

# *austfil* 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M



**TECHNICAL BULLETIN**

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WIA\_TB0002

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Welding Industries Limited ABN 18 004 547 111

Trading as Welding Industries of Australia.



# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## PRODUCT NAME - AUSTFIL 71T-1M

### GAS SHIELDING RUTILE/FLUX-CORED TUBULAR WIRES

#### WELDING POSITIONS



PRODUCT NAME -  
AUSTFIL 71T-1M

#### DESCRIPTION

All positional rutile micro-alloyed type flux cored wire formulated for Argon/18-25% CO<sub>2</sub> (recommended 25% for optimum) shielding gas mixtures. Exceptionally smooth arc performance producing a superb weld with low spatter losses in all positions with excellent appeal. Suitable for AS/NZS 1554.5 2004 of the structural code: Part 5; Welding of steel structures subject to high levels of fatigue loading.

#### ADVANTAGES

- High deposition rates and efficiencies.
- Low hydrogen applications with excellent weld metal toughness at -20°C.
- Single and multiple pass welding in the down hand and horizontal- vertical, vertical-up, and overhead positions designed for tensile strength up to 670MPa.
- Excellent operator appeal "Smooth arc Transfer".
- Grade 3 shipping approvals.
- Gas shielded rutile flux-cored tubular wire.

#### APPLICATIONS / INDUSTRY

Ideal for the welding of mild, carbon and carbon-manganese medium steels where good impact properties at -20°C are required.

**Defence and Specialised Welding** – Highly restrained welded beams and plate sections, steel structures subjected to high levels of fatigue loading used in large fabricated bridge beams and heavy thick sections.

**General Fabrication** – Fabricated beams & girders, sheds, plated box sections, storage tank and bridge construction.

**Earthmoving** – Front-end loader build and repair, tipper body building and repair, backhoe welding work.

**Transport Industry** – Fabrication work/body, trailer and chassis building.

**Shipping Industry** – General ship, hull construction, building and structural support fabrication.

**Agricultural** – Suitable for storage tanks, field machinery and assemblies, and general welding.

#### CLASSIFICATION

AS/NZS 2203.1 ETP-GMp\_W503A.CM1H10 (superseded)  
AS/NZS ISO 17632 BT 49 2 T1 1 M A U H10 (new)  
AWS A5.20 E71T-1M H8

#### PACKAGING

Diameter (mm)	Spool (kg)	Palette (kg)	Product No.
1.2	15	1080	71T1M12S
1.6	15	1080	71T1M16S

#### DIFFUSABLE HYDROGEN H10

Shielding Gas	Typical Results
Argon+18%CO <sub>2</sub>	7.56ml
Maximum diffusible hydrogen per 100g of deposited weld metal, 10ml.	

#### MECHANICAL PROPERTIES AS SPECIFIED BY STANDARDS

Standards	Yield Strength Mpa	Tensile Strength Mpa	Elongation %	Charpy V-notch (Joules)
AWS A5.20: E71T-1M, -9M, 12M	400min	480min	22	27J at -29°C
AS/NZS ISO 17632: BT 49 2 T1 1 M A U H10	390min	490-670	18	27J at -20°C
AS/NZS 2203.1 ETP-GMp-W503A.CM1 H10	360min	490-650	22	47J at -20°C

#### STORAGE AND PACKAGING

Products should be stored in dry conditions in original sealed undamaged packaging as supplied. The integrity of consumable products can be adversely affected by time and storage conditions and that the detail shown on the batch certificate is true at the time of packaging and is only valid for a LIMITED time. After that time the product may need to be reconditioned or checked to ensure it is suitable for the purpose it is intended to be used for\*.

\* NOTE: Refer to Welding Technology Institute of Australia (WTIA), technical 3. care and conditioning of arc welding consumables.

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# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## DEPOSITION RATE PERFORMANCE

DEPOSITION RATE PERFORMANCE

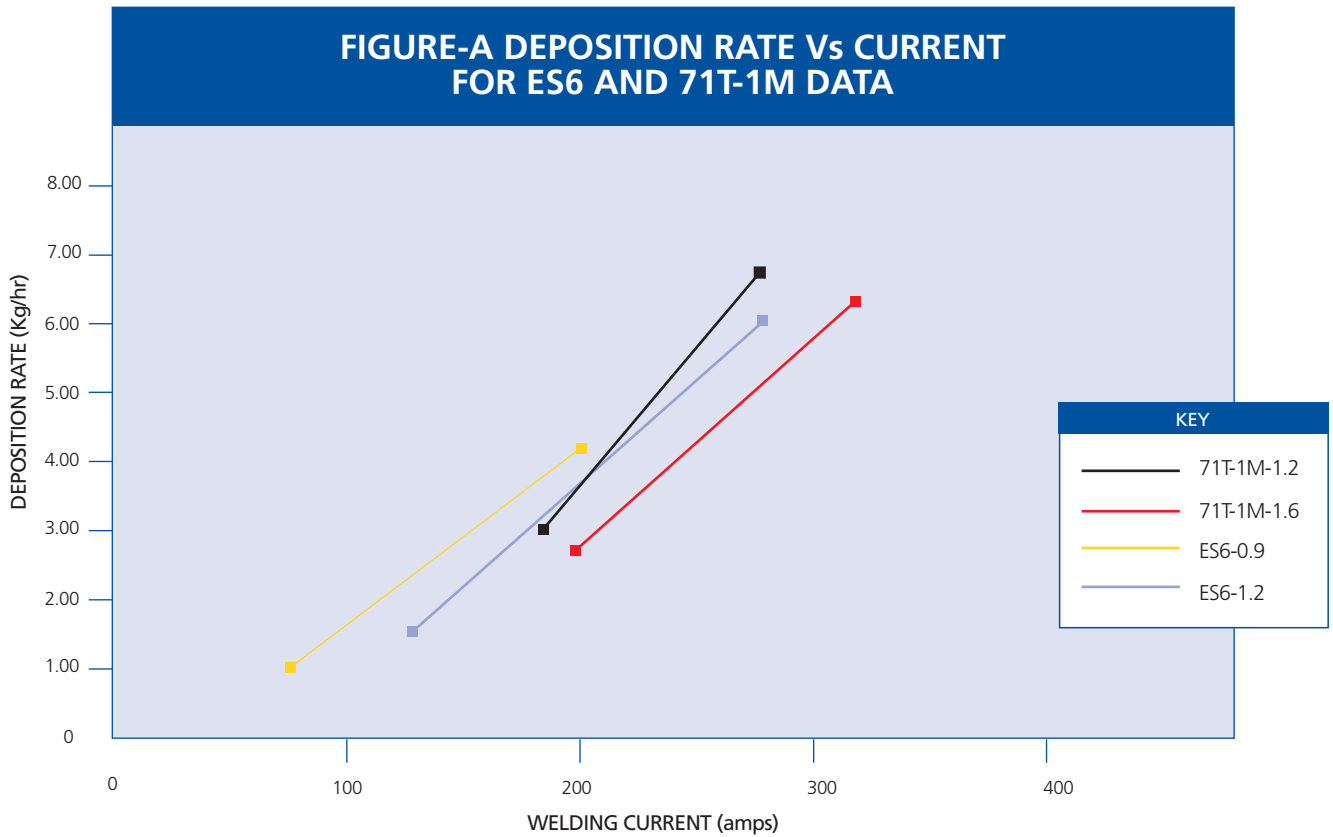


Figure A: Represents an increase in deposition rate with increased welding current for Flux Cored Wires versus Solid MIG Wire, therefore a more productive, faster burn off rate can be achieved.

**Weld metal arc on time comparisons are calculated by measuring one hour of continuous arc on time. The picture below shows Austfil 70C-6M metal cored wire runs at 630mm/min with 37.8 metres per hour achievable, Austfil 71T-1M rutile flux cored wire at 540mm/min with 32.4 metres per hour, and Austmig solid wire is 500mm/min at 30 metres of weld metal achieved per hour.**

**A Austfil 70C-6M**  
 Diameter - 1.2 mm  
 Current - 280 Amps  
 Volts - 31  
 Weld length - 315 mm

**B Austfil 71T-1M**  
 Diameter - 1.2 mm  
 Current - 265 Amps  
 Volts - 29  
 Weld length - 270 mm

**C Austfil ES6**  
 Diameter - 1.2 mm  
 Current - 270 Amps  
 Volts - 27  
 Weld length - 250mm



**The advantage of Austfil Flux Cored Wires is in the increased productivity when compared to the solid MIG wire process. With ease the Austfil 71T-1M will achieve a minimum production increase of 8% of sound x-ray quality weld metal. In simple terms, for every hour of arc on time it is possible to deposit 2.4 metres of extra weld metal per hour versus solid MIG wire.**

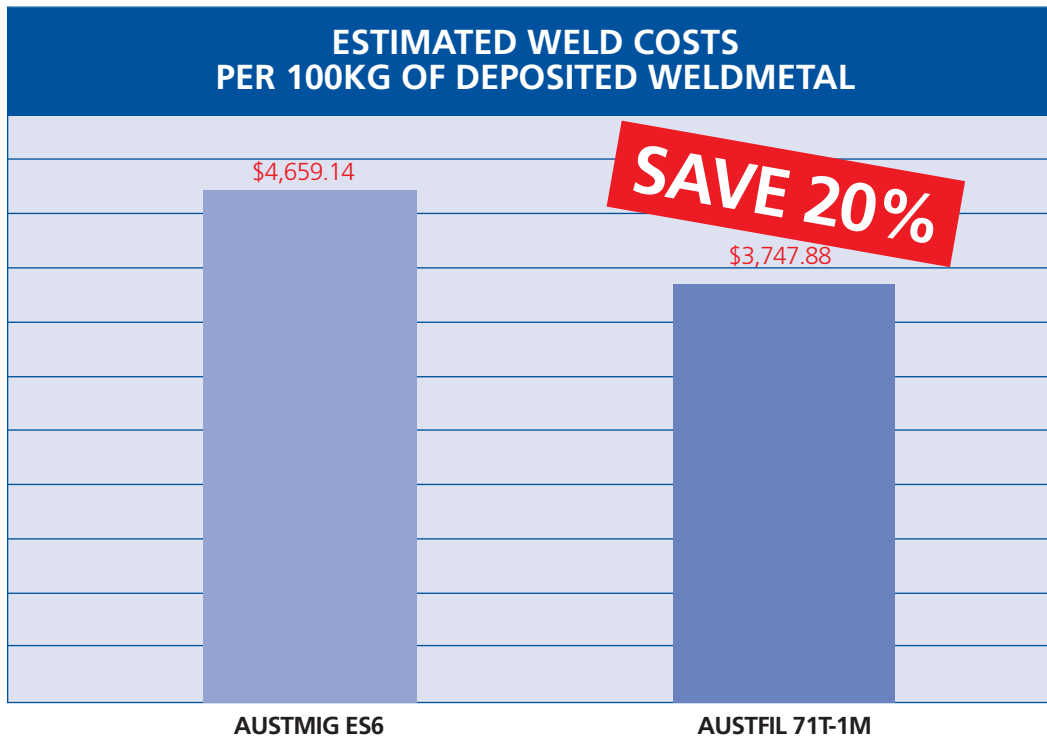
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# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## COMPARATIVE WELD COSTS



COMPARATIVE  
WELD COSTS

	CURRENT FILLER	PROPOSED FILLER
Filler Metal Brand	AUSTMIG ES6	<b>AUSTFIL 71T-1M</b>
Filler Metal Classification	ER70S-6	E71T-1M
Filler Diameter	1.20mm	1.20mm
Welding Current (amp)	240 amps	280 amps
Welding Voltage (Volts)	28 volts	30 volts
Deposition Rate (kg per Arc-hour)	4.5kg/Arc-hr	6.0kg/Arc-hr
Deposition Factor (% arc hour per man hour)	30%	30%
Labour & Overhead cost per hour (\$)	\$60.00	\$60.00
Filler cost per kg (\$)	\$2.40	\$4.68
Filler Deposition Efficiency %	97%	92%
Type of Shielding Gas	ARG/CO2	ARG/CO2
Arg/CO2 Shielding Gas Cost per Ltr	\$0.0064	\$0.0064
Shielding Gas Consumption (Ltr/min)	18 Ltr/min	18Ltr/min
Deposition Factor (kg weldmetal per hr)	1.35kg/hr	1.80kg/hr
Time required to deposit 100kg of weldmetal	74.07 hr	55.56 hr
Labour cost to deposit 100kg of weldmetal	\$4,444.44	\$3,333.33
Labour cost per 100kg of weldmetal	\$44.44	\$33.33
Kg of filler to deposit 100kg weldmetal	103.09kg	108.70kg
Filler cost per 100kg of weldmetal	\$247.42	\$508.70
Shielding Gas required to deposit 100kg of weldmetal	1333.33 Ltr	1000.00 Ltr
Cost of shielding gas per 100kg weldmetal deposited	\$8.51	\$6.38
Cost of Filler and Gas per 100kg	\$255.93	\$515.08
Cost of Filler and Gas per kg	\$2.56	\$5.15
Total Cost of Filler, Shielding Gas & Labour per 100kg deposited	\$4,700.38	\$3,848.41
<b>Savings in Labour per 100kg of weldmetal</b>		<b>\$1,111.11</b>
<b>Savings in Filler &amp; Shielding Gas per 100kg of weldmetal deposited</b>		<b>\$259.15</b>
<b>Overall savings per 100kg of weldmetal deposited</b>		<b>\$851.97</b>

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# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## AS/NZS ISO STANDARDS

### AS 2203.1-1990

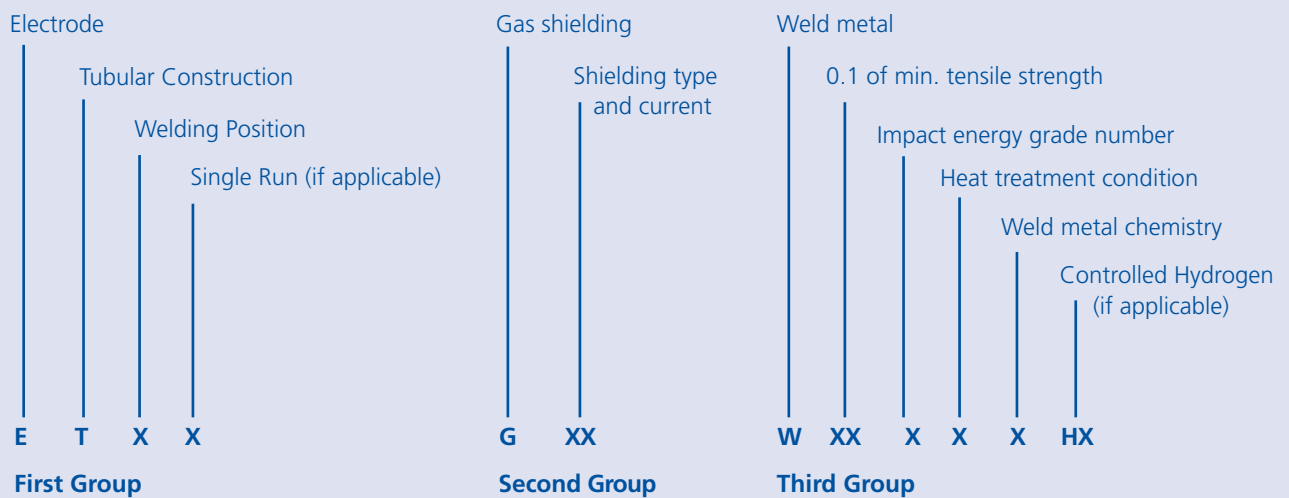
Scope: This standard specifies requirements for the following cored electrodes (as defined in AS2812) for self-shielded and gas shielded automatic and semi-automatic arc welding:

- (a) Carbon steel electrodes
- (b) Low or intermediate alloy ferritic steel electrodes.

It does not apply to cored electrodes for submerged-arc, electroslag, or electrogas welding.

Designation: The designation as illustrated below consists of the following:

### OLD CLASSIFICATION DESIGNATORS TO BE REPLACED

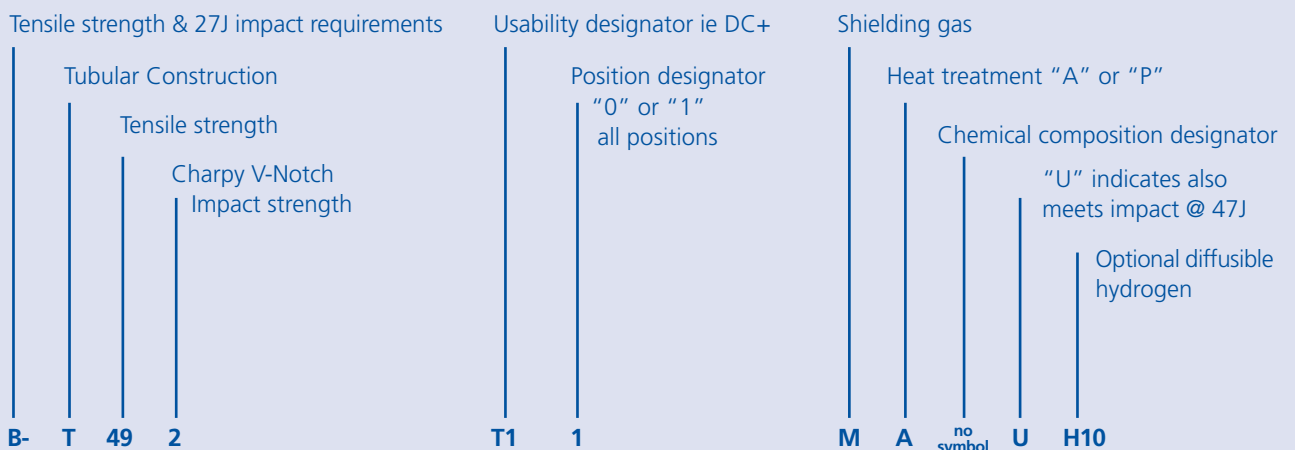


### AS/NZS ISO 17632: 2006

Scope: Australian/New Zealand Standard; Welding consumables-Tubular cored electrodes for gas shielded and non-gas shielded metal arc welding of non-alloy and fine grain steels-Classification(ISO 17632:2004,MOD)(a) Carbon steel electrodes.

It does not apply to cored electrodes for submerged-arc, electroslag, or electrogas welding. Usability designator ie DC+Shielding gas Designation: The designation as illustrated below consists of the following:

### NEW COMPULSORY CLASSIFICATION DESIGNATORS



# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## PRODUCT DATA SHEET

### WELDING POSITIONS



- Rutile Type Flux Cored Joining Wire, Micro Alloyed
- Formulated Exclusively for use with Ar/CO<sub>2</sub> Shielding Gas Mixtures
  - Excellent Operator Appeal "Smooth Spray Arc Transfer"
  - Versatile All Positional Capabilities
- Grade 3 Weld Metal Impact Properties
- Precision Layer Wound on 15kg Spools

### CLASSIFICATIONS

**AS/NZS 2203.1** 1ETP-GMp\_W503A.CM1H10 (superseded)  
**AS/NZS ISO** 17632 BT 49 2 T1 1 M A U H10\*  
**AWS A5.20** E71T-1M H8

\*New classification replaces AS/NZS 2203.1.

### DESCRIPTION AND APPLICATIONS

An all positional rutile micro alloyed type flux cored welding wire specifically formulated for optimum performance using Argon/CO<sub>2</sub> shielding gas mixtures.

The exceptionally smooth arc performance produces a superb weld for single or multipass welding with low spatter losses in all positions and applications (except vertical down).

Austfil 71T-1M is recommended for the welding of mild, carbon and carbon-manganese medium steels where good impact properties at -20°C are required.

This high deposition wire offers excellent operator appeal for general steel fabrications and constructions such as plate sections, beams, girders, truck chassis/bodies, shipbuilding, earth moving equipment, storage tanks, bridge construction etc.

Recommended shielding gases are: Argoshield 51/ 52, or Blueshield 7(M1) / 8 (M3) or Argon + 18-25%CO<sub>2</sub> or equivalent.

### OPERATIONAL DATA

WIRE SIZE (mm)	WELD POSITION	WELDING CURRENT RANGE (amps)	ARC VOLTAGE RANGE (volts)*
1.2	Flat	250-300	29-35
	Flat Fillet	230-280	28-30
	Vertical-up	170-220	24-28
1.6	Flat	300-350	28-34
	Flat Fillet	200-350	24-34
	Vertical-up	200-250	26-28

Recommended electrical stick out is 20 - 30mm. Welding Current DC +  
 \* Voltage is determined by arc current and wire arc length.  
 Welding currents and voltage shown are operational guides only.

### SHIPPING APPROVALS

LRS 3S, 3YS

### TYPICAL ALL WELD METAL CHEMICAL ANALYSIS

C	Mn	Si	S	P	Ni	Cr	Mo	Cu	Ti	B
0.04	1.20	0.42	0.012	0.013	0.01	0.06	0.01	0.06	0.07	0.001

### TYPICAL ALL WELD METAL MECHANICAL PROPERTIES

<b>Gas Type</b>	Ar+25% CO <sub>2</sub>
<b>Yield Stress</b>	487 Mpa
<b>Tensile Strength</b>	565 Mpa
<b>Elongation</b>	25%
<b>CVN Impact Values</b>	103J @ -20°C

In as welded position

### PACKAGING DATA

PACK SIZE (mm)	PALLET SIZE (kg)	PART NUMBER
1.2	1080	71T1M12S
1.6	1080	71T1M16S

### STORAGE INFORMATION

Products should be stored in dry conditions in original sealed undamaged packaging as supplied. The integrity of consumable products can be adversely affected by time and storage conditions and that the detail shown on the batch certificate is true at the time of packaging and is only valid for a LIMITED time. After that time the product may need to be reconditioned or checked to ensure it is suitable for the purpose it is intended to be used for\*. Welding wires are not immune to deterioration and should be stored in the bag provided when not in use for extended periods. Recommended conditions of storage are minimum temperature of 15°C and a humidity of 60% RH.

\* NOTE: Refer to Welding Technology Institute of Australia (WTIA), technical 3. care and conditioning of arc welding consumables.

# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## CERTIFICATE OF CONFORMANCE

<b>Commodity</b>			AUSTFIL 71T-1M		<b>Size x Length</b>		1.2	
<b>Mfg. date</b>			01/10/06		<b>Lot No.</b>		60110D12	
<b>Certificate No.</b>			011906-45		<b>Specification</b>		AS 2203.1: ETP-GMp-W503A-CM1H10	
<b>Amps DCEP</b>	<b>Volts</b>	<b>WFS</b>	<b>Shielding Gas</b>	<b>Electrode Stick-Out</b>	<b>Temperature</b>		<b>Travel Speed</b>	
					<b>Preheat</b>	<b>Interpass</b>		
250	32		AR+25%CO2	1 In. 25mm	RT F±25 RT C±14	300 F±25 149 C±14	12±1	lpm

<b>Chemical Analysis</b>	<b>Element (%)</b>	<b>C</b>	<b>Mn</b>	<b>Si</b>	<b>P</b>	<b>S</b>	<b>Ni</b>
	<b>Specification</b>	MAX 0.20	MAX 1.75	MAX 0.90	MAX 0.04	MAX 0.03	MAX 0.50
	<b>Filler Metal</b>	-	-	-	-	-	-
	<b>Deposited Metal</b>	0.058	1.12	0.48	0.015	0.004	0.02
	<b>Element (%)</b>	<b>Cr</b>	<b>Mo</b>	<b>V</b>	<b>Cu</b>	<b>Fe</b>	<b>-</b>
	<b>Specification</b>	MAX 0.20	MAX 0.30	MAX 0.08	-	-	-
	<b>Filler Metal</b>	-	-	-	-	-	-
	<b>Deposited Metal</b>	0.02	0.00	0.01	-	-	-

<b>Mechanical Properties</b>	<b>Sample's Diameter in</b>	<b>Tensile Strength 490-650 MPa</b>	<b>Yielding Point 360 Mpa</b>	<b>Elongation % 22 min</b>	<b>Impact Value 27J at -20°C</b>	
	NR	572	538	27	118	
	<b>Hardness Test (HRC)</b>	<b>Bending Test</b>		<b>Fillet Weld Test</b>	<b>Soundness Test</b>	<b>Moisture %</b>
		<b>Face</b>	<b>Root</b>			
NR	NR	NR	OK	Acceptable	NR	

<b>Remark</b>	<p>We hereby certify that this report is correct and that all test results are in compliance with the specification described herein.</p> <p>Diffusible Hydrogen: 7.56 ml/100g CONFORMS TO AWS A5.20</p>
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Quality Control Section

  
Kevin Yu

CERTIFICATE OF CONFORMANCE

# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## MATERIAL SAFETY DATA SHEET

INGREDIENTS	CAS No.	%	TWA
Ozone	10028-15-6		0.1ppm
Silica Crystalline - Quartz	14808-60-7	0.7	0.1mg/m <sup>3</sup>
Iron Oxide Fume	1309-37-1		5mg/m <sup>3</sup>
Welding Fumes	Not avail.	>60	

### PROPERTIES

Does not burn.

### HEALTH HAZARD INFORMATION



#### ACUTE HEALTH EFFECTS

Harmful by inhalation.  
May produce discomfort of the respiratory system\*.  
\* (limited evidence)



#### CHRONIC HEALTH EFFECTS

Limited evidence of a carcinogenic effect.  
Cumulative effects may result following exposure\*.  
\*(limited evidence)



### PRECAUTIONS FOR USE



#### ENGINEERING CONTROLS

Mechanical exhaust recommended.



#### GLASSES

Welding mask/goggles/handshield.



#### GLOVES

Welding.



#### RESPIRATOR

Type- P2 filter of sufficient capacity.



#### STORAGE & TRANSPORT



Keep container in a well ventilated place.  
Keep away from food, drink and animal feeding stuffs.



Store in cool, dry, protected area.



### EMERGENCY



#### FIRST AID

##### EYE

Do NOT remove embedded particles. Apply pads to BOTH eyes. URGENT MEDICAL ATTENTION.



##### SKIN

Wash with water and soap.

##### INHALED

Fresh air. Rest, keep warm. If breathing shallow, give oxygen. Medical attention.

##### ADVICE TO DOCTOR

Supportive care.

##### FIRE FIGHTING

Keep surrounding area cool. Water spray/fog.

##### SPILLS & DISPOSALS

Sweep/shovel to safe place.

Take off immediately all contaminated clothing.

To clean the floor and all objects contaminated by this material, use water and detergent.

### SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+



X



+



X



0



+

X: Must not be stored together

0: May be stored together with specific preventions

+: May be stored together

**NOT REGULATED FOR  
TRANSPORT OF DANGEROUS GOODS**

# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## PQR - FILLET WELDING PROCEDURE QUALIFICATION RECORD

<b>PROCEDURE No:</b>	W.P.S. No 71T-1M-00	<b>REVISION:</b>	<b>SHEET 1 OF 1</b>												
<b>PQR No:</b>	M-950														
<b>Welding Code</b>	AS/NZS 1554.1 SP	<p style="text-align: center;"><b>RUN REPLACEMENT SKETCH</b></p>													
<b>Material Grade</b>	AS 3678 - 350														
<b>Material Certificate No.</b>															
<b>Test Plate Thickness</b>	16mm														
<b>Welding Process</b>	FCAW														
<b>Joint Type Qualified</b>	FILLET														
<b>Position</b>	2F														
<b>Progression</b>	FLAT														
<b>Filler Type &amp; Batch No</b>	FLUX CORED WIRE No. 60110D12														
<b>Trade Name</b>	AUSTFIL 71T-1M														
<b>Flux Type &amp; Batch No</b>	NA	<b>Root Face</b>	NA												
<b>Gas Type &amp; Flowrate</b>	ARG/18% CO <sub>2</sub> 18L/min	<b>Bevel Angle</b>	NA												
<b>Technique</b>	5° PUSH	<b>Preheat Temp</b>	Room Temp												
<b>Electrode Stickout</b>	20-25mm	<b>P.W.H.T.</b>	Nil												
<b>Interpass Cleaning</b>	NA	<b>Polarity</b>	DCEP												
Run No.:	SIDE	WELD POS			GAS/FLUX		AMP		VOLTS		TRAVEL RATE			INTER PASS °C	HEAT INPUT Kj / mm
			SIZE	CLASS	TYPE	DC/PO	AC	DC/POL	AC	SEC	mm	mm/min			
1	1	2F	1.2	71T-1M	AR/18% CO <sub>2</sub>	272	—	30	—	24	200	500	25°C	0.98	
2															
3															
4															
5															

WELDER'S NAME & MARK: S. Dutch

PREPARED BY: WIA

DATE: 2006

APPROVED BY: N. Cornish

DATE: 2006

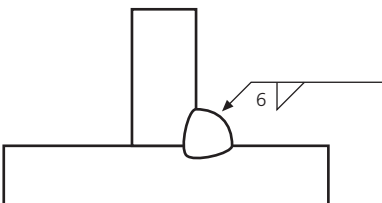
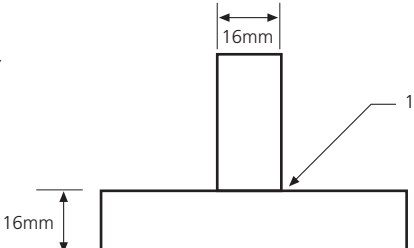
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# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## WELDING PROCEDURE SPECIFICATION

<b>PROJECT:</b> Rutile Flux Cored Wire		<b>REVISION:</b> A	
<b>WPS No:</b> 71T-1M/00		<b>PQR No:</b> M-950	
<b>WELDING CODE</b>	AS/NZS 1554.1 SP 2005		
<b>WELDING PROCESS</b>	FCAW		
<b>EDGE PREPARATION</b>	SQUARE		
<b>JOINT TYPE</b>	SINGLE PASS FILLET WELD		
<b>POSITION</b>	2F		
<b>WELDING M/C TYPE</b>	WELDMATIC FABRICATOR		<b>PROGRESSION:</b> FLAT
<b>JOINT DETAIL</b>	<b>SKETCH ONLY</b> 		<b>PASS SEQUENCE SKETCH ONLY</b> Typical Detail 
<b>JOINT TOLERANCE</b>		<b>MATERIAL SPECIFICATION</b>	
<b>ROOT OPENING</b>	0 -1 mm	<b>SPECIFICATION THICKNESS</b>	AS3678-350 16mm
<b>ROOT FACE</b>	NA	<b>RANGE</b>	≤ 50mm 't'
<b>GROOVE ANGLE</b>	NA	<b>THERMAL TREATMENT</b>	
		<b>MINIMUM PREHEAT</b>	10°C
		<b>MAX. INTERPASS TEMP.</b>	150°C
		<b>P.W.H.T.</b>	Nil
<b>TECHNIQUE</b>			
<b>STRING OR WEAVE</b>	STRING		
<b>CLEANING: INITIAL</b>	WIRE BRUSH		
<b>INTERPASS</b>	NA		
<b>BACKGOUGE METHOD</b>	NA		
<b>STICK-OUT</b>	20 -25mm		
<b>TRAVEL SPEED RANGE</b>	AS DETAILED BELOW		
<b>MAX WEAVE WIDTH</b>	NA		
<b>TUNGSTEN SIZE/TYPE</b>	NA		
<b>ELECTRODE ANGLE</b>	5° PUSH		
<b>CONSUMABLES</b>		<b>FILLER TYPE</b>	
		AS/NZS ISO 17632 BT 49 2 T1 1 M A U H10 (new) AS/NZS2203.1 ETP-GMp_503A.CM1 H10 (superseded) Batch No 60110D12	
		<b>BRAND NAME</b>	
		AUSTFIL 71T-1M	
		<b>GAS TYPE</b>	
		Arg / 18% CO <sub>2</sub>	
		<b>GAS FLOW</b>	
		18Ltr/min	
<b>WELD PASS DETAILS</b>		<b>ELECTRODE DESCRIPTION</b>	
<b>PASS</b>	<b>SIDE</b>	<b>POSITION</b>	<b>TYPE</b>
1	1	2F	71T-1M
			1.2
			AS/NZS-2203.1
			Ar+18%CO <sub>2</sub>
		<b>FLUX/GAS TYPE</b>	
		Ar+18%CO <sub>2</sub>	
		<b>WELDING PARAMETERS**</b>	
		<b>AMPS</b>	<b>VOLTS</b>
		260-280	24-31
		<b>POLARITY</b>	
		DCEP	
		<b>TRAVEL SPEED</b>	<b>INTERPASS</b>
		mm/min	°C Max
		500	150°C
		<b>HEAT INPUT</b>	
		Kj/mm	
		0.98	
<b>PREPARED BY</b>	WIA		<b>APPROVED BY</b>
<b>DATE</b>			N. Cornish
		<b>WELDER</b>	S. Dutch

<b>CUSTOMER</b>	
NAME	
SIGN	
DATE	
<b>COMMENTS.</b>	
1. CONSUMABLES TO BE STORED FOR USE AS RECOMMENDED BY THE MANUFACTURER.	
2. BALANCE WELD SEQUENCE TO MINIMISE DISTORTION.	
Macro required in accordance with AS/NZS1554.1SP to qualify the WPS.	
(Machine used: WIA - Weldmatic, Fabricator, Settings - Coarse; C, Fine: 3, Wire Feed: 6.5)	
<b>W.P.S STATUS</b>	
<b>SIGN:</b>	WIA
<b>DATE:</b>	2006



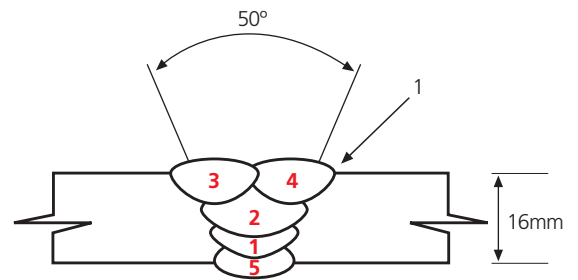
WELDING PROCEDURE SPECIFICATION

# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## PQR - BUTT WELDING PROCEDURE QUALIFICATION RECORD

PROCEDURE No:		W.P.S. No 71T-1M-01				REVISION:		0					SHEET 1 OF 1	
PQR No:		M-949												
Welding Code		AS/NZS 1554.1 SP												
Material Grade		AS 3678 - 350												
Material Certificate No.														
Test Plate Thickness		16mm												
Welding Process		FCAW												
Joint Type Qualified		BUTT												
Position		1G												
Progression		FLAT												
Filler Type & Batch No		FLUX CORED WIRE No. 60110D12												
Trade Name		AUSTFIL 71T-1M				Root Gap		0-2mm						
Flux Type & Batch No		NA				Root Face		2-3mm						
Gas Type & Flowrate		ARG/18% CO <sub>2</sub> 18-20 L/min				Bevel Angle		50°						
Technique		PUSH/DRAW				Preheat Temp		Room Temp						
Electrode Stickout		20-25mm				P.W.H.T.		Nil						
Interpass Cleaning		GRINDER / WIRE BRUSH				Polarity		DCEP						
Run No.:	SIDE	WELD POS			GAS/FLUX	AMP	VOLTS	TRAVEL RATE			INTER PASS °C	HEAT INPUT Kj / mm		
			SIZE	CLASS				TYPE	DC/PO	DC/POL			SEC	mm
1	1	1G	1.2	71T-1M	AR/18% CO <sub>2</sub>	270	30	50	300	360	100°C	1.35		
2	1	1G	1.2	71T-1M	AR/18% CO <sub>2</sub>	270	30	41	300	439	90°C	1.11		
3	1	1G	1.2	71T-1M	AR/18% CO <sub>2</sub>	242	30.5	38	300	474	90°C	0.93		
4	1	1G	1.2	71T-1M	AR/18% CO <sub>2</sub>	262	30	58	300	310	130°C	1.52		
5	2	1G	1.2	71T-1M	AR/18% CO <sub>2</sub>	254	30.5	63	300	286	-	1.63		



RUN REPLACEMENT SKETCH

WELDER'S NAME & MARK: S. Dutch

DATE: 2006

PREPARED BY: WIA

DATE: 2006

APPROVED BY: N. Cornish

DATE: 2006

**DISCLAIMER**

NOTE: WIA is a manufacturer and supplier of welding products, and does not operate as a provider of consultancy or other technical services or advice related to welding. The information provided in this Welding Procedure Specification is offered as a suggested procedure, to be assessed and approved by an appropriate authority for qualification or certification. No warranties are expressed, nor may be implied, as to the efficacy of this suggested procedure.

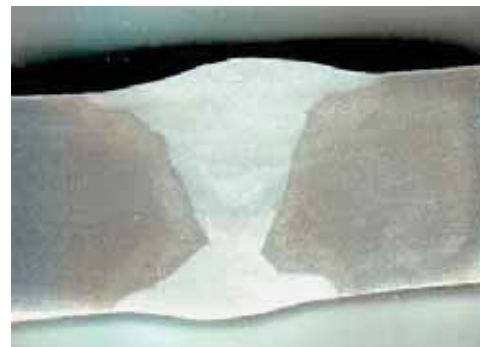
# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## WELDING PROCEDURE SPECIFICATION

<b>PROJECT:</b> Rutile Flux Cored Wire		<b>REVISION:</b> A										
<b>WPS No:</b> 71T-1M/01		<b>PQR No:</b> M-949										
<b>WELDING CODE</b>	AS/NZS 1554.1 SP											
<b>WELDING PROCESS</b>	FCAW											
<b>EDGE PREPARATION</b>	SINGLE BEVEL											
<b>JOINT TYPE</b>	SINGLE VEE BUTT WELD											
<b>POSITION</b>	1G											
<b>WELDING M/C TYPE</b>	WELDMATIC FABRICATOR		<b>PROGRESSION:</b> FLAT									
<b>JOINT DETAIL</b>			<b>PASS SEQUENCE SKETCH ONLY</b> 									
<b>JOINT TOLERANCE</b>		<b>MATERIAL SPECIFICATION</b>										
<b>ROOT OPENING</b>	1-3mm	<b>SPECIFICATION</b>	AS3678-350									
<b>ROOT FACE</b>	3mm	<b>THICKNESS</b>	16mm									
<b>GROOVE ANGLE</b>	50°	<b>RANGE</b>	≤50mm 't'									
		<b>THERMAL TREATMENT</b>										
		<b>MINIMUM PREHEAT</b>	10°C									
		<b>MAX. INTERPASS TEMP.</b>	150°C									
		<b>P.W.H.T.</b>	NA									
<b>TECHNIQUE</b>												
<b>STRING OR WEAVE</b>	STRING											
<b>CLEANING: INITIAL</b>	GRIND											
<b>INTERPASS</b>	WIRE BRUSH											
<b>BACKGOUGE METHOD</b>	GRIND											
<b>STICK-OUT</b>	20 -25mm											
<b>TRAVEL SPEED RANGE</b>	AS DETAILED BELOW											
<b>MAX WEAVE WIDTH</b>	NA											
<b>TUNGSTEN SIZE/TYPE</b>	NA											
<b>ELECTRODE ANGLE</b>	10° DRAG											
<b>CONSUMABLES</b>												
<b>FILLER TYPE</b>	AS/NZS ISO 17632 BT 49 2 T1 1 M A U H10 (new) AS/NZS2203.1 ETP-GMp-503A.CM1 H10 (superseded) Batch No 60110D12											
<b>BRAND NAME</b>	AUSTFIL 71T-1M											
<b>GAS TYPE</b>	Arg / 18% CO2											
<b>GAS FLOW</b>	18 Ltr/min											
<b>WELD PASS DETAILS</b>		<b>ELECTRODE DESCRIPTION</b>		<b>FLUX/GAS TYPE</b>		<b>WELDING PARAMETERS**</b>		<b>TRAVEL SPEED</b>	<b>INTERPASS</b>	<b>HEAT INPUT</b>		
<b>PASS</b>	<b>SIDE</b>	<b>POSITION</b>	<b>TYPE</b>	<b>SIZE</b>	<b>SPEC</b>	<b>AMPS</b>	<b>VOLTS</b>	<b>POLARITY</b>	<b>mm/min</b>	<b>°C Max</b>	<b>Kj/mm</b>	
1	1	1G	71T-1M	1.2	AS/NZS2203.1	Arg+18%CO2	260-280	29-32	DCEP	280-480	150°C	1.35
2	1	1G	71T-1M	1.2	AS/NZS2203.1	Arg+18%CO2	260-280	29-32	DCEP	280-480	150°C	1.35
3	1	1G	71T-1M	1.2	AS/NZS2203.1	Arg+18%CO2	240-270	29-32	DCEP	280-480	150°C	1.35
4	1	1G	71T-1M	1.2	AS/NZS2203.1	Arg+18%CO2	240-270	29-32	DCEP	280-480	150°C	1.35
5	2	1G	71T-1M	1.2	AS/NZS2203.1	Arg+18%CO2	240-270	29-32	DCEP	280-480	150°C	1.35
<b>PREPARED BY</b>		WIA		<b>APPROVED BY</b>		N. Cornish		<b>WELDER</b>		S. Dutch		
<b>DATE</b>												

<b>CUSTOMER</b>	
NAME	
SIGN	
DATE	
<b>COMMENTS.</b>	
1. CONSUMABLES TO BE STORED FOR USE AS RECOMMENDED BY THE MANUFACTURER.	
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(Machine used: WIA - Weldmatic, Fabricator, Settings - Coarse; C, Fine: 3, Wire Feed: 6.5)	
<b>W.P.S QA/QC STATUS</b>	
<b>SIGN:</b>	WIA
<b>DATE:</b>	2006



WELDING PROCEDURE SPECIFICATION

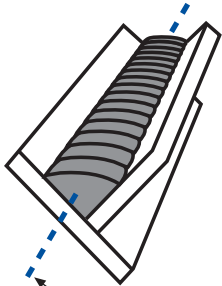
# austfil 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## WELDING POSITION DIAGRAMS

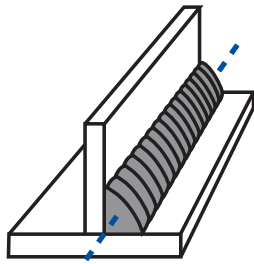
### FILLET WELDS

FLAT POSITION  
1F



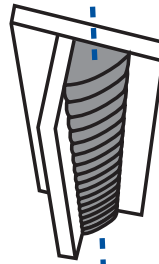
Axis of Weld  
Horizontal

HORIZONTAL POSITION  
2F



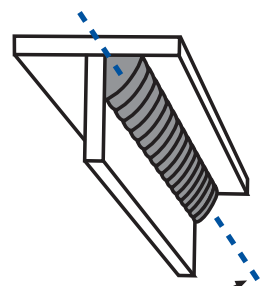
Axis of Weld  
Horizontal

VERTICAL POSITION  
3F



Axis of Weld  
Vertical

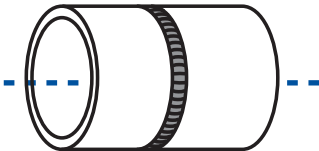
OVERHEAD POSITION  
4F



Axis of Weld  
Horizontal

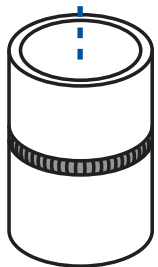
### PIPE BUTT WELDS

FLAT  
1G



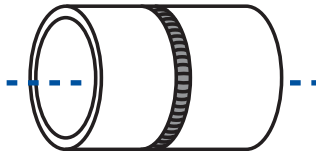
Pipe shall be turned or  
rolled while welding,  
Axis of Pipe Horizontal

HORIZONTAL  
2G



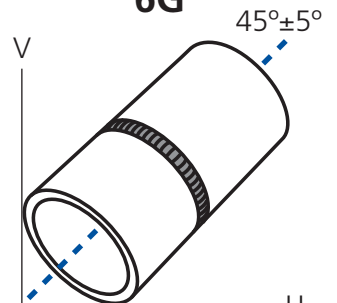
Axis of Pipe  
Vertical

POSITION  
5G



Pipe shall NOT be turned  
or rolled while welding,  
Axis of Pipe Horizontal

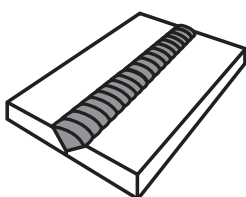
POSITION  
6G



Inclined Axis with  
Pipe Stationery

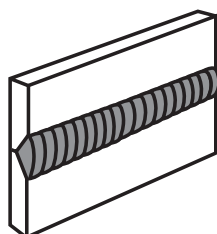
### BUTT WELDS

FLAT POSITION  
1G



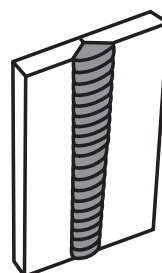
Plates Horizontal

HORIZONTAL POSITION  
2G



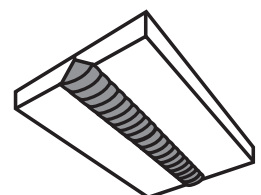
Plates Vertical

VERTICAL POSITION  
3G



Plates Vertical

OVERHEAD POSITION  
4G



Plates Horizontal

# *austfil* 71T-1M

GAS SHIELDED FLUX-CORED TUBULAR WIRE AWS A5.20:E71T-1M

## NOTES



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