

# Drawing Machine 20/2-31

## Modular cone drawing machine for flexible application

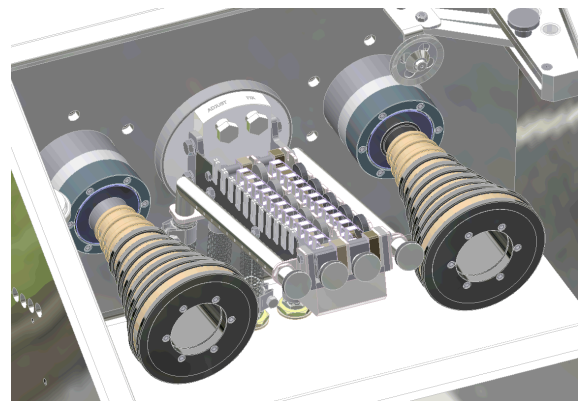
- Wet cone drawing machine for precious metals, with up to 3 drawing modules
- Minimized slip between the modules due to single drive concept
- Designed for a wide range of final wire diameters
- Wide spool range of cylindrical, conical and biconical spools
- Less maintenance due to central oil lubrication for all shaft bearings



Overview

### Wire material:

- bare copper, tin plated copper, silver plated copper and silver copper alloy, platinum and platinum alloy, gold, silver
- Max. tensile strength           1200 MPa
- Max. inlet- Ø:                   0.60 mm
- Max. outlet- Ø:                 0.25 mm
- Min. outlet- Ø:                 0.02 mm
- Maximum speed:               25 m/s



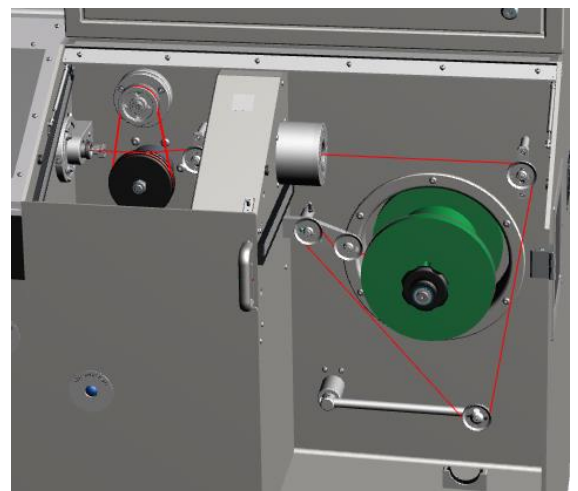
Drawing cones and die holder

### Drawing cones:

- Cone size Ø120, 10 steps
- Elongation 13% (11%,10%,8%,6%)  
Each drawing module can have cone pairs with different elongation, in accordance to desired final wire size
- Cone material:           zirconium oxide
- Elongation final die: 6-13 % (adjustable)

### Spooltype:

- Maximum flange diameter: 160 mm
- core diameter minimal:       80 mm
- traverse width maximal:       250 mm



Capstan, diameter measurement and spooler

### Options:

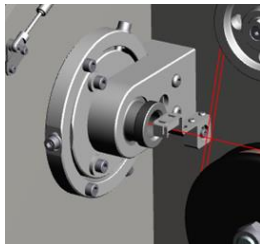
- Rotating final drawing die holder
- Wire-diameter and ovality supervision system (Zumbach ODAC15XY / USYS20)
- Electronically adjustable spooling tension

# Drawing Machine 20/2-31

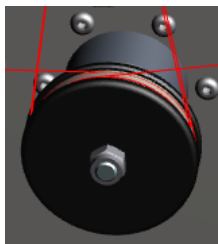
## Description

### Capstan and Spooling unit:

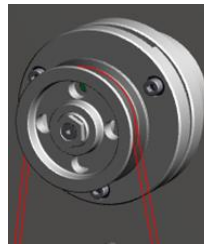
- Machine frame made from steel with cover made of safety glass
- Final drawing die holder, with axial adjustment for perfect strand alignment
- Final drawing die system with rotation movement (Option)
- Pull out capstan unit driven by AC servo motor, flat belt transmission
- Easy to adjust spreader disk for wire separation
- XY-Laser diameter measurement system Zumbach ODAC15XY-J (Option)
- Reverse moving wire diameter measurement system (Option)
- Diameter and ovality indication and supervision system Zumbach USYS20 (Option)
- Dancer tension adjustable by spring (range 1:5)
- Electronically adjustable dancer tension range 50 cN – 1000 cN (Option)
- Spooler capstan with changeable shaft  $\varnothing$  10,  $\varnothing$  15 or  $\varnothing$  22 mm
- Spooler revolution max. 5000 rpm
- Spool diameter  $\varnothing$  80, 100, 125 and 160 mm
- Foot pedal for threading, with safety stop function
- Central bearing lubrication with oil tank, pump, and min. level sensor



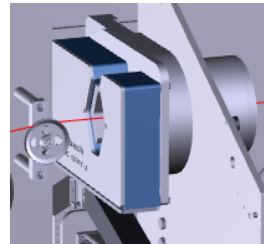
Final drawing die holder



capstan



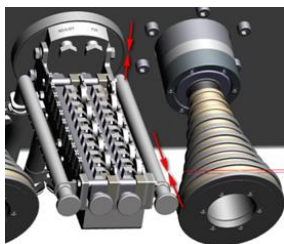
spreader disk



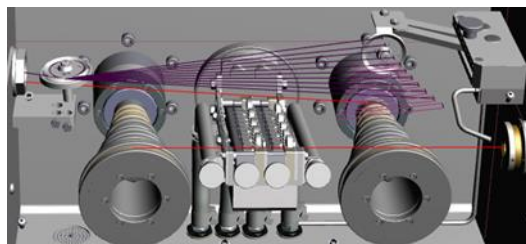
wire measurement system

### Drawing modules:

- Machine frame with cover made of safety glass
- Drawing bay made of stainless steel
- Drawing cone units driven by AC Servo Motor, tooth belt transmission
- Motor power selectable from 0,75 kW up to 1,5 kW, 3,0 kW and 4,0 kW
- Drawing cone spindle unit with central lubricated bearing and labyrinth sealing
- Drawing cones, compound construction made from stainless steel and zircon oxide sheaves
- Easy adjustable drawing die holder for 10 drawing dies, made from stainless steel
- Wire guiding pulleys to skip user-defined drawing steps
- Emulsion supply for drawing cone, drawing die holder and final drawing die
- Foot pedal for threading with safety stop function



Adjustable drawing die holder

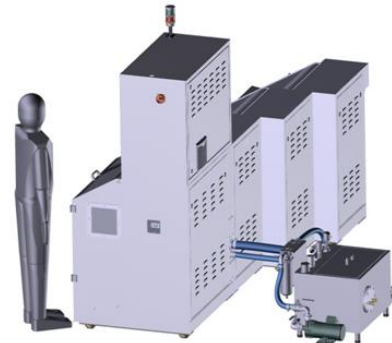


wire guiding pulleys

## Drawing Machine 20/2-31

### Lubrication Options:

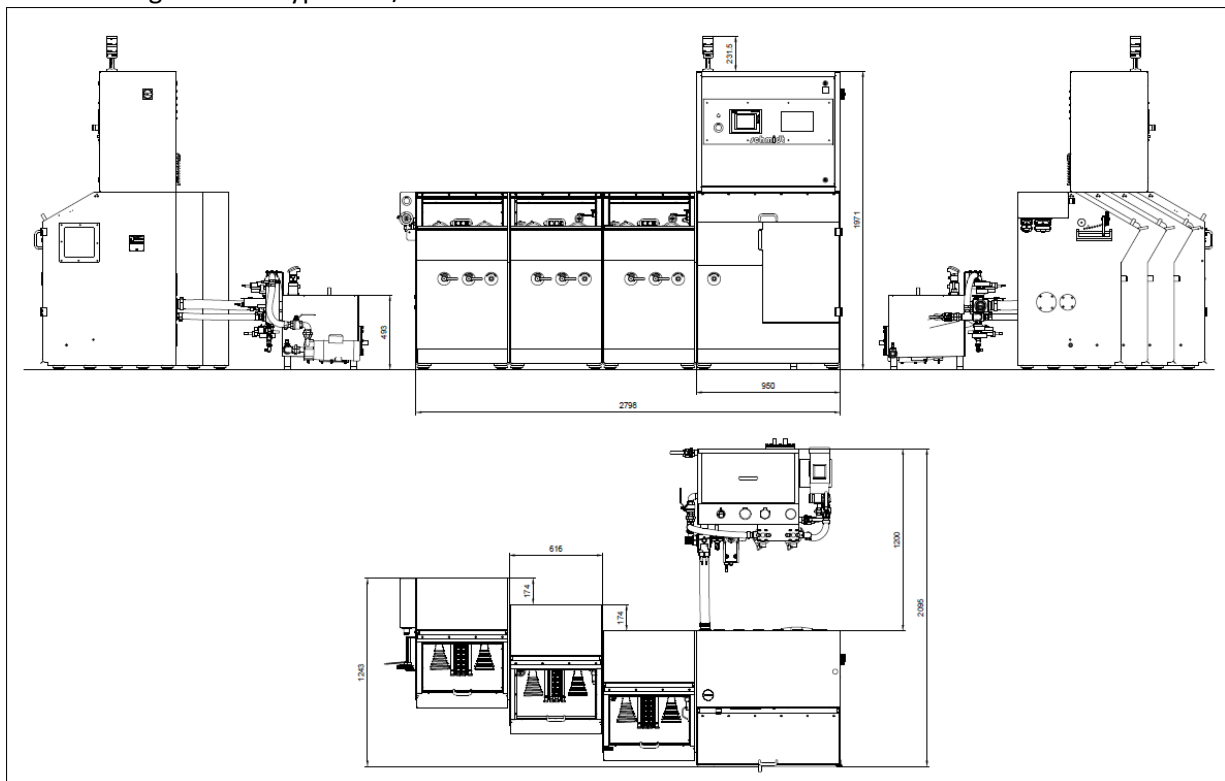
- Lubrication tank 80 litre with pump (magnetic coupling) and level sensor
- Filter system with cartridge (1 or 5 µm)
- Lubrication heating system with electric heater and temperature sensor
- Lubrication cooling system with heat exchanger
- automatic change over to central lubrication system



Lubrication tank

### Machine layout:

Wet Drawing Machine type 20-2/31



Layout plan with emulsion tank

# Drawing Machine 20/2-31

## Production calculations (samples)

20-3/31				20-3/31				20-3/31			
Wire	Inlet	0,225	31,1	Wire	Inlet	0,600	22,6	Wire	Inlet	0,400	26,1
Elongation	Step	mm	AWG	Elongation	Step	mm	AWG	Elongation	Step	mm	AWG
15%	Step 1	0,210	31,7	15%	Step 1	0,560	23,2	15%	Step 1	0,400	26,1
15%	Step 2	0,196	32,3	15%	Step 2	0,522	23,8	15%	Step 2	0,400	26,1
15%	Step 3	0,182	32,9	15%	Step 3	0,487	24,4	15%	Step 3	0,400	26,1
15%	Step 4	0,170	33,5	15%	Step 4	0,454	25,0	15%	Step 4	0,400	26,1
15%	Step 5	0,159	34,1	15%	Step 5	0,423	25,6	15%	Step 5	0,400	26,1
15%	Step 6	0,148	34,7	15%	Step 6	0,395	26,2	15%	Step 6	0,400	26,1
15%	Step 7	0,138	35,3	15%	Step 7	0,368	26,8	15%	Step 7	0,400	26,1
15%	Step 8	0,129	35,9	15%	Step 8	0,343	27,4	15%	Step 8	0,400	26,1
15%	Step 9	0,120	36,5	15%	Step 9	0,320	28,0	15%	Step 9	0,400	26,1
15%	Step 10	0,112	37,1	15%	Step 10	0,298	28,6	15%	Step 10	0,400	26,1
15%	Step 11	0,104	37,7	15%	Step 11	0,278	29,2	15%	Step 11	0,400	26,1
15%	Step 12	0,097	38,3	15%	Step 12	0,259	29,8	15%	Step 12	0,400	26,1
15%	Step 13	0,091	38,9	15%	Step 13	0,242	30,4	15%	Step 13	0,400	26,1
15%	Step 14	0,085	39,5	15%	Step 14	0,226	31,0	15%	Step 14	0,400	26,1
15%	Step 15	0,079	40,1	15%	Step 15	0,210	31,6	15%	Step 15	0,400	26,1
15%	Step 16	0,074	40,7	15%	Step 16	0,196	32,3	15%	Step 16	0,400	26,1
15%	Step 17	0,069	41,3	15%	Step 17	0,183	32,9	15%	Step 17	0,400	26,1
15%	Step 18	0,064	41,9	15%	Step 18	0,171	33,5	15%	Step 18	0,400	26,1
15%	Step 19	0,060	42,5	15%	Step 19	0,159	34,1	15%	Step 19	0,400	26,1
12,2%	Step 20	0,056	43,0	15%	Step 20	0,148	34,7	15%	Step 20	0,400	26,1
12,2%	Step 21	0,053	43,5	15%	Step 21	0,138	35,3	15%	Step 21	0,400	26,1
12,2%	Step 22	0,050	44,0	15%	Step 22	0,129	35,9	15%	Step 22	0,400	26,1
12,2%	Step 23	0,047	44,5	15%	Step 23	0,120	36,5	15%	Step 23	0,400	26,1
12,2%	Step 24	0,045	45,0	15%	Step 24	0,112	37,1	15%	Step 24	0,373	26,7
12,2%	Step 25	0,042	45,5	15%	Step 25	0,105	37,7	15%	Step 25	0,348	27,3
12,2%	Step 26	0,040	46,0	15%	Step 26	0,098	38,3	15%	Step 26	0,324	27,9
12,2%	Step 27	0,038	46,5	15%	Step 27	0,091	38,9	15%	Step 27	0,302	28,5
12,2%	Step 28	0,036	47,0	15%	Step 28	0,085	39,5	15%	Step 28	0,282	29,1
12,2%	Step 29	0,034	47,5	15%	Step 29	0,079	40,1	15%	Step 29	0,263	29,7
12,2%	Step 30	0,032	48,0	15%	Step 30	0,074	40,7	15%	Step 30	0,245	30,3
12,2%	Step 31	<b>0,030</b>	<b>48,5</b>	15%	Step 31	<b>0,069</b>	<b>41,3</b>	15%	Step 31	<b>0,229</b>	<b>30,9</b>

Other drawing steps are possible. The final diameter can cover a range from 0,020 up to 0,25 mm.