients are in addition to the notified polymer:

Carbon black has a workplace exposure standard of TWA 3 mg/m<sup>3</sup> (1). The other applicable standard for toners for workplace exposure is that for nuisance dusts (1). This is; TWA 10 mg/m<sup>3</sup> for inspirable dusts. Silica in the form stated is not listed as hazardous (1,2,3). The dyes and pigments used are not specified as being hazardous on the Material Safety Data Sheet (MSDS) and the formulations overall are not classified as hazardous on the MSDS.

#### **5. INDUSTRIAL USE, VOLUME & FORMULATION**

The polymer is imported as a component of plain paper copying toner. There will be two toner formulations imported into Australia containing the notified polymer. The volume of resin that the notifier proposes to import is <20000 kg/annum:

The toners have been in use for a period of at least six months in Europe and the USA. The toner will mainly be for use in offices with limited potential for home based use.

#### **6. OCCUPATIONAL EXPOSURE**

The toner formulations containing the notified polymer are imported in sealed bottles for direct replenishment of photocopiers. Exposure during transport and warehousing will only occur during accidental spillage. Twenty storemen will be employed in areas where the formulations are kept. The category of employee likely to have the highest level of exposure are the service technicians potentially exposed during photocopier toner replenishment and maintenance. There will be 50 service technicians who will be exposed to the notified polymer in this way. Exposure of the end user will be limited by the toner refilling process. In some cases only trained technicians can replenish the toner due to technical considerations. The toner refilling process minimises exposure; the polyethylene bottles containing toner are screwed onto the opened toner reservoir and when empty, removed and the reservoir closed. Spillage and/or the release of airborne particles is therefore

unlikely. There will be approximately 500 end users who can potentially be exposed to the notified polymer in this manner.

The particle size range of the imported toner formulations have a high percentage of what is considered as inspirable according to the International Organisation for Standardisation and the American Conference of Governmental Industrial Hygienists (1). The respirable fraction will be negligible according to the Standards Australia definition (1). The applicable standard for workplace exposure for nuisance dusts (1) is; TWA 10 mg/m<sup>3</sup> for inspirable dusts. It should also be noted that there are standards for carbon black and iron oxide; additional components of toners, these are 3 and 5 mg/m<sup>3</sup> respectively. Emission measurements in a study undertaken by Océ Netherlands found that the toner dust concentration in the workroom remains below 0.05mg/m<sup>3</sup>, however as this study was not submitted the applicability of the results cannot be confirmed.

Exposure to the notified polymer via copies is unlikely as the polymer, along with other components of the toner is irreversibly fused to the paper in the photocopying process.

## **7. PUBLIC EXPOSURE**

The two toners are packed in polyethylene bottles weighing <1kg. The toners will usually be transported by seafreight from the Netherlands, and if necessary combined with other goods into full container loads. Small quantities may be imported by airfreight. Within Australia, toners will generally be transported by road from Océ Australia's national warehouse to its branch warehouses, and from the warehouses direct to customer's premises. There is negligible potential for public exposure whilst the toners are in transit, except in a transport accident where the containers crack under pressure. In the event of a spill, toners accidentally released should be recovered by shovelling or vacuuming into a suitable container.

Public exposure is unlikely during refilling, as one model of Océ photocopier can only be refilled by an Océ technician, and in the other the toner is discharged into a totally enclosed environment. Public exposure is also unlikely during use, as the toner will be heat fixed to the paper. Residual toner contained within 'empty' plastic containers will be disposed of in the normal waste stream, in landfills or by incineration.

## **8. ENVIRONMENTAL EXPOSURE**

### **. Release**

Two toners, B1 and F3, containing the notified polymer will mostly be imported by sea freight, with occasional small quantities imported by airfreight. There is no re-formulation in Australia. Distribution of the toners within Australia will be by road from a central warehouse. Therefore environmental exposure of the polymer during transport, storage and handling would be minimal except in the case of an accident.

Accidental spillage during use of the polymer should be minimal as it will be marketed in plastic bottles for handling only by specially trained technicians for one model of copier, or toner transfer by direct screwing of the bottle into machine for a second type of copier.

Residual toner in empty containers disposed to landfill is estimated at 0.2-0.4%.

Environmental exposure to the notified substance could occur when paper containing the polymer is disposed of. As such, release to the environment may occur during paper recycling and this is explored in the sections below.

## . **Fate**

The polymer will most likely share the fate of its paper substrate, and be disposed of to landfill, incinerated or recycled. Small quantities, as residual toner in empty containers, will also be disposed of by landfill. Polymer disposed of to landfill is unlikely to leach or contaminate surface water because of its moderately low water solubility and expected high Log  $P_{ow}$ .

Incineration of paper and combustion of the notified polymer in the presence of excess air will result in products of oxides of carbon and water.

Paper recycling is a growing industry in Australia. Waste paper is repulped using a variety of alkalis, dispersing agents, wetting agents, water emulsifiable organic solvents and bleaching agents. These chemicals enhance the fibre separation, ink detachment from the fibres, pulp brightness and the whiteness of the paper. After pulping, the contaminants and the ink are separated from the fibres by pumping the stock through various heat washing, screening, cleaning, flotation and dispersion stages. The notifier has provided no data on the likely behaviour of the polymer during the recycling process. The hydrolysis of ether linkages under alkaline conditions will be minimal due to the low solubility of the polymer. The polymer therefore is likely to survive the paper recycling conditions, either remaining bound to the pulp or becoming associated with the sludge. In the latter case, the polymer will arrive in landfill where it can be expected to remain intact, or be destroyed through incineration.

## 9. EVALUATION OF TOXICOLOGICAL DATA

### 9.1 Acute Toxicity

#### Summary of the acute toxicity of Phenoxy Resin OR-961

<i>Test</i>	<i>Species</i>	<i>Outcome</i>	<i>Reference</i>
acute oral toxicity	rat	LD <sub>50</sub> > 2000 mg/kg	4
acute dermal toxicity	rat	LD <sub>50</sub> > 2000 mg/kg	6
skin irritation	rabbit	non-irritant	7
eye irritation	rabbit	slight irritant	8
skin sensitisation	mouse	non-sensitiser*	9

\* refer to text

#### 9.1.1 Oral Toxicity (4)

<i>Species/strain:</i>	Sprague-Dawley
<i>Number/sex of animals M/F:</i>	5/5
<i>Observation period:</i>	14 days
<i>Method of administration:</i>	gavage (formulated 20% w/v in 1% aqueous methylcellulose)
<i>Clinical observations:</i>	piloerection following dosing, recovery of all animals by day 5
<i>Mortality:</i>	no mortality
<i>Morphological findings:</i>	slightly lower bodyweight recorded for one rat
<i>Test method:</i>	in accordance with OECD guidelines for the testing of chemicals (5)
<i>LD<sub>50</sub>:</i>	> 2000 mg/kg
<i>Result:</i>	low oral toxicity on the rat

#### 9.1.2 Dermal Toxicity (6)

<i>Species/strain:</i>	Sprague-Dawley rat
<i>Number/sex of animals, M/F:</i>	5/5
<i>Observation period:</i>	14 days

<i>Method of administration:</i>	test material (formulated 70% w/v in 1% aqueous methylcellulose) applied for 24 hours under dressing on shaved skin
<i>Clinical observations:</i>	no signs of systemic reaction to treatment
<i>Mortality:</i>	no mortalities
<i>Morphological findings:</i>	no irritation or dermal changes, all Draize scores (7) for erythema and oedema were zero; see attachment 1 for Draize scales
<i>Test method:</i>	in accordance with OECD guidelines for the testing of chemicals (5)
<i>Result:</i>	low dermal toxicity

### **9.1.3 Skin Irritation (8)**

<i>Species/strain:</i>	New Zealand White rabbits
<i>Number/sex of animals:</i>	3 females
<i>Observation period:</i>	72 hours
<i>Method of administration:</i>	0.5 g applied to shaved skin for 4 hours under gauze patch
<i>Draize scores (7):</i>	no irritation or dermal changes, all Draize scores for erythema and oedema were zero
<i>Test method:</i>	in accordance with OECD guidelines for the testing of chemicals (5)
<i>Result:</i>	not a skin irritant in the rabbit

### **9.1.4 Eye Irritation (9)**

<i>Species/strain:</i>	New Zealand White rabbits
<i>Number/sex of animals:</i>	3 Male
<i>Observation period:</i>	72 hours
<i>Method of administration:</i>	0.1 ml into the conjunctival sac of one eye; eyelids held together for one second, contralateral eye remained untreated.

*Draize scores (5) of unirrigated eyes:*

***Time after instillation***



<i>Animal</i>	<i>1 day</i>		<i>2 days</i>		<i>3 days</i>		<i>4 days</i>		<i>7 days</i>						
<i>Cornea</i>	<i>o<sup>a</sup></i>	<i>a<sup>b</sup></i>	<i>o<sup>a</sup></i>	<i>a<sup>b</sup></i>	<i>o<sup>a</sup></i>	<i>a<sup>b</sup></i>	<i>o<sup>a</sup></i>	<i>a<sup>b</sup></i>	<i>o<sup>a</sup></i>	<i>a<sup>b</sup></i>					
1	0	0	0	0	0	0	0	0	0	0					
2	0	0	0	0	0	0	0	0	0	0					
3	0	0	0	0	0	0	0	0	0	0					
<i>Iris</i>															
1	0		0		0		0		0						
2	0		0		0		0		0						
3	0		0		0		0		0						
<i>Conjunctiva</i>	<i>r<sup>c</sup></i>	<i>c<sup>d</sup></i>	<i>d<sup>e</sup></i>	<i>r<sup>c</sup></i>	<i>c<sup>d</sup></i>	<i>d<sup>e</sup></i>	<i>r<sup>c</sup></i>	<i>c<sup>d</sup></i>	<i>d<sup>e</sup></i>	<i>r<sup>c</sup></i>	<i>c<sup>d</sup></i>	<i>d<sup>e</sup></i>	<i>r<sup>c</sup></i>	<i>c<sup>d</sup></i>	<i>d<sup>e</sup></i>
1	1	1		1	0		1	0		0	0		0	0	
2	1	0		1	0		0	0		0	0		0	0	
3	1	1		1	1		0	0		0	0		0	0	

<sup>i</sup> see Attachment 1 for Draize scales

<sup>a</sup> opacity <sup>b</sup> area <sup>c</sup> redness <sup>d</sup> chemosis <sup>e</sup> discharge

**Test method:** in accordance with OECD guidelines for the testing of chemicals (5)

**Result:** mild eye irritant in rabbits

#### 9.1.6 Skin Sensitisation (mouse ear) N.B. Original report not sighted (summary only)

**Species/strain:** mouse

**Number of animals:** 4 Females

**Induction procedure:** applied daily for 3 days in acetone : olive oil 4:1

**Sensitisation assessment procedure:** day 5, each mouse subjected to intravenous injection of radiolabelled thymidine 5 hours before sacrifice; incorporation of thymidine into local lymph nodes draining the ears is increased in mice treated with a strong sensitizer.

**Outcome** formulation (%m/v) 0 10 25 50  
proliferation Index 1 1.8 1.6 2.0

<i>Test method:</i>	not specified
<i>Result:</i>	not a strong skin sensitiser

### 9.3 Genotoxicity

#### 9.3.1 *Salmonella typhimurium* Reverse Mutation Assay (10)

<i>Strains:</i>	<i>Salmonella typhimurium</i> TA 1535, TA 1537, TA 1538, TA 98, TA 100
<i>Concentration range:</i>	toner containing 40% notified polymer at 5, 50, 500, 5000 µg/plate
<i>Test method:</i>	in accordance with OECD guidelines for the testing of chemicals (5)
<i>Result:</i>	no significant increases in revertant colony numbers were recorded in any of the five strains of bacteria at any concentration level, either with or without metabolic activation; positive controls gave appropriate responses

#### 9.3.2 Chromosomal aberration induction in human lymphocytes cultured *in vitro* (11)

<i>Species/strain:</i>	<i>Homo sapiens</i> /cultured lymphocytes
<i>Concentration range:</i>	toner containing 40% notified polymer at 15.6, 31.2, 62.5 µg/ml in the absence of S-9 mix and 125, 250 and 300 µg/ml in its presence
<i>Test method:</i>	in accordance with OECD guidelines for the testing of chemicals (5)
<i>Result:</i>	not clastogenic; positive controls gave large increases in the proportion of cells containing chromosomal aberrations

## 9.4 Overall Assessment of Toxicological Data

The notified polymer showed few indications of toxicological effects. It has a low oral toxicity in rats of LD<sub>50</sub> > 2000 mg/kg and a dermal toxicity in rats of LD<sub>50</sub> > 2000 mg/kg. It is not a skin irritant in rabbits and produced only mild eye irritant effects in rabbits confined to the conjunctiva and below the level where the polymer would be classified as hazardous according to the Worksafe Australia *Approved Criteria for Classifying Hazardous Substances* (12). A test performed to demonstrate potential for skin sensitisation indicated that it is not a strong skin sensitiser; the test performed is new methodology and no confirmation with internationally recognised protocols was submitted.

In genotoxicity studies it was not mutagenic in a *S. typhimurium* reverse mutation assay and was not clastogenic in a human lymphocyte (*in vitro*) study.

On the basis of submitted data, the notified chemical would not be classified as hazardous in accordance with Worksafe Australia's *Approved Criteria for Classifying Hazardous Substances* (12) in relation to acute lethal effects (oral, dermal); irritant effects (skin and eye) and mutagenic effects, the latter based on *in vitro* studies only.

## 10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided by the notifier. The notifier has provided a report by a consulting toxicologist that expresses the view that ecotoxicity studies are not necessary. This view is based on the resin having a high NAMW, a small fraction with low molecular weight and low water solubility. As the notified polymer has a water solubility of <0.01 g/L and a NAMW of <1000 of which <60% has a molecular weight below 1,000, the above argument would not apply and the polymer is of potential environmental concern.

## 11. ASSESSMENT OF ENVIRONMENTAL HAZARD

It is anticipated that the environmental hazard of the polymer would be low given: (i) the polymer is only to be used as a toner in photocopiers with very little (<1%) environmental release; (ii) release will be spread out over many sites across Australia; (iii) the polymer has a moderately low water solubility and; (iv) the absence of reactive groups within the polymer.

Accidental spillage of the polymer should result in negligible hazard as it will be marketed in plastic bottles for handling only by specially trained technicians for one model of copier, or toner transfer by direct screwing of the bottle into machine for a second type of copier.

Environmental exposure to the notified substance could occur when paper containing the polymer is recycled or disposed of. In each case, the final destination is likely to be landfill where the dispersed polymer can be expected to persist but

remain immobile, being either bound to paper or to the sludge from the recycling process.

The low environmental exposure of the chemical as a result of normal use indicates that the overall environmental hazard in use can be rated as negligible.

## **12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS**

Phenoxy Resin OR-961 is stable, non-flammable and is expected to exhibit low volatility. It is a component of photocopy toner and will be used mainly in offices. Based on the submitted data, the major toxicological concerns associated with Phenoxy Resin OR-961 will be its potential for mild eye irritation.

Occupational exposure will be significant in terms of the number of employees who could potentially be exposed, however the toner refilling process will minimise actual exposure. The polyethylene bottles containing toner are screwed onto the opened toner reservoir and when empty, removed and the reservoir closed. Spillage and/or the release of airborne particles is therefore unlikely. There will be approximately 500 end users who can potentially be exposed to the notified polymer in this manner. Occupational exposure standards for carbon black of TWA 3 mg/m<sup>3</sup> and nuisance dusts of TWA 10 mg/m<sup>3</sup> are unlikely to be reached if the toner replenishment is undertaken according to the suppliers directions.

The notified chemical will be imported into Australia in containers for use in photocopiers. There exists little possibility for public exposure to the notified chemical during normal use of the photocopier or by exposure to the photocopied pages. The potential for minor public exposure to the notified chemical exists during transport, disposal of accidental spills and disposal of used toner. This will be minimised by the use of recommended practices during transportation, spill cleanup and waste disposal.

In conclusion, under normal use conditions, the notified chemical is not expected to present any significant health or safety risk to workers or the general public.

### 13. RECOMMENDATIONS

To minimise occupational exposure to Phenoxo Resin OR-961 the following guidelines and precautions should be observed:

if engineering controls and work practices are insufficient to reduce exposure to the Phenoxo Resin OR-961, to a safe level, as may occur during copier maintenance or due to accidental spillage of the toner formulation then personal protective devices which conform to and are used in accordance with Australian Standards (AS) for eye protection (AS 1336, AS/NZ 1337) (13,14) should be used. The appropriate respiratory device should be selected and used in accordance to Australian Standard/New Zealand Standard (AS/NZS) 1715 (15) and should comply with AS/NZS 1716 (16);

- . a copy of the MSDS for the relevant Océ toners should be easily accessible to employees.
- . Implement good work practices to avoid the generation of dusts; avoid spillage.

### 14. MATERIAL SAFETY DATA SHEET

The MSDS for Phenoxo Resin OR-961 was provided in a format similar to the Worksafe Australia format described in the *National Code of Practice for the Preparation of MSDS* (17).

This MSDS was provided by Océ-Reprographics Limited as part of their notification statement. The accuracy of this information remains the responsibility of Océ-Reprographics Limited.

### 15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989*, secondary notification of Phenoxo Resin OR-961 shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

### 16. REFERENCES

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3. National Occupational Health and Safety Commission, [NOHSC:3008(1995)] & [NOHSC:1003(1995)], 1995. *Exposure standards for atmospheric contaminants in the occupational environment*, AGPS, Canberra.

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12. National Occupational Health and Safety Commission, 1994, *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)], Australian Government Publishing Service, Canberra.
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15. Standards Australia, Standards New Zealand, 1994. *Australian/New Zealand Standard 1715 - 1994 Selection, Use and Maintenance of Respiratory Protective Devices*. Standards Association of Australia Publ., Sydney, Australia, Standards Association of New Zealand Publ., Wellington, New Zealand.
16. Standards Australia/ Standards New Zealand, 1991. *Australian/New Zealand Standard 1716 - 1991 Respiratory Protective Devices*. Standards Association of Australia Publ., Sydney, Australia.
17. National Occupational Health and Safety Commission 1994, *National Code of Practice for the Preparation of Material Safety Data Sheets* [NOHSC:2011(1994)], Australian Government Publishing Service, Canberra.

## Attachment 1

The Draize Scale for evaluation of skin reactions is as follows:

<i>Erythema Formation</i>	<i>Rating</i>	<i>Oedema Formation</i>	<i>Rating</i>
No erythema	0	No oedema	0
Very slight erythema (barely perceptible)	1	Very slight oedema (barely perceptible)	1
Well-defined erythema	2	Slight oedema (edges of area well-defined by definite raising)	2
Moderate to severe erythema	3	Moderate oedema (raised approx. 1 mm)	3
Severe erythema (beet redness)	4	Severe oedema (raised more than 1 mm and extending beyond area of exposure)	4

The Draize scale for evaluation of eye reactions is as follows:

### *CORNEA*

<i>Opacity</i>	<i>Rating</i>	<i>Area of Cornea involved</i>	<i>Rating</i>
No opacity	0 none	25% or less (not zero)	1
Diffuse area, details of iris clearly visible	1 slight	25% to 50%	2
Easily visible translucent areas, details of iris slightly obscure	2 mild	50% to 75%	3
Opalescent areas, no details of iris visible, size of pupil barely discernible	3 moderate	Greater than 75%	4
Opaque, iris invisible	4 severe		

### *CONJUNCTIVAE*

<i>Redness</i>	<i>Rating</i>	<i>Chemosis</i>	<i>Rating</i>	<i>Discharge</i>	<i>Rating</i>
Vessels normal	0 none	No swelling	0 none	No discharge	0 none
Vessels definitely injected above normal	1 slight	Any swelling above normal	1 slight	Any amount different from normal	1 slight
More diffuse, deeper crimson red with individual vessels not easily discernible	2 mod.	Obvious swelling with partial eversion of lids	2 mild	Discharge with moistening of lids and adjacent hairs	2 mod.
Diffuse beefy red	3 severe	Swelling with lids half-closed	3 mod.	Discharge with moistening of lids and hairs and considerable area around eye	3 severe
		Swelling with lids half-closed to completely closed	4 severe		

### *IRIS*

<i>Values</i>	<i>Rating</i>
Normal	0 none
Folds above normal, congestion, swelling, circumcorneal injection, iris reacts to light	1 slight
No reaction to light, haemorrhage, gross destruction	2 severe