Health & Safety
GUIDANCE INFORMATION

KEN-WELD

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Associated document:	Lloyd's Register Welding Consumables Approval Certificate No. QDO 1410921

Product name:	A18 MIG wire reel
Product description:	0.6mm/5kg/Reel/KEN-887-1960K 0.8mm/5kg/Reel/KEN-887-1980K 1.0mm/5kg/Reel/KEN-887-2000K
Usage:	For welding mild steel and C-Mn steels including tanks, boilers, pipework, machinery, vehicle chassis fabrication and shipbuilding.

1. INTRODUCTION

This data has been prepared to give health and safety information for KEN-WELD welding wire. It is the responsibility of the user/employer under the Health and Safety at Work Act to ensure that safe working practices are employed and that safe working conditions are maintained.

2. WELDING FUMES

No fumes or gases are evolved by MIG consumables at normal ambient temperatures, but in use however welding fumes will be produced. Welding fume consists of various airborne substances-fine particles and gases-which may constitute a health hazard if inhaled or swallowed. The degree of hazard to the welder, or others in the nearby area depends on the composition of the fume, the concentration in the air being breathed and the time of exposure. The tables in this section give the chemical composition of the particulate fume evolved during the use of the welding consumables, generated under controlled conditions using a compatible base material. The chemical composition of the fume is expressed as weight percent of elements, as is conventional, rather than the oxides, silicates and other complex components, which actually arise in welding fume. MIG welding may give rise to the gases, particularly at high current levels and, ozone generation may be increased by the presence of argon in the

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atmosphere surrounding the arc. Carbon monoxide may be produced by decomposition of carbon dioxide in the shielding gas or of carbonates in flux cored wires.

3. OCCUPATIONAL EXPOSURE
It is the responsibility of the user/employer under the Health & Safety at Work Act and the Control of Substances Hazardous to Health (COSHH) regulations that limits are not exceeded.

4. HAZARDS OF EXCESSIVE EXPOSURE
Effects from excessive exposure to fume arising from inadequate ventilation may become apparent at the time of welding or shortly afterwards or at some later date. Some of the effects are summarised below, and here it is important to note that workers other than welders may also come into contact with the products of welding fume:-

(a) Irritation of the Respiratory Tract
This is the effect of dust or fume on the lining of the respiratory tract and can cause dryness of the throats, tickling, coughing, chest tightness, wheezing and difficulty in breathing. In its most acute form it can cause the lungs to become full of fluid. The effects will vary with exposure, concentration and type of irritant.

(b) Metal Fume Fever
The inhalation of freshly formed metallic oxides such as those of zinc, chromium, nickel, copper, manganese may lead to an acute influenza like illness termed metal fume fever.

(c) Systemic Poisoning
This can result from the inhalation or swallowing of substances such as fluorides, hexavalent chromium, lead and barium.

(d) Long Term Effects
It is possible that certain constituents of welding fume such as hexavalent chromium and nickel may be carcinogenic and until there is definite information about this it is wise to treat them as such.

(e) Fibrosis
This is the formation of fibrous or sore tissues in the lungs. It is the result of a reaction between dust or fume with the lung tissue. There are various types depending on the nature of the substance involved and duration of exposure.

In all cases of doubt concerning physiological response to welding pollutants, medical advice should be sought promptly.

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5. WELDING PROCESSES AND CONSUMABLE COMPOSITION

MIG welding consumables are bare wires deposited under an inert gas shield. Gas mixtures may also be used in which all or part of the gas is active rather than inert. Solid wire MIG consumables for the welding of mild and low alloy steels may have thin protective copper coating.

Chemical Composition (%)	Mechanical Properties
C 0.06 - 0.15 Mn 1.40 - 1.80 Si 0.80 - 1.15	$\sigma_b \geqslant 500MPa$ $\sigma_s \geqslant 420MPa$ $\delta_5 \geqslant 22\%$ AKv≥27J (-30 °C)

6. HANDLING AND STORAGE

No special safety precautions are necessary in the handling and storage of welding consumables, although obviously electrode coatings should not be ingested or allowed to come into contact with food or drink.

7. FIRE/EXPLOSION HAZARD

Welding consumables are not inflammable under ordinary conditions and do not present a fire or explosion risk. Welding consumables should not be allowed to come into contact with acids or other corrosive substances.

8. PERSONAL PROTECTION/VENTILATION

Welders should wear the protective clothing and eye protection appropriate to electric arc welding, i.e. protection against ultraviolet rays, spatter and slag. Local fumes extraction and/or general ventilation must be adequate to keep fume concentrations within safe limits for both the welder and others.

9. OTHER SOURCES OF FUME

Fume origination from welding consumables may be augmented by fume arising from substances present on the surface of the material being welded e.g. oil, grease, paint, protective coatings, degreasing agents. Advises regarding any possible hazard, which may result from these sources should be sought from the appropriate manufacturer or supplier.

Fume analysis for mild and low alloy MIG wire where control of the total welding fume to 5mg/m^3 will ensure that no individual constituent of the fume will exceed its own recommended occupational exposure limit (OEL).

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Occupational exposure limits for a large number of substances are listed in Guidance Note EH40.

Fume Analysis (wt %)							
Solid Wire	Fe	Mn	Ni	Cr	Cu	Pb	F
As per product description above	48	10.5	<0.1	<0.1	0.9	0.48 -	

10. PERSONAL PROTECTION/VENTILATION

Welders should wear the normal protective clothing and eye protection appropriate to electric arc welding. Under certain circumstances particularly with some high alloyed electrodes, the slag formed on the weld bead can detach and fly off in pieces, presenting a burn hazard to eyes and skin. Those in close proximity to welders should protect themselves from the danger of flying slag.

Ventilation and/or fume extraction must be adequate to keep fume concentration within safe limits.

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