

# Your triple savings book

Save time, work and money  
with Messer's ternary mixtures.





## Modern materials call for modern gases

In metal processing, overall production efficiency is influenced to a large extent by welding. Any potential improvement in productivity and quality has a positive impact on production costs.

However, different materials have different requirements when it comes to the welding process and the shielding gas atmosphere. Especially when welding unalloyed steels, welds with even lower spatter and slag levels are now required: nowadays, many end products are treated with water-soluble paint after welding, which in some cases do not fully cover the welding spatter or slag islands on the surface of the weld. In the worst case scenario, this could cause premature corrosion. Messer has reacted to this development precociously by developing a range of optimized shielding gas mixtures for welding.

## Messer's ternary mixtures are triple savers

The new shielding gas mixtures of Messer facilitate welding performance of the highest quality for every type of welding and every material. The improvement in quality allows a higher welding speed as well as a significantly reduced reworking time, which leads to a noticeable reduction in the overall costs.

You save:

- 1 **Time** – through up to 20% faster welding
- 2 **Work** – through up to 90% less reworking, higher welding quality and welds with lower slag levels
- 3 **Money** – through significantly reduced production costs



**Our tip: Since, on average, the gas costs only make up approx. 5% of the total welding production costs, the shielding gas costs pay for themselves with the first application. Let one of our technical consultants calculate your specific savings for you.**

## Good calculations – smart savings

In order to maintain their strong market position as the price war intensifies, every company constantly has to think carefully about how to reduce costs. While it is important to examine individual issues closely, it is crucial not to lose sight of the “big picture”.

Clever investment allows the entire production process to be made more economical.

- Example 1: An increase in the welding speed, combined with increased utilization of production capacity, leads to a corresponding reduction in all fixed costs per product.

Costs for welding consumables such as shielding gases, the consumption of which per unit of time remains the same, are also reduced.

- Example 2: If the welding speed can be increased from 32 cm/min to 38 cm/min, then the gas consumption for 1 m of weld at 15 l/min drops from 46.9 l to 39.5 l.



## Ferroline C12 X2

ISO 14175 M24

### Mixture

<b>Argon</b>	<b>86% by vol.</b>
<b>Oxygen</b>	<b>2% by vol.</b>
<b>Carbon dioxide</b>	<b>12% by vol.</b>

### Use

Shielding gas for manual, mechanized and automated MAG welding of unalloyed and low-alloy steels.

Particularly suitable for welding joints on components with a medium to greater sheet thickness.

### Properties

- steady, stable arc
- suitable for all sheet thicknesses
- suitable for all welding positions
- intensive penetration
- finely rippled, smooth weld surface
- fine-droplet metal transfer

# Savings potential

- 1 **Time:** low spattering
- 2 **Work:** less reworking
- 3 **Money:** shorter non-productive times



## Ferroline C12 X2

I:	260 A
U:	32.0 V
$V_D$ :	13.0 m/min
$V_S$ :	32.0 cm/min
P:	8.30 kW



## Ferroline C18

I:	252 A
U:	32.3 V
$V_D$ :	13.0 m/min
$V_S$ :	32.0 cm/min
P:	8.14 kW

## Ferroline C6 X1

ISO 14175 M24

### Mixture

<b>Argon</b>	<b>93% by vol.</b>
<b>Oxygen</b>	<b>1% by vol.</b>
<b>Carbon dioxide</b>	<b>6% by vol.</b>

### Use

Shielding gas for manual, mechanized and automated MAG welding of unalloyed and low-alloy steels.

Particularly suitable for welding joints on components with a low to medium sheet thickness.

### Properties

- steady, stable arc
- even penetration
- finely rippled, smooth weld surface
- fine-droplet metal transfer
- suitable for low to medium sheet thicknesses
- suitable for all welding positions



# Savings potential

- 1 **Time:** high deposition efficiency
- 2 **Work:** almost spatter-free, less distortion
- 3 **Money:** lower gas consumption



## Ferroline C6 X1

I:	292 A
U:	31.5 V
$V_D$ :	15.6 m/min
$V_S$ :	38.4 cm/min
P:	9.19 kW



## Ferroline C18

I:	252 A
U:	32.3 V
$V_D$ :	13.0 m/min
$V_S$ :	32.0 cm/min
P:	8.14 kW

# Inoxline He3 H1

## ISO 14175 R1

## Mixture

<b>Argon</b>	<b>95.5% by vol.</b>
<b>Helium</b>	<b>3% by vol.</b>
<b>Hydrogen</b>	<b>1.5% by vol.</b>

## Use

Shielding gas for manual, mechanized and automated TIG welding of stainless steel.

## Properties

The mixture is a reducing gas with a high arc pressure.

- narrower welds with the same penetration depth
- less distortion
- finely rippled, smooth weld surface
- also suitable for out-of-position welding


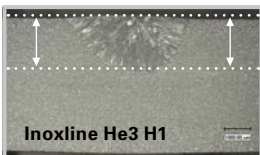



Less oxidation tint with greater sheet thicknesses

# Savings potential

- 1 **Time:** higher welding speed
- 2 **Work:** less distortion, reduced oxidation tint
- 3 **Money:** lower gas consumption, less electricity / lower energy costs



	Welding speed [cm/min]	Current [amperes]
 Argon	21	150
 Inoxline He3 H1	21	120
 Inoxline He3 H1	28.5	150

## Pores or cracks?

### – Moisture in the shielding gas

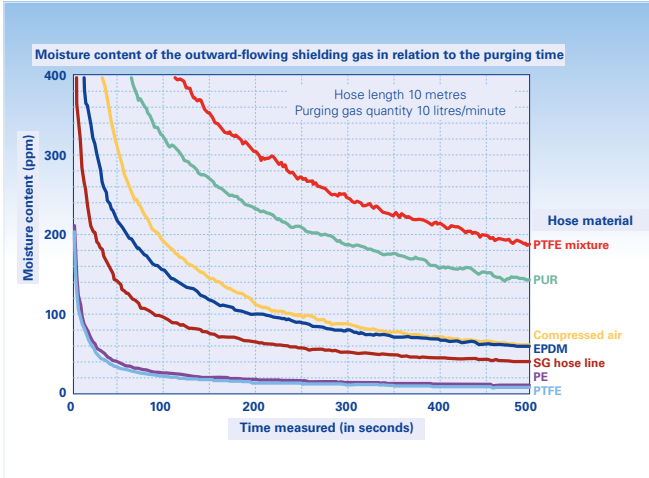
The purity of a shielding gas plays an important role both in processing sensitive metals such as titanium and in welding common structural steels and aluminium.

The quality requirements for shielding gases for welding are defined in the ISO 14175 standard.

In spite of the high level of gas purity, pores or hydrogen cracks are a frequent occurrence. The most common cause for this is moisture. This is introduced mainly through the gas hoses, as well as through leaks in the gas supply system. The shielding gases should be supplied using hoses that comply with ISO 3821 (formerly 559). These hoses can be easily recognized since the name of the standard is imprinted on them.

Many users use compressed-air hoses of the quality typically available in DIY superstores. While they cost significantly less, they do have clear disadvantages: the moisture in the air passes through the wall of the hose to the inside, where it is transferred to the dry shielding gas and only slowly purged again.

# Moisture through hoses



This means that the quality supplied by the gas manufacturer cannot be fully exploited.

**Our advice: Make sure you get certified quality when purchasing accessories!**  
**One of our technical consultants will be glad to help you with your selection.**

## EN 1090-2, which shielding gas complies with the standard?

Since July 2014, steel supporting structures have had to be manufactured in accordance with EN 1090-2. Every new regulation gives rise to new questions, e.g. "Which shielding gas complies with the standard?"

The requirements for welding consumables are dealt with under section 5.5 of EN 1090-2. This contains a crucial reference.

- All welding consumables must comply with the regulations as assigned in Table 5.

As far as shielding gases for welding are concerned, the table refers to ISO 14175 "Welding consumables – Gases and gas mixtures for arc welding".

This international standard specifies all the necessary requirements for shielding gases for welding. All gases which satisfy the ISO 14175 requirements therefore also comply with EN 1090-2.

This applies to all of our gas mixtures. Since they comply with ISO 14175, they also comply with EN 1090-2.

# Your Messer service: competent, friendly, fast

Many customers require expert advice, especially when switching to a new gas mixture. This is a matter of course for us. We answer all questions and concerns about gas-relevant welding and cutting processes quickly, personally and individually.

## **Expert advice**

Directly at our customers' premises of course.

- Process optimization for enhanced efficiency and quality
- Fault detection
- Process developments
- Help with gas selection

## **Technical training**

So that you are always up to date.

- Processes and their applications
- Use of different shielding gases for welding
- Safe use of industrial gases

## **Profitability analysis**

For quicker and more efficient production.

- Analysis of existing processes
- Identification of potential areas of optimization
- Process changes
- Comparison of efficiency before/after



# We are triple saver.

Save welding time, reworking and costs with Messer's ternary mixtures.

Peter von Mühlennen and Zeljko Zekovic, Bator Industrietore AG

  
gasesforlife.de

  
gase.de

  
facebook.com

  
instagram.com

  
xing.com

  
linkedin.com

  
twitter.com

**MESSER**   
Gases for Life

**Messer Group GmbH**

Gahlingspfad 31  
47803 Krefeld  
Germany

Phone +49 2151 7811-0

Fax +49 2151 7811-503

welding-technology@messergroup.com

www.messergroup.com