1. # WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

2. ## WELDING PROCEDURE QUALIFICATION – TEST CERTIFICATE

3.	Manufacturer's pWPS No.: **pWPS-003/24-K-A**	Examiner or examining body:	
4.	Manufacturer's WPQR No.: **WPQR K-A-003/24**	**Certification center SIA "LRTDEA" TUV Rheinland grupa**	
5.	Manufacturer: **SIA "KOMPĀNIJA AVOTIŅI"**	Reference No.:	**WPQR/K-A/035-1/24**
6.	Address: **Rīga, Rustēnu iela 1,**	Date of welding:	**13.11.2024**
7.	**LV-1073, Latvija**	Level (acc. to LVS EN ISO 15614-1:2017+A1:2019):	**2**

8. Code / testing standard: **LVS EN ISO 17660-1:2007; LVS EN ISO 15614-1:2017+A1:2019**

9. RANGE OF QUALIFICATION

10.	Product form:	**Bar + Bar**
11.	Welding process(es):	**135 – MAG welding (partly mechanized) with solid wire electrode acc. to EN ISO 4063**
12.	Type of joint and weld:	**Cross joint bar according to LVS EN ISO 17660-2:2007, Fig. 2.**
13.	Steel grade of reinforcing steel bars:	**Reinforcing steel with strength R_e = 500 N/mm², ductility R_m/R_e=1,08 and A_{gt}=5% (grade B500B) acc. to DIN 488 with carbon equivalent CEV ≤ 0,45**
14.	Material group(s) of steel components:	———
15.	Thickness of Steel Components [mm]:	———
16.	Deposited metal thickness [mm]:	———
17.	Throat thickness [mm]:	**Single layer: a=3,7 ÷ 7,5; multi-run: no restriction.**
18.	Single layer / multi-run:	**No restriction / Ierobežojumu nav / Без ограничений**
19.	Reinforcing Steel Bar Diameter [mm]:	**12,0 ÷ 16,0, provided that the bars are of the same diameter**
20.	Filler material designation:	**LVS EN ISO 14341-A G 42 4 M21 3Si1 or other materials as long as they have equivalent mechanical properties and the same chemical composition**
21.	Filler material make:	**No restriction / Ierobežojumu nav / Без ограничений**
22.	Filler material size:	**No restriction / Ierobežojumu nav / Без ограничений**
23.	Designation of shielding gas / Flux:	**LVS EN ISO 14175-M21-ArC-18 Max relative deviation of CO2 content is ±20 %**
24.	Designation of backing gas:	———
25.	Type of welding current and polarity:	**DC / +**
26.	Transfer mode:	**Spray, pulse and globular metal transfer (S;P;G) / Strūklas, ar impulsiem un lielpilienu metāla pārnesums (S;P;G) / Струйный, импульсный и крупнокапельный перенос металла (S;P;G)**
27.	Heat input [kJ/mm]:	———
28.	Welding positions:	**All positions except for PG and PJ-L045 / Visi stāvokļi, izņemot PG un PJ-L045 / Все положения кроме PG и PJ-L045 according to / pēc / по LVS EN ISO 6947**
29.	Preheat temperature:	**Min +5°C according to / saskaņā ar / в соответствии с LVS EN 1011-2**
30.	Interpass temperature:	**Max +250°C according to / saskaņā ar / в соответствии с LVS EN 1011-2**
31.	Post-weld heat treatment and / or ageing:	———
32.	OTHER INFORMATION:	**Load-bearing welded joints and non load-bearing welded joints.**

33. We confirm that the statements in this record are correct and that the test pieces were prepared, welded, tested and have fulfilled the requirements in accordance with LVS EN ISO 15614-1.

34. Date of issue: **28.11.2024** Location: **Riga, Latvia**

TÜV Rheinland group - LRTDEA 1407 Notified Body

Vjačeslavs Kuvšinovs

35. **Certification center SIA "LRTDEA" TUV Rheinland grupa**

36. # RECORD OF WELD TEST

37. Location: **Latvia**

Examiner or examining body: **Certification center SIA "LRTDEA" TUV Rheinland grupa**

38. Manufacturer's

39. pWPS No.: **pWPS-003/24-K-A**

Reference No.: **WPQR/K-A/035-1/24**

40. Manufacturer's WPQR No.: **WPQR K-A-003/24**

Method of preparation and cleaning: **Cutting, brushing and / or grinding.**

41. Manufacturer: **SIA "KOMPĀNIJA AVOTIŅI"**

42. Welder's / operator's name: **Jorge Leon Buelvas Alvarez**

Parent material **Bar 1: Grade B500B acc. to DIN 488**

43. Welding process: **135 (MAG welding)**

Specification: **Bar 2: Grade B500B acc. to DIN 488**

44. Joint type and weld: **Cross joint, FW**

Material thickness [mm]: ———

45. Welding position: **PB according to EN ISO 6947**

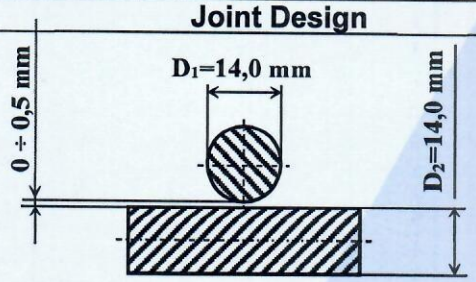
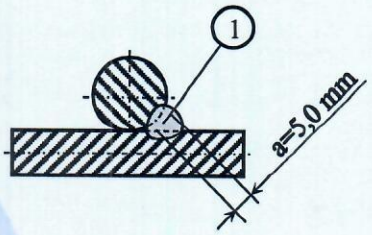
Outside pipe diameter [mm]: **D_1=14,0; D_2=14,0**

46. Power source manufacturer: **Lincoln Electric**

Waveform control mode: ———

47. **WELD PREPARATION DETAILS (SKETCH)*):**

48.

Joint Design	Welding sequence
	

Dimensions of the test specimens according to EN ISO 17660-2, Fig. 2. and Fig. B.2.)

49. **WELDING DETAILS**

50.

Run	Welding process	Size of filler material, [mm]	Current, [A]	Voltage, [V]	Type of current / Polarity	Wire feed speed, [m/min] *)	Travel speed [mm/min] *)	Heat input *) [kJ/mm]	Metal transfer
1	135	1,2	255,0	27,8	DC / +	———	———	———	S

51. **Filler material for root run:**

52. Designation: **LVS EN ISO 14341-A-G 42 4 M21 3Si1**

53. Trademark and make: **HUATONG HTW-50 / HIT WELDING INDUSTRY CO., LTD**

54. Any special baking or drying: ———

55. **Shielded gas / flux:**

56. Shielded: **M21-ArC-18**

57. Backing: ———

58. **Gas flow rate:**

59. Shielding: **14 ÷ 16 [l/min]**

60. Backing: ———

61. Tungsten electrode type / size: ———

62. Details of back gouging / backing: ———

63. Preheat temperature: **Min + 8°C**

64. Interpass temperature: ———

65. Post-weld heat treatment and / or ageing: ———

66. Time, temperature, method: ———

67. Heating and cooling rates*): ———

68. *) If required

69. Manufacturer:

Other information*), e. g.:

Weaving (maximum width of run): **10,0 mm**

Oscillation: amplitude, frequency, dwell time: ———

Distance contact tube / work piece: **12 ÷ 16 mm**

Nozzle diameter: **16,0 mm**

Number of wire electrodes: **1 pc.**

Torch angle: **5° ÷ 10°**

Pulse welding details: ———

The lowest work piece temperature immediately prior to welding without pre-heating, °C: ———

Filler material for interpass and face runs:

Designation: ———

Trademark and make: ———

Examiner or examining body:

70. **Sergejs Baturinskis, 28.11.2024** (Name, date and signature)

28. 11. 2024 Aleksandrs Filipovs Dr. sc. ing., EWE (Name, date and signature)

71. **TEST RESULTS**

72. Manufacturer's
73. pWPS No.: **pWPS-003/24-K-A**
74. Manufacturer's WPQR No.: **WPQR K-A-003/24**
75.
76. Visual examination: **acceptable**
77. Penetrant / magnetic particle testing*): **Not required**
78. TENSILE TESTS

Examiner or examining body: **Certification center SIA "LRTDEA" TUV Rheinland grupa**
Reference No.: **WPQR/K-A/035-1/24**
Radiographic testing *): **Not required**
Ultrasonic testing *): **Not required**
Temperature: **+20°C ÷ +24°C**

79. Type / No.	R_e [N/mm²]	R_m [N/mm²]	F_{max} [N]	A %	Z %	Fracture Location	Remarks
80. Requirement	≥ 500,0	≥ 540,0	≥ 83160,0				$F_{max} \geq A_n \cdot R_m$
							$R_m / R_e = 1,08$
							A_n =154,0 mm²
81. Transverse / 35-1-1_T/1	548	647	99574,0	10,8		Base metal	acceptable
82. Transverse / 35-1-2_T/2	551	650	100020,0	10,3		Base metal	acceptable
Transverse / 35-1-3_T/3	547	649	99945,0	10,5		Base metal	acceptable

83. BEND TESTS

84. Type / No.	Bend Angle, [°]	Elon-gation*)	Result
85. Specimen acc. to Fig. C.5 / 35-1-4_B/1	60°		acceptable
86. Specimen acc. to Fig. C.5 / 35-1-5_B/2	60°		acceptable
87. Specimen acc. to Fig. C.5 / 35-1-7_B/3	60°		acceptable
88.			

Former diameter [mm]: **100,0**
Macroscopic examination: **Not required**
Microscopic examination *): **Not required**

89. SHEAR TESTS

90. Type / No.	S_f [%]	A_s [mm²]	R_e [N/mm²]	F_s [N]	Fracture Location	Remarks
91. Requirement	≥ 80	154,0	500,0	≥ 61600,0		$F_S \geq S_f \cdot A_S \cdot R_e$
						Shear factor $S_f \geq 80\%$
Specimen acc. to Fig. C.4 / 35-1-4_Sh1				64831,0	HAZ	Acceptable
Specimen acc. to Fig. C.4 / 35-1-4_Sh2				75420,0	HAZ	Acceptable
Specimen acc. to Fig. C.4 / 35-1-4_Sh3				78367,0	HAZ	Acceptable

92. HARDNESS TEST*): **Not required**
93. Type / Load: —
94. Parent metal: —
95. Heat affected Zone: —
96. Weld metal: —
97. OTHER TESTS: —
98. REMARKS: —
99. *) If required

Location of Measurements (Sketch)*):

100. Tests carried out in accordance with the requirements of standard: **LVS EN ISO 17660-1:2007; LVS EN ISO 15614-1:2017+A1:2019**
101. Laboratory report reference No.: **VT-300-01; DT-20034**
102. Test results were **acceptable** / ~~**not acceptable**~~ (delete as appropriate)

103. Test carried out in the presence of: **Sergejs**
104. **Baturinskis** from 19.11.2024 to 25.11.2024

Examiner or examining body:
Aleksandrs Filipovs
Dr. sc. ing., EWE
28. 11. 2024
(Name, date and signature)

105.

EUROPEAN WELDING ENGINEER EWE Aleksandrs Filipovs EWE cert. No.: DE-18059-1173-980430