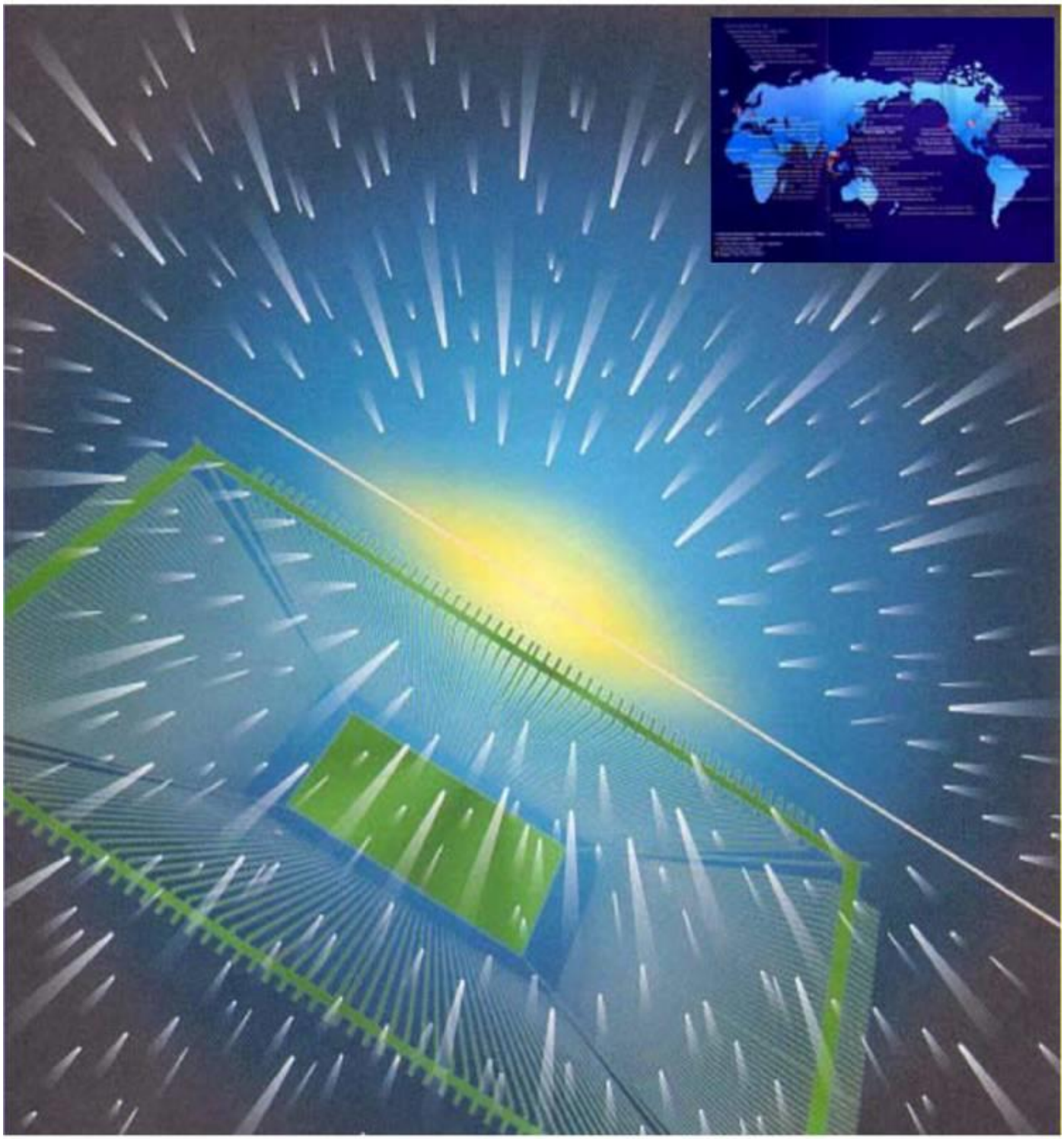
CUTWIRE

Electrode wire for wire electric discharge machine

Electrode wire for efficient wire electrical discharge machine

Electrode wire for superprecision wire electrical discharge machine

Pipe and stick electrode for precise fine hole electrical discharge machine



SUMITOMO ELECTRIC INDUSTRIES, LTD.

Reliable high quality that high technology invents

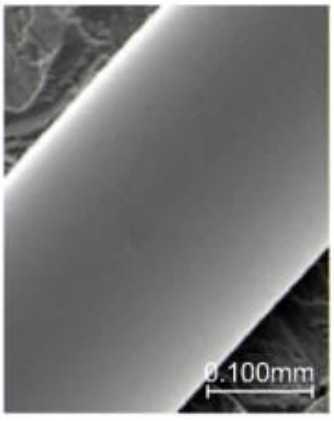
- Making to high performance such as super-high speed, super-high accuracy, and super-fineness is advanced to the electric discharge machining technology widely used in various fields of various metal mold production and part processings, etc. recently more and more. The electrode used as a tool is paid to attention more and more as a very important element of a technological improvement.

Sumitomo Electric Industries,Ltd. group will respond to such needs and will deliver the solution of an efficient electrode such as Sumispark series etc. wire and the electric discharge machining technology that matches it to needs of the customer in addition to a standard electrode wire by making good use of the high technology that cultivates it by the developments of the copper alloy and the powdery alloy product, etc.

Feature of cutting wire Sumispark

Most advanced technological development and strict quality control that supports high efficiency and accuracy

- **Steady mechanical, electric characteristic**
  A carefully selected material that suppresses impurities as much as possible is finished up in an electorode wire with steady for various characteristics of tensile strength and the electric conductivity, etc. for both Hard material (H) and softness material (A), by the accumulation drawing technology for years
- **Excellent straightness**
  The improvement of the processing accuracy and the rate of an automatic connecting wires can be attempted because there is little twist or curl.
- **High dimension accuracy**
  wire diameter tolerance is highly accurate managed within ±1.0μ or less by the diamond die
- **Clean surface**
  The electrode wire is smooth free from surface defect and dimple etc. , suppresses the generation of the brass powder by an, original smooth surface finish, and corresponds to a continuous operation for a long time.
- **Smooth wire feeding**
  The electrode wire even fine size and heavy ones can be fed smoothly by optimization of the winding tension etc.



Surface of cutting wire (SBS-25HN)

Best Selection of EDM Wire

Recommended electrode wire list according to processing machine

WEDM	Standard Cutting	Taper processing
Mitsubishi	SBS-HN	SBS-A□
Sodick	SBG-H	SBS-A□
Fanuc□	SBX-HN(SBS-HN)	SBS-A□
Makino	SBS-HN	SBS-A□
The west	SBS-HN□	SBS-A□
Agee Charmie	SBS-HN□	SBS-A□
Brother	SBS-HN□	SBS-A□

The best electrode line according to purpose

Wire classification and type / Applieation and content of improvement	Standard Wire (SBS、SBG、SBX)	High strength wire (SS)	Hhigh electrical discharge wire (SZA)
I want to decrease wire break frequency.	Standard	○	
I want to decrease the copper adhesion to the processing object	Standard		◎
I want to improve the rate of an automatic connecting wires.	Standard	◎	
I want to improve the processing speed.	Standard	○	○
I want to process fine shape.	Standard	◎	○
I want to improve the surface smobthness	Standard	○	◎

◎Best ○Recommendation

To use it more effectively

- **In case that wire breaks happens due to insufficient processing liguid such as the processing place is on the edge side**
  → Please use SS-HN that high temperature strength is high.
- **In case that you want to improve the rate of an automatic connecting wires for fine electrode wire.**
  → Please use excellent SS-HN straight.
- **In case that you want to improve the processing speed**
  → Please use Sumispark A(SZA-HN) with ultra thin high purity Zn layer.

Surface improvement of cut wire

Non paraffin wire

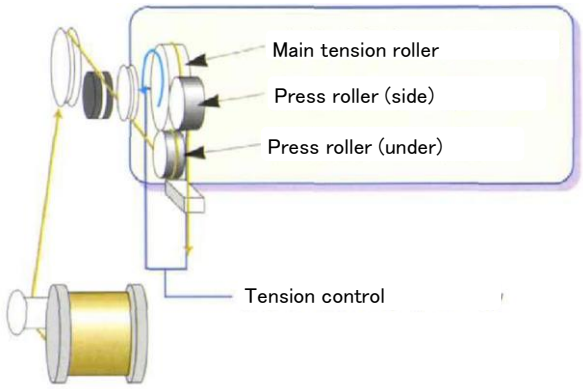
Improvement of surface treatment

New idea for electrode wire surface treatment Non paraffin wire

It is a special surface treatment wire that suppresses the wire slippig at electrical discharge machine, and achieves the wire feeding by a steady tension. It is steady guality and possible to use it under the standard brass condition in the processing manual. Because the wire surface is smooth, the amount of the metal powder generation in the guide part of the wire electric discharge machine is a little, it is saitable for long continuous operation.
It has excellent staighthess and processing characteristic, lqguivalent to standard wire.

Feature of non paraffin wire

Wire feeding illustration of wire electric discharge machine



If there is paraffin

- The wire slips at the tension roller.
- The oil that adheres to the roller increases.

Trouble expected by real processing

- The wire sending is unstable.
- The wire tension is unstable.
  - It stops the processing with wire break
  - The finish machining is abnormal.

Reguired guality for non paraffin wire

Surface remaining oil
- Great decrease
- Moderate slipping character that considers wear-out surface metallic powder of other parts
- It decreases than the past

Others
- Discoloration prevention property more than the pas
- Processing characteristic eguiralent to the past

The demand for quality is satisfied with the

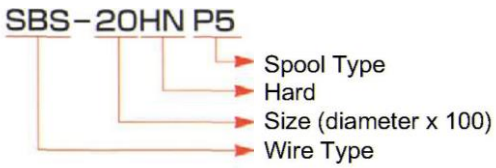
Change of discoloration prevention material

It succeeds in coexisting of a discoloration prevention performance more than the past and a moderate slipping.

Management strengthening of wire and introduction of

Great decrease of surface adhesion metal powder and steady processing characteristic

Name of articles and reel sign



It corresponds to non paraffin by the following types.

SBS It is a standard brass wire corresponding to a most processing machine.
SBX It is a standard wire that improves the electrical discharge characteristic.
SS,SZA It is the most suitable wire for microfabrication, and the thick material processing.

Standard brass electrode wire

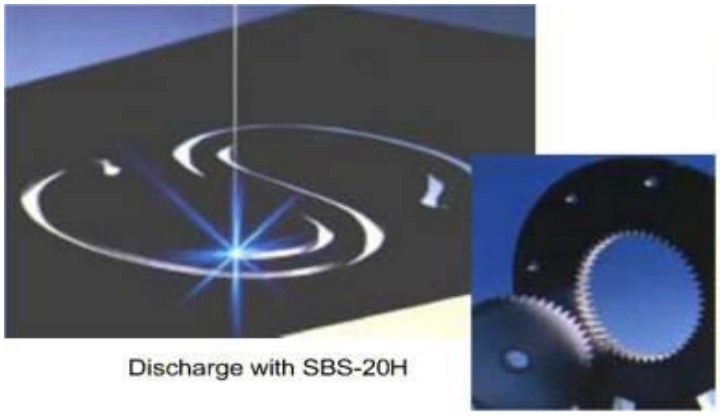
Cutting wire SBS,SBG

Material Standard Brass

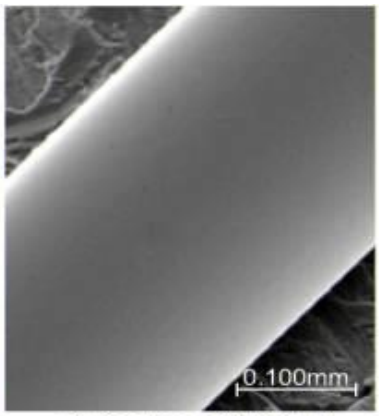
Standard electrode wire in which it boasts of steady quality

- SBS is a wire for the mediocrity of the world standard that uses the C2700 faction brass alloy corresponding to most wire electric discharge machines including Mitsubishi Electric Corporation and Charmie.
- SBG is the best electrode wire for the wire made by Sodick electrical discharge machine (since the MK21 power supply) that adds the improvement to standard SBS.
- It is possible to use it under the standard brass condition in the processing manual by a steady quality.
- The generation of a metallic powder in the guide part of the wire electric discharge machine is a little because the bar chart side is smooth, and it is suitable for a continuous operation for a long time.
- Straight excelling and strength are possessed, and a steady automatic connecting wires is achieved.

Properties of SBS & SBG



Discharge with SBS-20H



Surface Image (SBS-25H)

Properties of SBS & SBG		
Type	Hard (SBS, SBG-H)	Soft (SBS-A)
Tensile Strength(N/mm2)	930 - 1080	440 - 585
Elongation (%)	<3%	>15%
Conductivity (%IACS)	19-23	22-29

●The measuring method applies to JIS.

※ %IACS shows the international annealed copper wire standard.

winding weight (kg) / wire diameter (kg)	P3	P5	P10	P20	DIN 200
	3.0	5.0	10.0	20.0	15.0
0.10	H				
0.15	H, A				
0.20	H, A	H, A	H, A	H, A	H, A
0.25	H, A	H, A	H, A	H, A	H, A
0.30	H, A	H, A	H, A	H, A	H, A

Electrode line for efficient electric discharge machining

Cutting wire SBX

Material Special Brass Alloy

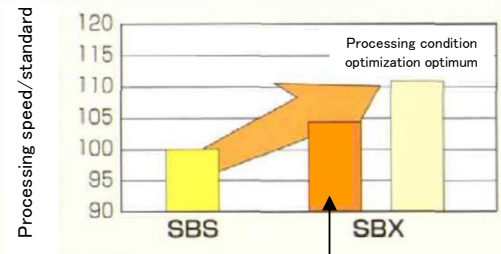
Efficient electrode wire by improvement of content of zinc etc.

- SBX is electrode wire that adds the improvement such as raising the content of zinc compared with a standard brass electrode wire, and improves the rough processing speed and the finish surface quality.
- It is a high zinc brass wire that is appropriate for FANUC, Makino, and the Sodick machine.
- The generation of a metallic powder in the guide part of the wire electric discharge machine is a little because the wire surface is smooth, and it is suitable for a continuous operation for a long time.
- Because the rigidity is stronger than the standard electrode wire, it excels in an automatic connecting wires.

Characteristic with excellent cutting wire SBX

	Processing speed	Surface roughness
Standard brass electrode wire	100	100
Cutting wire SBX	111	94
Improvement rate	11%	6%

Processing speed of cutting wire SBX



Processing test condition

Work material SKD-11 25mmt.

Processing environment immersion type and nozzle sticking

Method of setting processing condition

・The current is set high.

・When the wire tension is dropped, it is effective.

Performance of cutting wire SBX	
Appearance	Brass luster color
Tensile strength (N/mm²)	930～1080
Elongation (%)	＜3%
Electric conductivity ※ (%IACS)	19-23

●The measuring method applies to JIS.

※%IACS shows the international annealed copper wire standard.

Winding weight (mm) / wire diameter (kg)	P3	P5	P10	P20	DIN200
	3.0	5.0	10.0	20.0	15.0
0.10□	○	–	–	–	–
0.15□	○	–	–	–	–
0.20□	△	○	○	○	○
0.25□	△	○	○	○	○
0.30□	–	○	○	○	○

●△ becomes a build-to-order manufacturing.

Name of articles and reel sign mark

SBS-20 H P5

- Spool type
- Hardness
  - Hard & Paraffin H
  - Hard and Non-Paraffin HN
  - Soft (Paraffin only) A
- Size (diameter x 100)
- Wire Type

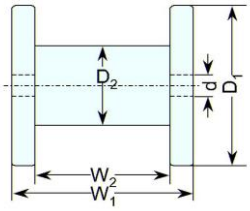
● Please refer to the kind attached table of tucking in separately for the combination of the kind, the wire diameter, and the reel.

※ Please contact the agency and the nearest address for the special goods that have not been described and specification may be changed without notification by a ceaseless technological improvement.

Parameter of plastic reel

Reel sign	Size (mm)					Amount of standard volume (kg)	Number of packing in a case (Box)
	D1	D2	W1	W2	d		
P3	130	80	110	90	20	3.0	6
P5	160	90	114	90	20	5.0	4
P10	200	90	134	110	25	10.0	2
P20	250	110	140	110	34	20.0	1
P30	300	130	160	130	34	30.0	1
DIN200	200	125	200	160	22	15.0	1

Spool shape



● P3～30 : JIS standard reel

● DIN200 : German standard reel

(There is an axis hole surrounding taper.)

The reference information: Standard length of the cutting wire.

(The unit of length is kg.)

Amount of reel sign volume / Line diameter (mm)	JIS standard reel					DIN standard reel
	P3	P5	P10	P20	P30	DIN200
	3.0kg	5.0kg	10.0kg	20.0kg	30.0kg	15.00kg
0.10	45.9					
0.15	20.4					
0.20	11.5	19.1	38.0	76.0	114.0	57.3
0.25	7.3	12.2	24.4	48.8	73.2	36.6
0.30		8.5	17.0	34.0	51.0	25.5