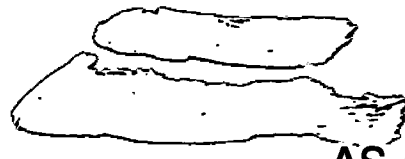

AS 4211.1(Int)—1994
**(Expires 15 August 1996)**

Interim Australian Standard®

# Gas recovery or combined recovery and recycling equipment

## Part 1: Automotive air-conditioning systems

STANDARDS AUSTRALIA

This Interim Australian Standard was prepared by Committee ME/75, Gas Recovery and Reclaiming Equipment. It was approved on behalf of the Council of Standards Australia on 24 May 1994 and published on 15 August 1994.

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The following interests are represented on Committee ME/75:

Air Conditioning and Refrigeration Manufacturers Association

Appliance Industry Association

Association of Fluorocarbon Consumers and Manufacturers

Australian Automotive Aftermarket Association

Australian Chamber of Commerce and Industry

Australian Chamber of Manufacturers

Australian Industrial Gas Manufacturers Association

Australian Institute of Refrigeration, Air Conditioning and Heating

Building Services Corporation

Commercial Refrigeration Manufacturers Association of Australia

Environment Protection Authority of N.S.W.

Fire Protection Industry Association of Australia

Metal Trades Industry Association of Australia

Motor Trades Association of Australia

Motor Vehicle Repair Industry Council

New South Wales TAFE Commission

Office of Planning and Urban Development, S.A.

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# Gas recovery or combined recovery and recycling equipment

# Part 1: Automotive air-conditioning systems

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# PREFACE

This Interim Standard was prepared by the Standards Australia Committee on Gas Recovery and Reclaiming Equipment.

In view of concern about the effect that chlorofluorocarbons (CFCs) and halons used in refrigeration, air-conditioning and firefighting equipment have on the stratospheric ozone layer, it has become mandatory to recover these ozone-depleting substances rather than vent them to atmosphere during servicing of equipment.

Recycling of the refrigerant to a minimum purity level will ensure that system operation with recycled refrigerant provides the same level of performance as those systems using new refrigerant.

This Interim Standard is Part 1 in a series of Standards on recovery or combined recovery and recycling equipment. This Part has been written specifically for use with automotive air-conditioning systems. Other parts are specific to other industries such as commercial and domestic refrigeration or air-conditioning, or fire protection. It has been initially published as an Interim Standard due to the pressing need to give manufacturers minimum requirements to which equipment can be manufactured.

It is a recommendation of Committee ME/75 that substances used as alternatives to CFCs and halons, including HCFCs and HFCs, should be recovered, or recovered and recycled.

In the preparation of this Interim Standard, cognizance was taken of relevant Society of Automotive Engineers (SAE) Standards.

Standards Australia invites comment on this Interim Standard from persons and organizations concerned with this subject. The date of expiry for comment is two years after publication at which time this Interim Australian Standard will be confirmed, withdrawn or revised in the light of public comment.

During the life of this document the Committee will monitor all comment as it is received.

Attention is drawn to the fact that this document is an Interim Australian Standard and should be regarded as a development Standard liable to future alteration.

# CONTENTS

# FOREWORD

Chemicals called chlorofluorocarbons (CFCs) were first synthesized in the 1920s and found rapid acceptance as refrigerants, replacing toxic chemicals such as methyl chloride and sulphur dioxide. By the 1950s, CFCs had become so cheap that it was not economical to recover them from most equipment being leak tested, serviced or decommissioned and even when it was economical to recover the bulk of the refrigerant from large equipment, recovery of the residual vapour was rarely attempted.

In 1974, scientists hypothesized that CFCs could cause depletion of ozone in the stratosphere. Because CFCs are stable compounds, their vapours when released will disperse throughout the lower atmosphere without being destroyed by natural processes and slowly migrate into the stratosphere where they are degraded by ultraviolet radiation, releasing chlorine which catalytically destroys ozone.

In 1987, concern about the potential effect of ozone depletion led to an international treaty called the Montreal Protocol on Substances that Deplete the Ozone Layer. By 1988, scientific evidence had implicated chlorine from CFCs and bromine from halons in the annual Antarctic ozone hole and had shown that a total phasing out of ozone depleting substances was necessary to protect the global ozone layer. Recovery and recycling became widely adopted as a means of reducing emissions of CFCs and halons prior to their phasing out.

The Montreal Protocol now requires that CFCs and halons be phased out by 1996, although another class of chemical, hydrochlorofluorocarbons (HCFCs), which have a low but still significant ozone depletion potential, will continue in use for some decades. Users of HCFCs are urged by the Montreal Protocol to implement recovery and recycling programs.

Among the replacements for CFCs and HCFCs is a third class of chemical called hydrofluorocarbons (HFCs) which, like CFCs and HCFCs, is a greenhouse gas with significant global warming potential. There is an environmental need for such chemicals to be recovered and recycled if they are to be used industrially.

STANDARDS AUSTRALIA

# Interim Australian Standard

# Gas recovery or combined recovery and recycling equipment

## Part 1: Automotive air-conditioning systems

## SECTION 1 SCOPE AND GENERAL

**1.1 SCOPE** This Standard specifies the minimum requirements for safe and efficient recovery or combined recovery and recycling of refrigerants directly removed from and intended for reuse in automotive air-conditioning systems. It outlines minimum equipment specifications, test methods to determine equipment performance and specifies minimum purity levels allowed for recycled R12 and R134a. This information applies to equipment used to service cars, trucks and other vehicles with similar air-conditioning systems. Equipment used on mobile vehicles that have hermetically sealed systems for refrigerated cargo are not covered in this document.

**1.2 APPLICATION** This Standard is intended for use by both users and manufacturers of equipment which is used to either recover or recover and recycle refrigerant from automotive air-conditioning systems.

**1.3 REFERENCED DOCUMENTS** The following documents are referred to in this Standard:

AS

1210 Unfired Pressure Vessels (known as the SAA Unfired Pressure Vessels Code)

1677 Refrigerating systems

1939 Degrees of protection provided by enclosures for electrical equipment (IP Code)

2030 The approval, filling, inspection, testing and maintenance of cylinders for the storage and transport of compressed gases (known as the SAA Gas Cylinders Code)

2030.1 Part 1: Cylinders for compressed gases other than acetylene

2473 Valves for compressed gas cylinders (threaded outlet)

2613 Safety devices for gas cylinders

2971 Serially produced pressure vessels

3100 Approval and test specification—General requirements for electrical equipment

SAE

J2196 Service hose for automotive air-conditioning

J2197 HFC-134a (R-134a) service hose fittings for automotive air-conditioning service equipment.

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

**1.4.1 Continuous operation** The capacity of equipment to perform the performance test cycles given in Section 3 without cycling on any of its safety devices.

**1.4.2 Recovered refrigerant** A refrigerant that has been removed from an automotive air-conditioning system.