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APPENDICES

APPENDIX A

HARDNESS TEST CALCULATION

T-Test

Group Statistics

	Electrode	N	Mean	Std. Deviation	Std. Error Mean
Outer	Import	3	1.2267E2	6.11010	3.52767
	Domestic	3	1.1733E2	3.05505	1.76383
Middle	Import	3	1.2000E2	9.16515	5.29150
	Domestic	3	1.1800E2	6.00000	3.46410
Inner	Import	3	1.2000E2	7.21110	4.16333
	Domestic	3	1.1667E2	4.04145	2.33333

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									99% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Outer	Equal variances assumed	1.538	.283	1.352	4	.248	5.33333	3.94405	-12.82546	23.49213
	Equal variances not assumed			1.352	2.941	.271	5.33333	3.94405	-18.16631	28.83297
Middle	Equal variances assumed	.727	.442	.316	4	.768	2.00000	6.32456	-27.11885	31.11885
	Equal variances not assumed			.316	3.448	.770	2.00000	6.32456	-30.55943	34.55943
Inner	Equal variances assumed	1.363	.308	.698	4	.523	3.33333	4.77261	-18.64020	25.30687
	Equal variances not assumed			.698	3.144	.533	3.33333	4.77261	-23.31734	29.98400

APPENDIX B

WELDING TEST CALCULATION

T-Test

Group Statistics

	electrode	N	Mean	Std. Deviation	Std. Error Mean
weld_thickness	import	9	1.4156	.76373	.25458
	domestic	9	1.3667	.73619	.24540
weld_width	import	9	.44722	.047507	.015836
	domestic	9	.47111	.047813	.015938
HAZ_width	import	9	.9444	.26154	.08718
	domestic	9	.8667	.25495	.08498
weld_length	import	9	2.1000	.14142	.04714
	domestic	9	1.9667	.29155	.09718
HAZ_length	import	9	2.2500	.13229	.04410
	domestic	9	2.0722	.28407	.09469
weld_interval	import	9	1.6333	.16394	.05465
	domestic	9	1.7444	.30046	.10015
HAZ_interval	import	9	1.5056	.14240	.04747
	domestic	9	1.6333	.29155	.09718

spot	import	9	27.4444	4.18662	1.39554
	domestic	9	27.4444	4.18662	1.39554

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									99% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
weld_thickness	Equal variances assumed	.016	.902	.138	16	.892	.04889	.35359	-.98388	1.08166
	Equal variances not assumed			.138	15.978	.892	.04889	.35359	-.98406	1.08184
weld_width	Equal variances assumed	.013	.910	-1.063	16	.303	-.023889	.022467	-.089511	.041733
	Equal variances not assumed			-1.063	15.999	.303	-.023889	.022467	-.089512	.041734
HAZ_width	Equal variances assumed	.000	.983	.639	16	.532	.07778	.12175	-.27782	.43338

	Equal variances not assumed			.639	15.990	.532	.07778	.12175	-.27785	.43341
weld_length	Equal variances assumed	5.115	.038	1.234	16	.235	.13333	.10801	-.18215	.44881
	Equal variances not assumed			1.234	11.567	.242	.13333	.10801	-.19885	.46552
HAZ_length	Equal variances assumed	5.712	.030	1.702	16	.108	.17778	.10445	-.12731	.48286
	Equal variances not assumed			1.702	11.314	.116	.17778	.10445	-.14483	.50039
weld_interval	Equal variances assumed	4.266	.055	-.974	16	.345	-.11111	.11409	-.44435	.22213
	Equal variances not assumed			-.974	12.375	.349	-.11111	.11409	-.45769	.23547
HAZ_interval	Equal variances assumed	4.894	.042	-1.181	16	.255	-.12778	.10816	-.44368	.18812
	Equal variances not assumed			-1.181	11.611	.261	-.12778	.10816	-.46016	.20461
spot	Equal variances assumed	.000	1.000	.000	16	1.000	.00000	1.97359	-5.76443	5.76443
	Equal variances not assumed			.000	16.000	1.000	.00000	1.97359	-5.76443	5.76443

APPENDIX C

IMPORT ELECTRODE SPECTROMETER TEST

PT. STILMETINDO PRIMA
ALLOY STEEL SPECIALIST

Cert No: FS 545043
ISO 9001 : 2000

Jl. Jababeka XII B Blok W No. 16
Kawasan Industri Jababeka 1
Cikarang - Bekasi 17832

Certificate of Verification

XLt 17304

Reading No	111
Mode	ALLOY
Time	
Duration	13.04
Alloy1	C814Hi Cu : 2.00
Alloy2	No Match : *3.30
Flags	
SAMPLE	
HEAT	
LOT	
BATCH	
MISC	
NOTE	

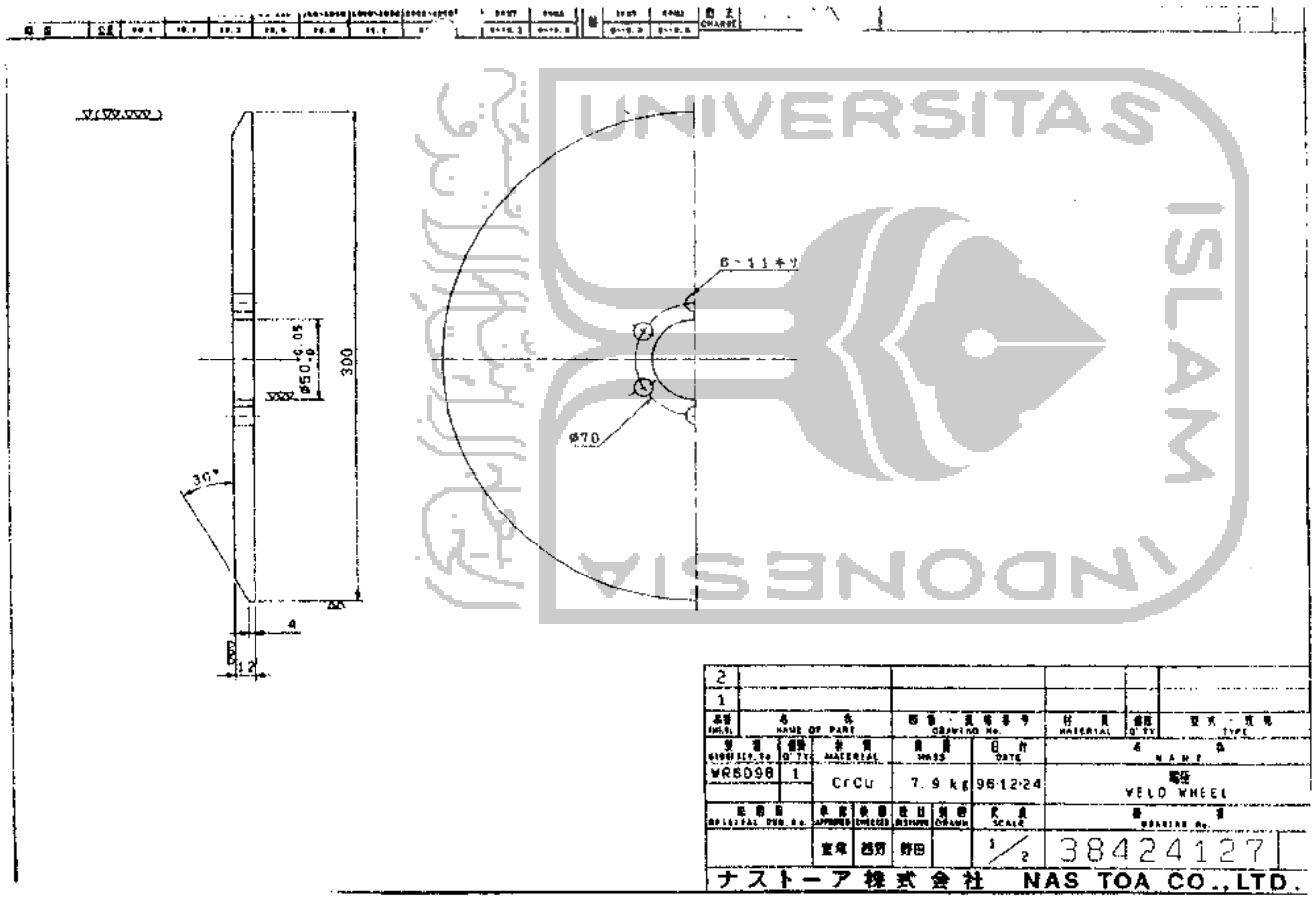
	%	±	Error
Sb	< LOD	:	0.18
Sn	< LOD	:	0.11
Pd	< LOD	:	0.04
Ag	< LOD	:	0.20
Al	< LOD	:	80.00
Mo	< LOD	:	0.02
Nb	< LOD	:	0.02
Zr	< LOD	:	0.02
Bi	< LOD	:	0.02
Pb	< LOD	:	0.03
Se	< LOD	:	0.03
W	< LOD	:	0.39
Zn	< LOD	:	0.20
Cu	98.37	±	2.24
Ni	< LOD	:	0.14
Co	< LOD	:	0.06
Fe	< LOD	:	0.08
Mn	< LOD	:	0.14
Cr	1.17	±	0.35
V	< LOD	:	0.36
Ti	< LOD	:	2.00

ENG AGUS M 01

Supervised By: Agus Mulyadi

APPENDIX D

ELECTRODE DIMENSION



APPENDIX E

DOMESTIC ELECTRODE SPECIFICATION

Phone (021) 6334948
(021) [illegible]
Fax (021) 6347072

P.T. ELO DUNIA MITRASARANA

SARANA

Jalan K.H. Hasyim Ashari No. 46 D-E Jakarta 10130 Indonesia
E-mail Address edmsmen@dola.net.id
Email Address info@edmsarana.co.id

SPECIFICATION OF SEAM WELDING

CuCr1Zr

Composition :

Chromium 1.0% Zirconium [illegible] Copper Remainder

Related Specifications

BS 4577 (A2/1) BS 2872, 2874 (CC102) ISO 5182 (A2/2), RWMA CLASS 2, Din 17666 CuCrZr 2.1293

Mechanical Properties

Property Min Values	Drawn Rod & Bar Up to 25 mm Dia	Drawn Rod & Bar Over to 25 mm Dia	Forging Seam Welding Wheels
Hardness VPN (Vickers)	140	30	[illegible]
0.2% Proof Stress (N/mm2)	(370)	(320)	(280)
Ultimate Tensile Strength (N/mm2)	[illegible]	[illegible]	100
Elongation % on 5.65 So	[illegible]	5	[illegible]

Physical Properties

In The Solution Heat Treated & Precipitation Hardened Condition	
Electrical Conductivity % IACS (min)	75
Thermal Conductivity Cal.cm/cm^2 Sec °C	0.75
Softening Temperature °C	525
Density Kg/M^3	[illegible]
Colour Code	Pink