Australian Standard®

Metal finishing—Preparation and pretreatment of surfaces

Part 4: Abrasive blast cleaning

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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

Royal Australian Chemical Institute

Society of Automotive Engineers — Australasia

Telecom Australia

University of Queensland

Additional interests participating in preparation of Standard:

Abrasive Blast Cleaning and Protective Coating Association of New South Wales

Association of Abrasive Blast Cleaners and Protective Coaters (Queensland)

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PREFACE

This Standard was prepared by the Standards Australia Committee on Metal Finishing to supersede AS 1627.4–1974, *Code of practice for preparation and pretreatment of metal surfaces prior to protective coating — Abrasive blast cleaning of steel surfaces*. In this edition the technical details have been upgraded and expanded.

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:

1627.0 — *Method selection guide for preparation and pretreatment of steel surfaces.*

1627.1 — *Cleaning using liquid solvents and alkaline solutions.*

1627.2 — *Power tool cleaning.*

1627.3 — *Flame descaling.*

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

Abrasive blast cleaning utilizes a stream of abrasive particles directed onto a metal surface to remove millscale, rust, corrosion products, process scales and foreign particles. The abrasive may be propelled by centrifugal force, or carried in an air or water stream.

Abrasive propelled by centrifugal force using impeller wheels in closed recirculating systems is suited to production line work and other specialized applications. Airborne abrasive is projected through a nozzle and is suitable for open field or on-site conditions, enclosed blasting chambers and portable enclosed circulating systems.

The various forms of wet blasting are usually carried out with non-metallic abrasives with a corrosion inhibitor added to the water. The method serves to minimize dust levels. The high velocity of water, with or without abrasive, aids in removal of contaminants such as salts and process fallout, especially so in pitted steel.

There are two general classes of abrasive, metallic and non-metallic. Practitioners should be aware that a general dust hazard exists for all forms of dry abrasive blast cleaning, and that the use of silica abrasives in dry abrasive blast cleaning represents a specific health hazard to blasters and other people close by. Silica abrasives are banned for dry blasting by many statutory authorities, but may be permitted in wet abrasive blast cleaning, subject to the granting of a special licence and strict observance of safety precautions and conditions laid down by the Statutory Authority.

The texture and colour of the blasted surface may vary depending upon the type of abrasive and method used.

The surface roughness or profile achieved depends on several factors. These include metal substrate, blasting process, abrasive type, abrasive velocity at impact (affected by distance between the workface and nozzle, or wheel), and angle of the blast stream to the workface.

Blast-cleaned surfaces may start to rust quickly and should always be coated before any discolouration occurs. The use of inhibitors in wet abrasive blast cleaning can maintain the condition of blasted surfaces.

STANDARDS AUSTRALIA

Australian Standard

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SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard specifies surface preparation and describes procedures for the abrasive blast cleaning of metal surfaces prior to application of protective coatings, with specific reference to steel. Guidance is given on the choice of abrasives, abrasive methods and types of application.

NOTES:

1. Certain abrasives and blast cleaning methods may be incompatible. State health regulations may prohibit the use of certain dust producing abrasives (see Clause 2.5).
2. Appendix A contains advice and recommendations on information which should be supplied by the purchaser at the time of enquiry or order.

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

AS
1270 Hearing protection devices
1627 Code of practice for preparation and pretreatment of metal surfaces prior to protective coating
1627.1 Part 1: Cleaning using liquid solvents and alkaline solutions
1627.2 Part 2: Power tool cleaning
1627.7 Part 7: Hand tool cleaning of metal surfaces
1627.9 Part 9: Pictorial surface preparation standards for painting steel surfaces
1715 Selection, use and maintenance of respiratory protective devices
1716 Respiratory protective devices
2210 Safety footwear
2312 Guide to the protection of iron and steel against exterior atmospheric corrosion
2536 Surface texture

1.3 DEFINITIONS. For the purpose of this Standard, the definitions below apply.

1.3.1 Abrasive — material which, when projected against a surface at high velocity, will wear and roughen the surface.

1.3.2 Abrasive blast cleaning — the cleaning and roughening of a surface by projection of an abrasive on to it.

1.3.3 Brush (whip) blasting — light abrasive blast cleaning to roughen the surface or remove light rust, foreign particles, scale deposits and chalked outer layers of coating.

1.3.4 Feather edging — reduction of the thickness of the edge of a dry paint film.

1.3.5 Preparation grades — classification describing the quality of preparation achieved by a method of surface cleaning.

1.3.6 Profile comparator — an instrument used to assess the roughness of a blast-cleaned surface.

1.3.7 Selective blasting — the abrasive blast cleaning of a previously coated surface to produce areas of bare exposed metal and areas of brush-blasted surfaces.

1.3.8 Surface profile — the micro-roughness of a surface generally expressed as the height of the major peaks relative to the major valleys.

NOTE: Methods of determining maximum profile height are given in Appendix C.

1.3.9 Threshold limit value — time weighted average concentrations of respirable air-borne particles, for a normal eight hour work day or forty hour week, to which nearly all workers may be repeatedly exposed day after day without adverse effect.

1.3.10 Visible rust and millscale — rust or millscale which can be seen without magnification, with normal or corrected vision.

1.3.11 Water blasting — the method of cleaning a surface by the use of a jet of water under pressure. The jet of water may be accompanied by abrasives.

1.3.12 Wet abrasive blast cleaning — abrasive blast cleaning of a surface by compressed air or mechanical means using a mixture of abrasive and water, with or without air mixed into the abrasive stream.

1.3.13 Wet blasting inhibitor — a chemical added to the water used in wet abrasive cleaning or water blasting to reduce the susceptibility of the surface to flash corrosion.

1.4 CLASSES OF SURFACE PREPARATION.

1.4.1 Steel. Four classes of surface preparation are specified as follows:

(a) *Class 1 — Light Blast Cleaning* — the blast intensity and distribution are such that loose mill scale, loose rust, and foreign particles are removed.

This degree of preparation approximates the applicable grade of steel and pictorial surface preparation standard Sa 1 of AS 1627.9.

(b) *Class 2 — Medium Blast Cleaning* — the blast intensity and distribution are such that mill scale, rust and foreign particles are substantially removed and grey metal is visible.