



名佳利 金屬工業股份有限公司
Minchali Metal Industry Co., Ltd.

品質 · 技術 · 服務 · 創新
Quality / Technology / Service / Innovation



名佳利金屬工業股份有限公司
Minchali Metal Industry Co., Ltd.

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公司概要

Company Profile

公司名稱：名佳利金屬工業股份有限公司

董事長：林世強
總經理：林世強

公司地址：32063 桃園市中壢區北園路11號

E-MAIL：business@minchali.com.tw

設立日期：1978年7月25日

資本額：新台幣貳拾陸億陸仟零玖拾柒萬貳仟叁佰元整

土地面積：9,728 坪

廠房面積：6,862 坪

員工人數：250 人

Company Name : Minchali Metal Industry Co., Ltd.

Chairman / President : Daniel Lin

Company Address : No.11, Beiyuan Rd., Zhongli Industrial Park, Zhongli Dist.,
Taoyuan City 32063, Taiwan

E-Mail : business@minchali.com.tw

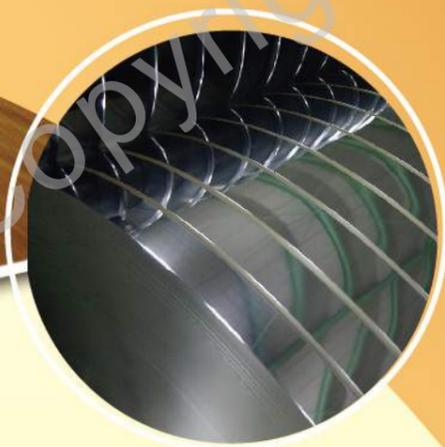
Date of Establishment : 25-Jul-1978

Capital : NT\$2,660,972,300

Company Land : 32,158m²

Factory : 22,684m²

Employee : 250



公司沿革

Brief History



- 1978年：公司創立
- 1980年：產品上市，正式營業
- 1981年：產品試銷香港成功，首創國產銅片外銷記錄
- 1983年：第一家製銅廠獲頒中央標準局正字標記證書
- 1986年：第一廠熔解鑄造設備及化性分析儀器啟用
- 1992年：評鑑合格成立名佳利金屬工業股份有限公司中心衛星工廠體系
- 1992年：本公司股票經證管會核准上市6/12正式掛牌上市
- 1992年：獲行政院環境保護署頒發第一屆中華民國企業環保獎
- 1996年：PM導入宣告
- 1997年：股長級以上全體至日本YAMAHA TPM研修
- 1997年：別與日本YAMAHA及財團法人中衛發展中心簽訂TPM輔導專案
- 1997年：通過經濟部商品檢驗局ISO 9002認證，取得證書
- 1998年：TPM Kick off大會
- 1998年：董事長至日本YAMAHA研修
- 1998年：銅品擴廠土地取得簽訂合約
- 1999年：銅品擴廠開工動土
- 2000年：榮獲TPM第一類優秀獎
- 2002年：銅品擴廠設備正式量產
- 2002年：取得經濟部標準檢驗局ISO 9001:2000（轉版）證書
- 2003年：取得ISO 9001:2000品質管理系統GIC國際證書
- 2003年：新增14噸爐投產
- 2004年：新增橫連爐投產
- 2006年：取得ISO 14001：2004環境管理系統GIC國際證書
- 2007年：取得IECQ/QC080000有害物質管理系統ECCB & ABS國際認證，以符合RoHS指令要求
- 2008年：取得OHSAS18001及TOSHMS職業安全衛生管理系統台灣SGS認證，並於2009年間轉換由經濟部中央標準局認證
- 2009年：增設無鉛純錫表面處理Reflow設備
- 2010年：積極導入推行ISO/TS 16949汽車業品質管理系統
- 2011年：取得ISO/TS 16949:2009汽車業品質管理系統認證
- 2012年：增設高精密分條設備，提供產品精密分條加工服務
- 2013年：生技研發單位成立；提供客戶技術支援服務及新產品與製程開發
- 2014年：與工研院簽訂合作開發高性能磷青銅產品專案
- 2015年：增設第二套精密分條機、自動包裝線，提昇高端產品之裁切與包裝品質

- 1978 : Establishing the company, Minchali
- 1980 : Introducing products and starting business
- 1981 : Being successful in trial selling into Hong Kong, which makes a new record of exporting copper strip
- 1983 : Being the first copper manufacturing company awarded the Certificate of CNS by bureau of Standards, Metrology and Inspection , MOEA
- 1986 : Starting using the Casting Equipment and the newest Chemical Analysis Instrument
- 1992 : Establishing "The Center-Satellite Factory System of Minchali" after being assessed and acclaimed for being qualified
- 1992 : Receiving the guidance of "Integrated program of Whole-Company Computerization" from China Steel Company
- 1992 : Being approved by Securities and Exchange Commission, Minchali's stocks started listing on June12th
- 1992 : Being awarded "The First National Enterprise Honors of Contribution to Environmental Protection" by the Environmental Protection Administration, Executive Yuan
- 1996 : Declaring the implementation of TPM (Total Productive Maintenance)
- 1997 : Being representatives, staff above chief goes to research and study the TPM of YAMAHA Metanix Corporation in Japan
- 1997 : Contracting "TPM Guidance Programs" individually with YAMAHA in Japan and Corporate Synergy Development Center in Taiwan.
- 1997 : Being awarded the certificate of ISO 9002 by Bureau of Standards, Metrology and Inspection, MOEA
- 1998 : Holding the TPM Kick off Meeting
- 1998 : Being representative, Chairman of Minchali goes to research and study the TPM of YAMAHA in Japan
- 1998 : Signing the land contract for the Expansion Copper Factory
- 1999 : Starting to build the Expansion Copper Factory
- 2000 : Having the honor to win the "TPM Award" for Excellence-First Category
- 2002 : The Expansion Copper Factory completed and starting on production.
- 2002 : Quality Management System ISO 9001:2000/CNS 12681 approved and registered by the BSMI/MOEA (Bureau of Standards, Metrology and Inspection, Ministry of Economic of Affairs, Taiwan.)
- 2003 : ISO 9001:2000/CNS 12681 Quality Management System approved and registered by the GIC.
- 2003 : Expansion 14 Ton Vertical Casting (VC) furnace joins production.
- 2004 : Expansion Horizontal Continuous Casting (HCC) furnaces join production.
- 2006 : ISO 14001:2000 Environmental Management System approval and registration by GIC.
- 2007 : IECO/QC080000(HSPM) approved and registered by the ECCB and ABS Quality Evaluations Inc. Singapore to meet RoHS directive.
- 2008 : OHSAS18001 and TOSHMS Occupational Health and Safety Management System approved and registered by SGS Taiwan. And been transferred to the Bureau of Standards, Metrology and Inspection, MOEA's approval during the next year.
- 2009 : Installing a Lead-free Pure Tin Plating Line with Reflow process
- 2010 : Introducing ISO/TS 16949 Quality Management system into company for automotive-related products
- 2011 : ISO/TS 16949:2009 Quality Management system approved and registered
- 2012 : Installing a Precision Coil Slitting Line.
- 2013 : Founding the Production Engineering Division.
- 2014 : Cooperate with ITRI a contract to develop high-performance phosphor bronze products
- 2015 : Installing the second Precision Coil Slitting Line and automatic packing line.

ISO 9001 & ISO/TS16949

電子科技的日新月異，帶動了產業界對基礎材料的銅板品質要求更為嚴格。名佳利為了加強表面品質管理，特別導入高速表面檢查機、硬度機、分光儀，以及金屬萬能試驗機等，以貫徹「品質是管理出來」的最高原則。同時，名佳利更在各工程上實施Q要點管理，充份掌握材料、設備、加工方法等4M的條件狀況，隨時了解品質狀態，以確保產品品質，為顧客提供滿足需求、使用安心、值得信賴的高水準產品。



The quality requirements, which manufacturers ask for copper strip, the basic material, are more and more rigid because of the daily fast changes of electronic technologies. For the purpose of reinforcing the surface quality control, the On-Line Web Inspection System, Hardness Tester, Metal Analyzer, and Micro-Computer Universal Testing Machines are installed in Minchali to carry out the highest principle of "Quality is made via Management". Meanwhile, the Q-Component Management is put into effect in all engineering in order that we can have all the situations of 4M, including materials, machines, man, and method, in hand. Additionally, we are able to master the quality condition at any time to make sure the product quality, satisfy our customers' demands, and provide the best products of guaranty and trustworthiness.

IECQ /QC080000 HSPM

在進入國際化重視環境保護之同時，名佳利也注意到了全球日益關注歐盟規範對有害物質使用限制加以有效管理之趨勢。為符合此一趨勢要求，2007年間名佳利全面導入並取得IECQ/QC080000有害物質管理系統 ECCB & ABS 國際認證，也使名佳利產品得以符合歐盟RoHS指令要求。不僅如此，我們更斥資購入ICP試驗機及建立ICP試驗室，以確保有能力透過對我們產品、流程和系統監控來瞭解產品及管理的能力，有效使現有的品質管理系統提昇到對產品，皆符合歐盟規範及客戶需求之有害物質使用限制；並逐步達成全產品無有害物質的目標使符合國際環保要求。



This promises that our products have all met RoHS/EC directive. More than this, Minchali also invested the ICP Spectrometer and laboratory to ensure the products and production processes are able to fulfill RoHS as well as customer's HSF requirements. With our efforts, we shall to do our best to satisfy not only the quality, but also the environmental requirements to our costumers in the world.

OHSAS 18001&TOSHMS Safety & Healthy

為落實職業安全衛生管理工作、善盡企業責任及持續改善安衛各項績效要求，名佳利自2007年即規劃比照品質管理系統ISO9001與環境管理系統ISO14001來推動職業安全衛生管理系統OHSAS及TOSHMS；並已經於2008年取得SGS OHSAS及TOSHMS之認證，以貫徹本公司「安全第一、災害歸零」之理念；名佳利根據此一管理系統，確實執行安全衛生工作之規劃、執行、查核與改善的PDCA管理循環機制，以落實全方位的安全衛生管理，創造安全舒適的工作環境。



To proceed the Occupational Health and Safety Management tasks and to do our best to fulfill our company's duty, and continual improvement of the performance of the Employer Health and Safety's requirements, Minchali Metal had scheduled to establish the International Occupational Health and Safety Management System (OHSAS) plus TOSHMS since 2007, and got approved by SGS during 2008. So that Minchali can meet the company policy of "Safety is the first priority. Zero accident and injury". And according this management system, to utilize the methodology of Plan-Do-Check-Act PDCA to maintain and implement OHSAS/TOSHMS effectively. Also creating a safety and healthy working environments.

ISO 14001 Environment Management

為善盡對社會環境保護以及提供員工一個明亮、安全的環境之責任，名佳利不惜以鉅資在硬體上設置了集塵機2套以及廢水處理設備等，並在軟體方面推動污染發生源減廢改善活動，不但定期委由政府認可之環保公司檢測環境品質，並聘請專業顧問進行輔導改善活動之推行及教育訓練，藉此對維護社會環境盡一己之力，並不斷提升員工對環境保護之認知水準。

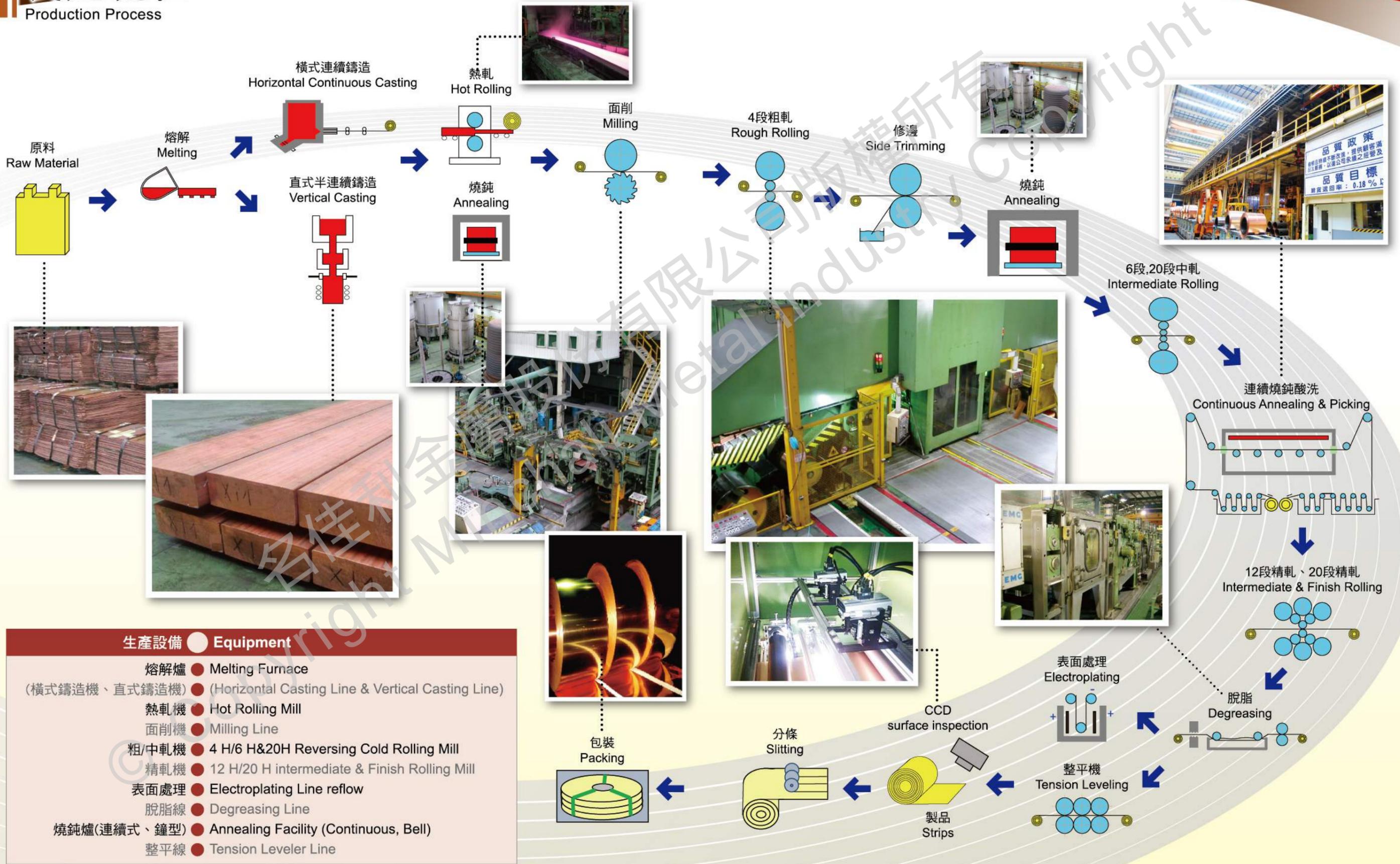


Win order to fulfill our social obligations of environmental protection and duties of providing a bright and safe environment to our staff, Minchali invests a large sum of money in hardware and installs Wasted Water Treatment Plant and two sets of Fume Exhaust, etc. As for software, we promote improvement activities of reducing and eliminating causes of pollution. Minchali entrusts the environmental protection companies, approved by government, with the inspection of environmental quality, and professional consultants are employed to give instructions in improvement activities and training courses in the related field. By raising continuously the level of staff's understandings of environmental protection, Minchali will exert herself to the utmost to protect our social environment on and on.

Less pollution is the best solution for earth.

製造流程

Production Process



生產設備 Equipment

- 熔解爐 Melting Furnace
(橫式鑄造機、直式鑄造機) (Horizontal Casting Line & Vertical Casting Line)
- 熱軋機 Hot Rolling Mill
- 面削機 Milling Line
- 粗/中軋機 4 H/6 H&20H Reversing Cold Rolling Mill
- 精軋機 12 H/20 H intermediate & Finish Rolling Mill
- 表面處理 Electroplating Line reflow
- 脫脂線 Degreasing Line
- 燒鈍爐(連續式、鐘型) Annealing Facility (Continuous, Bell)
- 整平線 Tension Leveler Line

產品規格

Production specifications

A. 紅銅系列產品之規格、成份、特性及用途(Product Standards for Copper Materials)

(1)化學成份Chemical Composition (產品符合RoHS法規規範標準; Meets RoHS)

品名 Type No.	種類 Alloy No.	記號 Symbol 板Plate 卷Ribbon	化學成份% Chemical Composition		含氧量 O ²	特性與用途 Features & Application
			銅 Cu	磷 P		
無氧銅 OFUCU	C1020	C1020P C1020R	>99.96	—	<0.002%	特性：電導性、熱傳導性、延展性、擠壓加工性、耐蝕性、耐候性均佳。 用途：接線端子、散熱片、變壓器線圈等高導電材料。 Application: Materials of high electricity conduction, such as wiring terminals, radiating fin, and transformer coils.
韌煉銅 TCU	C1100	C1100P C1100R	>99.90	—	<0.045%	特性：電導性、熱傳導性、延展性、擠壓加工性、耐蝕性、耐候性均佳。 用途：電器品、端子、化學工業、建築業、飾品業、襯墊、器皿等。 Application: Electrical equipment, terminals, chemical industry, architectural industry, ornamental industry, gaskets, and trays, etc.
磷脫酸銅 RCU DCU	C1201	C1201P C1201R	>99.90	0.004~0.015	<0.004%	特性：延展性、擠壓加工性、熔接性、耐蝕性、耐候性、熱傳導性、電導性均佳。 用途：洗浴熱水爐、襯墊、工藝品、建築用材料、化學工業、電器端子。 Application: Gas fired boiler, gaskets, handicraft articles, building materials, chemical industry, and terminals of electrical equipment.
	C1220	C1220P C1220R		0.015~0.040		

(2)機械性質 & 物理性質 Mechanical Properties & Physical properties

種類 Alloy No.	機械性質 Mechanical Properties						物理性質 physical properties					
	質別 Quality Grade	記號 Symbol 板Plate 卷Ribbon	抗拉強度 Tensile Strength (Kg/mm ²)	伸長率% Elongation	硬度HV Hardness		彈性模數 Modulus of elasticity (GPa)	導電率% Electric Conductivity (%IACS)	比熱 Specific heat capacity (J/kg·K)	比重Density (g/cm ³)	熱膨脹係數 Coefficient of thermal expansion (x10 ⁻⁶ /K)	熱傳導係數 Thermal conductivity W/(m·K)
JIS規格 Standards	名佳利 Minchali											
C1020	O	C1020P-O C1020R-O	>20	>35	—	<70	118	≥97	385	8.94	17.7	391
	1/4H	C1020P-1/4H C1020R-1/4H	22~28	>25	55~100	65~85						
	1/2H	C1020P-1/2H C1020R-1/2H	25~32	>15	75~120	80~100						
	H	C1020P-H C1020R-H	>28	—	>80	>90						
C1100	O	C1100P-O C1100R-O	>20	>35	—	<70	118	≥97	385	8.94	17.7	391
	1/4H	C1100P-1/4H C1100R-1/4H	22~28	>25	55~100	65~85						
	1/2H	C1100P-1/2H C1100R-1/2H	25~32	>15	75~120	80~100						
	H	C1100P-H C1100R-H	>28	—	>80	>90						
C1201	O	C1201P-O C1201R-O	>20	>35	—	<70	118	≥90	385	8.94	17.7	381
	1/4H	C1201P-1/4H C1201R-1/4H	22~28	>25	55~100	65~85						
	1/2H	C1201P-1/2H C1201R-1/2H	25~32	>15	75~120	80~100						
	H	C1201P-H C1201R-H	>28	—	>80	>90						
C1220	O	C1220P-O C1220R-O	>20	>35	—	<70	118	≥80	385	8.94	17.7	339
	1/4H	C1220P-1/4H C1220R-1/4H	22~28	>25	55~100	65~85						
	1/2H	C1220P-1/2H C1220R-1/2H	25~32	>15	75~120	80~100						
	H	C1220P-H C1220R-H	>28	—	>80	>90						

上表所示僅供材料選用參考,實際規格應以訂單確認內容為準
The data shown on above are for material comparison purpose only. Actual specification shall be based on the agreed purchasing order separately.

B. 丹銅系列產品之規格、成份、特性及用途(Product Standards for Red Brass Materials)

(1)化學成份Chemical Composition (產品符合RoHS法規規範標準; Meets RoHS)

品名 Type No.	種類 Alloy No.	記號 Symbol 板Plate 卷Ribbon	化學成份% Chemical Composition				特性與用途 Features & Application
			銅 Cu	鐵 Fe	鉛 Pb	鋅 Zn	
丹銅 RBS	C2200	C2200P C2200R	89.0~91.0	<0.05	<0.05	餘量 remainder	特性：色澤美觀、延展性、沖製加工性、電鍍性、耐蝕性良好。 用途：建築用品、裝飾品、化妝品盒等。 Features: Good color and luster; good elongation; being pressed and processed well; being electroplated well; good Application: corrosion-resistance. Building articles, ornaments, and cosmetics boxes, etc.
	C2300	C2300P C2300R	84.0~86.0	<0.05	<0.05	餘量 remainder	

(2)機械性質 & 物理性質 Mechanical Properties & Physical properties

種類 Alloy No.	機械性質 Mechanical Properties						物理性質 physical properties					
	質別 Quality Grade	記號 Symbol 板Plate 卷Ribbon	抗拉強度 Tensile Strength (Kg/mm ²)	伸長率% Elongation	硬度HV Hardness		彈性模數 Modulus of elasticity (GPa)	導電率% Electric Conductivity (%IACS)	比熱 Specific heat capacity (J/kg·K)	比重Density (g/cm ³)	熱膨脹係數 Coefficient of thermal expansion (x10 ⁻⁶ /K)	熱傳導係數 Thermal conductivity W/(m·K)
JIS規格 Standards	名佳利 Minchali											
C2200	O	C2200P-O C2200R-O	>23	>35	—	<90	118	≥43	377	8.8	18.4	188
	1/4H	C2200P-1/4H C2200R-1/4H	26~34	>25	—	85~105						
	1/2H	C2200P-1/2H C2200R-1/2H	29~37	>20	—	105~125						
	H	C2200P-H C2200R-H	>34	—	—	>120						
C2300	O	C2300P-O C2300R-O	>25	>40	—	<90	118	≥37	377	8.75	18.7	159
	1/4H	C2300P-1/4H C2300R-1/4H	28~36	>28	—	85~105						
	1/2H	C2300P-1/2H C2300R-1/2H	31~39	>23	—	105~125						
	H	C2300P-H C2300R-H	>36	—	—	>120						

C. 黃銅系列產品之規格、成份、特性及用途(Product Standards for Brass Materials)

(1)化學成份Chemical Composition (產品符合RoHS法規規範標準; Meets RoHS)

品名 Type No.	種類 Alloy No.	記號 Symbol 板Plate 卷Ribbon	化學成份% Chemical Composition				特性與用途 Features & Application
			銅 Cu	鐵 Fe	鉛 Pb	鋅 Zn	
黃銅 BS	C2600	C2600P C2600R	68.5~71.5	<0.05	<0.05	餘量 remainder	特性：延展性、沖製加工性、電鍍性均佳。 用途：電器品、裝飾品、端子、汽車用散熱器、照相機 零件、工藝品、保溫瓶等。 Features: Good elongation; being pressed and processed well; being electroplated well. Application: Electrical equipment, ornaments, terminals, radiators for cars, components of camera, handicraft articles, and thermos bottles, etc.
	C2680	C2680P C2680R	64.0~68.0	<0.05	<0.05	餘量 remainder	
	C2801	C2801P C2801R	59.0~62.0	<0.07	<0.10	餘量 remainder	
	其他 Others	—	商議 Negotiation				

上表所示僅供材料選用參考,實際規格應以訂單確認內容為準
The data shown on above are for material comparison purpose only. Actual specification shall be based on the agreed purchasing order separately.

產品規格

Production specifications

(2)機械性質 & 物理性質 Mechanical Properties & Physical properties

種類 Alloy No.	機械性質 Mechanical Properties						物理性質 physical properties					
	質別 Quality Grade	記號 Symbol 板Plate 卷Ribbon	抗拉強度 Tensile Strength (Kg/mm ²)	伸長率% Elongation	硬度HV Hardness		彈性模數 Modulus of elasticity (GPa)	導電率% Electric Conductivity (%ACS)	比熱 Specific heat capacity (J/kg·K)	比重Density (g/cm ³)	熱膨脹係數 Coefficient of thermal expansion (x10 ⁻⁶ /K)	熱傳導係數 Thermal conductivity W/(m·K)
					JIS規格 Standards	名佳利 Minchali						
C2600	O	C2600P-O C2600R-O	>28	>40	—	<90	110	24.0~28.7	377	8.53	19.9	121
	1/4H	C2600P-1/4H C2600R-1/4H	33~42	>35	75~125	90~110						
	1/2H	C2600P-1/2H C2600R-1/2H	36~45	>28	85~145	110~135						
	3/4H	C2600P-3/4H C2600R-3/4H	39~50	>20	95~160	130~145						
	H	C2600P-H C2600R-H	42~55	—	105~175	140~160						
	EH	C2600P-EH C2600R-EH	53~63	—	145~195	>160						
	SH	C2600P-SH C2600R-SH	58~68	—	165~215	>180						
	ESH	C2600P-ESH C2600R-ESH	>63.5	—	>180	>185						
C2680	O	C2680P-O C2680R-O	>28	>40	—	<90	103	24.0~27.8	377	8.47	20.3	117
	1/4H	C2680P-1/4H C2680R-1/4H	33~42	>35	75~125	90~110						
	1/2H	C2680P-1/2H C2680R-1/2H	36~45	>28	85~145	110~135						
	3/4H	C2680P-3/4H C2680R-3/4H	39~50	>20	95~165	130~145						
	H	C2680P-H C2680R-H	42~55	—	105~175	140~160						
	EH	C2680P-EH C2680R-EH	53~63	—	145~195	>160						
	SH	C2680P-SH C2680R-SH	58~68	—	165~215	>180						
	ESH	C2680P-ESH C2680R-ESH	>63.5	—	>180	>185						
C2801	O	C2801P-O C2801R-O	>33	>35	—	<100	103	24.3~28.3	377	8.39	20.8	121
	1/4H	C2801P-1/4H C2801R-1/4H	36~45	>25	85~145	90~115						
	1/2H	C2801P-1/2H C2801R-1/2H	42~50	>15	105~160	110~140						
	3/4H	C2801P-3/4H C2801R-3/4H	40~50	>10	—	120~150						
	H	C2801P-H C2801R-H	>48	—	>130	>140						
	EH	C2801P-EH C2801R-EH	>55	—	—	>160						

上表所示僅供材料選用參考,實際規格應以訂單確認內容為準
The data shown on above are for material comparison purpose only. Actual specification shall be based on the agreed purchasing order separately.

D.磷青銅系列產品之規格、成份、特性及用途(Product Standards for Phosphor Bronze Materials)

(1)化學成份Chemical Composition (產品符合RoHS法規規範標準; Meets RoHS)

品名 Type No.	種類 Alloy No.	記號 Symbol 板Plate 卷Ribbon	化學成份% Chemical Composition					特性與用途 Features & Application	
			銅+錫+磷 Cu+Sn+P	鐵 Fe	鉛 Pb	鋅 Zn	錫 Sn		
磷青銅 PB	C5102	C5102P C5102R	>99.5	<0.10	<0.02	<0.20	4.5~5.5	0.03~0.35	特性: 延展性、耐疲勞性、耐蝕性均佳。 用途: 電子、電器用彈簧、開關、導線架、連接器、隔膜片、風箱、保險絲夾頭等。
	C5111	C5111P C5111R	>99.5	<0.10	<0.02	<0.20	3.5~4.5	0.03~0.35	Features: Good elongation, endurance, and corrosion-resistance. Application: Electronics, Springs, switches, lead frames, connectors, diaphragms, bellows, fuse clips, and so on used in electronic machine.
	C5191	C5191P C5191R	>99.5	<0.10	<0.02	<0.20	5.5~7.0	0.03~0.35	
彈性用 磷青銅 PBS	C5210	C5210P C5210R	>99.7	<0.10	<0.02	<0.20	7.0~9.0	0.03~0.35	特性: 延展性、耐疲勞性、耐蝕性均佳。 用途: 電子、通信、資訊、計測機器用之開關、繼電器、連接器。 Application: Switches, relays, and connectors used in machines of electronics, communication information, and measurement.

(2)機械性質 & 物理性質 Mechanical Properties & Physical properties

種類 Alloy No.	機械性質 Mechanical Properties						物理性質 physical properties						
	質別 Quality Grade	記號 Symbol 板Plate 卷Ribbon	抗拉強度 Tensile Strength (Kg/mm ²)	降伏強度 Yield Strength (Kg/mm ²)	伸長率% Elongation	硬度HV Hardness		彈性模數 Modulus of elasticity (GPa)	導電率% Electric Conductivity (%ACS)	比熱 Specific heat capacity (J/kg·K)	比重Density (g/cm ³)	熱膨脹係數 Coefficient of thermal expansion (x10 ⁻⁶ /K)	熱傳導係數 Thermal conductivity W/(m·K)
						JIS規格 Standards	名佳利 Minchali						
C5102	1/2H	C5102P-1/2H C5102R-1/2H	48~58	—	>15	130~190	140~170	110	≥15	377	8.86	17.8	71
	3/4H	C5102P-3/4H C5102R-3/4H	—	—	—	—	160~190						
	H	C5102P-H C5102R-H	58~68	—	>7	170~220	180~210						
	EH	C5102P-EH C5102R-EH	63~72	—	>4	190~230	200~230						
C5111	1/2H	C5111P-1/2H C5111R-1/2H	42~52	—	>12	120~180	140~170	110	≥20	377	8.86	17.8	84
	3/4H	C5111P-3/4H C5111R-3/4H	46~56	—	>10	—	160~190						
	H	C5111P-H C5111R-H	50~60	≥45	>7	150~200	180~210						
	EH	C5111P-EH C5111R-EH	58~67	≥52	>3	170~220	200~230						
C5191	1/2H	C5191P-1/2H C5191R-1/2H	50~62	≥46	>20	150~205	140~170	105	≥13	377	8.83	18.0	67
	3/4H	C5191P-3/4H C5191R-3/4H	—	—	—	—	160~190						
	H	C5191P-H C5191R-H	60~70	≥53	>8	180~230	180~210						
	EH	C5191P-EH C5191R-EH	65~73	≥61	>5	200~210	200~230						
C5210	1/2H	C5210P-1/2H C5210R-1/2H	48~62	≥37	>27	140~205	140~170	110	≥11	377	8.80	18.2	63
	3/4H	C5210P-3/4H C5210R-3/4H	—	≥47	—	—	160~190						
	H	C5210P-H C5210R-H	58~72	≥54	>20	185~235	180~210						
	EH	C5210P-EH C5210R-EH	70~80	≥60	>11	210~260	200~230						
	SH	C5210P-SH C5210R-SH	75~85	≥70	>9	230~270	220~250						
	ESH	C5210P-ESH C5210R-ESH	79~90	≥75	>5	245~285	230~260						

※ C5240、C50715、C2720接單生產(On Request)

上表所示僅供材料選用參考,實際規格應以訂單確認內容為準
The data shown on above are for material comparison purpose only. Actual specification shall be based on the agreed purchasing order separately.

產品規格

Production specifications

E. 引線架系列產品之規格、成份、特性及用途(Product Standards for Lead Frame Material: C1921、C1940)

(1) 化學成份 Chemical Composition (產品符合RoHS法規規範標準; Meets RoHS)

品名 Type No.	種類 Alloy No.	記號 Symbol 板Plate 卷Ribbon	化學成份% Chemical Composition				特性與用途 Features & Application
			銅 Cu	鐵 Fe	磷 P	鋅 Zn	
引線架材 Lead Frame Material	C1921	C1921P C1921R	餘量 REM	0.05~ 0.15	0.015~ 0.050	—	特性: C1921極佳焊接性, 良好焊材。高導電率(85% IACS以上), 軟化溫度390°C。C1940耐蝕性強、冷熱加工性佳、良好焊接性、高強度、高導電率(60% IACS以上), 軟化溫度450°C。 用途: IC引線架材、彈性接點、電晶體、二極體、BGA機板散熱材、汽車保險絲、汽車端子。 Features: C1921-Excellent soldering, brazing, and coated metal arc welding. High electric conductivity (85% IACS min.) Good workability. Anti-corrosion. Soften tem. 390°C. C1940-Good to excellent corrosion resistance. Excellent hot and cold workability. High strength, high electric conductivity (60% IACS min.). Soften tem. 450°C. Application: Lead frame, contact springs, Transistor, Diode, etc., BGA heat sink, automobile safety fuse, automobile terminal.
	C1940	C1940P C1940R	餘量 REM	2.1~ 2.6	0.015~ 0.150	0.05~ 0.20	

(2) 機械性質 & 物理性質 Mechanical Properties & Physical properties

種類 Alloy No.	機械性質 Mechanical Properties					物理性質 physical properties					
	質別 Quality Grade	記號 Symbol 板Plate 卷Ribbon	抗拉強度 Tensile Strength (Kgf/mm ²)	伸長率% Elongation	硬度HV Hardness 名佳利 Minchali	彈性模數 Modulus of elasticity (GPa)	導電率% Electric Conductivity (%IACS)	比熱 Specific heat capacity (J/kg·K)	比重 Density (g/cm ³)	熱膨脹係數 Coefficient of thermal expansion (x10 ⁻⁶ /K)	熱傳導係數 Thermal conductivity W/(m·K)
C1921	O	C1921P-O C1921R-O	26~35	≥30	<100	126	≥85	385	8.94	16.9	—
	1/4H	C1921P-1/4H C1921R-1/4H	28~38	≥15	90~120						
	1/2H	C1921P-1/2H C1921R-1/2H	30~43	≥4	100~130						
	3/4H	C1921P-3/4H C1921R-3/4H	—	—	—						
	H	C1921P-H C1921R-H	34~47	≥4	110~140						
	EH	C1921P-EH C1921R-EH	≥38	—	≥130						
	SH	C1921P-SH C1921R-SH	—	—	—						
C1940	O	C1940P-O C1940R-O	30~38	≥15	80~105	121	≥60	385	8.91	17.9	262
	1/4H	C1940P-1/4H C1940R-1/4H	31~42	≥6	95~120						
	1/2H	C1940P-1/2H C1940R-1/2H	37~44	≥5	115~135						
	3/4H	C1940P-3/4H C1940R-3/4H	—	—	—						
	H	C1940P-H C1940R-H	42~49	≥2	125~145						
	EH	C1940P-EH C1921R-EH	47~51	—	135~150						
	SH	C1940P-SH C1940R-SH	49~53	—	140~155						
	ESH	C1940P-ESH C1940R-ESH	51~56	—	≥145						

上表所示僅供材料選用參考, 實際規格應以訂單確認內容為準
The data shown on above are for material comparison purpose only. Actual specification shall be based on the agreed purchasing order separately.

F. 銅錫合金系列產品之規格、成份、特性及用途(Product Standards for Copper-Tin Alloy Materials: C1441)

(1) 化學成份 Chemical Composition (產品符合RoHS法規規範標準; Meets RoHS)

品名 Type No.	種類 Alloy No.	記號 Symbol 板Plate 卷Ribbon	化學成份% Chemical Composition					特性與用途 Features & Application	
			銅 Cu	錫 Sn	鐵 Fe	鉛 Pb	磷 P		鋅 Zn
銅錫合金	C1441	C1441P C1441R	餘量 REM	0.1~0.2 0.1~0.2	<0.02 <0.02	<0.03 <0.03	0.001~0.020 0.001~0.020	<0.1 <0.1	特性: 耐蝕性、熱傳導性、電導性、電鍍性均佳、高耐軟化溫度。 用途: 引線架材、散熱片、電氣開關、繼電器。 Features: Good corrosion-resistance, good electricity and heat conduction, being electroplated well, high soften tem. Application: Lead frame, heat sink, connectors used machines of electronics and relays.

(2) 機械性質 & 物理性質 Mechanical Properties & Physical properties

種類 Alloy No.	機械性質 Mechanical Properties						物理性質 physical properties					
	質別 Quality Grade	記號 Symbol 板Plate 卷Ribbon	抗拉強度 Tensile Strength (Kgf/mm ²)	伸長率% Elongation	硬度HV Hardness JIS規格 Standards 名佳利 Minchali		彈性模數 Modulus of elasticity (GPa)	導電率% Electric Conductivity (%IACS)	比熱 Specific heat capacity (J/kg·K)	比重 Density (g/cm ³)	熱膨脹係數 Coefficient of thermal expansion (x10 ⁻⁶ /K)	熱傳導係數 Thermal conductivity W/(m·K)
C1441	1/2H	C1441P-1/2H C1441R-1/2H	25~35	>10	60~120	—	118	≥78	—	8.9	17.3	143~360
	H	C1441P-H C1441R-H	28~40	>2	90~125	—						
	EH	C1441P-EH C1441R-EH	36~45	—	100~135	—						
	SH	C1441P-SH C1441R-SH	>39	—	>115	—						

G. 無鉛鍍錫銅合金系列產品之規格、成份、特性及用途(Reflow Tin Plated Copper & Copper Alloy Strip)

(1) 基材 Base Materials

黃銅系(Brass)	C2600	C2680	C2801	Others On Request
磷銅系(Bronze)	—	C5102	C5191	C5111 C5210
紅銅系(Copper)	—	C1020	C1100	C1201 C1220
銅鐵合金(Cu-Fe Lead Frame)	—	—	—	C1921 C1940

(2) 基材化學成份&機械性質 Chemical Composition and Mechanical Properties

依顧客訂單要求、符合JIS H3100規範: 產品符合RoHS法規規範標準	According to Customer Requirements & Meets JIS H3100 Standard: Meets RoHS Requirements	特性: 銀白光澤表面。預防錫鬚、增加儲存壽命及焊錫性; 有助耐蝕性、導電性、插拔力以及連接器元件之展延性, 具良好耐候性及冶金組織。 用途: 電子、半導體及汽車用之端子、連接器、電子電器元件、導線架等
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(3) Reflow 無鉛鍍錫規格 Lead-free Electro-Reflow Tin

厚度(Strip Thickness)	0.1~0.8mm	Features: Eliminating detrimental "tin whisker", improving conductivity, corrosion-resistance, insertion force, and malleability of electrical connectors are additional benefits. Application: Connectors, lead frames, electronic devices for the telecommunications appliance, automotive, semiconductor, computer, and electronics industries
寬度(Width)	Max. 300mm	
捲重(Coil Weight)	Max. 2400kg : Coil: 8kg/mm	
預鍍銅膜(Pre-Plating)	Cu 0.4~0.6µm	
鍍錫膜厚(Reflow Tin Plating)	Sn 0.8~2.0µm (~2.5µm On Request)	

上表所示僅供材料選用參考, 實際規格應以訂單確認內容為準
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