Australian Standard®

Metal finishing—Preparation and pretreatment of surfaces

Part 1: Cleaning using liquid solvents and alkaline solutions

This Australian Standard was prepared by Committee MT/9. It was approved on behalf of the Council of Standards Australia on 28 November 1988 and published on 13 March 1989.

The following interests are represented on Committee MT/9:

Aluminium Development Council

Australasian Institute of Metal Finishing

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Department of Defence

Metal Trades Industry Association of Australia

Society of Automotive Engineers, Australasia

Telecom Australia

The Royal Australian Chemical Institute

University of Queensland

This Standard was issued in draft form for comment as DR 86025.

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Part 1: Cleaning using liquid solvents and alkaline solutions

First published as AS CK9.1—1965.
Revised and redesignated AS 1627.1—1974.
Second edition 1989.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140
ISBN 0 7262 5454 1

PREFACE

This Standard was prepared under the direction of the Standards Australia Committee on Metal Finishing to supersede AS 1627.1–1974, *Code of practice for preparation and pretreatment of metal surfaces prior to protective coating, Part 1: Degreasing of metal surfaces using solvent or alkaline solutions.*

This Standard is one in the AS 1627 series of Standards covering the preparation and pretreatment of metal surfaces used in metal finishing. Others in the series are as follows:

AS
1627.0 *Method selection guide for preparation and pretreatment of steel surfaces.*
1627.2 *Power tool cleaning.*
1627.3 *Flame descaling.*
1627.4 *Abrasive blast cleaning.*
1627.5 *Pickling steel surfaces.*
1627.6 *Phosphate treatment of iron and steel surfaces.*
1627.7 *Hand tool cleaning of metal surfaces.*
1627.8 *Wash primer pretreatment of metal surfaces.*
1627.9 *Pictorial surface preparation standards for painting steel surfaces.*
1627.10 *Cleaning and preparation of metal surfaces using acid solutions (non-immersion).*

CONTENTS

FOREWORD

The procedures described are not suitable for removal of rust, rust scale or millscale but may be used to degrease surfaces prior to using other heavier or mechanical methods such as power tool cleaning or abrasive blasting. Included in the procedures are simple solvent wiping, immersion in solvent, solvent spray, vapour degreasing, emulsion cleaning and alkaline cleaning.

Solvent cleaning is not a suitable method for removal of corrosive salts including chlorides and sulphates, or of detrimental weld flux. These require treatment, according to the degree of contamination, by washing with aqueous solutions, or by power tools or abrasive blast cleaning.

Liquid solvent cleaning seldom completely removes oil and grease but if the type of cleaning is properly selected and properly performed the residue will be tolerable to most paint systems. If not, then other methods of surface preparation will be necessary.

A wide range of methods is in use as well as a wide range of compositions of alkaline cleaning compounds. The nature of the final coating must be taken into account as this may be affected by the method used in alkaline cleaning. It is essential that residues of alkaline cleaning compounds are removed. Cleaning is suitable for removal of dirt, perspiration, light deposits of oil and grease and other water wettable or water soluble contaminants.

Certain detergents used to remove oil and grease may leave residues which can be detrimental to the adhesion of some coatings.

In the cleaning operation care must be exercised to use the solvent properly, as some solvents are toxic or highly flammable or both. With many of the materials mentioned, special safety precautions must be followed for ventilation, smoking, static electricity, respirators, eye protection, skin contact and disposal of wastes.

STANDARDS AUSTRALIA

Australian Standard

Metal Finishing—Preparation and Pretreatment of surfaces

Part 1: Cleaning using liquid solvents and alkaline solutions

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard describes procedures for cleaning metal surfaces of loosely adhering matter, oil, grease, wax, dirt and perspiration, by treatment with liquid solvents and alkaline solutions.

NOTES:

1. Appendix A contains advice and recommendations on information which should be supplied by the purchaser at the time of inquiry or order.
2. Guidance on the selection of cleaning processes is given in Appendix B.

1.2 REFERENCED DOCUMENTS. The documents below are referred to in this Standard.

AS
1337 Eye protectors for industrial applications
1627 Code of practice for preparation and pretreatment of metal surfaces prior to protective coating
1627.5 Part 5: Pickling steel surfaces
1715 Selection, use and maintenance of respiratory protective devices
1716 Respiratory protective devices
2661 Vapour degreasing plant—Design, installation and operation—Safety requirements
K178 Glossary of terms used in electroplating

1.3 DESIGNATION. The designations adopted for the various types of cleaning processes given in Table 2.1 are listed below:

(a) *Alkaline degreasing process (A)*

AS . . . . . Alkaline process—spray process
AD . . . . Alkaline process—dip or soak process
ADM . . . AD process with mechanical agitation
AL . . . . . Alkaline degreasing process—electrolytic

(b) *Solvent degreasing process (S)*

SS . . . . . Solvent degreasing process—spray process
SD . . . . . Solvent degreasing process—cold dip process
SW . . . . Solvent degreasing process—hand wipe
SVD . . . Solvent vapour degrease

(c) *Emulsion degreasing process (EM)*

EMS . . . Emulsion degreasing process—spray process
EMD . . . Emulsion degreasing process—dip process

(d) *High pressure cleaning (P)*

PWJ . . . . Hot water jet—spray process or cold water jet—spray process

1.4 DEFINITIONS. For the purpose of this Standard the definitions in AS K178 and those below apply.

1.4.1 Solvent cleaning—solution of oils and greases assisted by mechanical displacement such as wiping, agitation and spraying, and run-off of degreasing solvent.

1.4.2 Vapour degreasing—removal of oil, grease and dirt by condensation and run-off of degreasing solvent.

1.4.3 Solvent—emulsion cleaning—removal of oil, grease and dirt by emulsification and solution.

1.4.4 Alkaline cleaning (includes detergent cleaning)—removal of oil, grease and dirt by a water solution containing alkaline cleaning components and detergents.

1.4.5 High pressure cleaning—removal of oil, grease and dirt by solution, emulsion and displacement with high pressure hot or cold water containing appropriate cleaning compounds.

1.4.6 Dirt (soil)—unwanted particles of matter which will interfere with a subsequent metal finishing operation (process) if not removed.

NOTE: Dirt and soil in metal finishing may be deemed to be any one or a number of materials, such as oils, greases, lubricants, coolants, pigmented metal drawing compounds (including chlorinated and resulfurized oils), impacted or caked on oils and compounds, shop dirt, abrasive grains, metal dust and chips from metal surface, and free graphite carbon smut.

1.5 SURFACE REQUIREMENTS. The metal surface shall be free from moisture, oil, grease, wax, dirt, perspiration and other soluble and loosely adherent matter to ensure its suitability for the selected subsequent treatment.