

TEST CERTIFICATE

MODISON METALS LTD.

G I D C, VAPI – 396195.

GUJARAT, INDIA.

TEL : 91-0260-2424819

FAX : 91-0260-2429262

TO:

ENERGO PROFIT LTD.

CHAPAEVA STR.,

14/6, OFF-9,

EKATERINBURG-620102, RUSSIA

T. C. No.: 2K21 –872 DT: 09.06.2021

DRG NO.: 53A.552.411

INV NO.: EXP2100213 DT: 11.06.2021

P.O. NO.: APPENDIX NO.76 DT: 09.04.2021

CONTRACT NO.007-07122016

QTY: 100 Nos.

PHYSICAL / CHEMICAL TESTS

COMPOSITION: Wcu 75/25+ COPPER

WCu 75/25		ETP COPPER		
TEST	POWDER BATCH NO. 2K21 154	TEST	REQUIRED VALUE	ACTUAL VALUES
Cu % BY WT.	PLEASE REFER PAGE 2	%CU BY EIGHT	MIN 99.85%	99.96%
W % BY WT.		TENSILE STRENGTH	MIN 240 N/mm ²	296.4 N/mm ²
DENSITY		% ELONGATION	MIN 10	21.06%
CONDUCTIVITY		HARDNESS	MIN 80 BHN	93 BHN
HARDNESS		CONDUCTIVITY	MIN 95% IACS	98.7% IACS
		SILVER PLATING	24µm	28.4 MICRON

MICROSTRUCTURE:

Uniform distribution of tungsten particles in the copper matrix observed. Insitu bonding of WCu with Cu found okay. Microstructure okay. Please refer Page 2 for Conformance to GRADE WCu25

E.B. WELDING: BEND TEST FOUND OKAY.

DIMENSIONAL REPORT

DRAWING DIMENSION	TOLERA NCE	ACTUAL DIMENSION		DRAWING DIMENSION	TOLER ANCE	ACTUAL DIMENSION	
335	-0.8	334.63	334.60	M42x2		OKAY	OKAY
76	±0.5	75.95	76.10	2X45°		OKAY	OKAY
51	±0.5	50.88	51.05	Ø28	+0.3	28.15	28.20
R10		OKAY	OKAY	Ø14	+1	14.25	14.20
14°	±0.5°	OKAY	OKAY	Ø5	+0.4	5.28	5.30
Ra 1.6		0.30	0.35	7	±0.2	7.15	7.18
Ø44		44.04	44.05	3	+0.3	OKAY	OKAY
Ø30.4	+0.3	30.50	30.55	Ø39	-0.5	38.85	38.88
WCu 17		17.10	17.0	Ø30.7	+0.5	30.90	30.86
8	±0.2	8.0	8.0	3	±0.5	OKAY	OKAY
M30 X 1.5		OKAY	OKAY	45°		OKAY	OKAY
Ø20	+0.4	20.10	20.02	R0.5		OKAY	OKAY
25	+0.2	25.04	25.10				
19	+0.4	19.25	19.30				
1x45°		OKAY	OKAY				

FNI-F-01

INSPECTED BY


(Mahela R. R.)

SEEN BY





TEST CERTIFICATE
T.C. NO.: 2K21 872 DT : 09.06.2021

CONFORMANCE TO WCu 25 SPECIFICATION

DRG NO.: 53A.552.411

MATERIAL: COPPER TUNGSTEN	GRADE: WCu 25
---------------------------	---------------

PROPERTIES	UNIT	REQUIRED VALUE	ACTUAL VALUE
			POWDER BATCH NO. 2K21 154
Density	g/cm ³	14.6 - 15.2	14.86
Hardness	HB	180 - 240	192
Electrical Conductivity	% IACS	29.3 MIN	32.5
Metallography Aspect		Homogeneous	Homogeneous
• Grain size Distribution			
• Range	µm	1 - 15	1 - 15
• Mean size of grains of W	µm	4 - 6	5.0
Porosity			
• Quantity of pores	%	≤ 1.5	0.32
• Size of pores	µm	≤ 30	<30

Chemical composition in %

Elements	Tungsten	Copper	Nickel	Traces
Required value	72 - 78	22 - 28	0.2 - 0.8	≤ 0.2
Actual value	73.86	25.72	0.34	0.08

NOTE:

VISUAL: Visual inspection includes surface finish, Pin holes, feed marks, burrs, dents, cracks, blow holes, inclusions, forging folds etc.

INSPECTED BY:

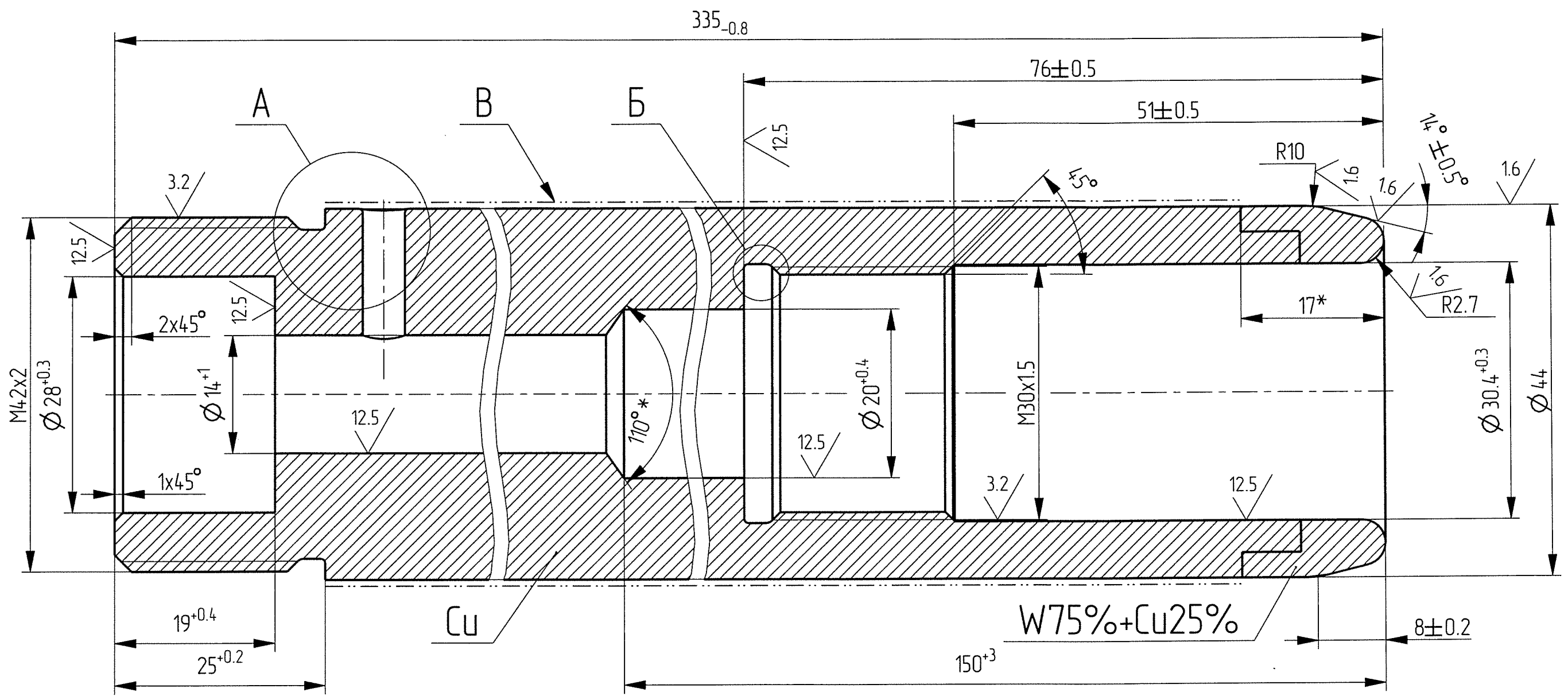

(Mahela R. R.)

SEEN BY:

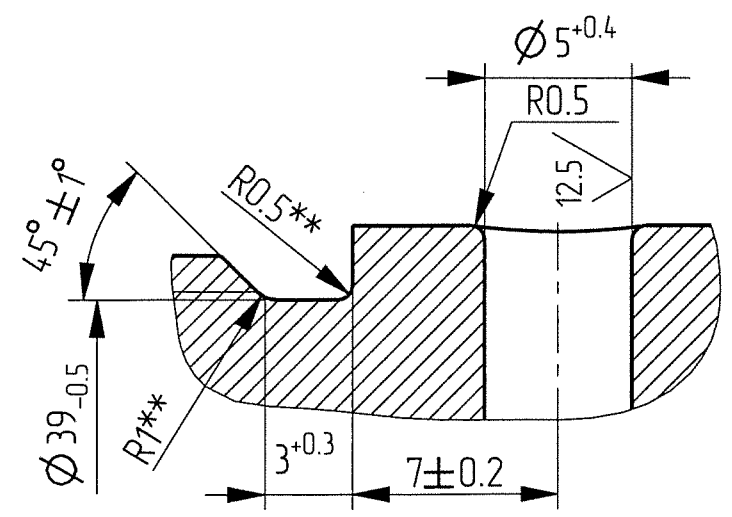


Исполнитель
04.03.21

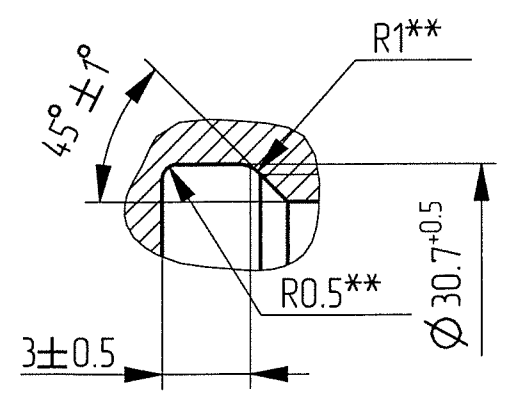
Справ. №	Перб. примен.
91Г-220	53A.552.412
Инд. № дубл.	
Взам. инд. №	
Подпись и дата	
Инд. № подл.	



А(4:1)



Б(4:1)



- *Размеры для справок.
- **Размеры обеспечиваются инструментом.
- Радиусные переходы должны быть плавными, без острых кромок.
- Покрывание поверхностей В – Ср24. Допускается покрывание всей детали.
- Номер по документации поставщика – 5EA.552.411.

					53A.552.411									
					Контакт					Лит.		Масса	Масштаб	
Изм.	Лист	№ докум.	Подп.	Дата							A		3.5	2:1
Разраб.	Бирюков	02.21r												
Провер.	Наумкин													
Т.контр.	Григуть									Лист 1		Листов 1		
Н.контр.	Строкова													
Утв.	Карлов													
										Электроаппарат				