



TESYDO, s.r.o.

Mariánské nám. 1, 617 00 Brno, Česká republika (CZ)

* / Člen AIO, HK, TNK, CWS ANB (člen EWF, IIW a IAB) /*

* / Member of AIO, HK, TNK, CWS ANB (member of EWF, IIW a IAB) /*


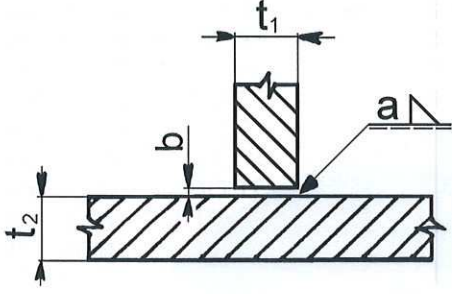
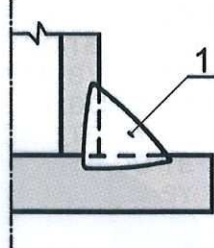
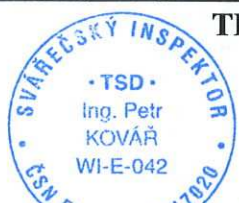
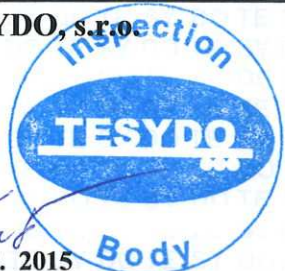
Technická, školící, zkušební, certifikační a inspekční činnost


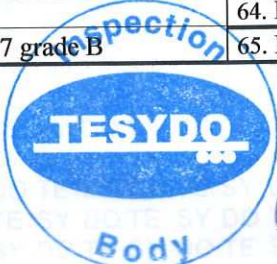

Technical, training, testing, certification and inspection activity

Autorizovaná osoba / Notifikovaná osoba, Authorized Body / Notified Body

301-F02

1. Welding procedure Qualification Record (WPQR) – Test certificate		2. Reference No. 2557 – 2015	3. Leaf 1 4. Total 3 5. Check No. 7
6. Firm : DRAHOŠ s.r.o.	7. Address : Letiště 322 539 73 Skuteč		
8. Inspecting procedure: TOS - 301 - A	9. Date of Welding : 14. 5. 2015		
10. Rules / Testing Standards : ČSN EN ISO 15614-1	Specification and qualification of welding procedures for metallic materials. Welding procedure test – Part 1 : Arc and gas welding of steels and arc welding of nickel and nickel alloys.		
11. Range of	– test	– approval	
12. Welding process	135 (MAG)	135 (MAG) - according to ČSN EN ISO 4063	
13. Stage of mechanization (machinery)	Hand	Hand - acc. to ČSN EN ISO 15614-1 article 8.4.1	
14. Joint type and weld variety	FW - ČSN EN ISO 9692-1	FW - acc. ČSN EN ISO 15614-1 art. 8.4.3	
15. Dimension of fillet weld [mm]	a = 4,0	a = 3,0 to 6,0 - ČSN EN ISO 15614-1 table. 6	
16. Welding position	PH - ČSN EN ISO 6947	- according to ČSN EN ISO 15614-1 art. 8.4.2	
17. Parent metal mark	S355J2H, group 1.2 S355J2+N, group 1.2	- acc. to ČSN EN ISO 15614-1; CEN ISO/TR 15608	
18. Parent metal thickness [mm]	t₁ = 6,0 t₂ = 6,0	t₁ = 3,0 to 12,0 – dle ČSN EN ISO 15614-1 table. 6 t₂ = 3,0 to 12,0 – dle ČSN EN ISO 15614-1 table. 6	
19. Pipe outside diameter [mm]	D = 60,0	D = — - acc. to ČSN EN ISO 15614-1 table 7	
20. Filler metal type	EN ISO 14341-A: G3Si1	- acc. to ČSN EN ISO 15614-1 art. 8.4.4; art. 8.4.6	
21. Shielding gas / Flux	EN ISO 14175: M21	- acc. to ČSN EN ISO 15614-1 art. 8.5.2	
22. Type of Welding current / Polarity	DC (+) / indirect	DC (+) / indirect - ČSN EN ISO 15614-1 art. 8.4.7	
23. Angle branch pipe [°]	α_{odb} = —	α_{odb} = — - acc. to ČSN EN ISO 15614-1 art. 8.4.3	
24. Heat input [kJ/mm]	Q = 0,45 až 0,54	Q = ± 25% - acc. to ČSN EN ISO 15614-1 art. 8.4.8	
25. Metal transfer	spray	spray, globular - acc. to ČSN EN ISO 15614-1 art. 8.5.2	
26. Preheat temperature [°C]	T_p = min. 10		
27. Interpass temperature [°C]	T_i = —		
28. Post weld heat treatment	After welding - free cooling on air according to product standard or ČSN 050211		
29. Other informations :	Qualification of welder according to ČSN EN 287 - 1		
30. <i>Certified that test welds were prepared, welded and tested in accordance with the requirements of the code, respective testing standards, with satisfactory result.</i>			
31. Location of issue : Brno			32. Inspecting Authority: TESYDO, s.r.o.
33. Date of issue : 27. 5. 2015			 Ing. Vladimír Kudělka Ph.D.
„Deutsch“ siehe Rückseite. „Čeština“ viz druhá strana.		34. Name, signature	

		TESYDO, s.r.o.		301-F02		
		1. DETAILS OF WELD TEST NOTED LEAF OF WELDING PARAMETERS				2. Leaf 2 3. Total 3 4. Check No. 7
5. WPQR No.	2557 – 2015		8. Manufacturer	DRAHOŠ s.r.o.		
6. WPS No.	03/135/2015		9. Location	Letiště 322, 539 73 Skuteč		
7. Testing piece No.	15 – 036 – 1		10. Welder's name	MALINSKÝ Ondřej		
11. Joint weld						
12. Joint type		FW		15. Welding process		135 (MAG)
13. Weld variety		singlelayer		16. Welding position		PH
14. Way of preparation weld bevel		working, grinding		17. Cleaning		brushing, degreasing
18. Parent metal			24. Filler metal			
19. Marking of mater. 1		S355J2H, group 1.2		25. Marking		EN ISO 14341-A: G 3Si1
20. Marking of mater. 2		S355J2+N, group 1.2		26. Manufacturer / Trade mark		ESAB/OK ARISTOROD 12. 50
21. Metal thickness		t ₁ = 6,0 mm; t ₂ = 6,0 mm		27. Marking		—
22. Outside diameter		D = 60,0 mm		28. Manufacturer / Trade mark		—
23. Other informations		—		29. Drying filler metal		—
30. Draft of joint			31. Dimensions		32. Welding procedure	
			a [mm]			
			4,0			
			b [mm]			
			0 – 0,5			
			c [mm]			
—		α [°]		—		
33. WELDING PARAMETERS						
34. Weld bead		1				
35. Welding process		135				
36. Diameter of filler metal [mm] - Ø		1,0				
37. Welding current [A]		200 – 230				
38. Welding voltage [V]		22 - 23				
39. Type of Welding current and polarity		DC (+)				
40. Transfer of metal filler material		spray				
41. Speed feeding of wire [m.min ⁻¹]		10,5				
42. Speed feed of welding [mm.s ⁻¹]		7,8				
43. Heat input [kJ.mm ⁻¹]		0,45 – 0,54				
44. Measured preheat temperature [°C]		18		45. After - heat :		46. Type of automatic machine
47. Interpass temperature [°C]		—		—		and Welding head :
48. Other informations				60. Post weld heat treatment or ageing		
49. Shielding gas - Shield of weld		EN ISO 14175: M21		61. Speed of heating		
50. Rate of flow gas [l/min]		10 - 12		62. Speed of cooling		
51. Shielding gas - Schield of root		—		63. Temperature		
52. Rate of flow gas [l/min]		—		64. Dwell at temperature		
53. Angle of oscilation (max. width bead)		—		65. Inspecting Authority		
54. Type and dimension of wolfram electrode		—		 		
55. Oscilation – amplitude, frequency, time of dwell		—				
56. Angle of positioning torch		—				
57. Electrode sparing (contacting Welding tip) [mm]		12 - 14				
58. Details for Welding pulsation		—				
59. Details to grooving of root		—				
66. Name, Date of test, Signature		Ing. Petr Kovář 14. 5. 2015				
„Deutsch“ siehe Rückseite „Čeština“ viz druhá strana.						

	TESYDO, s.r.o.				301-F02			
	1. DETAILS OF WELD TEST TEST RESULTS				2. Leaf 3 3. Total 3 4. Check No. 7			
5. WPQR No. 2557 – 2015		6. Manufacturer DRAHOŠ s.r.o.						
7. NON – DESTRUCTIVE TEST								
8. Criteria for approval Welding procedure : ČSN EN ISO 17637, ČSN EN ISO 3452-1, ČSN EN ISO 5817, ČSN EN ISO 15614-1								
9. TESTS		10. Testing laboratory		11. Report reference No		12. Result		
13. Vizual control (VT)		TESYDO, s.r.o.		15-079-VT		satisfactory		
14. Penetration test (PT)		TESYDO, s.r.o.		15-080-PT		satisfactory		
15. Magnetic test (MT)		—		—		—		
16. Radiographic test (RT)		—		—		—		
17. Ultrasonic test (UT)		—		—		—		
18. DESTRUCTIVE TESTS								
19. A) Transversal tensile test – Takeing rule : ČSN EN ISO 4136, ČSN EN ISO 15614-1								
20. Testing laboratory —				21. Report reference No : —				
22. Testing specimen No	23. Testing temperature [°C]	24. Section [mm ²]	25. Siold point R _e [MPa]	26. Tensile strength R _m [MPa]	27. Ductility A [%]	28. Reduction of area Z [%]	29. Fracture poit	30. Result
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
31. B) Bend test – Takeing rule : ČSN ISO 7438, ČSN EN ISO 5173, ČSN EN ISO 15614-1								
32. Testing laboratory —				33. Report reference No : —				
34. Testing specimen No	35. Testing temperature [°C]	36. Thickness of specimen [mm]	37. Diameter of formel [mm]	38. Bend Angle [°]	39. Note		40. Result	
—	—	—	—	—	—		—	
—	—	—	—	—	—		—	
—	—	—	—	—	—		—	
—	—	—	—	—	—		—	
41. C) Impact test – Takeing rule : ČSN EN ISO 9016, ČSN EN ISO 15614-1								
42. Testing laboratory —				43. Report reference No : —				
44. Type —		45. Dimensions —						
46. Testing specimen No	47. Location notch	48. Testing temperature [°C]	49. Values [J]			50. Average value	51. Note	52. Result
—	—	—	—			—	—	—
—	—	—	—			—	—	—
53. D) Hardness test – Takeing rule : ČSN EN ISO 9015-1, ČSN EN ISO 15614-1								
54. Testing laboratory TESYDO, s.r.o.				55. Report reference No : 15-257-HV				
56. Type / load : HV 10		57. Parent metal	58. Heat affected zone	59. Weld metal	60. Result			
61. Location of measuring - weld face / root		see record	see record	see record	satisfactory			
62. E) Macroscopic examination – Takeing rule : ČSN EN ISO 17639, ČSN EN ISO 15614-1								
63. Testing laboratory		TESYDO, s.r.o. evaluation of defects - ČSN EN ISO 5817 grade B			64. Report reference No : 15-258-MA			
					65. Result : satisfactory			
66. Test carried out in the presence of :								
67. <u>Test results were acceptable</u>								
68. Head of Inspecting Authority :								
						TESYDO, s.r.o.  Ing. Vladimír Kudělka, Ph.D. 27. 5. 2015 69. Name, signature, date		
„Deutsch“ siehe Rückseite „Čeština“ viz druhá strana.								

Welding procedure specification „WPS“ according to ČSN EN ISO 15609 - 1 (Arc welding)

Leaf 1
Total 1
Check No. 5



1. Manufacturer : DRAHOŠ s.r.o Letiště 322 539 73 Skuteč	10. Inspecting Authority : TESYDO, s.r.o. Mariánské nám. 1 617 00 Brno
2. Location : —	11. Way of preparation weld bevel : working, grinding
3. Proof No. (WPS) : 03/135/2015	12. Way of cleaning : brushing, degreasing
4. WPQR No : 2557- 2015	13. Parent metals specification CR ISO 15608
5. Testing piece No : 15 - 036 - 1	- material 1: S355J2H group 1.2
6. Welder's qualification : ČSN EN 287-1	- material 2: S355J2+N group 1.2
7. Welding process : 135 (MAG)	14. Welded thickness [mm]: $t_1 = 6,0; t_2 = 6,0$
8. Weld variety : FW	15. Outside diameter [mm] : D = 60,0
9. Informations about preparation weld surfaces : ČSN EN ISO 9692-1	16. Welding position : PH

17. Draft of joint	18. Dimensions	19. Welding procedure
	a [mm] 4,0 b [mm] 0 - 0,5 c [mm] — α [°] —	

20. Parameters for Welding	
21. Weld beat	1
22. Welding process	135
23. Diameter of filler metal [mm] - Ø	1,0
24. Welding current [A]	200 - 230
25. Welding voltage [V]	22 - 23
26. Type of Welding current and polarity	DC (+)
27. Transfer of metal filler material	spray
28. Speed Frediny of wire [m.min ⁻¹]	10,5
29. Speed feed of travel [m.min ⁻¹]	7,8
30. Heat input [J.cm ⁻¹]	0,45 - 0,54

31. Filler metal – classing and trade mark: EN ISO 14341-A: G3Si1/ OK ARISTOROD 12.50	
32. Rule for drying : —	42. Testing piece No : —
33. Schielding / Flux : EN ISO 14175: M21	43. Ober informations : Angle of oscillation - amlitude : —
- Schielding gas [l.min. ⁻¹] : 10 - 12	- frequency and pause : —
- Schield of root [l.min. ⁻¹] : —	Angle of oscillation (max. bead width) : —
34. Wolfram electrode, variety / diameter: —	44. Information for Welding pulsation : —
35. Information about grooving / backing root : —	45. Information for Welding plasma : —
36. Preheat temperature [°C] : min.10	46. Angle of positioning torch : —
37. Interpass temperature [°C] : —	47. Type of automatic machine and Welding : —
38. Heat treatment / ageing : —	48. Peening of Weld : —
39. Time, temperature, procedure : —	49. Notes : —
40. Speed of heating and cooling : —	
41. Sparing contacting welding tip from parent metal [mm] : 12 - 14	„Čeština“ viz druhá strana, „Deutsch“ siehe Rückseite

50. Manufacturer _____ _____ _____	52. Inspecting Authority or Technical Inspecting Authority <div style="text-align: center;"> </div> Ing. Petr KOVÁŘ WI-E-042 Ing. Petr Kovář 27. 5. 2015
51. Date, name, signature and stamp of Welding Inspection	53. Date, name, signature and stamp of Inspecting Authority



TESYDO, s.r.o.

Mariánské nám. 1, 617 00 Brno, Česká republika (CZ)

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* / Member of AIO, HK, TNK, CWS ANB (member of EWF, IIW a IAB) I*


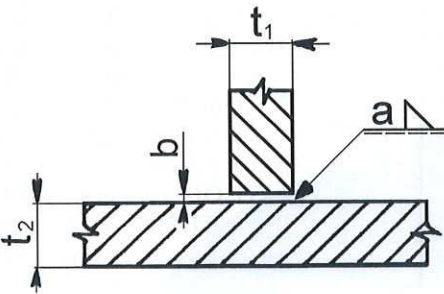
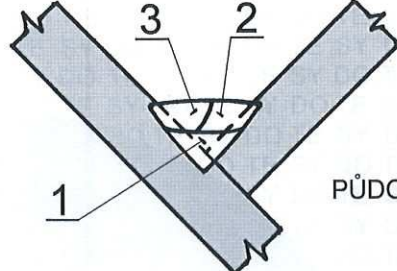

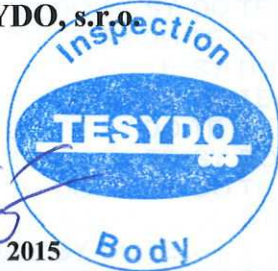
Technická, školicí, zkušební, certifikační a inspekční činnost


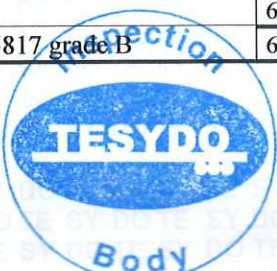

Technical, training, testing, certification and inspection activity

Autorizovaná osoba / Notifikovaná osoba, Authorized Body / Notified Body

301-F02


1. Welding procedure Qualification Record (WPQR) – Test certificate		2. Reference No. 2544 – 2015	3. Leaf 1 4. Total 3 5. Check No. 7
6. Firm : DRAHOŠ s.r.o.	7. Address : Letiště 322 539 73 Skuteč		
8. Inspecting procedure: TOS - 301 - A	9. Date of Welding : 12. 3. 2015		
10. Rules / Testing Standards : ČSN EN ISO 15614-1	Specification and qualification of welding procedures for metallic materials. Welding procedure test – Part 1 : Arc and gas welding of steels and arc welding of nickel and nickel alloys.		
11. Range of	– test	– approval	
12. Welding process	135 (MAG)	135 (MAG) - according to ČSN EN ISO 4063	
13. Stage of mechanization (machinery)	hand	hand - acc. to ČSN EN ISO 15614-1 article 8.4.1	
14. Joint type and weld variety	FW - ČSN EN ISO 9692-1	FW - acc. ČSN EN ISO 15614-1 art. 8.4.3	
15. Dimension of fillet weld [mm]	a = 10	a = unlimited - ČSN EN ISO 15614-1 table. 6	
16. Welding position	PF - ČSN EN ISO 6947	- according to ČSN EN ISO 15614-1 art. 8.4.2	
17. Parent metal mark	S355J2+N, group 1.2	- acc. to ČSN EN ISO 15614-1; CEN ISO/TR 15608	
18. Parent metal thickness [mm]	t = 35,0	t ≥ 5 acc. to ČSN EN ISO 15614-1 table 6	
19. Pipe outside diameter [mm]	D = —	D = — - acc. to ČSN EN ISO 15614-1 table 7	
20. Filler metal type	EN ISO 14341-A: G3Si1	- acc. to ČSN EN ISO 15614-1 art. 8.4.4; art. 8.4.6	
21. Shielding gas / Flux	EN ISO 14175: M21	- acc. to ČSN EN ISO 15614-1 art. 8.5.2	
22. Type of Welding current / Polarity	DC (+) / indirect	DC (+) / indirect - ČSN EN ISO 15614-1 art. 8.4.7	
23. Angle branch pipe [°]	$\alpha_{odb} = —$	$\alpha_{odb} = —$ - acc. to ČSN EN ISO 15614-1 art. 8.4.3	
24. Heat input [kJ/mm]	Q = 1,28 to 1,60	Q = ± 25% - acc. to ČSN EN ISO 15614-1 art. 8.4.8	
25. Metal transfer	dip transfer	dip transfer acc. to ČSN EN ISO 15614-1 art. 8.5.2	
26. Preheat temperature [°C]	T_p = min. 150		
27. Interpass temperature [°C]	T_i = max. 300		
28. Post weld heat treatment	After welding - free cooling on air according to product standard or ČSN 050211		
29. Other informations :	Qualification of welder according to ČSN EN 287 - 1		
30. <i>Certified that test welds were prepared, welded and tested in accordance with the requirements of the code, respective testing standards, with satisfactory result.</i>			
31. Location of issue : Brno			32. Inspecting Authority: TESYDO, s.r.o.
33. Date of issue : 17. 4. 2015			 Ing. Vladimír Kudělka Ph.D.
„Deutsch“ siehe Rückseite. „Čeština“ viz druhá strana.		34. Name, signature	

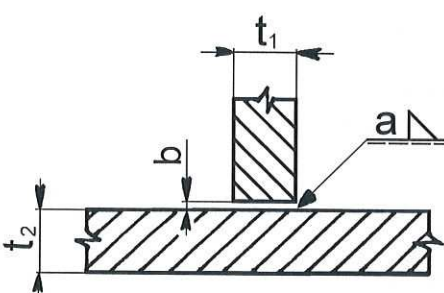
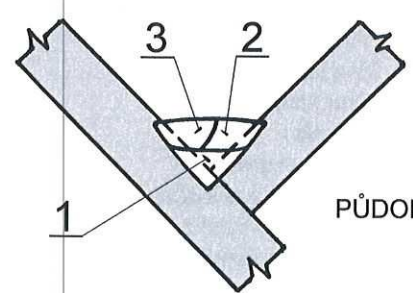
		TESYDO, s.r.o.		301-F02		
		1. DETAILS OF WELD TEST NOTED LEAF OF WELDING PARAMETERS				2. Leaf 2
5. WPQR No.	2544 – 2015		8. Manufacturer	DRAHOŠ s.r.o.		
6. WPS No.	01/2015		9. Location	Letiště 322, 539 73 Skuteč		
7. Testing piece No.	15 – 027 – 1		10. Welder's name	ŠEBEK Zdeněk		
11. Joint weld						
12. Joint type	FW		15. Welding process	135 (MAG)		
13. Weld variety	multilayer		16. Welding position	PB		
14. Way of preparation weld bevel	working, grinding		17. Cleaning	brushing, degreasing		
18. Parent metal			24. Filler metal			
19. Marking of mater. 1	S355J2+N, skupina 1.2		25. Marking	EN ISO 14341-A: G3Si1		
20. Marking of mater. 2	S355J2+N, skupina 1.2		26. Manufacturer / Trade mark	ESAB/WELD G3Si1		
21. Metal thickness	t ₁ = 35,0 mm; t ₂ = 35,0 mm		27. Marking	—		
22. Outside diameter	D = —		28. Manufacturer / Trade mark	—		
23. Other informations	—		29. Drying filler metal	—		
30. Draft of joint		31. Dimensions		32. Welding procedure		
		a [mm]				
		10				
		b [mm]				
		0 - 1,0				
		c [mm]				
		α [°]				
		—				
33. WELDING PARAMETERS						
34. Weld bead	1		2		3	
35. Welding process	135		135		135	
36. Diameter of filler metal [mm] - Ø	1,2		1,2		1,2	
37. Welding current [A]	160 – 180		160 – 180		160 – 180	
38. Welding voltage [V]	18 - 20		18 - 20		18 - 20	
39. Type of Welding current and polarity	DC (+)		DC (+)		DC (+)	
40. Transfer of metal filler material	dip transfer		dip transfer		dip transfer	
41. Speed feeding of wire [m.min ⁻¹]	4,2		4,2		4,2	
42. Speed feed of welding [mm.s ⁻¹]	1,8		1,8		1,8	
43. Heat input [kJ.mm ⁻¹]	1,28 – 1,60		1,28 – 1,60		1,28 – 1,60	
44. Measured preheat temperature [°C]	150		45. After - heat :	46. Type of automatic machine		
47. Interpass temperature [°C]	max.300		—		and Welding head :	
48. Other informations				60. Post weld heat treatment or ageing		
49. Shielding gas - Shield of weld	EN ISO 14175: M21			61. Speed of heating		—
50. Rate of flow gas [l/min]	14 - 16			62. Speed of cooling		—
51. Shielding gas - Schield of root	—			63. Temperature		—
52. Rate of flow gas [l/min]	—			64. Dwell at temperature		—
53. Angle of oscilation (max. width bead)	—			65. Inspecting Authority		
54. Type and dimension of wolfram electrode	—			 		
55. Oscilation – amplitude, frequency, time of dwell	—					
56. Angle of positioning torch	—					
57. Electrode sparing (contacting Welding tip) [mm]	12 - 13					
58. Details for Welding pulsation	—			Ing. Petr Kovář 12. 3. 2015		
59. Details to grooving of root	—			66. Name, Date of test, Signature		
„Deutsch“ siehe Rückseite „Čeština“ viz druhá strana.						

		TESYDO, s.r.o.						301-F02	
1.		DETAILS OF WELD TEST TEST RESULTS						2. Leaf 3 3. Total 3 4. Check No. 7	
5. WPQR No.		2544 – 2015		6. Manufacturer		DRAHOŠ s.r.o.			
7. NON – DESTRUCTIVE TEST									
8. Criteria for approval Welding procedure : ČSN EN ISO 17637, ČSN EN ISO 3452-1, ČSN EN ISO 5817, ČSN EN ISO 15614-1									
9. TESTS		10. Testing laboratory			11. Report reference No			12. Result	
13. Vizual control (VT)		TESYDO, s.r.o.			15-149-VT			satisfactory	
14. Penetration test (PT)		TESYDO, s.r.o.			15-150-PT			satisfactory	
15. Magnetic test (MT)		—			—			—	
16. Radiographic test (RT)		—			—			—	
17. Ultrasonic test (UT)		—			—			—	
18. DESTRUCTIVE TESTS									
19. A) Transversal tensile test – Taking rule : ČSN EN ISO 4136, ČSN EN ISO 15614-1									
20. Testing laboratory		—			21. Report reference No : —				
22. Testing specimen No	23. Testing temperature [°C]	24. Section [mm ²]	25. Yield point R _e [MPa]	26. Tensile strength R _m [MPa]	27. Ductility A [%]	28. Reduction of area Z [%]	29. Fracture poit	30. Result	
—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	
31. B) Bend test – Taking rule : ČSN ISO 7438, ČSN EN ISO 5173, ČSN EN ISO 15614-1									
32. Testing laboratory		—			33. Report reference No : —				
34. Testing specimen No	35. Testing temperature [°C]	36. Thickness of specimen [mm]	37. Diameter of formel [mm]	38. Bend Angle [°]	39. Note		40. Result		
—	—	—	—	—	—		—		
—	—	—	—	—	—		—		
—	—	—	—	—	—		—		
—	—	—	—	—	—		—		
41. C) Impact test – Taking rule : ČSN EN ISO 9016, ČSN EN ISO 15614-1									
42. Testing laboratory		—			43. Report reference No : —				
44. Type		—			45. Dimensions —				
46. Testing specimen No	47. Location notch	48. Testing temperature [°C]	49. Values [J]		50. Average value	51. Note	52. Result		
—	—	—	—	—	—	—	—		
—	—	—	—	—	—	—	—		
53. D) Hardness test – Taking rule : ČSN EN ISO 9015-1, ČSN EN ISO 15614-1									
54. Testing laboratory		TESYDO, s.r.o.			55. Report reference No : 15-158-HV				
56. Type / load : HV 10		57. Parent metal		58. Heat affected zone		59. Weld metal		60. Result	
61. Location of measuring - weld face / root		see record		see record		see record		satisfactory	
62. E) Macroscopic examination – Taking rule : ČSN EN ISO 17639, ČSN EN ISO 15614-1									
63. Testing laboratory		TESYDO, s.r.o. evaluation of defects - ČSN EN ISO 5817 grade B			64. Report reference No : 15-159-MA				
65. Result :		satisfactory							
66. Test carried out in the presence of :					TESYDO, s.r.o.				
67. <u>Test results were acceptable</u>									
68. Head of Inspecting Authority :		„Deutsch“ siehe Rückseite „Čeština“ viz druhá strana.			Ing. Vladimír Kudělka, Ph.D. 17. 4. 2015				
69. Name, signature, date									

Welding procedure specification „WPS“ according to ČSN EN ISO 15609 - 1 (Arc welding)



Leaf 1
Total 1
Check No. 5

1. Manufacturer : DRAHOŠ s.r.o. Letiště 322 539 73 Skuteč	10. Inspecting Authority : TESYDO, s.r.o. Mariánské nám. 1 617 00 Brno <div style="text-align: right; margin-top: 10px;">  </div>
2. Location : —	11. Way of preparation weld bevel : working, grinding
3. Proof No. (WPS) : 01/2015	12. Way of cleaning : brushing, degreasing
4. WPQR No : 2544- 2015	13. Parent metals specification CR ISO 15608
5. Testing piece No : 15 - 027 - 1	- material 1: S355J2H group 1.2
6. Welder's qualification : ČSN EN 287-1	- material 2: S355J2+N group 1.2
7. Welding process : 135 (MAG)	14. Welded thickness [mm]: $t_1 = 35,0$ $t_2 = 35,0$
8. Weld variety : FW	15. Outside diameter [mm] : D = —
9. Informations about preparation weld surfaces : ČSN EN ISO 9692-1	16. Welding position : PF

17. Draft of joint	18. Dimensions	19. Welding procedure
	a [mm] 10,0 b [mm] 0 - 1,0 c [mm] — α [°] —	 <p style="text-align: right;">PŮDORYS</p>

20. Parameters for Welding						
21. Weld beat	1	2	3			
22. Welding process	135	135	135			
23. Diameter of filler metal [mm] - Ø	1,2	1,2	1,2			
24. Welding current [A]	160 - 180	160 - 180	160 - 180			
25. Welding voltage [V]	18 - 20	18 - 20	18 - 20			
26. Type of Welding current and polarity	DC (+)	DC (+)	DC (+)			
27. Transfer of metal filler material	dip transfer	dip transfer	dip transfer			
28. Speed Frediny of wire [m.min ⁻¹]	4,2	4,2	4,2			
29. Speed feed of travel [m.min ⁻¹]	1,8	1,8	1,8			
30. Heat input [J.cm ⁻¹]	1,28 - 1,60	1,28 - 1,60	1,28 - 1,60			

31. Filler metal – classing and trade mark: EN ISO 14341-A: G3Si1/ OK ARISTOROD 12.50	
32. Rule for drying : —	42. Testing piece No : —
33. Shielding / Flux : EN ISO 14175: M21	43. Ober informations : Angle of oscillation - amplitude : —
- Shielding gas [l.min. ⁻¹] : 14 - 16	- frequency and pause : —
- Shield of root [l.min. ⁻¹] : —	Angle of oscillation (max. bead width) : —
34. Wolfram electrode, variety / diameter: —	44. Information for Welding pulsation : —
35. Information about grooving / backing root : —	45. Information for Welding plasma : —
36. Preheat temperature [°C] : min.150	46. Angle of positioning torch : —
37. Interpass temperature [°C] : max.300	47. Type of automatic machine and Welding : —
38. Heat treatment / ageing : —	48. Peening of Weld : —
39. Time, temperature, procedure : —	49. Notes : —
40. Speed of heating and cooling : —	
41. Sparing contacting welding tip from parent metal [mm] : 12 - 13	

50. Manufacturer	<p style="text-align: center;">„Čeština“ viz druhá strana, „Deutsch“ siehe Rückseite</p> <div style="text-align: center;">  <p>Inspecting Authority or Technical Inspecting Authority Ing. Petr KOVÁŘ WI-E-042 Ing. Petr Kovář 17. 4. 2015</p> </div> <div style="text-align: right;">  </div>
51. Date, name, signature and stamp of Welding Inspection	53. Date, name, signature and stamp of Inspecting Authority



TESYDO, s.r.o.

Mariánské nám. 1, 617 00 Brno, Česká republika (CZ)

* / Člen AIO, HK, TNK, CWS ANB (člen EWF, IIW a IAB) /*

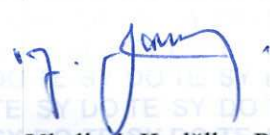
* / Member of AIO, HK, TNK, CWS ANB (member of EWF, IIW a IAB) /*

Technická, školící, zkušební, certifikační a inspekční činnost


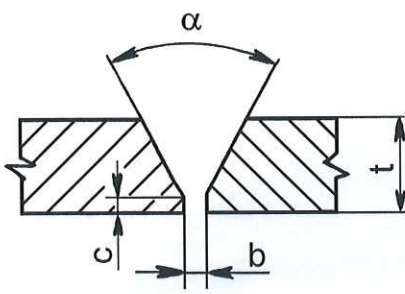
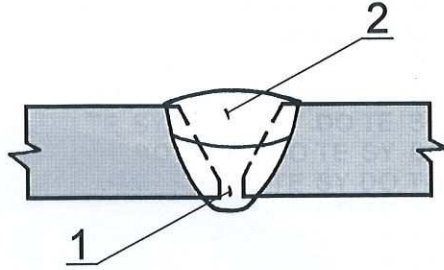


Technical, training, testing, certification and inspection activity

Autorizovaná osoba / Notifikovaná osoba, Authorized Body / Notified Body

301-F02

1. Welding procedure Qualification Record (WPQR) – Inspecting certificate		2. Reference No. 2650 – 2015	3. Leaf 1 4. Total 3 5. Check No. 7
6. Firm : DRAHOŠ s.r.o.		7. Address : Letiště 322 539 73 Skuteč	
8. Inspecting procedure: TOS - 301 - A		9. Date of Welding : 11. 12. 2015	
10. Rules / Testing Standards : ČSN EN ISO 15614-1		Specification and qualification of welding procedures for metallic materials. Welding procedure test – Part 1 : Arc and gas welding of steels and arc welding of nickel and nickel alloys.	
11. Range of		– test	– approval
12. Welding process	135 (MAG)	135 (MAG) – according to ČSN EN ISO 4063	
13. Stage of mechanization (machinery)	manual	manual - acc. to ČSN EN ISO 15614-1 article 8.4.1	
14. Joint type and weld variety	BW - ČSN EN ISO 9692-1	BW + FW - acc. to ČSN EN ISO 15614-1 art. 8.4.3	
15. Dimension of fillet weld [mm]	a = —	a = unlimited - ČSN EN ISO 15614-1 table 6	
16. Welding position	PA - ČSN EN ISO 6947	- according to ČSN EN ISO 15614-1 art. 8.4.2	
17. Parent metal mark	P265GH, group 1.1	acc. to ČSN EN ISO 15614-1; CEN ISO/TR 15608	
18. Parent metal thickness [mm]	t = 10,0	t = 3,0 to 12,0 – acc. to ČSN EN ISO 15614-1 table 5	
19. Pipe outside diameter [mm]	D = —	D > 150 in position PA or PC with a rotating D > 500 - ČSN EN ISO 15614-1 article 8.4.7	
20. Filler metal type	EN ISO 14341-A: G2Mo	acc. to ČSN EN ISO 15614-1 art. 8.4.4; art. 8.4.6	
21. Shielding gas / Flux	EN ISO 14175: M23	acc. to ČSN EN ISO 15614-1 art. 8.5.2.1	
22. Type of Welding current / Polarity	DC(+) / indirect	DC(+) / indirect - ČSN EN ISO 15614-1 art. 8.4.7	
23. Angle branch pipe [°]	$\alpha_{odb} = —$	$\alpha_{odb} = —$ - acc. to ČSN EN ISO 15614-1 art. 8.4.3	
24. Heat input [kJ/mm]	Q = 1,00 až 1,31	Q = +- 25% - acc. to ČSN EN ISO 15614-1 art. 8.4.8	
25. Metal transfer	spray	spray, globular - ČSN EN ISO 15614-1 art. 8.5.2	
26. Preheat temperature [°C]	T_p = min. 5		
27. Interpass temperature [°C]	T_i = max. 300		
28. Post weld heat treatment	After welding - free cooling on air according to product standard or ČSN 050211		
29. Other informations :	Qualification of welder according to ČSN EN 287 – 1		
30. <i>Certified that test welds were prepared, welded and tested in accordance with the requirements of the code, respective testing standards, with satisfactory result.</i>			
31. Location of issue : Brno		32. Technical Inspecting Authority : TESYDO, s.r.o.	
33. Date of issue : 19. 1. 2016			
„Deutsch“ siehe Rückseite. „Čeština“ viz druhá strana.		Ing. Vladimír Kudělka, Ph.D. 34. Name, signature	



		TESYDO, s.r.o.		301-F02	
		1. DETAILS OF WELD TEST NOTED LEAF OF WELDING PARAMETERS			2. Leaf 2 3. Total 3 4. Check No. 7
5. WPQR No.	2650-2015	8. Manufacturer	DRAHOŠ s.r.o.		
6. WPS No.	03/2015	9. Location	Letiště 322, 539 73 Skuteč		
7. Testing piece No.	15 - 086 - 1	10. Welder's name	MALINSKÝ Ondřej		
11. Joint weld					
12. Joint type	BW	15. Welding process	135 (MAG)		
13. Weld variety	„V“ - multilayer	16. Welding position	PA		
14. Way of preparation weld bevel	working, grinding	17. Cleaning	brushing, degreasing		
18. Parent metal		24. Filler metal			
19. Marking of mater. 1	P265GH, group 1.1	25. Marking	EN ISO 14341-A: G2Mo		
20. Marking of mater. 2	P265GH, group 1.1	26. Manufacturer / Trade mark	ESAB OK ARISTOROD 13.09		
21. Metal thickness	t = 10,0 mm	27. Marking	—		
22. Outside diameter	D = —	28. Manufacturer / Trade mark	—		
23. Other informations	—	29. Drying filler metal	—		
30. Draft of joint		31. Dimensions	32. Welding procedure		
		a [mm]			
		—			
		b [mm]			2,5 - 3,0
		c [mm]			2,0 - 3,0
		α [°]			
		50			
33. WELDING PARAMETERS					
34. Weld bead	1	2			
35. Welding process	135	135			
36. Diameter of filler metal [mm] - Ø	1,0	1,0			
37. Welding current [A]	230 - 240	280 - 300			
38. Welding voltage [V]	23 - 25	28 - 30			
39. Type of Welding current and polarity	DC (+)	DC (+)			
40. Transfer of metal filler material	sprchový	sprchový			
41. Speed feeding of wire [m.min ⁻¹]	12,9	14,2			
42. Speed feed of welding [mm.s ⁻¹]	4,2	5,5			
43. Heat input [kJ.mm ⁻¹]	1,00 - 1,14	1,14 - 1,31			
44. Measured preheat temperature [°C]	18	45. After - heat :	46. Type of automatic machine	—	
47. Interpass temperature [°C]	max.300	—	and Welding head :	—	
48. Other informations			60. Post weld heat treatment or ageing		
49. Shielding gas - Shield of weld	EN ISO 14175: M23		61. Speed of heating	—	
50. Rate of flow gas [l/min]	14 - 16		62. Speed of cooling	—	
51. Shielding gas - Shield of root	—		63. Temperature	—	
52. Rate of flow gas [l/min]	—		64. Dwell at temperature	—	
53. Angle of oscilation (max. width bead)	—		65. Inspecting Authority, Technical Inspecting Authority		
54. Type and dimension of wolfram electrode	—		<div style="text-align: center;"> TESYDO, s.r.o.   Ing. Petr Kovář 11. 12. 2015 </div>		
55. Oscilation - amplitude, frequency, time of dwell	—				
56. Angle of positioning torch	—				
57. Electrode sparing (contacting Welding tip) [mm]	12 - 13				
58. Details for Welding pulsation	—				
59. Details to grooving of root	—				
„Deutsch“ siehe Rückseite „Čeština“ viz druhá strana.			66. Name, Date of test, Signature		



TESYDO, s.r.o.

301-F02

1.

**DETAILS OF WELD TEST
TEST RESULTS**2. Leaf 3
3. Total 3
4. Check No.7

5. WPQR No.

2650 – 2015

6. Výrobce

DRAHOŠ s.r.o.

7.

NON – DESTRUCTIVE TEST8. **Criteria for approval Welding procedure : ČSN EN ISO 17637, ČSN EN 571-1, ČSN EN ISO 5817, ČSN EN ISO 15614-1**

9. TESTS	10. Testing laboratory	11. Report reference No	12. Result
13. Vizual control (VT)	TESYDO, s.r.o.	15-237-VT	satisfactory
14. Penetration test (PT)	TESYDO, s.r.o.	15-238-PT	satisfactory
15. Magnetic test (MT)	—	—	—
16. Radiographic test (RT)	TESYDO, s.r.o.	15-239-RT	satisfactory
17. Ultrasonic test (UT)	—	—	—

18.

DESTRUCTIVE TESTS19. **A) Transversal tensile test – Taking rule : ČSN EN ISO 4136, ČSN EN ISO 15614 – 1**

20. Testing laboratory						21. Report reference No : 15-268-TT		
22. Testing specimen No	23. Testing temperature [°C]	24. Section [mm ²]	25. Yield point R _e [MPa]	26. Tensile strength R _m [MPa]	27. Ductility A [%]	28. Reduction of area Z [%]	29. Fracture point	30. Result
1	20	240,96	—	501,3	—	—	out of weld	satisfactory
2	20	240,96	—	498,0	—	—	out of weld	satisfactory

31. **B) Bend test – Taking rule : ČSN EN ISO 5173, ČSN ISO 7438, ČSN EN ISO 15614 – 1**

32. Testing laboratory					33. Report reference No : 15-269-BT		
34. Testing specimen No	35. Testing temperature [°C]	36. Thickness of specimen [mm]	37. Diameter of formel [mm]	38. Bend Angle [°]	39. Note	40. Result	
1	18	10,0	40,0	180	TFBB – no cracks	satisfactory	
2	18	10,0	40,0	180	TFBB – no cracks	satisfactory	
3	18	10,0	40,0	180	TRBB – no cracks	satisfactory	
4	18	10,0	40,0	180	TRBB – no cracks	satisfactory	

41. **C) Impact test – Taking rule : ČSN EN ISO 9016, ČSN EN ISO 15614 – 1**

42. Testing laboratory					43. Report reference No : —			
44. Type					45. Dimensions			
46. Testing specimen No	47. Location notch	48. Testing temperature [°C]	49. Values [J]			50. Average value	51. Note	52. Result
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—

53. **D) Hardness test – Taking rule : ČSN EN ISO 9015-1, ČSN EN ISO 15614 – 1**

54. Testing laboratory					55. Report reference No : —				
56. Type / load : —			57. Parent metal	58. Heat affected zone	59. Weld metal	60. Result			
61. Location of measuring - weld face / root			—	—	—	—			

62. **E) Macroscopic examination – Taking rule : ČSN EN 1321, ČSN EN ISO 5817, ČSN EN ISO 15614-1**

63. Testing laboratory					64. Report reference No : 15-164-MA		
evaluation of defects - ČSN EN ISO 5817 grade B					65. Result : —		

66. Test carried out in the presence of :

67. **Test results were acceptable**

68. Head of Inspecting Authority :



TESYDO, s.r.o.

Ing. Vladimír Kudělka, Ph.D. 19. 1. 2016

69. Name, signature, date

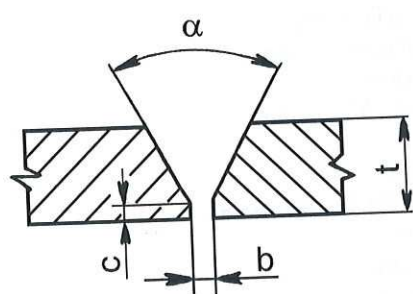
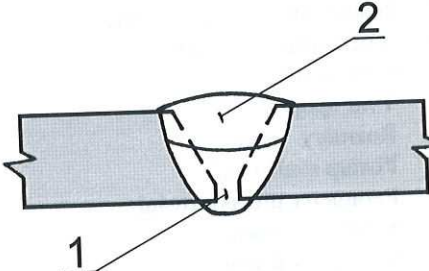
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Welding procedure specification „WPS“ according to ČSN EN ISO 15609 - 1 (Arc welding)

Leaf 1
Total 1
Check No. 5





1. Manufacturer : DRAHOŠ s.r.o Letiště 322 539 73 Skuteč	10. Inspecting Authority : TESYDO, s.r.o. Mariánské nám. 1 617 00 Brno
2. Location : —	11. Way of preparation weld bevel : working, grinding
3. Proof No. (WPS) : 03/2015	12. Way of cleaning : brushing, degreasing
4. WPQR No : 2650 – 2015	13. Parent metals specification CR ISO 15608
5. Testing piece No : 15 – 086 – 1	- material 1: P265GH group 1.1 - material 2: P265GH group 1.1
6. Welder's qualification : ČSN EN 287-1	14. Welded thickness [mm]: t = 10,0
7. Welding process : 135 (MAG)	15. Outside diameter [mm] : D = —
8. Weld variety : BW multilayer	16. Welding position : PA
9. Informations about preparation weld surfaces : ČSN EN ISO 9692-1	

17. Draft of joint 	18. Dimensions	19. Welding procedure 
	a [mm] —	
	b [mm] 2,5 – 3,0	
	c [mm] 2,0 – 3,0	
	α [°] 50	

20. Parameters for Welding		
21. Weld beat	1	2
22. Welding process	135	135
23. Diameter of filler metal [mm] - Ø	1,0	1,0
24. Welding current [A]	230 - 240	280 - 300
25. Welding voltage [V]	23 - 25	28 - 30
26. Type of Welding current and polarity	DC (+)	DC (+)
27. Transfer of metal filler material	spray	spray
28. Speed Frediny of wire [m.min ⁻¹]	12,9	14,2
29. Speed feed of travel [m.min ⁻¹]	4,2	5,5
30. Heat input [J.cm ⁻¹]	1,00 – 1,14	1,14 – 1,31

31. Filler metal – classing and trade mark: EN ISO 14341-A: G2Mo / ESAB OK ARISTOROD 13.09	
32. Rule for drying : —	42. Testing piece No : —
33. Schielding / Flux : EN ISO 14175: M23	43. Ober informations : Angle of oscillation - amplitude : —
- Schielding gas [l.min. ⁻¹] : 12 - 16	- frequency and pause : —
- Schield of root [l.min. ⁻¹] : —	Angle of oscillation (max. bead width) : —
34. Wolfram electrode, variety / diameter: —	44. Information for Welding pulsation : —
35. Information about grooving / backing root : —	45. Information for Welding plasma : —
36. Preheat temperature [°C] : min.5	46. Angle of positioning torch : —
37. Interpass temperature [°C] : max.300	47. Type of automatic machine and Welding : —
38. Heat treatment / ageing : —	48. Peening of Weld : —
39. Time, temperature, procedure : —	49. Notes : —
40. Speed of heating and cooling : —	
41. Sparing contacting welding tip from parent metal [mm] : 12 - 13	„Čeština“ viz druhá strana , „Deutsch“ siehe Rückseite

50. Manufacturer	52. Inspecting Authority or Technical Inspecting Authority  Ing. Petr Kovář 19.1.2016 
51. Date, name, signature and stamp of Welding Inspection	53. Date, name, signature and stamp of Inspecting Authority



TESYDO, s.r.o.

Mariánské nám. 1, 617 00 Brno, Česká republika (CZ)

* / Člen AIO, HK, TNK, CWS ANB (člen EWF, IIW a IAB) /*

* / Member of AIO, HK, TNK, CWS ANB (member of EWF, IIW a IAB) /*


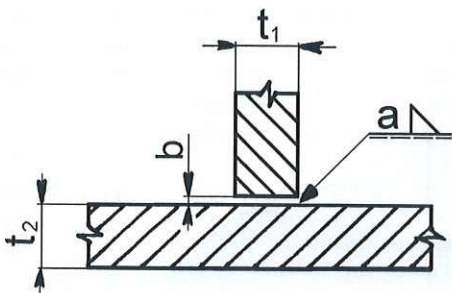
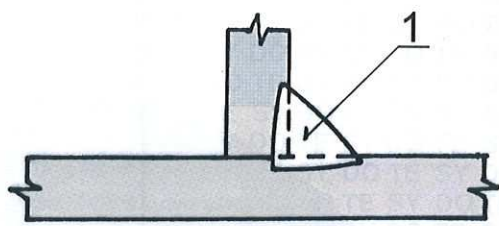


Technická, školicí, zkušební, certifikační a inspekční činnost


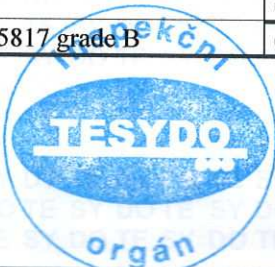

Technical, training, testing, certification and inspection activity

Autorizovaná osoba / Notifikovaná osoba, Authorized Body / Notified Body

301-F02

1. Welding procedure Qualification Record (WPQR) – Test certificate		2. Reference No. 2651 – 2015	3. Leaf 1 4. Total 3 5. Check No. 7
6. Firm : DRAHOŠ s.r.o.		7. Address : Letiště 322 539 73 Skuteč	
8. Inspecting procedure: TOS - 301 - A		9. Date of Welding : 11. 12. 2015	
10. Rules / Testing Standards : ČSN EN ISO 15614-1		Specification and qualification of welding procedures for metallic materials. Welding procedure test – Part 1 : Arc and gas welding of steels and arc welding of nickel and nickel alloys.	
11. Range of – test		– approval	
12. Welding process	135 (MAG)	135 (MAG) - according to ČSN EN ISO 4063	
13. Stage of mechanization (machinery)	Hand	Hand - acc. to ČSN EN ISO 15614-1 article 8.4.1	
14. Joint type and weld variety	FW - ČSN EN ISO 9692-1	FW - acc. ČSN EN ISO 15614-1 art. 8.4.3	
15. Dimension of fillet weld [mm]	a = 5,0	a = 3,75 to 7,5 - ČSN EN ISO 15614-1 table. 6	
16. Welding position	PB - ČSN EN ISO 6947	- according to ČSN EN ISO 15614-1 art. 8.4.2	
17. Parent metal mark	P265GH, group 1.1 P265GH, group 1.1	- acc. to ČSN EN ISO 15614-1; CEN ISO/TR 15608	
18. Parent metal thickness [mm]	t₁= t₂ = 10,0	t₁=t₂ = 5,0 to 20,0 – dle ČSN EN ISO 15614-1 table. 6	
19. Pipe outside diameter [mm]	D = —	D = — - acc. to ČSN EN ISO 15614-1 table 7	
20. Filler metal type	EN ISO 14341-A: G2Mo	- acc. to ČSN EN ISO 15614-1 art. 8.4.4; art. 8.4.6	
21. Shielding gas / Flux	EN ISO 14175: M23	- acc. to ČSN EN ISO 15614-1 art. 8.5.2	
22. Type of Welding current / Polarity	DC (+) / indirect	DC (+) / indirect - ČSN EN ISO 15614-1 art. 8.4.7	
23. Angle branch pipe [°]	α_{odb} = —	α_{odb} = — - acc. to ČSN EN ISO 15614-1 art. 8.4.3	
24. Heat input [kJ/mm]	Q = 0,54 až 0,59	Q = ± 25% - acc. to ČSN EN ISO 15614-1 art. 8.4.8	
25. Metal transfer	spray	spray, globular - acc. to ČSN EN ISO 15614-1 art. 8.5.2	
26. Preheat temperature [°C]	T_p = min. 5		
27. Interpass temperature [°C]	T_i = max. 300		
28. Post weld heat treatment	After welding - free cooling on air according to product standard or ČSN 050211		
29. Other informations :	Qualification of welder according to ČSN EN 287 - 1		
30. <i>Certified that test welds were prepared, welded and tested in accordance with the requirements of the code, respective testing standards, with satisfactory result.</i>			
31. Location of issue : Brno			32. Inspecting Authority: TESYDO, s.r.o.
33. Date of issue : 19. 1. 2016			
„Deutsch“ siehe Rückseite. „Čeština“ viz druhá strana.		Ing. Vladimír Kudělka Ph.D. 34. Name, signature	

		TESYDO, s.r.o.		301-F02		
		1. DETAILS OF WELD TEST NOTED LEAF OF WELDING PARAMETERS				2. Leaf 2 3. Total 3 4. Check No. 7
5. WPQR No.	2651-2015		8. Manufacturer	DRAHOŠ s.r.o.		
6. WPS No.	04/2015		9. Location	Letiště 322, 539 73 Skuteč		
7. Testing piece No.	15-086-2		10. Welder's name	MALINSKÝ Ondřej		
11. Joint weld						
12. Joint type	FW		15. Welding process	135 (MAG)		
13. Weld variety	singlelayer		16. Welding position	PB		
14. Way of preparation weld bevel	working, grinding		17. Cleaning	brushing, degreasing		
18. Parent metal			24. Filler metal			
19. Marking of mater. 1	P265GH, skupina 1.1		25. Marking	EN ISO 14341-A: G2Mo		
20. Marking of mater. 2	P265GH, skupina 1.1		26. Manufacturer / Trade mark	ESAB/OK ARISTOROD 13.09		
21. Metal thickness	t ₁ = t ₂ = 10,0 mm		27. Marking	—		
22. Outside diameter	D = —		28. Manufacturer / Trade mark	—		
23. Other informations	—		29. Drying filler metal	—		
30. Draft of joint		31. Dimensions		32. Welding procedure		
		a [mm]				
		5,0				
		b [mm]				
		0 - 1,0				
		c [mm]				
		α [°]				
		—				
33. WELDING PARAMETERS						
34. Weld bead	1					
35. Welding process	135					
36. Diameter of filler metal [mm] - Ø	1,0					
37. Welding current [A]	220 - 230					
38. Welding voltage [V]	24 - 25					
39. Type of Welding current and polarity	DC (+)					
40. Transfer of metal filler material	sprchový					
41. Speed feeding of wire [m.min ⁻¹]	10,7					
42. Speed feed of welding [mm.s ⁻¹]	7,8					
43. Heat input [kJ.mm ⁻¹]	0,54 - 0,59					
44. Measured preheat temperature [°C]	18		45. After - heat :	46. Type of automatic machine and Welding head :		
47. Interpass temperature [°C]	—		—	—		
48. Other informations			60. Post weld heat treatment or ageing			
49. Shielding gas - Shield of weld	EN ISO 14175: M23		61. Speed of heating	—		
50. Rate of flow gas [l/min]	12 - 16		62. Speed of cooling	—		
51. Shielding gas - Shield of root	—		63. Temperature	—		
52. Rate of flow gas [l/min]	—		64. Dwell at temperature	—		
53. Angle of oscilation (max. width bead)	—		65. Inspecting Authority			
54. Type and dimension of wolfram electrode	—		 			
55. Oscilation - amplitude, frequency, time of dwell	—					
56. Angle of positioning torch	—					
57. Electrode sparing (contacting Welding tip) [mm]	12 - 13					
58. Details for Welding pulsation	—					
59. Details to grooving of root	—					
„Deutsch“ siehe Rückseite „Čeština“ viz druhá strana.			Ing. Petr Kovář 14. 5. 2015			
			66. Name, Date of test, Signature			

		TESYDO, s.r.o.				301-F02		
1.		DETAILS OF WELD TEST TEST RESULTS				2. Leaf 3 3. Total 3 4. Check No.7		
5. WPQR No.		2651 – 2015		6. Manufacturer		DRAHOŠ s.r.o.		
7. NON – DESTRUCTIVE TEST								
8. Criteria for approval Welding procedure : ČSN EN ISO 17637, ČSN EN ISO 3452-1, ČSN EN ISO 5817, ČSN EN ISO 15614-1								
9. TESTS		10. Testing laboratory		11. Report reference No		12. Result		
13. Vizual control (VT)		TESYDO, s.r.o.		15-240-VT		satisfactory		
14. Penetration test (PT)		TESYDO, s.r.o.		15-241-PT		satisfactory		
15. Magnetic test (MT)		—		—		—		
16. Radiographic test (RT)		—		—		—		
17. Ultrasonic test (UT)		—		—		—		
18. DESTRUCTIVE TESTS								
19. A) Transversal tensile test – Takeing rule : ČSN EN ISO 4136, ČSN EN ISO 15614-1								
20. Testing laboratory				21. Report reference No :				
—				—				
22. Testing specimen No	23. Testing temperature [°C]	24. Section [mm ²]	25. Yield point R _e [MPa]	26. Tensile strength R _m [MPa]	27. Ductility A [%]	28. Reduction of area Z [%]	29. Fracture poit	30. Result
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
31. B) Bend test – Takeing rule : ČSN ISO 7438, ČSN EN ISO 5173, ČSN EN ISO 15614-1								
32. Testing laboratory				33. Report reference No :				
—				—				
34. Testing specimen No	35. Testing temperature [°C]	36. Thickness of specimen [mm]	37. Diameter of formel [mm]	38. Bend Angle [°]	39. Note		40. Result	
—	—	—	—	—	—		—	
—	—	—	—	—	—		—	
—	—	—	—	—	—		—	
—	—	—	—	—	—		—	
41. C) Impact test – Takeing rule : ČSN EN ISO 9016, ČSN EN ISO 15614-1								
42. Testing laboratory				43. Report reference No :				
—				—				
44. Type				45. Dimensions				
—				—				
46. Testing specimen No	47. Location notch	48. Testing temperature [°C]	49. Values [J]		50. Average value	51. Note	52. Result	
—	—	—	—		—	—	—	
—	—	—	—		—	—	—	
53. D) Hardness test – Takeing rule : ČSN EN ISO 9015-1, ČSN EN ISO 15614-1								
54. Testing laboratory				55. Report reference No :				
—				—				
56. Type / load :		57. Parent metal		58. Heat affected zone		59. Weld metal		60. Result
—		—		—		—		—
61. Location of measuring - weld face / root				62. E) Macroscopic examination – Takeing rule :				
—				ČSN EN ISO 17639, ČSN EN ISO 15614-1				
63. Testing laboratory				64. Report reference No :				
TESYDO, s.r.o.				15-271-MA				
evaluation of defects - ČSN EN ISO 5817 grade B				65. Result :				
				satisfactory				
66. Test carried out in the presence of :								
67. <u>Test results were acceptable</u>								
68. Head of Inspecting Authority :								
								
				TESYDO, s.r.o.  Ing. Vladimír Kudělka, Ph.D. 19. 1. 2015 69. Name, signature, date				
„Deutsch“ siehe Rückseite „Čestina“ viz druhá strana.								

Welding procedure specification „WPS“ according to ČSN EN ISO 15609 - 1 (Arc welding)

Leaf 1
Total 1
Check No. 5



1. Manufacturer : DRAHOŠ s.r.o. Letiště 322 539 73 Skuteč	10. Inspecting Authority : TESYDO, s.r.o. Mariánské nám. 1 617 00 Brno
2. Location : —	11. Way of preparation weld bevel : working, grinding
3. Proof No. (WPS) : 04/2015	12. Way of cleaning : brushing, degreasing
4. WPQR No : 2651 – 2015	13. Parent metals specification CR ISO 15608
5. Testing piece No : 15 – 086 – 2	- material 1: P265GH group 1.1
6. Welder's qualification : ČSN EN 287-1	- material 2: P265GH group 1.2
7. Welding process : 135 (MAG)	14. Welded thickness [mm]: $t_1 = t_2 = 10,0$ mm
8. Weld variety : FW- singlelayer	15. Outside diameter [mm] : D = —
9. Informations about preparation weld surfaces : ČSN EN ISO 9692-1	16. Welding position : PB

17. Draft of joint 	18. Dimensions a [mm] 5,0 b [mm] 0 – 1,0 c [mm] — α [°] —	19. Welding procedure
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20. Parameters for Welding					
21. Weld beat	1				
22. Welding process	135				
23. Diameter of filler metal [mm] - Ø	1,0				
24. Welding current [A]	220 – 230				
25. Welding voltage [V]	24 - 25				
26. Type of Welding current and polarity	DC (+)				
27. Transfer of metal filler material	spray				
28. Speed Frediny of wire [m.min ⁻¹]	10,7				
29. Speed feed of travel [m.min ⁻¹]	7,8				
30. Heat input [J.cm ⁻¹]	0,54 – 0,59				

31. Filler metal – classing and trade mark: EN ISO 14341-A: G2Mo / ESAB OK ARISTOROD 13.09	
32. Rule for drying : —	42. Testing piece No : —
33. Schielding / Flux : EN ISO 14175: M23	43. Ober informations : Angle of oscillation - amplitude : —
- Schielding gas [l.min. ⁻¹] : 14 - 16	- frequency and pause : —
- Schield of root [l.min. ⁻¹] : —	Angle of oscillation (max. bead width) : —
34. Wolfram electrode, variety / diameter: —	44. Information for Welding pulsation : —
35. Information about grooving / backing root : —	45. Information for Welding plasma : —
36. Preheat temperature [°C] : 220 - 250	46. Angle of positioning torch : —
37. Interpass temperature [°C] : max.300	47. Type of automatic machine and Welding : —
38. Heat treatment / ageing : —	—
39. Time, temperature, procedure : —	48. Peening of Weld : —
40. Speed of heating and cooling : —	49. Notes :
41. Sparing contacting welding tip from parent metal [mm] : 12 - 13	„Čeština“ viz druhá strana , „Deutsch“ siehe Rückseite

50. Manufacturer _____ _____	52. Inspecting Authority or Technical Inspecting Authority
51. Date, name, signature and stamp of Welding Inspection	53. Date, name, signature and stamp of Inspecting Authority



TESYDO, s.r.o.

Mariánské nám. 1, 617 00 Brno, Česká republika (CZ)

* / Člen AIO, HK, TNK, CWS ANB (člen EWF, IIW a IAB) /*

* / Member of AIO, HK, TNK, CWS ANB (member of EWF, IIW a IAB) /*

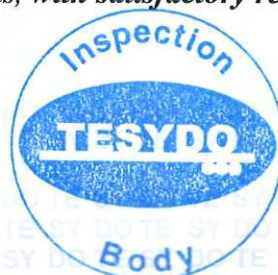
Technická, školící, zkušební, certifikační a inspekční činnost


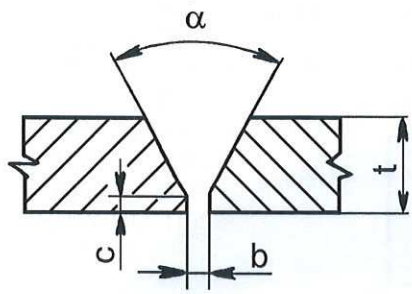
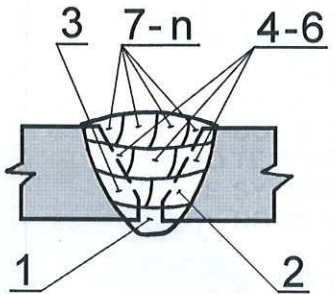

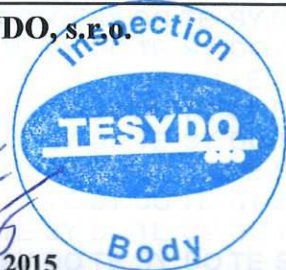
Technical, training, testing, certification and inspection activity


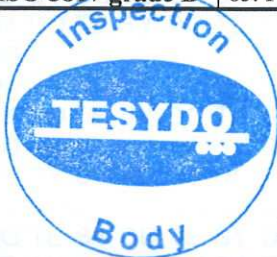

Autorizovaná osoba / Notifikovaná osoba, Authorized Body / Notified Body

301-F02

1. Welding procedure Qualification Record (WPQR) – Inspecting certificate		2. Reference No. 2545 – 2015	3. Leaf 1 4. Total 3 5. Check No. 7
6. Firm : DRAHOŠ s.r.o.		7. Address : Letiště 322 539 73 Skuteč	
8. Inspecting procedure: TOS - 301 - A		9. Date of Welding : 12. 3. 2015	
10. Rules / Testing Standards : ČSN EN ISO 15614-1		Specification and qualification of welding procedures for metallic materials. Welding procedure test – Part 1 : Arc and gas welding of steels and arc welding of nickel and nickel alloys.	
11. Range of – test		– approval	
12. Welding process	135 (MAG)	135 (MAG) – according to ČSN EN ISO 4063	
13. Stage of mechanization (machinery)	manual	manual - acc. to ČSN EN ISO 15614-1 article 8.4.1	
14. Joint type and weld variety	BW - ČSN EN ISO 9692-1	BW + FW - acc. to ČSN EN ISO 15614-1 art. 8.4.3	
15. Dimension of fillet weld [mm]	a = —	a = unlimited - ČSN EN ISO 15614-1 table 6	
16. Welding position	PF - ČSN EN ISO 6947	- according to ČSN EN ISO 15614-1 art. 8.4.2	
17. Parent metal mark	S355J2+N, Group 1.2	acc. to ČSN EN ISO 15614-1; CEN ISO/TR 15608	
18. Parent metal thickness [mm]	t = 35,0	t = 17,5 to 70,0 – acc. to ČSN EN ISO 15614-1 table 5	
19. Pipe outside diameter [mm]	D = —	D > 150 in position PA or PC with a rotating D > 500 - ČSN EN ISO 15614-1 table 7	
20. Filler metal type	EN ISO 14341-A: G3Si1	acc. to ČSN EN ISO 15614-1 art. 8.4.4; art. 8.4.6	
21. Shielding gas / Flux	EN ISO 14175: M21	acc. to ČSN EN ISO 15614-1 art. 8.5.2.1	
22. Type of Welding current / Polarity	DC(+) / indirect	DC(+) / indirect - ČSN EN ISO 15614-1 art. 8.4.7	
23. Angle branch pipe [°]	$\alpha_{odb} = —$	$\alpha_{odb} = —$ - acc. to ČSN EN ISO 15614-1 art. 8.4.3	
24. Heat input [kJ/mm]	$Q = 0,86$ to 1,70	$Q = + - 25\%$ - acc. to ČSN EN ISO 15614-1 art. 8.4.8	
25. Metal transfer	dip transfer	dip transfer - ČSN EN ISO 15614-1 art. 8.5.2	
26. Preheat temperature [°C]	$T_p = \text{min. } 150$		
27. Interpass temperature [°C]	$T_i = \text{max. } 300$		
28. Post weld heat treatment	After welding - free cooling on air according to product standard or ČSN 050211		
29. Other informations : Qualification of welder according to ČSN EN 287 – 1			
30. <i>Certified that test welds were prepared, welded and tested in accordance with the requirements of the code, respective testing standards, with satisfactory result.</i>			
31. Location of issue : Brno		32. Technical Inspecting Authority : TESYDO, s.r.o.	
33. Date of issue : 17. 4. 2015			
„Deutsch“ siehe Rückseite. „Čeština“ viz druhá strana.		Ing. Vladimír Kudělka, Ph.D. 34. Name, signature	



		TESYDO, s.r.o.		301-F02		
		1. DETAILS OF WELD TEST NOTED LEAF OF WELDING PARAMETERS				2. Leaf 2
5. WPQR No.	2545 – 2015	8. Manufacturer	DRAHOŠ s.r.o.			
6. WPS No.	02/2015	9. Location	Letiště 322, 539 73 Skuteč			
7. Testing piece No.	15 – 027 – 2	10. Welder's name	NEUMANN Martin			
11. Joint weld						
12. Joint type	BW	15. Welding process	135 (MAG)			
13. Weld variety	„V“ - multilayer	16. Welding position	PF			
14. Way of preparation weld bevel	working, grinding	17. Cleaning	brushing, degreasing			
18. Parent metal			24. Filler metal			
19. Marking of mater. 1	S355J2+N, Group 1.2	25. Marking	EN ISO 14341-A: G3Si1			
20. Marking of mater. 2	S355J2+N, Group 1.2	26. Manufacturer / Trade mark	ESAB/OK ARISTOROD 12. 50			
21. Metal thickness	t = 35,0 mm	27. Marking	—			
22. Outside diameter	D= —	28. Manufacturer / Trade mark	—			
23. Other informations	—	29. Drying filler metal	—			
30. Draft of joint		31. Dimensions	32. Welding procedure			
		a [mm]	—			
		b [mm]	2,5 - 3,0			
		c [mm]	2,5 - 3,0			
		alpha [°]	50			
						
33. WELDING PARAMETERS						
34. Weld bead	1	2-6	7-n			
35. Welding process	135	135	135			
36. Diameter of filler metal [mm] - Ø	1,2	1,2	1,2			
37. Welding current [A]	120 – 140	150 – 170	150 – 170			
38. Welding voltage [V]	17 - 19	18 – 20	18 – 20			
39. Type of Welding current and polarity	DC (+)	DC (+)	DC (+)			
40. Transfer of metal filler material	dip transfer	dip transfer	dip transfer			
41. Speed feeding of wire [m.min ⁻¹]	3,2	4,2	4,2			
42. Speed feed of welding [mm.s ⁻¹]	1,9	1,6	1,6			
43. Heat input [kJ.mm ⁻¹]	0,86 – 1,12	1,35 – 1,70	1,35 – 1,70			
44. Measured preheat temperature [°C]	150	45. After - heat :	46. Type of automatic machine			
47. Interpass temperature [°C]	max. 300	—	and Welding head :			
48. Other informations			60. Post weld heat treatment or ageing			
49. Shielding gas - Shield of weld	EN ISO 14175: M21		61. Speed of heating	—		
50. Rate of flow gas [l/min]	14 - 16		62. Speed of cooling	—		
51. Shielding gas - Schield of root	—		63. Temperature	—		
52. Rate of flow gas [l/min]	—		64. Dwell at temperature	—		
53. Angle of oscilation (max. width bead)	—		65. Inspecting Authority, Technical Inspecting Authority			
54. Type and dimension of wolfram electrode	—		 			
55. Oscilation – amplitude, frequency, time of dwell	—					
56. Angle of positioning torch	—					
57. Electrode sparing (contacting Welding tip) [mm]	12 - 13					
58. Details for Welding pulsation	—					
59. Details to grooving of root	—					
„Deutsch“ siehe Rückseite „Čeština“ viz druhá strana.			66. Name, Date of test, Signature			

		TESYDO, s.r.o.			301-F02			
		1. DETAILS OF WELD TEST TEST RESULTS			2. Leaf 3 3. Total 3 4. Check No. 7			
5. WPQR No. 2545 – 2015		6. Výrobce DRAHOŠ s.r.o.						
7. NON – DESTRUCTIVE TEST								
8. Criteria for approval Welding procedure : ČSN EN ISO 17637, ČSN EN 571-1, ČSN EN ISO 5817, ČSN EN ISO 15614-1								
9. TESTS		10. Testing laboratory		11. Report reference No		12. Result		
13. Vizual control (VT)		TESYDO, s.r.o.		15-151-VT		satisfactory		
14. Penetration test (PT)		TESYDO, s.r.o.		15-152-PT		satisfactory		
15. Magnetic test (MT)		—		—		—		
16. Radiographic test (RT)		—		—		—		
17. Ultrasonic test (UT)		TESYDO, s.r.o.		15-153-UT		satisfactory		
18. DESTRUCTIVE TESTS								
19. A) Transversal tensile test – Takeing rule : ČSN EN ISO 4136, ČSN EN ISO 15614 – 1								
20. Testing laboratory		TESYDO, s.r.o.			21. Report reference No : 15-160-TT			
22. Testing specimen No	23. Testing temperature [°C]	24. Section [mm ²]	25. Siold point R _e [MPa]	26. Tensile strength R _m [MPa]	27. Ductility A [%]	28. Reduction of area Z [%]	29. Fracture point	30. Result
1	20		—		—	—	out of weld	satisfactory
2	20		—		—	—	out of weld	satisfactory
31. B) Bend test – Takeing rule : ČSN EN ISO 5173, ČSN ISO 7438, ČSN EN ISO 15614 – 1								
32. Testing laboratory		TESYDO, s.r.o.			33. Report reference No : 15-161-BT			
34. Testing specimen No	35. Testing temperature [°C]	36. Thickness of specimen [mm]	37. Diameter of formel [mm]	38. Bend Angle [°]	39. Note		40. Result	
1	18	10	40	180	SBB – no cracks		satisfactory	
2	18	10	40	180	SBB – no cracks		satisfactory	
3	18	10	40	180	SBB – no cracks		satisfactory	
4	18	10	40	180	SBB – no cracks		satisfactory	
41. C) Impact test – Takeing rule : ČSN EN ISO 9016, ČSN EN ISO 15614 – 1								
42. Testing laboratory		TESYDO, s.r.o.			43. Report reference No : 15-162-KC			
44. Type		—			45. Dimensions		—	
46. Testing specimen No	47. Location notch	48. Testing temperature [°C]	49. Values [J]		50. Average value	51. Note	52. Result	
1	VWT 0/2	- 20				—	satisfactory	
2	VHT 1/2	- 20				—	satisfactory	
53. D) Hardness test – Takeing rule : ČSN EN ISO 9015-1, ČSN EN ISO 15614 – 1								
54. Testing laboratory		TESYDO, s.r.o.			55. Report reference No : 15-163-HV			
56. Type / load : HV 10		57. Parent metal	58. Heat affected zone	59. Weld metal	60. Result			
61. Location of measuring - weld face / root		see record	see record	see record	satisfactory			
62. E) Macroscopic examination – Takeing rule : ČSN EN 1321, ČSN EN ISO 5817, ČSN EN ISO 15614-1								
63. Testing laboratory		TESYDO, s.r.o.			64. Report reference No : 15-164-MA			
		evaluation of defects - ČSN EN ISO 5817 grade B			65. Result : satisfactory			
66. Test carried out in the presence of :								
67. <u>Test results were acceptable</u>								
68. Head of Inspecting Authority :								
						TESYDO, s.r.o.  Ing. Vladimír Kudělka, Ph.D. 17. 4. 2015		
69. Name, signature, date								

Welding procedure specification „WPS“ according to ČSN EN ISO 15609 - 1 (Arc welding)

Leaf 1
Total 1
Check No. 5



1. Manufacturer : DRAHOŠ s.r.o Letiště 322 539 73 Skuteč	10. Inspecting Authority : TESYDO, s.r.o. Mariánské nám. 1 617 00 Brno
2. Location : —	11. Way of preparation weld bevel : working, grinding
3. Proof No. (WPS) : 02/2015	12. Way of cleaning : brushing, degreasing
4. WPQR No : 2545- 2015	13. Parent metals specification CR ISO 15608
5. Testing piece No : 15 - 027 - 2	- material 1: S355J2H group 1.2
6. Welder's qualification : ČSN EN 287-1	- material 2: S355J2+N group 1.2
7. Welding process : 135 (MAG)	14. Welded thickness [mm]: $t_1 = 35,0$ $t_2 = 35,0$
8. Weld variety : BW multilayer	15. Outside diameter [mm] : D = —
9. Informations about preparation weld surfaces : ČSN EN ISO 9692-1	16. Welding position : PF

17. Draft of joint 	18. Dimensions a [mm] — b [mm] 2,5 - 3,0 c [mm] 2,5 - 3,0 α [°] 50	19. Welding procedure
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20. Parameters for Welding					
21. Weld beat	1	2-6	7-n		
22. Welding process	135	135	135		
23. Diameter of filler metal [mm] - Ø	1,2	1,2	1,2		
24. Welding current [A]	120 - 140	150 - 170	150 - 170		
25. Welding voltage [V]	17 - 19	18 - 20	18 - 20		
26. Type of Welding current and polarity	DC (+)	DC (+)	DC (+)		
27. Transfer of metal filler material	dip transfer	dip transfer	dip transfer		
28. Speed Frediny of wire [m.min ⁻¹]	3,2	4,2	4,2		
29. Speed feed of travel [m.min ⁻¹]	1,9	1,6	1,6		
30. Heat input [J.cm ⁻¹]	0,86 - 1,12	1,35 - 1,70	1,35 - 1,70		

31. Filler metal – classing and trade mark: EN ISO 14341-A: G3Si1/ OK ARISTOROD 12.50	
32. Rule for drying :	—
33. Schielding / Flux :	EN ISO 14175: M21
- Schielding gas [l.min. ⁻¹]:	14 - 16
- Schield of root [l.min. ⁻¹]:	—
34. Wolfram electrode, variety / diameter:	—
35. Information about grooving / backing root :	—
36. Preheat temperature [°C] :	min.150
37. Interpass temperature [°C] :	max.300
38. Heat treatment / ageing :	—
39. Time, temperature, procedure :	—
40. Speed of heating and cooling :	—
41. Sparing contacting welding tip from parent metal [mm] :	12 - 13
42. Testing piece No :	—
43. Ober informations : Angle of oscillation - amlitude :	—
- frequency and pause :	—
Angle of oscillation (max. bead width) :	—
44. Information for Welding pulsation :	—
45. Information for Welding plasma :	—
46. Angle of positioning torch :	—
47. Type of automatic machine and Welding :	—
48. Peening of Weld :	—
49. Notes :	—

50. Manufacturer _____ _____ _____	52. Inspecting Authority or Technical Inspecting Authority TSD Ing. Petr KOVÁŘ WI-E-042 Ing. Petr Kovář 17. 4. 2015 _____ _____
51. Date, name, signature and stamp of Welding Inspection	53. Date, name, signature and stamp of Inspecting Authority

