

PRODUCT INFORMATION SHEET (PIS)

COPPER MASSIVE PRODUCED

0. Introduction to this e-SDS

Copper in massive form (particle size >1mm) does not meet the criteria for classification in accordance with Regulations (EC) No 1272/2008 and 67/548/EEC. No safety measures are therefore needed for copper in massive form.

During production of copper in massive forms (e.g. cathodes) and during specific industrial uses (e.g. melting), safety measures may however be needed due to the potential occurrence of hazardous copper-bearing materials (dusts, mists, fumes) and soluble copper compounds in and around industrial settings. This SDS therefore focuses on safety data and safety measures of relevance to the production and industrial uses of copper massive.

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

• Substance name:	Copper massive (particle size >1mm)
• EC number:	231-159-6
• EC name:	copper
• CAS number:	7440-50-8
• Index Number:	Not assigned
• Molecular formula:	Cu
• Registration number:	01-2119480154-42-0061

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Uses of copper in massive and powder forms can be summarised as:

Downstream and Formulation stages – Industrial

DM1 - Production of copper fire-refined ingots, and unwrought shapes (billets, slabs and cakes, etc)

DM2 - Production of copper particulates and powders (including catalyst pellets) – e.g. by thermal, hydrometallurgical and electrochemical processes

F1. Production of alloys, in which copper is the main constituent, as well as where it is a minor alloying element (e.g. in stainless steel, in alloy particulates, in alloy shapes, etc)

F2. Production of copper-powder containing preparations (e.g. brazing paste, pigment paints, etc)

Uses of copper as such or in preparation, including production of articles

U1. Production of copper containing articles (finished and semi-finished products - e.g. wire rod, wires, bars, sections, tubes, strip/sheet, cables and cast products)

U2. Production of articles made from copper and copper containing particulates (e.g. sintered products)

U3. Use as an intermediate in the production of other copper containing substances

U4. Use as brazing paste (handling of preparation by industrial workers) U5. Use

as catalyst (handling of powder by industrial workers)

Service life stage (article or preparation in sealed container) –consumers, professional /industrial workers

- S1. Use of article (handling by consumer) - e.g. handling of coins
- S2. Use of article (handling by professional worker) - e.g. installation of roofs and tubes
- S3. Use as spray coating agent (handling of preparation in sealed container)
- S4. Use of article made from copper and copper-containing particulates - e.g. brake pads

End-of-life stage4

- EoL1. Of industrial wastes -e.g. recycling and recovery as raw material
- EoL2. Of private wastes e.g. collecting, recovery, and disposal

The following exposure scenarios, developed in the REACH Chemical Safety Report for Copper, are relevant to the production and identified uses of copper in massive forms:

Scenario Number	Exposure scenario title as presented in Annex I
1	Raw material and scrap handling of massive metal
20	Raw material and scrap handling of fines, milling to fines
2	Smelting and fire refining
3	Electrolytic Refining
30	Hydro-metallurgical copper production
23	Melting and casting
13	Continuous Dipping
13	Hot processes
9	Heat Treatment
25	Electro deposition
11	Coating & Electroplating
26	Surface treatment
27	Compaction & Sintering & Injection moulding
28	Metallization and Thermal Spraying
5	Low energy mechanical processing of cold metal
12	Welding
16	Etching
18	Handling of articles by consumer and professional worker

1.2.2. Uses advised against

There are no uses advised against

1.3. Details of the supplier of the safety data sheet

- Registered company name: La Farga Lacambra, SAU
- Address: Ctra.C-17 z, km 73,5
08508, Les Massies de Voltregà
- Telephone: (+34) 93 859 04 02
- Fax: (+34) 93 859 04 02
- Email : xavier.fabrega@lafarga.es

1.4. Emergency telephone number

- Emergency telephone: (+34) 93 859 04 02

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

2.1.1. Classification according to Regulation (EC) No. 1272/2008 (CLP/GHS)

Not classified

2.1.2. Classification according to Directive 67/548/EEC

Not classified

2.2. Label elements

2.2.1. Labeling according to Regulation (EC) No. 1272/2008 (CLP/GHS)

None

2.3. Other hazards

The substance does not meet the criteria for a PBT or vPvB substance.

Copper is not expected to contribute to ozone depletion, ozone formation, global warming or acidification.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Constituent	Typical concentration	Concentration range	Remarks
Copper EC no.: 231-159-6	≥ 99.9%	≥99.9— < 100 % (w/w)	No classified impurities

4. FIRST AID MEASURES

4.1. Description of first aid measures

Copper in massive form is not hazardous.

During production and some uses, the following hazardous derivatives may occur/be formed: respirable copper bearing particles and soluble copper compounds. This section also considers potential hazards of copper-bearing materials and copper compounds (referred to as "copper"), relevant to the production and use of copper massive.

General advice: Get medical attention if any discomfort develops. Show this safety data sheet to the doctor in attendance.

Following inhalation: In case of exposure to fumes, fine particulates, powders, flakes: move to fresh air, lay patient down, get medical attention if discomfort persists.

Following skin contact: Use general hygiene measures for contact with the material: wash with soap and warm water. In case of contact with molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Following eye contact: Use general measures if eye irritations occur. Do not rub eyes. Remove any contact lenses. Flush eyes thoroughly with water, taking care to rinse under eyelids. If discomfort continues, consult a physician.

After ingestion: In case of significant oral intake (several mg Cu), rinse mouth and give 200-300 ml water to drink. Do not induce vomiting. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

Gastro-intestinal symptoms are the first symptoms for high oral intakes of soluble copper compounds. Vomiting may occur.

The most critical organ for delayed effects from “copper” excess is the liver.

Nose-lung irritation may be a symptom occurring after inhalation of copper containing fumes/dusts/mists.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable: Massive Copper itself is non-flammable. Use fire fighting measures appropriate to surrounding materials.

Not suitable: Extinguishing media which may be used where molten copper is present: sand, sodium chlorite

Extinguishing media which must not be used where molten copper is present: water or halogenated extinguishing media.

5.2. Special hazards arising from the substance or mixture

Respirable dust

5.3. Advice for firefighters

General protection is needed: wear a self-contained breathing apparatus and a fully protective suit and gloves. Dispose of fire debris and contaminated fire fighting media in accordance with official regulations.

6. ACCIDENTAL RELEASE MEASURES

Copper in massive form is not hazardous.

During production and some uses, hazardous “copper” may be formed and therefore accidental releases of respirable copper-bearing particles and soluble copper compounds are considered.

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel:

Avoid formation of dust.

Ensure adequate ventilation.
Avoid inhalation of dust and fumes. Wear suitable protective equipment.

6.1.2. For emergency responders:

Avoid formation of dust. Ensure adequate ventilation.
Avoid inhalation of dust and fumes. Wear suitable protective equipment. Keep unprotected persons away.

6.2. Environmental precautions

Liquids containing powder should be absorbed in vermiculite, dry sand, or earth before putting into a suitable container for recycling or disposal as hazardous waste.

-Collect dust, particulates, powders, flakes using a vacuum cleaner with a HEPA filter. Place in a suitable container for recycling or disposal as hazardous waste.

-Although the substance is not classified as dangerous to the environment, in the event of an accidental release the product should be prevented from reaching the sewage system or any water course, and from penetrating the ground/soil. Dispose of spilled material in accordance with the relevant local regulations. See Section 13 for disposal considerations.

6.3. Methods and material for containment and cleaning up

Avoid dust formation.
Sweep all spilled material or use an appropriate industrial vacuum cleaner.
Collect spilled material in suitable containers or closed plastic bags for recovery or disposal.
Dispose spilled material or contaminated material as waste. See section 13 for disposal considerations

6.4. Reference to other sections

For more information on exposure controls/personal protection or disposal considerations, check Sections 8 to 13 of this Safety Data Sheet.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

7.1.1. Protective measures

Copper is not classified in massive forms and no protective measures are needed for safe handling.

7.1.2. Advice on general occupational hygiene

Avoid contact with molten material. Do not use water on molten metal.
Melting, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts. Avoid generation and spreading of dust. Avoid inhalation of dust and small particles and contact with eyes.
Provide adequate ventilation.

Observe good industrial hygiene practices

7.2. Conditions for safe storage, including any incompatibilities

Avoid direct contact with strong acids.

7.3. Specific end use(s)

Check the identified uses in section 1.2 of this safety data sheet.

For more information check section 2.1: Control of workers exposure.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

An overview of the assigned protection factors (APFs) of different RPE (according to BS EN 529:2005) can be found in the glossary of MEASE (www.ebrc.de/tools/mease.php)

8.1. Control parameters

The following current national occupational exposure limit values for copper and copper compounds apply:

Country	Occupational exposure limit	Maximum exposure time	Document number–Date	Basis	Link to the legislation
UK	0.2 mg Cu (fume)/m ³ 1 mg Cu (dust and mist)/m ³	8h TWA (dust and mist)/m ³	2007	Copper	Health and Safety Executive- http://www.hse.gov.uk/coshh/table1.pdf
Finland	0.1 mg Cu (alveolar)/m ³ 1 mg Cu (dust and mist)/m ³	8h TWA	2009	Copper	The Ministry of Social Affairs and Health- http://pre20090115.stm.fi/hm1113394626349/passthru.pdf
Belgium	0.2 mg Cu (fume)/m ³ 1 mg Cu (dust and mist)/m ³	8h TWA	2007	Copper	Service public fédéral Emploi, Travail et Concertation sociale- http://www.emploi.belgique.be/WorkArea/showcontent.aspx?id=23914
France	0.2 mg Cu (fume)/m ³ 1 mg Cu (dust)/m ³	8h TWA	2008	Copper	INSTITUT NATIONAL DE RECHERCHE ET DE SÉCURITÉ- http://en.inrs.fr/inrs-pub/inrs01.nsf/IntranetObject-accesParReference/ED%20984/\$File/ED984.pdf
Spain	0.2 mg Cu (fume)/m ³ 1 mg Cu (dust and mist)/m ³	8h TWA	NIPO:792-10-031-X (2011)	Copper	INSTITUTO NACIONAL DE SEGURIDAD E HIGIENE EN EL TRABAJO http://www.insht.es/

8.1.1. PNECs and DNELs

Exposure pattern	Route	Descriptor	DNEL / PNEC
Human –Long-term – systemic effects	Oral, dermal and inhalation	Internal dose DNEL (Derived No Effect Level) Using absorption factors of 25% for oral, 100% for inhalation (respirable) and 0.03% for dermal exposure routes	0.041mg Cu/kg B wt/d
Human –Short-term – systemic effects	Oral, dermal and inhalation	Internal dose DNEL (Derived No Effect Level) Using absorption factors of 25% for oral, 100% for inhalation (respirable) and 0.03% for dermal exposure routes	0.082mg Cu/kg B wt/d
Human –Short-term – effects- drinking water	Oral	A NOAEL for drinking water	4 mg/l
Environmental	Freshwater	PNEC (Predicted No Effect Concentration) Includes a default bio-availability correction	7.8 µg dissolved Cu/L ⁽¹⁾
Environmental	Marine water	PNEC (Predicted No Effect Concentration) Includes a default bio-availability correction	5.2 µg dissolved Cu/L ⁽¹⁾
Environmental	Sediment freshwater	PNEC (Predicted No Effect Concentration) Includes a default bio-availability correction	87 mg Cu/kg dry wt ⁽¹⁾
Environmental	Sediment estuarine	PNEC (Predicted No Effect Concentration)	288 mg Cu/kg dry wt ⁽¹⁾
Environmental	Sediment marine	PNEC (Predicted No Effect Concentration)	676 mg Cu/kg dry wt ⁽¹⁾
Environmental	Soil	PNEC (Predicted No Effect Concentration) Includes a default bio-availability correction	65.5 mg Cu/kg dry wt ⁽¹⁾
Environmental	STP	PNEC (Predicted No Effect Concentration)	230 g dissolved Cu/L

(1) Default PNEC values are given. These can be refined if information on local environment is available (see section 12.1)

8.2. Exposure controls

See section 2.1 of the individual exposure scenarios in Annex I for a detailed description of the required exposure control measures. Any control measures and associated efficiency values are based on actual measured data at the workplace or on the MEASE tool for occupational exposure assessment (<http://www.ebrc.de/ebrc/ebrc-mease.php>).

For appropriate air monitoring, "total" and "respirable" copper levels should be assessed. An Excel sheet that allows the systemic internal human health exposure levels to be calculated is available from: <http://www.eurocopper.org/copper/reach.html>

The environmental assessment uses the Metal EUSES calculator for Downstream Uses which can be freely downloaded from <http://www.arche-consulting.be/Metal-CSA-toolbox/du-scaling-tool>. For environmental monitoring, the physico-chemical characteristics of the local receiving environment should preferably be monitored (see section 12).

8.2.1. Appropriate engineering controls

Prevent formation of dust where possible. Ensure appropriate ventilation/exhaustion at machinery and places where dust can be generated.

Any deposit of dust which cannot be avoided should be regularly removed preferably using appropriate industrial vacuum cleaners or central vacuum systems.

Waste air should be released into the atmosphere only after it has passed through suitable dust separators.

Waste water generated during the production process or cleaning operations should be collected and should preferably be treated in an on-site waste water treatment plant which ensures efficient removal of copper.

8.2.2. Occupational exposure controls:

8.2.2.1. Eye/face protection:

As a precautionary measure, the wearing of suitable safety glasses is advised.

8.2.2.2. Skin protection:

Copper is not classified as hazardous to skin (see section 11 for more details).

8.2.2.3. Respiratory protection

Melting, grinding or machining operations as well as packaging may generate fumes and dusts. Avoid generation and spreading of dust - Use local ventilation to keep levels below established threshold values. A suitable particle filter mask is recommended where needed (see annex 1).

8.2.2.4. Thermal hazards

Not applicable. Copper does not have any self-heating or auto-flammable properties.

8.2.3. Environmental exposure controls

Avoid release to the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Property	Results	Remarks
Appearance	Solid, copper colour.	The particle size >1mm
Odour	Odourless	
Odour threshold	n.a.	
pH	Not applicable to an inorganic solid	
Melting / freezing point	1059-1069°C	
Initial boiling point and boiling range	Not applicable to a solid that melts >300°C	
Flash point	n.a.	
Evaporation rate	n.a.	
Flammability	Non-flammable	
Upper/lower flammability or explosive limits	n.a.	
Vapour pressure	Not applicable to a solid that melts at >300°C	

Property	Results	Remarks
Vapour density	n.a.	
Relative density	8.78g/cm ³ at 20°C	At 20°C
Solubility(ies)	Insoluble	Copper needs to be transformed into a copper compound to become soluble
Partition coefficient: n-octanol/water	n.a.	
Auto-ignition temperature	No auto-ignition	
Decomposition temperature	Decomposition and/or melting starts at 1059°C	
Viscosity	Not applicable to an inorganic solid	
Explosive properties	Non-explosive. The substance does not contain chemical groups associated with explosive properties	
Oxidising properties	Non-oxidising substance.	

9.2. Other information

Not applicable.

10. STABILITY AND REACTIVITY

10.1. Reactivity

Not applicable. See section 9.

10.2. Chemical stability

Under normal conditions of use and storage, the product is stable.

10.3. Possibility of hazardous reactions

Reaction with H- equivalents releases soluble copper compounds.

10.4. Conditions to avoid

Avoid dust formation and contact with acids.

10.5. Incompatible materials

Strong acids.

10.6. Hazardous decomposition products

The element Cu⁰ does not decompose but may be transformed into other metal forms (e.g. Cu²⁺) see section 10.3.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity: The classification criteria, for copper in massive form and copper powder, according to Regulations (EC) No 1272/2008 and 67/548/EEC on acute toxicity, are not met.

STOT single exposure: The classification criteria, for copper in massive form and copper powder, according to Regulations (EC) No 1272/2008 and 67/548/EEC on STOT-SE are not met.

Skin/eye irritation/corrosion: The classification criteria, for copper in massive form and copper powder, according to Regulations (EC) No 1272/2008 and 67/548/EEC on skin/eye irritation are therefore not met.

Respiratory or Skin Sensitisation: The classification criteria, for copper in massive form and copper powder, according to Regulations (EC) No 1272/2008 and 67/548/EEC on sensitization are not met.

Genotoxicity: The classification criteria for copper in massive form and copper powder, according to Regulations (EC) No 1272/2008 and 67/548/EEC on germ cell mutagen are not met.

Carcinogenicity: The classification criteria for copper in massive form and copper powder, according to Regulations (EC) No 1272/2008 and 67/548/EEC on carcinogenicity are not met.

Toxicity for reproduction: The classification criteria for copper in massive form and copper powder, according to Regulations (EC) No 1272/2008 and 67/548/EEC on reproductive toxicity are therefore not met.

Repeated dose toxicity and STOT-RE: The classification criteria, for copper in massive form and copper powder, according to Regulations (EC) No 1272/2008 on Specific Target Organ Toxicity are therefore not met.

12. ECOLOGICAL INFORMATION

Most of the available hazard data are related to exposure of soluble copper compounds (e.g. copper sulphate). For the hazard profile of copper massive forms (assessed from a sphere of 1mm diameter), information on solubility and bioavailability are combined with the hazard profile of soluble copper compounds in a read-across approach to assess its potential hazards

12.1. Toxicity

Environmental bioavailability: The non-abrasive release of dissolved copper ions to the aqueous transformation/dissolution medium (7 days, 100 mg/L loading, pH6), was 6.7 µg Cu/l corresponding to a surface – specific release of 0.15 µg Cu/mm² (Rodriguez et al., 2007)

Acute aquatic toxicity test results and environmental classification: The assessment demonstrates that, according to Regulations (EC) No 1272/2008 and 67/548/EEC, copper massive forms do not need to be classified for acute environmental hazards. Based on the assessment (see section 12.2 and 12.3), according to Regulations (EC) No 1272/2008 and 67/548/EEC, Copper massive does not meet the classification for chronic aquatic toxicity.

Version 2.2 / EN	March 2015	According to COMMISSION REGULATION (EU) No 1907/2006	10/13
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Chronic freshwater toxicity test results and PNEC derivation: Conclusion: a value of 7.8 µg dissolved Cu/L is the default chronic freshwater PNEC, to be used to assess local risks. The assessment can be refined if information on local water chemistry (dissolved organic carbon, pH, calcium, magnesium, sodium and alkalinity) is available.

Chronic marine waters toxicity test results and PNEC derivation: Conclusion: a value of 5.2µg dissolved Cu/L is the default chronic marine water PNEC, to be used to assess local risks. The assessment can be refined if the dissolved organic carbon concentration of the local environment is available.

Chronic freshwater sediment toxicity test results and PNEC derivation: Conclusion: a value of 87 mg Cu/kg dry weight is the default chronic freshwater sediment PNEC, to be used to assess local risks. The assessment can be refined if the organic carbon concentration and the Acid Volatile Sulphide concentrations of the local sediment is available.

Chronic terrestrial toxicity test results and PNEC derivation: Conclusion: a value of 65.5 mg Cu/kg dry weight is the default chronic soil PNEC, to be used to assess local risks. The assessment can be refined if the pH and Cation Exchange Capacity of the local soil is available.

12.2. Persistence and degradability

“Copper” cannot be degraded, but may be transformed between different phases, chemical species, and oxidation states.

In accordance to the EU 2009 CLP guidance, the fate of the copper ion under “environmentally relevant” conditions was modeled, using the Ticket Unit World Model. Rapid removal from the water column was also assessed using data from one mesocosm and three field studies (Rader et al., 2010). The assessment demonstrated the rapid removal of copper-ions, delivered as soluble copper compounds, from the water column under “normal environmental conditions”. Rapid removal of a substance from the water column is defined as 70% removal within 28 days. Literature data demonstrates the strong binding of copper-ions to sediment materials and especially the anaerobic CuS complexes are very stable (Simpson et al., 1998; Sundelin and Erickson, 2001). The remobilisation of Cu-ions to the water column is therefore not expected. The assessment therefore demonstrates that “copper” does not meet the criterion as “persistent”.

12.3. Bioaccumulative potential

The Guidance states the following on Bioaccumulation: “Metals that are essential nutrients are actively regulated: removal and sequestration processes that minimise toxicity are complemented by an ability to up-regulate concentrations for essentiality. As a result, the “bioaccumulative” criterion is not applicable to these metals.”

12.4. Mobility in soil

Copper-ions bind strongly to the soil matrix. The binding depends on the soil properties. A median water-soil partitioning coefficient (Kp) of 2120 L/kg has been derived for soils (more details see Copper Risk Assessment Report, 2008 and Copper Chemical Safety Report, 2010).

12.5. Results of PBT and vPvB assessment

The PBT and vPvB criteria of Annex XIII to the Regulation do not apply to inorganic substances, such as copper and its inorganic compounds.

Copper is not PBT or vPvB

12.6. Other adverse effects

Copper is not expected to contribute to ozone depletion, ozone formation, global warming or acidification.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility.

14. TRANSPORT INFORMATION

Copper massive do not need to be classified for transportation.

RID/ADR:	not restricted	ADNR/ADN:	not restricted
IATA/ICAO:	not restricted	IMO/IMDG:	not restricted

14.1. UN number: Not applicable.

14.2. UN proper shipping name: Not applicable.

14.3. Transport hazard class(es): Not applicable.

14.4. Packing group: Not applicable.

14.5. Environmental hazards: Not applicable.

14.6. Special precautions for users: Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. Worldwide Chemical Inventories

EC inventory (EU): 231-159-6	ENCS (Japan): listed TSCA
(USA): listed	ECL(Korea): listed
DSL(Canada): listed	PICCS (Philippines): listed
AICS (Australia): listed	IECSC(China): listed
NZIoC (New Zealand): listed	

Copper is not a SEVESO substance, not an ozone depleting substance and not a persistent organic pollutant.

15.2. Chemical safety assessment

Chemical safety assessment was carried out for this substance, though as the substance is not hazardous the exposure scenarios are not attached. For any further information please contact the provider (refer to section 1.3 for contact details).

16. OTHER INFORMATION

16.1. Indication of changes

Version 2.0/EN Updated in order to adapt to the Commission Regulation (EU) No 453/2010

Version 2.1/EN Change of the contact phone number and email address, change of the emergency telephone number.

Version 2.2/EN Change of logo

Note: The information provided in this safety data sheet is current to the best of our knowledge and available information from the REACH Joint Dossier (dated 2010).

The data contained in this document are intended as a guide for the user and are based on bibliographic information and actual experiences, in an effort to reflect the current state of the art but should in no way signify our responsibility.

This document is intended as a guide for appropriate precautionary handling of the material by properly trained personnel. It is the user's responsibility to determine the conditions for safe use of this product. Atlantic Copper makes no representations or claims either express or implied, including, without limitation, any warranties of merchantability, fitness for a particular purpose with respect to the information set forth herein or the product to which the information refers. Accordingly, Atlantic Copper will not be responsible for damages that may result from use of or reliance upon this information.

Users must comply with any applicable laws and regulations in force and, in particular, those concerning Safety and Health, Storage and Transport of Dangerous Goods.

We encourage our customers to conduct the appropriate tests before using the product in new areas inadequately qualified previously.