



ES1098 & ES1099

Product & Application Overview

A concise public overview of product context, project evaluation, process selection, HSE and technical support.

ORE

RECYCLING

TESTWORK

PROCESS

IMPORTANT

This edition includes the material-usage amounts published in the ES1098 application manual. They are reference starting points and worked examples—not universal operating setpoints. Final conditions must be defined by qualified personnel using representative metallurgical testing, the current SDS, site-specific HSE review and local requirements.

01 Product Overview

Portfolio context and application scope

EcoSafeChem presents **ES1098 and ES1099** as part of its precious-metal recovery product portfolio. The published source manual is for ES1098; the current website presents both products for project evaluation.

- **Applications:** selected ore, e-waste, automotive catalyst and solar-panel feedstocks.
- **Product form:** light-grey to light-brown solid granules or powder.
- **Project basis:** feed-specific testing, process review and



PRODUCT

ES1098 & ES1099

PHYSICAL FORM

Granules or powder

PROJECT BASIS

Testwork before scale-up

Application Categories



ORE LEACHING

Selected mineral feeds

Oxide, semi-oxide, quartz-vein and sulphide feeds after feed-specific testwork.



SELECTED RECYCLING

Urban-mining feedstocks

Boards, connectors, ICs, automotive catalysts and solar panels using a feed-appropriate circuit.

PROJECT PRINCIPLE

Final operating conditions and dosage are selected only after representative testing and review of the actual feed.

06 Storage, Handling & HSE

Current SDS and site rules govern

GENERAL GUIDANCE - SITE CONTROLS REMAIN ESSENTIAL

Current SDS, site risk assessment and local requirements take precedence.

STORAGE

Dry, ventilated storage

Keep the product in a dry, well-ventilated area.

SEGREGATION

Separate materials

Keep apart from food and SDS-listed incompatibles.

PERSONAL PROTECTION

PPE by site review

Site HSE review sets gloves, clothing and eye/face protection.

SITE CONTROL

Controlled access

Restrict access; follow local environmental and tailings rules.

ENVIRONMENT

Solution recycling, treatment, discharge and disposal must be defined by qualified site personnel under applicable environmental requirements.

07 Technical Support & Contact

01 TESTING

Project-specific metallurgical testwork.

02 REVIEW

Leaching, recovery, recirculation, pH and sampling review.

03 DOCUMENTATION

Current manual, SDS, technical data and site procedures.

START A PROJECT REVIEW

For an initial review, send feed description, assay, capacity, current route and recovery target.

Contact EcoSafeChem

WEBSITE

www.ecosafechem.com

GENERAL EMAIL

info@ecosafechem.com

SALES EMAIL

sales@ecosafechem.com

H.Q. OFFICE

8 Floor, Guting Building, Hefeng Creative Square, 495 Jiangdong North Road, Ningbo, Zhejiang Province, China

TURKEY OFFICE

Osmanaga Mah., Vahapbey Sk., Firincioglu Ishani No: 16/2, Kadikoy, Istanbul, Turkey

Website information does not replace the SDS, site risk assessment, local requirements or representative metallurgical testwork. Verify process conditions on representative feed.

05 Product Characteristics

Physical profile and verification

The source manual describes the agent as a solid product that may vary in colour between batches. The published material also notes a weak ammonia-like odour.

DOCUMENT CONTROL

Consult the current SDS and test documentation for validated technical data.



Published Physical Description

APPEARANCE	Light grey to light brownish
PHYSICAL FORM	Granular or powder
ODOUR	Weak ammonia-like odour noted in source material
BATCH VARIATION	Visual colour differences may occur

Performance Claims & Verification

The source manual contains performance figures and comparative claims. They are guidance for evaluation and must be confirmed by project-specific testwork before scale-up.

USE PUBLISHED FIGURES AS

Starting points for test design

DO NOT TREAT THEM AS

Guaranteed industrial outcomes

VERIFY

Confirm the actual feed, operating window and recovery route before scale-up.

02 ES1098 Material Usage Amounts

Published manual values

These ES1098 values are reproduced from the supplied application manual. Use them as reference starting points only; representative metallurgical testing defines the optimum

BASIS OF USE

All ES1098 dosage values are expressed against the mass or volume of **water solution**, not against dry ore tonnage. Do not apply these values to ES1099 without separate controlled documentation.

Starting Concentration Guidance

MATERIAL / CONDITION	PUBLISHED AMOUNT	MANUAL CONTEXT
Common oxide, semi-oxide, quartz-vein and easy-leaching ores; 3–8 g/t gold grade	0.5–1.5 kg ES1098 per tonne of water	For multiple elements such as Au and Ag, the manual gives doubling as an example; confirm by testwork.
Sulfide-dominant gold ores	2–5 kg ES1098 per tonne of water	Higher consumption is anticipated because multiple metallic species may participate in reactions.
Existing cyanidation facility	Same amount as the existing cyanide concentration	Presented in the manual as a replacement reference; validate the change under site controls.

Worked Manual Examples

01 FRESH SOLUTION

1,500 L water → 0.975 kg ES1098

Manual assumptions: 1,500 L = 1.5 tonnes of water; 5 g/t ore; selected concentration 0.65 kg per tonne of water. Calculation: $0.65 \times 1.5 = 0.975$ kg.

02 REPLENISHMENT

100 m³ pool → add 50 kg ES1098

Target 1.2 per mille; measured 0.7 per mille; volume 100 m³. Manual formula: $(\text{target} - \text{current}) \times \text{m}^3$. Calculation: $(1.2 - 0.7) \times 100 = 50$ kg.

TITRATION MATERIALS & PREPARATION

Agent A: 1.7332 g laboratory-grade AgNO₃, made to 1,000 mL with distilled water.
Indicator B: 0.1 g Rhodanine, made to 100 mL with acetone (purity >98%) or 95% alcohol.

Test: about 10 mL leach solution + 2–4 drops Indicator B. Concentration = Agent A consumed (mL) ÷ 2; example: 4.8 mL ÷ 2 = 2.4 per mille.
pH adjuster: no fixed lime/NaOH mass is stated; dose while measuring to pH 11.0–11.5. With lime, do not exceed pH 12.

03 Project Evaluation & Test Programme

Representative data before scale-up



DEFINE THE OPERATING WINDOW

Testing converts representative feed data into a project-specific basis.

The manual and current website emphasize that operating conditions must be defined for each feed rather than copied from a generic recipe.

01 FEED DATA

Collect the basis

Assays, mineralogy, grade, particle size and processing history.

02 TEST DESIGN

Define variables

Confirm the variables that require representative testing.

03 OPTIMISATION

Review behaviour

Assess recovery, consumption, concentration trends and interfering elements.

04 PROPOSAL

Document the range

Set out an operating range, recovery route, supply plan and HSE requirements.

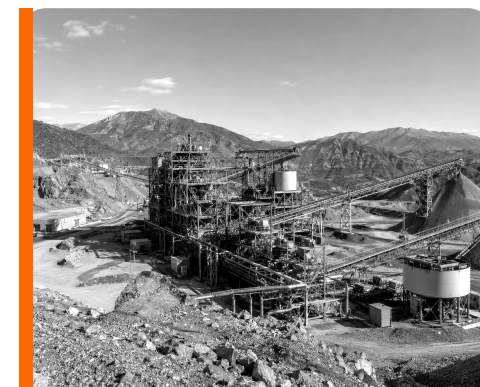
Parameters to Define During Testwork

- Agent concentration for the specific feed.
- Solution pH and process stability.
- Leach or contact time.
- Particle size and exposure of valuable mineral grains.
- Economically appropriate recovery point.
- Downstream recovery and solution-management approach.

04 Process Context & Recovery Options

Select the route by feed

The source manual describes use in conventional mineral-processing contexts such as heap, vat and agitated CIL/CIP-type circuits. A feed-appropriate circuit should be selected only after project review and representative testing.



ORE CONTEXT

Heap, vat or agitated

The process context is reviewed against feed characteristics and test results.

RECYCLING CONTEXT

Dedicated systems

Stripping or agitated systems are selected for the actual recycling feed.

SOLUTION CONTROL

Recirculate and monitor

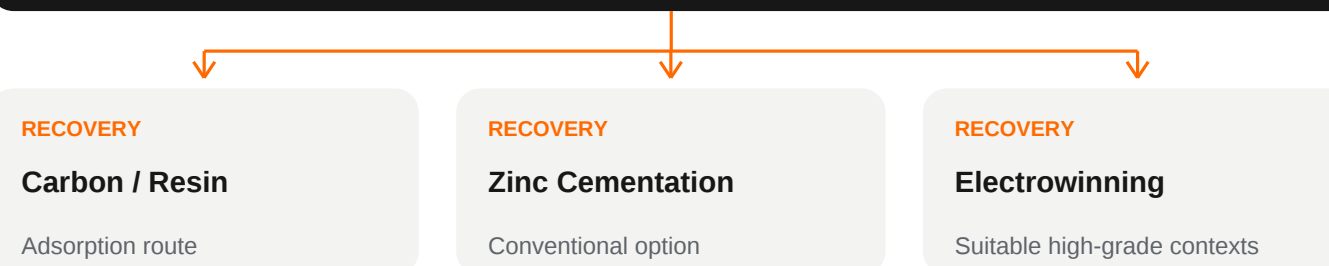
Process-specific recirculation and monitoring belong in the flowsheet.

Pregnant-Solution Recovery

The source material identifies several conventional downstream routes. Selection depends on solution grade, target metal, test results and actual project conditions.

INPUT

Pregnant solution



SELECTION RULE

The downstream route is confirmed by representative solution data, recovery targets and the project flowsheet.