A Brief Introduction of intMPE Pump Industry Manufacturing Group*

MINERAL PROCESSING EQUIPMENT

Brief description:

intMPE Pump Industry Group is ISO9001 certified specialized pump manufacturer, in China. It has total 235 personnel, 10% of which are technical staff, foundry staff is 70%. It has a pump research institute serving whole pump industry in China.

Type of Products:

1). Pumps, including slurry pumps, submersible pumps, sewage pump, horizontal split double suction water pumps, submersible sewage pumps, submersible slurry pumps and etc.,

2). Parts, either machined or as-cast castings, including pump components, motor components, made either to our own designed drawings or customer's drawings.

1. Pattern

We are use seasoned teak wood to manufacture patterns which are stored in foundry racks. Wood is seasoned for good life comparatively. Expected life : 5 - 7 years with small repair of wear & tear. No. of parts expected is approximately 500 : Stored in rack as per accepted standards.

2. Foundry Information:

1). Material processed and capacity:

We can make a variety of ferrous and non-ferrous materials such as gray iron, ductile iron, copper, aluminum, stainless steel , Ni hard , High Chrome and other alloys.

a. Gray iron (in cast iron foundry): 5 tons/day, Grade: Class 25-40

b. Ductile iron (in cast iron foundry) : 3 tons/day, Grade: QT450-10, QT500-

c. Steel (in cast steel foundry): 4 tons/day, Grade:

2). Current Utilization of Foundry Capacity:

a. Cast iron foundry: 70%

b. Cast steel foundry: 70%

3). Casting Weight Ranges:

Minimum weight: 1 lbs, Maximum:2500 lbs

4). Sand system:

Furan resin sand, green sand

5). Equipment:

a. Melting equipment:

(1) Cupola, 2 sets, 5T, Alkaline lining
(2) Induction furnace, 3 sets, 3T, Acid lining
(3) Arc furnace, 1 set, 5T, Alkaline lining
(4) Medium frequency furnace, 1 set, 0.5T, Acid lining

b. Molding and Coring Equipment:

(1) Type 148, 1410 molding machine
(2) Simpson consecutive sand mixer, 2 sets
(3) Mold turnover and draft machine, 1 set
(4) ECO Reclaimer, 2 sets
(5) Bowl shape sand mixer and K87 shell coring machine
(6) 10T/h consecutive mixer, 2 sets 10 T/h interval mixer, 1 sets (cast iron foundry) 6 T/h interval mixer, 1 ses (cast steel foundry)
(7) DV-4 Baird photoelectric direct reading spectrograph, 1 set
(8) Sand blasting house, 1 set (cast iron foundry)
(9) Sand blasting roller, 3 sets (1 in cast steel foundry, 2 in cast iron foundry)
(10) Suspending sand blaster,1 set (cast steel foundry) etc.

c. Heat Treatment Equipment

(1) Electric Oven, 4 sets, respectively 600kw, 420kw, 320kw and 200kw, Maximum capacity: 15 tons, highest temperature: 1050 centigrade degrees, maximum area: 4.5m x 3.0m x 1.5m

(2) Well Type Oven: 1 set, 190kw, dia.900mm x 3100mm
(3) Medium Frequency Quenching Oven: 1 set, dia.105mm x 1300mm (shaft)

1. Quality Assurance:

(1). Inspecting Equipment:

A Chemistry analysis:

Besides common chemical analyzers, Canamera also has type DV-4 BAIRD photoelectric direct reading spectrograph imported from U.S.A., oxygen & hydrogen testing instrument, and nitrogen gas testing instrument.. Chemical composition analysis can be done here for carbon steel, steel alloy, cast iron alloy, ductile iron, copper alloy, natural rubber, synthetic rubber and etc.

B Microstructure analysis:

Canamera is equipped with type Neophot-32 microstructure microscope made in Germany, which can do analysis for microstructure of metal material.

C Mechanical property:

It is equipped with universal material tester, impact tester, tension tester, hardness meter and etc., with which we can do mechanical property test for metal material and rubber material.

D Measurement:

It is equipped with length meter and universal tool, microscope as well as energy-saving interferometer, spectrophotometer, photographic optical gauge, which can measure length, angle, roughness and etc.

(2) Testing Facilities

1) GENERAL

The pump test station consists of high voltage pump test station and low voltage station. The test rig locates inside house.

1)-1. HIGH VOLTAGE PUMP TEST STATION (VOLTAGE: 10KV, 6KV, 3KV)

shop area: 42x15 = 630 m2
volume of water tank:

2. One 396 cum 6m deep water tank locates in the shop . There is also one 22m deep well of 2m dia. (for testing submersible pumps). (this water tank connects through with that at the low voltage pump test station)

3. One 2800 cum water tank locates outside the shop, the deepest level is 8m below surface level.

lifting equipment: 30t hoist, one set.
lifting height from the floor: 13m
voltage: 10kv, 6kv, 3kv
max. Power: 2400kw
max. Size of pump tested: 1200mm
max. Water pressure: 12mpa

1)-2. LOW VOLTAGE PUMP TEST STATION (VOLTAGE: 380V)

shop area: 42x21=882 m2
volume of water tank:

4. One 518 cum water tank (connecting through with the water tank in the high voltage test station), the biggest depth is 6.5m below surface.

5. One 163 cum water tank , the deepest level is 4m

lifting equipment : one 10t and one 5t hoists.
lifting height from the floor: 7m
voltage: 380v

max. Power: 300kw
max. Size of pump tested: 400mm
max. Water pressure: 4mpa

2). MOTOR USABLE FOR PUMP TEST:

3000rpm	1.1—160kw
1500rpm	3 —300kw
1000rpm	7.5 —710kw
750rpm	11 –- 245kw

3). FREQUENCY CONVERTER: POWER :240KW; FREQUENCY: 5—60HZ
Speed reducer: one set, reduction ratio: i=1:2, pmax=560kw
ONE SET, REDUCTION RATIO: I=1:2.8, PMAX=745KW
LOAD CAPACITY: N1=1000RPM

4). PRESSURE CONTROL

Control valves are used for measurement under high pressure, dia.300 and dia.500 valves are available, max. Pressure is 10mpa.

5). TESTING METHOD AND RANGE:

5)-1 **FLOW RATE:**

The flow rate of pump is measured by two METHODS, ELECTROMAGNETIC FLOW METER AND WEIR.

Accuracy of measurement:
50-100% capacity: +,- 0.5% measurement
10-50% capacity: +,-1% measurement

Range of flow meter:

size (dia.)	
25mm	0—6 l/s
50mm	0.5—23 l/s
80MM	0.5—60 L/S
100mm	1—94 l/s
150mm	2—212 l/s
200mm	3.8—376 l/s
300mm	8.5—848 l/s
500mm	19.6—1963 l/s
700mm	46—4618 l/s
800mm	60—6031 l/s
1600mm	240—24127 l/s

5)-2 **PRESSURE MEASUREMENT**

Discharge pressure is measured with pressure gauge, accuracy is 0.4% of full scale. Suction pressure is measured with u type mercury meter, accuracy is 02.% of full scale.

Range of pressure gauge:
0—10 m water column ----------0—1000 m water column

Range of vacuum gauge:
-10--+6 M WATER COLUMN

5)-3 POWER CONSUMPTION MEASUREMENT

Three methods are available:
(1). Two-watt. Meter
(2). Power TRANSDUCER
(3). TORQUE METER

Accuracy of measuring equipment:
Mutual inductor: grade 0.2
Watt. Meter: grade 0.5
Power transducER: GRADE 0.5
Torque meter: grade 0.5

5)-4 MEASURE OF ROTATING SPEED

Speed is measured with torque meter or portable digital tachometer, the range is 10—50000 RPM .

ACCURACY OF MEASUREMENT:

10—11999 RPM	+-1RPM
12000—29999 RPM	+-2RPM
30000—50000 RPM	+-4RPM

5)-5 MEASURE OF NPSH

NPSH can be measured for all pumps with suction flanges(except for submersible and deep well pumps).

Method:
(1). On the open test rig, a valve in the suction line is used to adjust the suction resistance for measuring npsh, in addition, booster pumps can be used for positive suction head if required.
(2). On the close test rig, npsh is measured by increasing the vacuum value and lowering the pressure of return pipe.
(3). On the high voltage test rig, npsh is measured by lowering water level.

5)-6 OTHER MEASURING FACILITY:

5. Noise measurement : 36—130dba
6. Frequency range: 20hz—8khz
7. b. Vibration measurement

Amplitude: 0.3—1000 microns
Velocity: 0.03mm—100mm/s
Accelerate: 0.3—50M/S2

c. Temperature measurement : surface and liquid: -25—100

d. Torque measurement: power, speed and torque are displayed at the same time.
TORQUE: 10—10000N.M

6). HYDROSTATIC PRESSURE TEST: MAX. PRESSURE CAN BE UP TO 100MPA

7). TEST REPORT:

7)-1 NORMAL TEST: TEST DATA IS INPUT INTO THE COMPUTER BY A PERSON AND THE ACTUAL PERFORMANCE MEASUREMENT AND PERFORMANCE CURVE ARE PRINTED OUT ,THEN A DECISION WILL BE MADE ON THE QUALITY BASED ON THE COMPARISON BETWEEN THE ACTUAL ONE AND STANDARD ONE.

7)-2. CLOSE TYPE TEST RIG: THE HIGH VOLTAGE TEST RIG FOR VERTICAL PUMPS CAN DO AUTOMATIC TESTING USING COMPUTER BESIDES THE FUNCTION DESCRIBED ABOVE(BUT THIS SYSTEM IS STILL UNDER ADJUSTMENT), AND THE ACTUAL MEASURED CURVES CAN BE CHECKED AT ANY TIME ON THE COMPUTER SCREEN DURING THE TEST AND IT CAN BE RE-TESTED AND CORRECTED IN CASE OF ANY PROBLEMS WITH THE CURVES ON ACTUAL MEASUREMENT.

8). TEST STANDARD

8)-1. ISO2548
8)-2. ISO3555
8)-3. GB3216-89

9). CALIBRATION OF MEASURING INSTRUMENTS

The measuring instruments are calibrated on a regular basis according to the requirements on the calibration intervals specified in china national standard. The records/ certificates of each time calibration are registered and put into file for information.

3. MAIN MACHINING CAPACITY:

Process Description	Machining capacity
Cutting	Dia.630×4500 (Shaft)
Grinding	Dia.500×4000
Vertical turning	Dia.5000×2000
Boring	6000×2400×3000
Drilling	Working stand: 1600×1400 Dia.80
Planing	dia.1250×900
N. C. vertical turning	1000×800×600
Computerized machining center	

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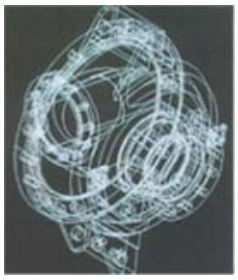
4. Other Manufacturing Equipment:

Our Rubber Shop has two sets of 350T Plate Press made by STACY Company in Australia and 800/150 Transmission Plate Press. It can complete independently the entire manufacture procedures from rubber mixing and smelting to curing. Rubber materials we can make include: natural rubber, butyl rubber, butyronitrile rubber and hypalon.

Quality and Capability

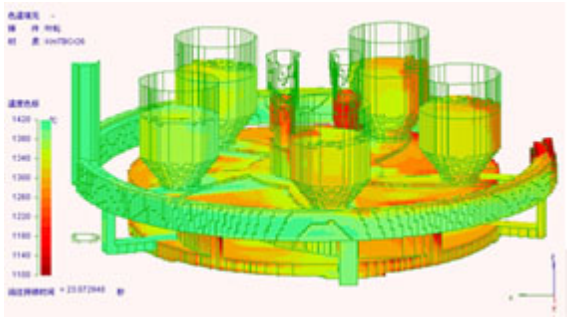


◆Hardware and software Platform of **CAD & SOLID WORKS**.

◆**CFD** (Computational Fluid Dynamics) software to predicate the flowing field and performance parameters inside the passage of pump. Design improvement and optimum plan selection can be performed based on the predicated result.

◆**CSD** (Computational Structural Dynamics) software to predicate the structural inside the pump.
Design improvement and optimum plan selection can be performed based on the predicated result.

◆**CAE** software to simulate the behavior in the process of mould filling and solidification for castings. Calculation and analysis on solidification, liquid metal flow and thermo physical properties for various alloys (casting steel, graphitic iron, ductile iron and etc.) and various kinds of casting method (sand mould, metal mould, compression mould, low press mould, investment mould and etc.) can be performed by **CAE**.



◆I-DEAS has been selected in the platform. 3-D modeling, surface design, assembling interference examination and finite element analysis for the products has been realized.
◆Our manufacturing system is a close-type manufacturing system from design, mould-making, foundry, heat treatment and machining to assembling and test.

◆The no-bake sand process is used in our foundries. Quality is controlled by direct analyses with type of OBLF QSN750 Direct-reading spectrometer. The maximum weight of casting and part is up to 10 tons.

◆There are all kinds of machining equipments such as CNC numerical control machine, boring machine, miller, planer and grinder which maximum machining capacity is up to 5000mm. There is a calibration station for inspecting measure instruments.
◆ISO9001-2000 has been certified in all our manufacturing processes.
◆Our company accesses the largest High-voltage pump test station and low-voltage pump test station in China when required.

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Casting & Machining

- intMPE would like to have the cooperation with you in the forms of OEM, manufacturing as per customer's drawings, biding in cooperation, management as an agent and cooperative manufacturing.

- We can be rest assured of a unique understanding of your requirements, specifications, pump design and testing, engineering standards, reliability, assured delivery within specific time frame, consistent quality and competitive prices.

- intMPE has the right experience and professional expertise in supplying castings for various **pump components, valve body & disc, motor yokes & frames, Grinding roll and others** on the materials and specifications given by the customers, ASTM A532 Grade 3A (High Chrome),Ni-Hard, High-manganese, Gray Iron, Ductile Iron, Bronze, stainless steel and so on.
intMPE has veterans who are experts in different casting which be finished machine condition.

- Abrasive resistant white irons : We have a long experience in producing complete range of Ni-Hard, 27% Chrome required for Solids-Liquid Mixture handling applications.

- We are strongly committed to provide complete solution for **MINING AND MINERALS INDUSTRIES** requirement of finished casting components in high chrome, Ni-hard, manganese steel, carbon steel materials conforming to international standards with best quality at reasonable rates.
  - Slurry Pump - Spares like impeller, volute liner, back liner, front liner, casing etc.
  - Dredge pumps' casing and impeller.
  - Wear parts for Coal mill pulverizer-grinding roller & ring.
  - Clinker Grinder Assembly, Clinker Grinding Roller sets etc., spares per your drawing and samples.
  - Anti-abrasion combining tube
- For speed and efficiency kindly mail us drawings in the following formats: **.dwg , .dfx** (**.dwg** preferred)

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