Introduction

Rolling, Extruding and Drawing,
Machining of Non-ferrous Metals

Hanametal Co., Ltd

INDEX

1. Introduction & Products

☐ Company introduction

Hana Metal Co., Ltd is a company that endlessly researches new technologies,and produces various products like nonferrous metal material and electrical plant equipment. Recent conditions require continuous technological innovation to stay alive within the limitless competition. We think that this means the success of the company depends on what kind of technological innovation and trust is formed.

Our Hana Metal Corporation will continue to accumulate know-how through various practical experiences that includes product material development and the production of plant facilities based on the new technologies that we've developed over the recent past.
We will grow into a company that can contribute to the nation's key industry

☐ Products

Items	Descriptions
Sheet	Copper strip & sheets, Brass strip & sheets, forged copper plates
Bus Bar	Copper Bus Bars, Rods & Bars, Profiles Bus Bars
Strips	Copper Strips
Special copper Alloys	Beryllium copper, Cr-Cu, Si-Cu Alloys
Others	▯ Plant works (Electrical copper Bus bars Line works) ▯ Specially machined products based on copper materials in relation to water cooling

2. History of The Company

Year	History
1996. 2	Established Hanametal Co., Ltd
1996. 3	Selected as a cooperative company with LG Industrial Systems Co., Ltd
1997. 2	Permitted status of a military service exemption company (No. 92-208)
1997. 4	Development on Equipotential bars by water cooling
1998. 9	Acquisition for patent for the purpose of electrical Zinc analysis
1998. 11	Acquisition for korean industrial standard certificate
2000. 8	Extended installation of coil facilities
2001. 8	Development on copper jacket
2002. 2	Acquisition for patent on equipotential bar production procedures
2002. 3	Under developments with korea technology Development & research
2002. 5	Construction of horizontal continuous casting facility to produce oxygen free copper
2002. 10	Selected as a promissory small and medium size company by korea bank of industry
2002. 12	Acquisition of certificate for specialized company on materials and parts by korea ministry of industry
2003. 2	Acquisition ISO 9001-2000

3. List of Main Equipment & Facility

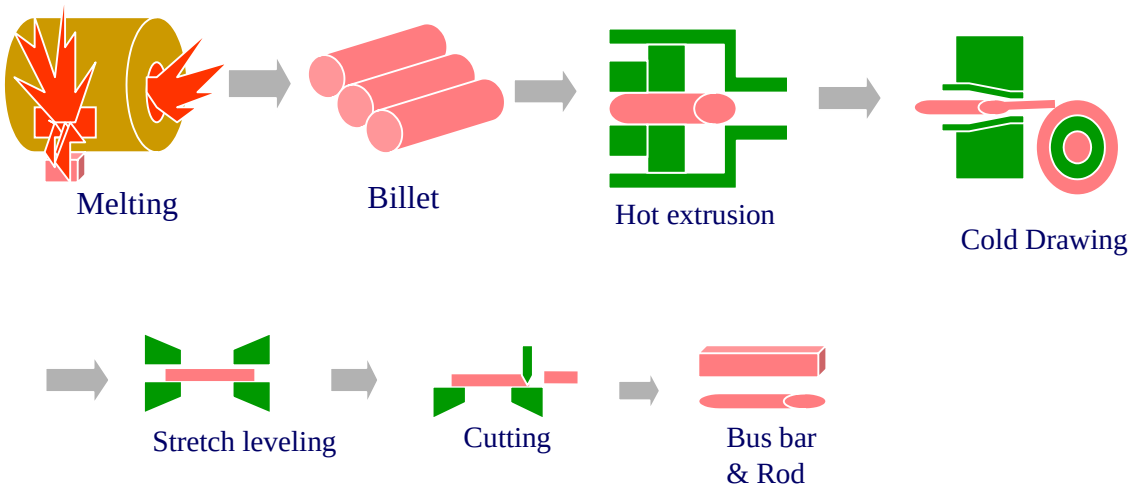
Division	Name of facilities	Remarks
Melting	High frequency electric furnace	
	Facility for vertical & Horizontal	
Drawing/ Extruding	Extruding equipment in water	
	Drawing equipments No. 1~ No.3	
	Straightness correction equipment on drawing and etc.	
Rolling	2 passes rolling equipment, 4 passes rolling equipment	
	Plate correction equipment and cutting machinery	
	Heat treatment furnace and slab face shearing	
Coil	6 passes rolling machinery, 4 passes rolling machin-ery, 4 HI Break-down machinery	
	Annealing furnace and cutting machinery	
Machineries	Miller, radial work machinery, MCT	

4. Business Performance Record

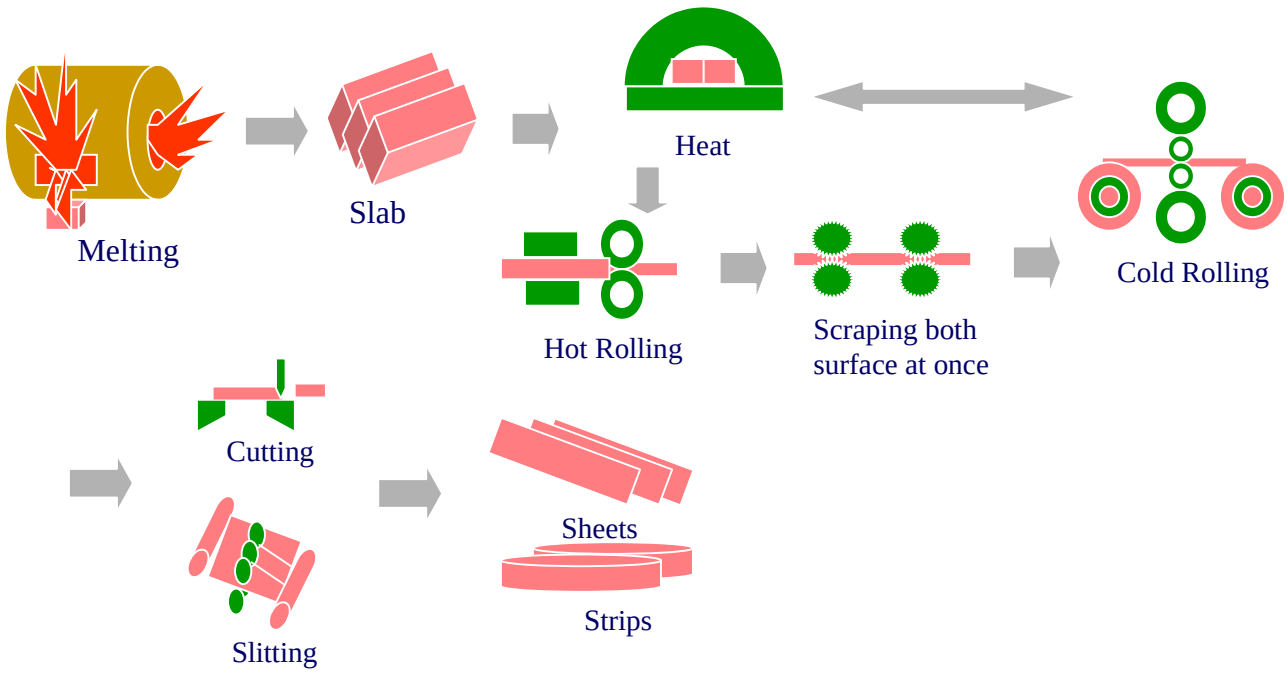
List		Business performance records
1	Project name	DC 12,000A(24V~48V) 50units (ETL, CGL CAL, ECL, Bus-Bar Line works, Leflow included)
	Work scope	⊙ Design (CAD) ⊙ Bus-Bar & all the other materials ⊙ Installation
2	Facility name	□ Copper Jacket facility by water cooling system (First time in korea) (DC 160,000A)
	Work scope	⊙ Hot forging & machining ⊙ Defects inspection (Water pressure Test, RT,UT,PT Check Test)
3	Project name	□ Australia S.M.C (Sun metal Co., zinc electrical analysis Facility) □ Pb anode plate □ Main Bus-Bar and Special alloy Copper (Bus-Bar) materials supply
4	Project name	POSTIN Electric Tin plate Line plant (DC 8,000A , 15,000A)
	Work scope	⊙ Design ⊙ Bus Bars and all other materials ⊙ Installation, Inspection

5. Work Process

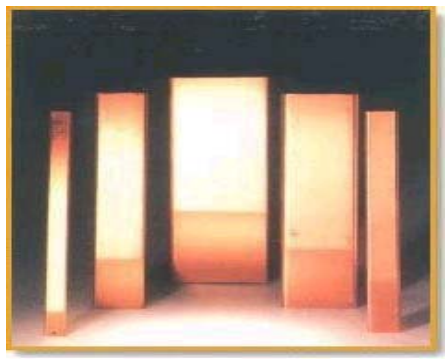
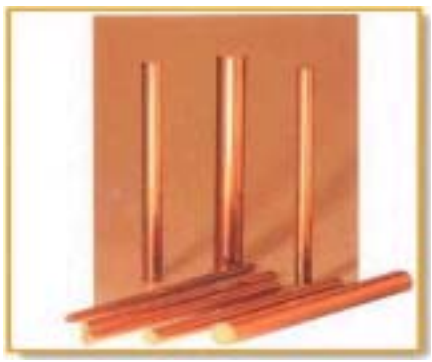
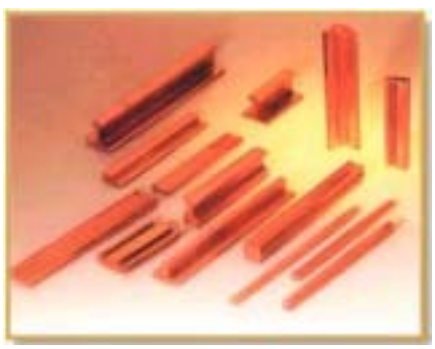
☐ Bus Bar & Rod Line



☐ Sheets & Strips Line



6. Copper Material

1. Copper Bus Bar		• High quality of Conductivity, chemical composition • Use : High capacity electrical main lines, distributor
2. Copper Rods/ Round Bars		• High quality of conductivity and Heat radiation with high anticorrosion • Use : Electrical parts for chemical industries
3. Deformed Profiles & Ground Rods		• Trolley bars, I-beam, Angle, channel and etc. • Deformed Bus bars
4. Copper Sheets/ Strips		• Conductivity 98% above and excellent welding performance • Use : Electrical parts, welding rods, chemical industries construction materials, roof materials joint bars

7. Copper Jacket Manufacturing Process

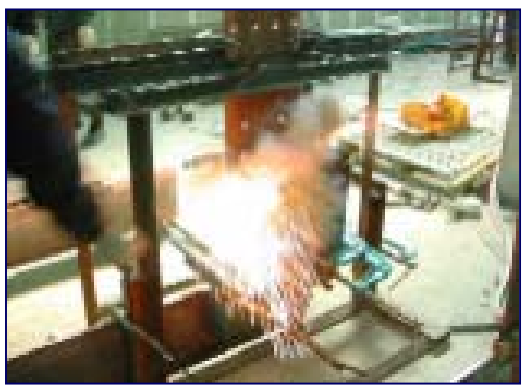
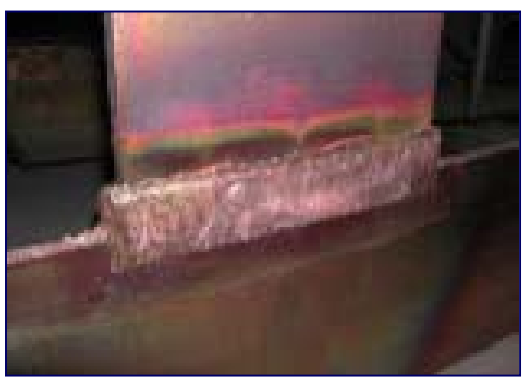
1. Casting Process		• Casting process after copper melting
2. Pre-Heating Before Hot-forging		• Pre-Heating / Hot-forging Processes
3. Hot Forging process		
4. Forming After Forging		• Finished products after forging

5. Flow test		• Water flow test
6. Complete Sets	 	• Cooling Plant Sets

8. Copper Bus Bar Electrical Line Work

A. Electrical Copper Bus bar line work for refinery mill

1. Main Bus Bar & other materials		• Main Bus Bar bending & Hole drilling (30~80T * 200~600T * Max 7000M)
		
		• Sub-Bus Bars
		• Neutral Bus bars

1. Main Bus Bar & other materials		• Main Bus bar bending & Hole drilling
		
2. Explosion welding		• View of graphite Molding setting for explosion welding & Firing
		• Explosion welding Area on the jointed parts

3. Electrical Lines

• View after explosion welding

• longitudinal copper bus bar sizes (15~ 30T& * 200~400W * Max 15M)

• View after explosion welding & bus bar line installation

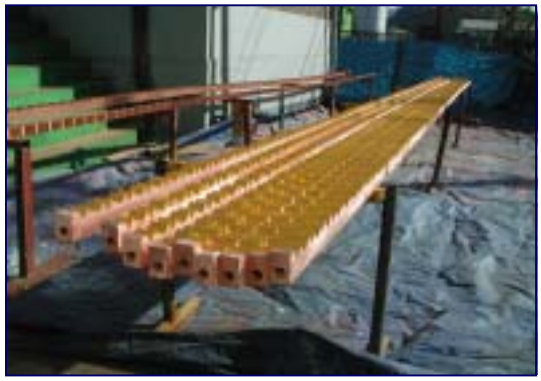
4. Main Bus Bar Installation	 	• Main Bus Bar Installation working process
5. Completion Of installation	 	• View after electrical lines work completion

B. Bus bars line works for steel mills & chemical industries

1. Bus Bar Electrical Line Work		• The connecting area between rectifier and main Bus bars
		• Bus bar line installation from low voltage to high voltage
		• Bus Bar Line
		• View after rubber coating flexible installation on Bus bar line

9. Electrical Material

1. Machined Copper Products & Coating		• Tin coating after machined Copper products
		• Ag coating after machined Copper products
2. D-Type Bus Bar		• Specially formed D-type Bus bar for distributors
3. Bi-Metal Contact		• Copper and Aluminum Bi-Metal contacts by progressive welding

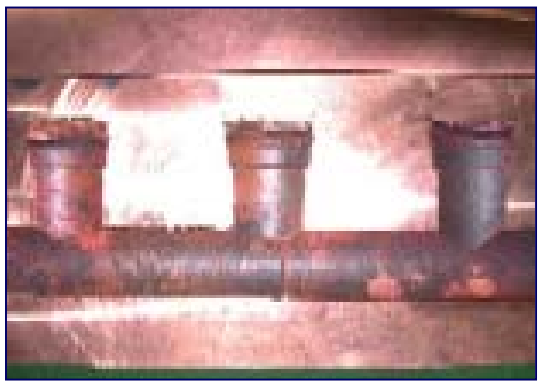
4. Equipo-tential Bar		• Feature: by water cooling with 15Ø hole in the center line to prevent over-heating of the products working so mass-production available
		• Final Product - Water cooling of OFC materials (40~60T * 50~200W * Max 15000L)
5. Flexible		• Copper Flexible - Connecting parts for high voltages (50T * 550W * 1500L) - Buffer area on heat expansion
		• Aluminum Flexible (6T * 400 *750L)

6. Head Bar		• Rolled bus bars for high capacity (80T * 550W * 3300L)
7. Bus Bar		• Silver plated (50~80T * 200~600W * 1000~8000L)
8. PB Anode Plate		• Materials to refine waste Sulphur-acid liquids (Bus bar and Pb acid plate assembled)
9. Short Bar		• Electrical contact points parts

10. Diverter S/W		• Diverter S/W under part (High voltage shutter)
		• Diverter S/W side (High voltage shutter)

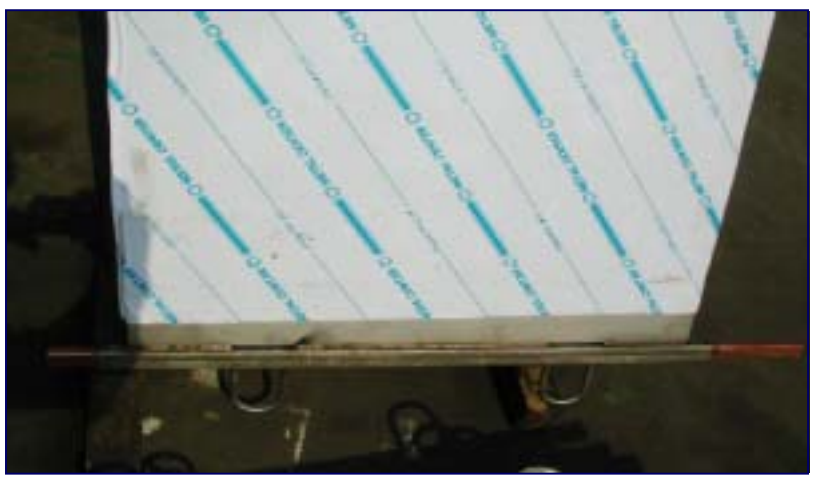
10. Welding

1. Explosion Welding		• Jig Setting before explosion welding
		• Firing
		• The surface after explosion welding (T-type) (35T * 60W * 300L)
		

3. AL + Cu Welding		• To prevent the heat radiation from the welding points, do welding after clothing with asbestos
		• AL Bar & Cu Bar welded metal bar machining process
4. Cu Welding		• Sectional cutting area to test welding points ① Cu welding ② BAg welding ③ Bcup welding
		

11. SUS Cathode Blank

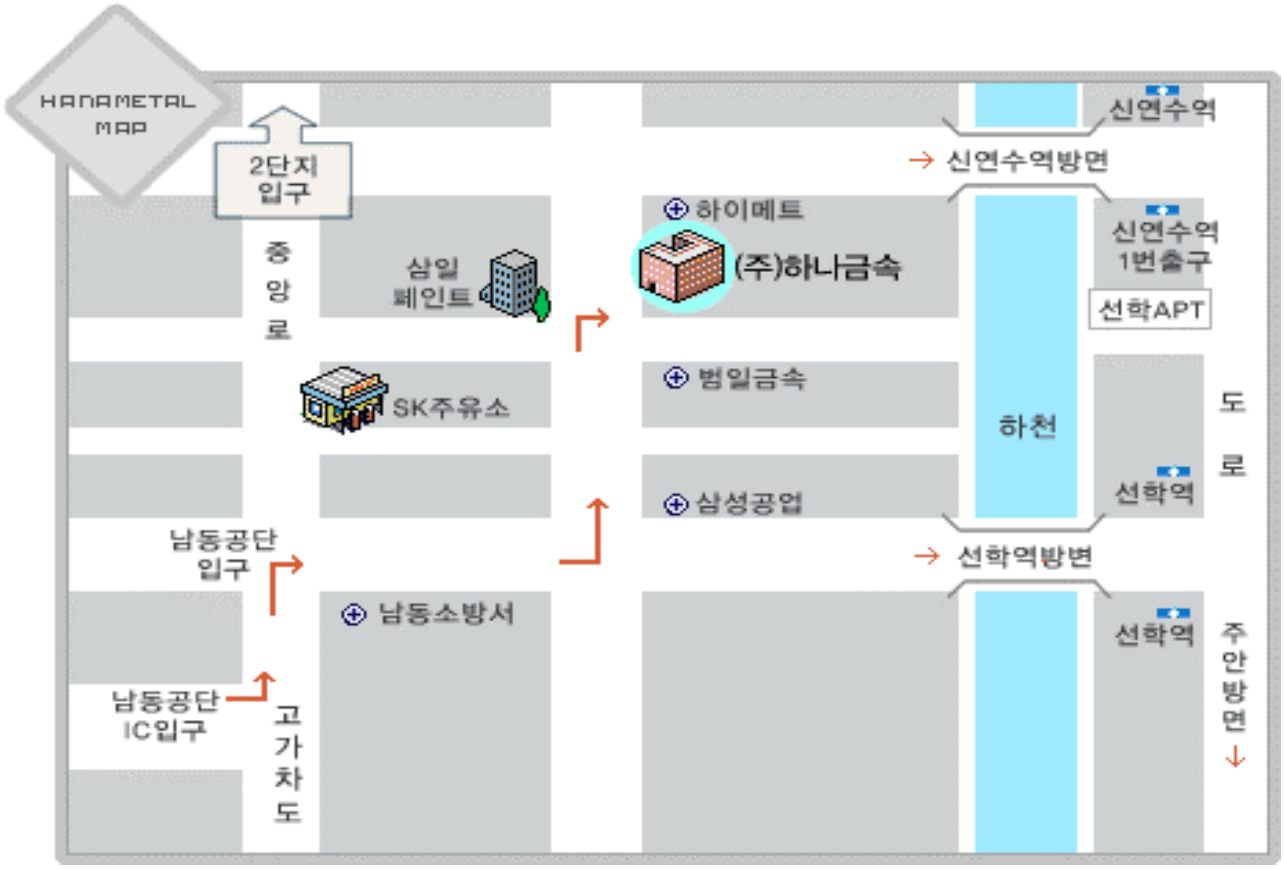
A. SUS Cathode Blank (Type A)

Front View	
The Welding Point Of Stainless Steel	
	

B. SUS Cathode Blank (Type B)

Front View	
The Contact Point with Copper and Stainless Steel	
	

12. MAP



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