

MIG/MAG weld seam faults & mistakes

Overview

There are many types of weld seam faults. They are classified and the permissible limit values are specified in standards. Weld seam faults impede the welded construction and are often categorised as:

- Inner weld seam faults
- Outer weld seam faults

For more on this topic, see pages of the relevant Welding Manuals:



- TIG - Unit 13, page 70
- MIG/MAG - Unit 13, page 64
- MMA - Unit 10, page 49

Inner welding seams

Fault type	Appearance	Cause(s)	Remedy
Pores		<ul style="list-style-type: none"> – Faulty shielding gas cover – Humidity – Contaminations – Impeding coating 	<ul style="list-style-type: none"> – Improve shielding gas cover – Keep workpiece and filler metal dry – Clean the workpiece – Use clean filler metal – Remove coatings
Slag entrapment		<ul style="list-style-type: none"> – Welding power too low – Arc too long – Poor joint preparation – Forward slag during flux-cored wire welding 	<ul style="list-style-type: none"> – Increase welding power – Shorten arc – Clean joint preparation – Correct welding torch position
Lack of penetration		<ul style="list-style-type: none"> – Unsuitable joint preparation – Welding power too low – Arc too long – Welding speed too high 	<ul style="list-style-type: none"> – Enlarge root opening – Increase power – Shorten arc – Reduce welding speed
Cracks / heat cracks		<ul style="list-style-type: none"> – Unfavourable ratio between weld seam width and weld seam depth – High internal stresses in the component – Incorrect filler metal – Coolant escape 	<ul style="list-style-type: none"> – Observe normal ratio between weld width and weld depth 1:1 (unalloyed steels) – Tack component without tension – Select suitable filler metal – Check welding torch

Outer welding seams

Fault type	Appearance	Cause(s)	Remedy
Unsymmetrical weld		<ul style="list-style-type: none"> – Incorrect work angle of the welding torch – Weld pool too large – Incorrect welding parameters 	<ul style="list-style-type: none"> – Correct welding torch position – Reduce welding power – Shorten arc length – Correct parameter selection
Weld reinforcement		<ul style="list-style-type: none"> – Too much filler metal in relation to the welding speed – Wire diameter too large – Incorrect welding torch position 	<ul style="list-style-type: none"> – Increase welding speed – Use less filler metal – Select suitable wire diameter – Correct welding torch position
Undercuts		<ul style="list-style-type: none"> – Arc too long/voltage too high – Welding power too high – Excessive weaving – Incorrect welding torch position 	<ul style="list-style-type: none"> – Reduce arc length/voltage – Reduce welding power – Correct welding torch position
Cater cracks		<ul style="list-style-type: none"> – Severe shrinking when the weld pool freezes – Welding power reduced too quickly 	<ul style="list-style-type: none"> – Lower the welding power before the end of welding – Leave welding torch for gas post-flow at the end of welding
Edge misalignment		<ul style="list-style-type: none"> – Poor fixing or tacking of workpieces – Distortion during tacking – Breaking of tack welds before welding over 	<ul style="list-style-type: none"> – Fix workpieces securely – Use correct weld sequence – Dimension stitch welds adequately
Excessive penetration		<ul style="list-style-type: none"> – Heat input too high – Air gap too large – Root pass too thin 	<ul style="list-style-type: none"> – Reduce welding power – Reduce air gap
Welding spatter		<ul style="list-style-type: none"> – Incorrectly set welding parameters – Incorrect polarity – Poor quality filler metal – Inferior shielding gas 	<ul style="list-style-type: none"> – Set the correct welding parameters – Select the correct polarity – Test the filler metal – Check the shielding gas supply