

SAMWON Industrial Co.,Ltd.

HEAD OFFICE

246-33, Pyeongdongsandan-ro, Gwangsan-gu, Gwangju, Korea

2nd FACTORY

71-14, Haebononggong-gil, Haebo-myeon, Hampyeong-gun, Jeollanam-do, Korea

R&D CENTER

64, Cheomdan venture so-ro 37beon-gil, Buk-gu, Gwangju, Korea

THAILAND FACTORY

23/53, M.7, T.Bung, A.Siriracha, Chonburi, 20230, Thailand / Tel. +66-38-350-802~3

SAMWON FINE CROP.

6, Jillye-ro 311beon-gil, Jillye-myeon, Gimhae-si, Gyeongsangnam-do, Korea

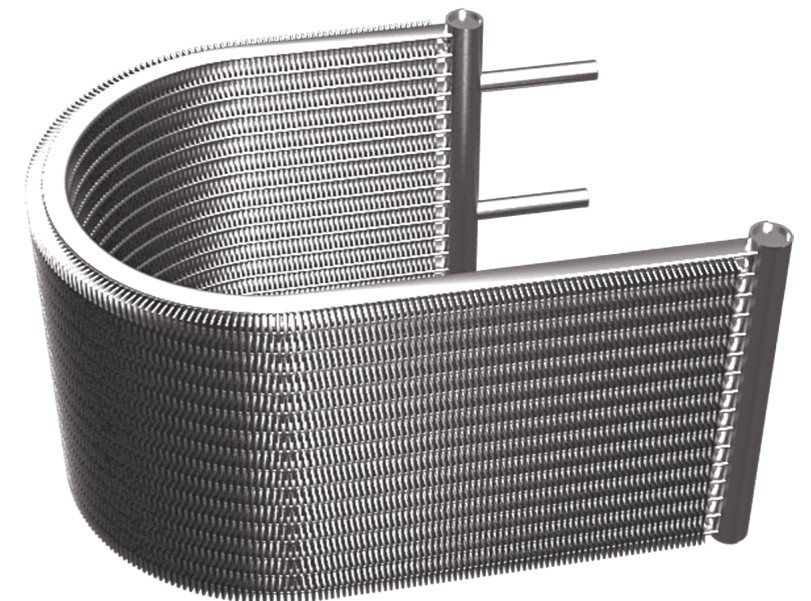
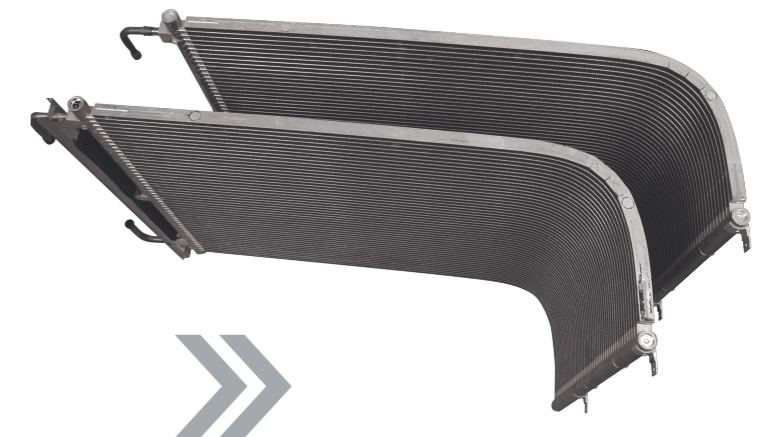
NUMAS CROP.

88, 3rd Pyeongdongsandan-ro, Gwangsan-gu, Gwangju, Korea



Global Leader in the Component Industry

SAMWON INDUSTRIAL





Management Philosophy

Management Policy

- * Thinking for customers
- * Prompt confrontation against environments
- * Challenge toward super first class.

Quality Policy

- * Customer-required quality target
- * Constant quality innovation
- * Achievement of the best quality without defect - First class quality

Environmental Policy

- * Minimization of production resources
- * 20% saving
- * Improvement of environmentally harmful substance factors

Realization of a Human-respecting Comapany

A person doing one's best for the given work today for a better future based on creativity and trust

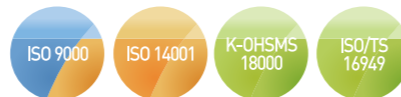


Company History

Establishment of Samwon Industrial Co., Ltd.

Build a stable foundation for business

- 2004. 06. Establishment of Samwon Industrial Co., Ltd.
- 2004. 10. Starting up up trade with Samsung Electronics
- 2005. 01. Acquisition of ISO 9001 Certification
- 2005. 07. Acquisition of ISO 14001 Certification
- 2006. 08. Building up the ERP, SCM, MES System
- 10. Acquisition of class A from customers



A leading company in the world throughout technical development

- 2007. 06. Selection as a family company for Industrial Bank of Korea
- 2008. 01. Acquisition of Committee European(CE)
- 08. Starting up a business of an aluminum heat exchanger
- 12. Factory Extension
- 2009. 06. Participating in a technology development project for acquisition of CE
- 11. Selection as a Promising company by Industrial Bank of Korea
- 2010. 12. An award for best collaboration by Samsung Electronics

Jumping up to be a global leading company

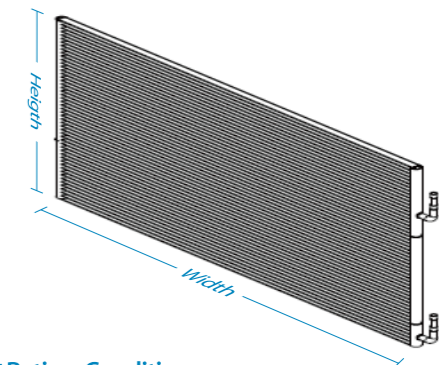
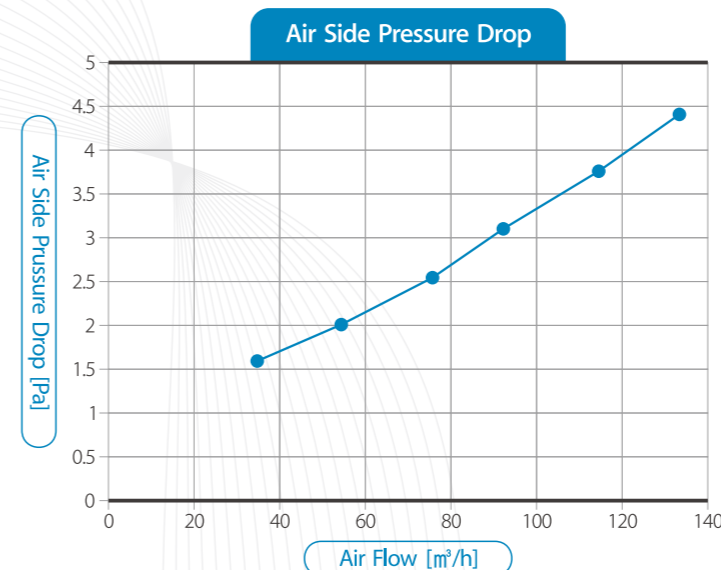
- 2012. 04. Establishment of the Y-MECO Corporation in Thailand
- 06. Establishment of a research institute
- 12. Establishment of the 2nd Hampyeong factory(Wire production line)
- 2014. 01. Starting up supply of the automobile parts to the US market.
- 12. Establishment of the NUMAS Corporation
- 06. Development of the next generation heat exchanger and starting up the mass production for Samsung Electronics
- 12. Selection as a hidden champion of Gwangju Metropolitan City
- 2016. 01. Acquisition of ISO/TS 16949 Certification
- 05. Selection as a global hidden champion

Heat Exchanger Refrigerator & Show Case



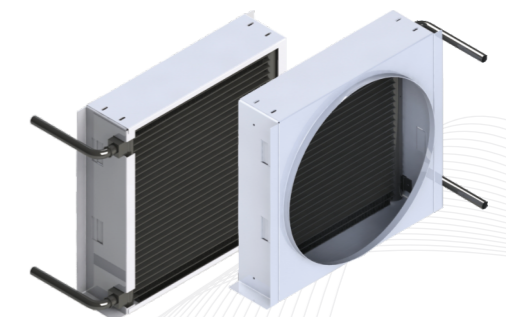
Condenser Series

Model NO	Width (mm)	Heighth (mm)	Performance		Face Area (mm ²)	Inlet Connection Dia. Inch(mm)	Outlet Connection Dia. Inch(mm)	FPI
			Btu/hr	W				
SW-FLAT-14	536	145	1,050	308	1,500,332	0.18(4.76)	0.18(4.76)	17
SW-FLAT-08	536	86	1,018	298	895,514	0.18(4.76)	0.18(4.76)	17



* Rating Conditions

- R600A Inlet Pressure : 134psi
- R600A Inlet Temperature : 70°C
- R600A Outlet Sub-cooling : 5°C
- Air Temperature : DB/WB(30/17.9°C)



For a show case

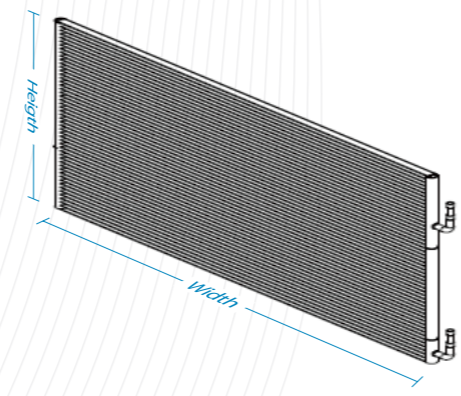
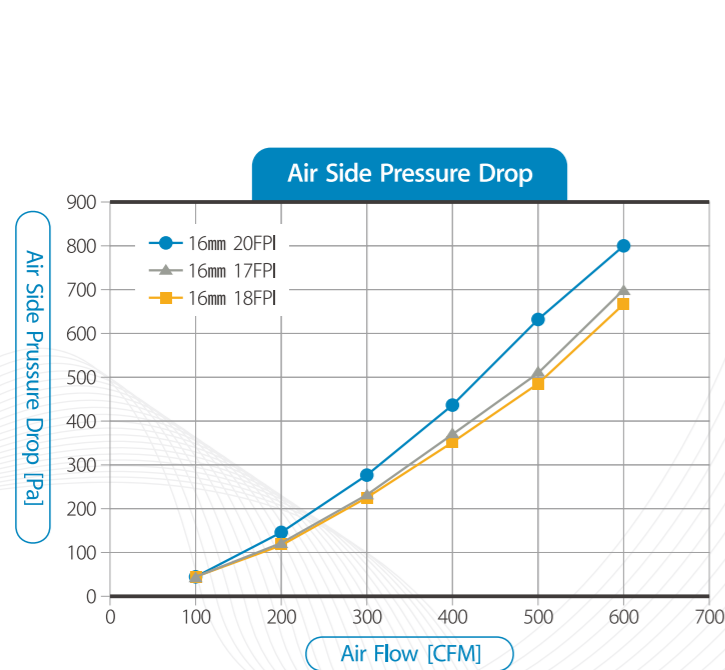
Heat Exchanger

Air Conditioner



Condenser Series

Model NO	Width (mm)	Height (mm)	Performance		Face Area (mm ²)	Inlet Connection Dia. Inch(mm)	Outlet Connection Dia. Inch(mm)	FPI
			Btu/hr	kw				
SW-17-111	931	580	23,607	6.918	11,188,993	0.47(12)	0.37(9.52)	17
SW-17-132	931	687	27,028	7.921	13,281,475	0.47(12)	0.37(9.52)	17
SW-20-083	703	409	16,607	4.867	8,364,461	0.47(12)	0.37(9.52)	20
SW-20-149	844	760	29,797	8.732	14,935,228	0.47(12)	0.37(9.52)	20
SW-20-119	854	604	23,687	6.942	11,929,374	0.47(12)	0.37(9.52)	20
SW-20-097	824	520	19,453	5.701	9,765,216	0.47(12)	0.37(9.52)	20
SW-20-117	844	604	23,397	6.857	11,784,490	0.47(12)	0.37(9.52)	20
SW-20-103	910	480	20,604	6.038	10,375,744	0.47(12)	0.37(9.52)	20
SW-18-244	1,314	895	51,090	14.973	24,410,998	0.47(12)	0.37(9.52)	18
SW-18-216	917	638	26,328	7.716	21,617,845	0.47(12)	0.37(9.52)	18
SW-18-151	917	765	31,733	9.3	15,147,409	0.47(12)	0.37(9.52)	18
SW-18-092	854	501	19,404	5.686	9,293,566	0.47(12)	0.37(9.52)	18



***Rating Conditions**
 R-410A Inlet Pressure : 406psi
 R-410A Inlet Temperature : 72°C
 R-410A Outlet Sub-cooling : 6.7°C
 Air Temperature : DB/WB(35/23.9°C)

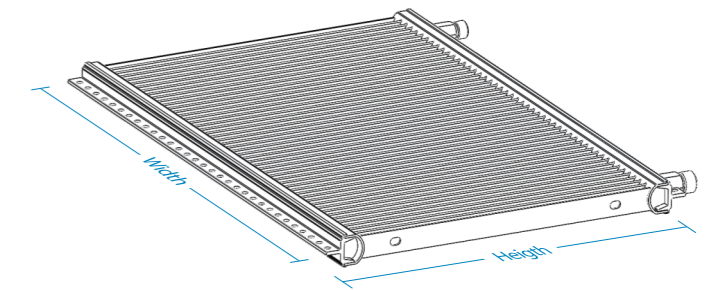
Heat Exchanger

Automobile



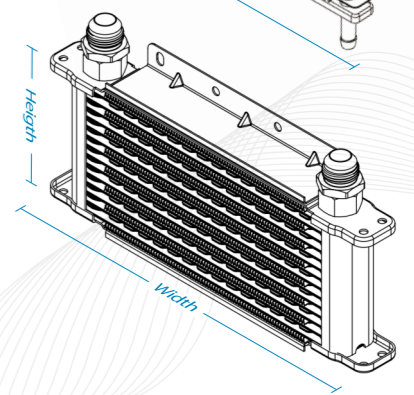
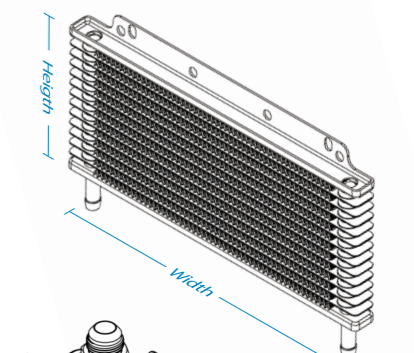
Condenser Series

Model NO	Width (mm)	Height (mm)	Inlet Connection Dia. Inch	Outlet Connection Dia. Inch	FPI
SW-AT-001	255.0	315.0	3/8 UNF	1/2 UNF	18
SW-AT-002	355.1	355.6	3/8 UNF	1/2 UNF	14
SW-AT-003	394.8	430.5	3/8 UNF	1/2 UNF	14
SW-AT-004	496.4	489.2	3/8 UNF	1/2 UNF	14
SW-AT-005	752.0	394.3	3/8 UNF	1/2 UNF	14
SW-AT-006	394.3	812.8	3/8 UNF	1/2 UNF	14



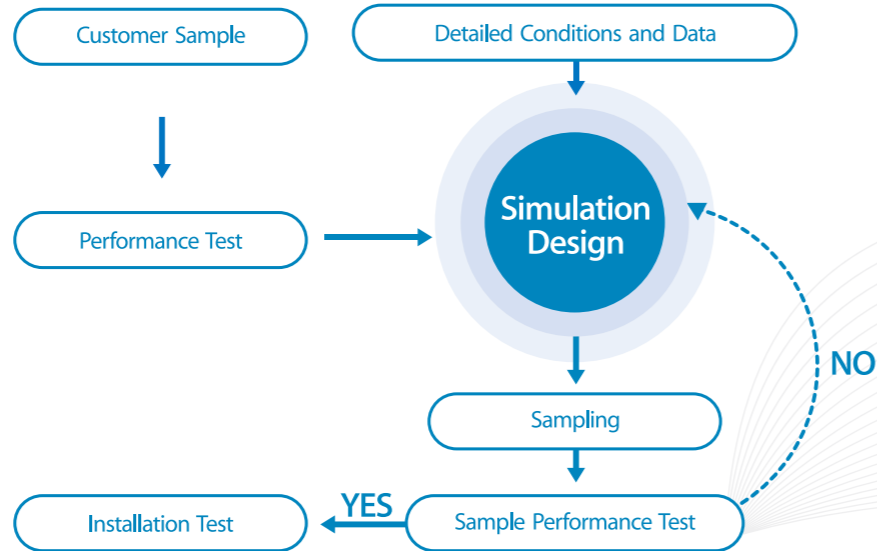
Oil-Cooler Series

Model NO	Width (mm)	Height (mm)	FPI	Connection Type	Tube Type
SW-C-001	279	140	12	Basic Fitting Bypass	19mm
SW-C-002	279	180	12		
SW-C-003	279	227	12		
SW-C-004	279	282	12	Fitting	37mm
SW-C-005	282	108	16		
SW-C-006	282	168	16		
SW-C-007	282	226	16		
SW-C-008	282	285	16		

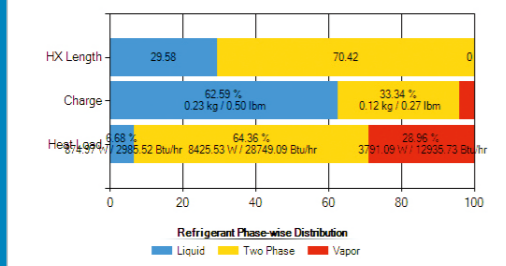
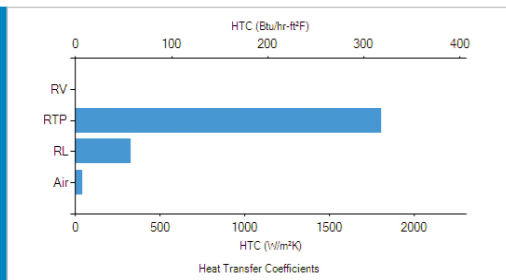




Product Development Process



Coil Designer (Performance and structure design)



CoilDesigner® Results

File Name: hcmc_R134a_71by1_Cond.chx
Heat Exchanger Type: Micro Channel Heat Exchanger
Description:

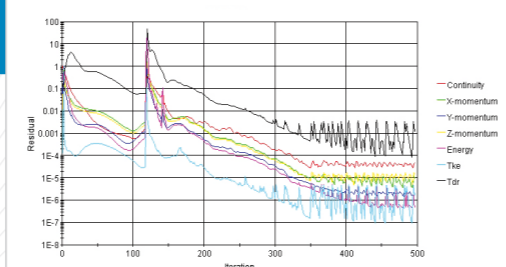
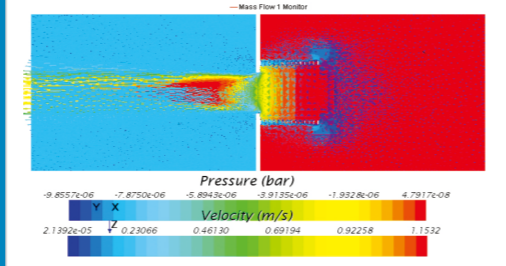
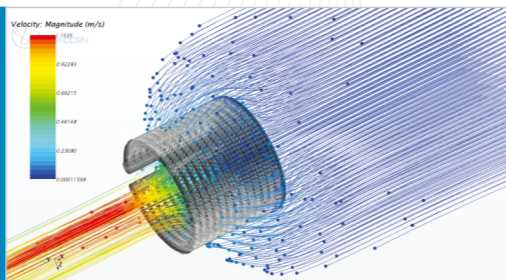
Dimensions

Rows: 71	Number Of Tubes: 71
Columns: 1	Heat Exchanger Height: 1.78 m
Spacing: 0.025 m/0.019 m	Heat Exchanger Width: 0.762 m
Fin Type: Louvered	Heat Exchanger Depth: 0.02 m
Fin Pitch: 20	Face Area: 1.36 m²
Fin Pitch: 0.001 m	Primary Area: 2.21 m²
Tube Length: 0.762 m	Secondary Area: 39.31 m²

Working Fluids

In Tube/Refrigerants: R134a
Secondary Fluid: AirMoist

Star CCM+ (Fluid design of air and refrigerant)

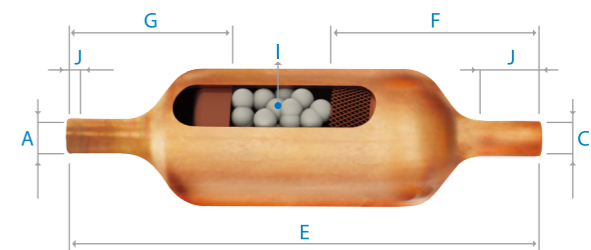


Application

Air conditioning components for a refrigerator and dehumidifier



Specification



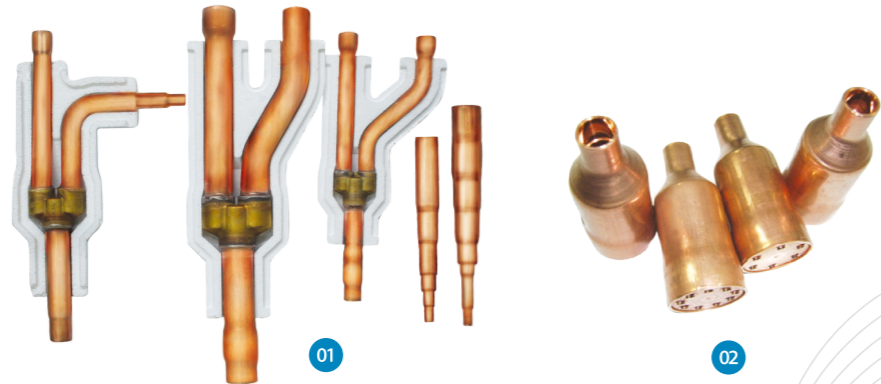
Material	Forming	Filter Absorbent		Molecular Sieve				
		Out(A)	In(C)	L(E)	In-Filter(F)	Out-Filter(F)	Standard(I)	Weight(g)
41.28	0.80	12.7	12.7	180	60	60	XH-9	50
31.75	0.80	6.5	9.7	150	50	50	XH-9	20
25.20	0.55	3.3	6.5	150	50	50	XH-9	10
18.80	0.51	3.4	6.5	110	25	30	XH-9	10
15.88	0.51	2.2	4.9	94	30	25	XH-9	5

- Notice 1.** It is capable to produce various sizes of products based on customer's needs.
- 2.** There are a few packing ways such as Vacuum Nylon Vinyl bag, Plastic Cap, Tin Can etc.
- 3.** The standards of molecular sieve can be changed by the different kind of refrigerant gas.

Ass'y Distributor



Application
System Air-Conditioner



Specification

01

Capacity (kw)	Pipe		
	Gas(mm)	Liquid(mm)	High-Pressure Gas
15.0	15.9	9.5	15.9
15.0 ~ 23.2	19.1	9.5	15.9
23.2 ~ 29.0	22.2	9.5	19.1
29.0 ~ 40.6	25.4	12.7	22.2
40.6 ~ 46.4	28.6	12.7	22.2
46.4 ~ 69.6	28.6	15.9	25.4
69.6 ~ 98.6	31.8	19.1	28.6
98.6 ~ 139.2	38.1	19.1	31.8
139.2	44.5	22.2	38.1



Distributor Specification

02

NO	Spec.					Type	
	A(L)	B(OD)	C(Hole)	D(ID)	E(ID)	Insertor	Screen
1	63.0	25.4	4 ~ 12	3.4	9.7	○ (Cu)	○
2	63.0	25.4	6	3.4	9.7	○ (Cu)	○
3	63.0	32.0	10	3.4	9.7	○ (Cu)	○
4	70.0	55.0	14 ~ 18	6.5	9.7	○ (Cu)	
5	70.0	66.0	22	6.5	9.7	○ (Cu)	
6	70.0	79.0	26	6.5	9.7	○ (Cu)	
7	63.0	25.4	4 ~ 8	3.4	9.7	○ (Cu)	○

Wire Products

CCAW



Current Status of Equipment and Production Capacity

Equipment	Quantity	Monthly Production Capacity (Day/Night 2 shifts)	Remark
Cu Former	2ea	5,000kg↑	
Consecutive Drawing Machine	58ea	5,000kg↑	
Al Wire Rod Drawer	1ea	5,700kg↑	
Reeling Machine	3ea	3,300kg↑	
Eddy Current Test	3ea		
Vacuum Heat Furnace	3ea		



Manufacturing Process

Drawing an Aluminum Wire



01 Drawing



02 Removal of grease



03 Reeling

Cu Forming and Welding



04 Brushing



05 Cu Forming



06 Welding (Cu+Al)



07 Reeling (CCA Wire)

Heat Treatment / Inspection



08 Vacuum Heat Treatment



09 Eddy Current Test



10 Reeling (CCA Wire)

Wire Products

Annealed Stranded Copper Wire




Current Status of Equipment and Production Capacity

Equipment	Specification	Quantity	Monthly Production Capacity (Day/Night 2 shifts)
Multi Drawing M/C	Multi 20 Line	3ea	800ton↑
Buncher	Double Twist	43ea	800ton↑


Manufacturing Process

Multiple Drawing Process


01 Inserting Raw Material (Copper 2.0mm)




02 Drawing



03 Reeling the Wire Drawn




04 Completing Reeling the Wire (Copper 0.160~0.500mm)




Twisting Process

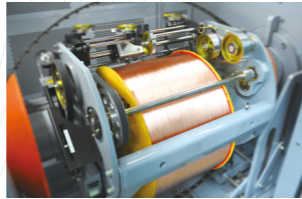
01 Inserting the Wire Drawn



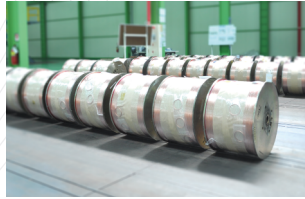
02 Twisting Multiple-wire



03 Reeling the Wire Twisted



04 Completing Reeling the Wire Twisted



Wire Products

Specification



Annealed Stranded Copper Wire

Type	SQ	Composition	Quantity (Single Wire)	Diameter (Single Wire)	External Diameter	Twisted Direction	Resistance (Ω/km, 20°C)
AVSS	0.30	07 / 0.260	7	0.250~0.270	0.765	S	50.2↓
	0.50	07 / 0.320	7	0.310~0.330	0.945	S	32.7↓
	0.85	19 / 0.240	19	0.230~0.250	1.180	S	21.7↓
	1.25	19 / 0.290	19	0.280~0.300	1.430	S	14.9↓
AVS	2.00	37 / 0.260	37	0.250~0.270	1.790	S	9.5↓
	3.00	41 / 0.320	41	0.310~0.330	2.318	S	5.59↓
AVSS(X)F	0.30	19 / 0.160	19	0.152~0.168	0.800	S	48.8↓
	0.50	19 / 0.190	19	0.182~0.198	0.950	S	34.6↓
	0.75	19 / 0.230	19	0.222~0.238	1.150	S	23.6↓
CHFUS	1.25	37 / 0.210	37	0.202~0.218	1.450	S	14.6↓
	0.22	07 / 0.208	7	-	0.550	S, Z	84.8↓
FLRY-A	0.35	07 / 0.250	7	0.240~0.260	0.760	S	50.0~54.4
	0.50	19 / 0.180	19	0.172~0.188	0.890	S	34.1~37.1
IEC	0.50	20 / 0.174	20	0.166~0.182	0.930	S	39.0↓
	0.75	30 / 0.174	30	0.166~0.182	1.140	S	26.0↓

CCAW

Nominal Diameter (mm)	Cross Sectional Area (mm ²)	Copper Thickness (mm)		Mass Per Unit Length (kg/km)		DC Resistance Per Unit Length (Ω/km, at 20°C)			DC Resistance Per Unit Length (Ω/km, at 90°C)		
		CCA-1 0%	CCA-1 5%	CCA-1 0%	CCA-1 5%	Copper	CCA-1 0%	CCA-1 5%	Copper	CCA-1 0%	CCA-1 5%
5.40	22.89	0.139	0.211	76.00	83.09	0.76	1.19	1.17	0.76	1.19	1.17
5.15	22.82	0.132	0.201	69.12	75.58	0.83	1.31	1.28	0.83	1.31	1.28
5.05	20.02	0.130	0.197	66.46	72.67	0.86	1.36	1.34	0.86	1.36	1.33
4.97	19.39	0.128	0.194	64.38	70.39	0.89	1.41	1.38	0.89	1.41	1.38
4.90	18.85	0.126	0.191	62.57	68.42	0.92	1.45	1.42	0.92	1.45	1.42
4.85	18.47	0.124	0.189	61.30	67.03	0.94	1.48	1.45	0.94	1.48	1.45
4.80	18.09	0.123	0.187	60.05	65.65	0.96	1.51	1.48	0.96	1.51	1.48
4.50	15.90	0.115	0.176	52.78	57.70	1.09	1.72	1.68	1.09	1.72	1.68
4.00	12.56	0.103	0.156	41.70	45.59	1.38	2.17	2.13	1.38	2.17	2.13
3.89	11.88	0.100	0.152	39.44	43.12	1.46	2.30	2.25	1.46	2.30	2.25
3.50	9.62	0.090	0.137	31.93	34.91	1.80	2.84	2.78	1.80	2.84	2.78
3.00	7.07	0.077	0.117	23.46	25.65	2.45	3.86	3.79	2.45	3.86	3.78
2.50	4.91	0.064	0.098	16.29	17.81	3.53	5.56	5.45	3.52	5.56	5.45
2.05	3.30	0.053	0.080	10.95	11.98	5.25	8.28	8.11	5.24	8.27	8.10
2.00	3.14	0.051	0.078	10.42	11.40	5.51	8.69	8.52	5.51	8.69	8.51