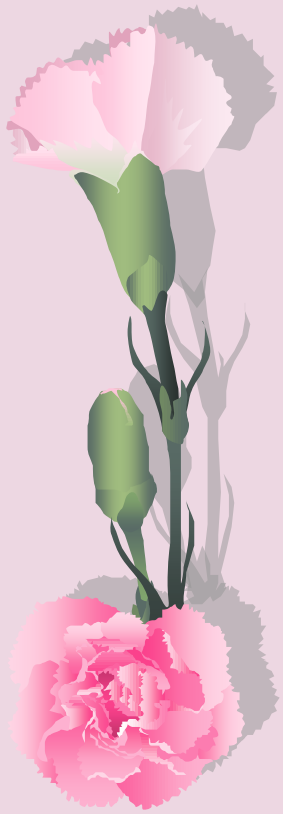
Pump standardization flow

1. Necessity of pump standardization

As introduced before, pump standardization is “Unite the quality, shape, and the size of a pump with standards. Interchangeability is improved by it.” In general, when the pump of a model with a lot of numbers of production is standardized, the advantage grows.

Here, it explains how to standardize a pump by concretely using flow.



Pump standardization flow

2. Pump standardization flow - items

Pump standardization flow, when picking up items as follows, starts from A and completes by G. Though work is started from A, it advances in B, C, and order. There is an obstacle, it returns ahead, and it corrects. It means like "「A→B→C→D→B→C→D→C→D→E・・・・」. There is frequently when returns ahead.

A. Needs are understood

B. Design specification is decided

C. Hydro is decided

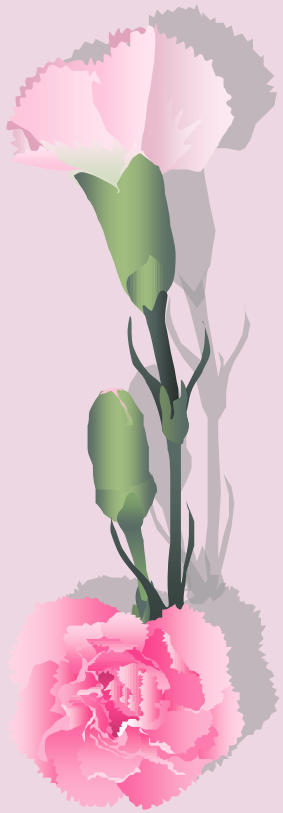
D. Details are designed

E. Technical documents are made

F. Production drawings and purchasing documents are made

G. Technical documents for sales are made

Then, let's see details of each item.



Pump standardization flow

3. Pump standardization flow - details

A. Needs are understood

(1) Market research

(2) Pumps of the other companies are investigated

(3) Opinions from estimate section and sales section are investigated

(4) Pump grade is decided

(5) When model change of pump, past problems and customers' complaints are corresponded

(6) Price is checked

Pump standardization flow

3. Pump standardization flow - details

B. Design specification is decided

(1) Applicable standard is decided

(2) Standard and option are divided

(3) Handling liquid and its temperature are decided

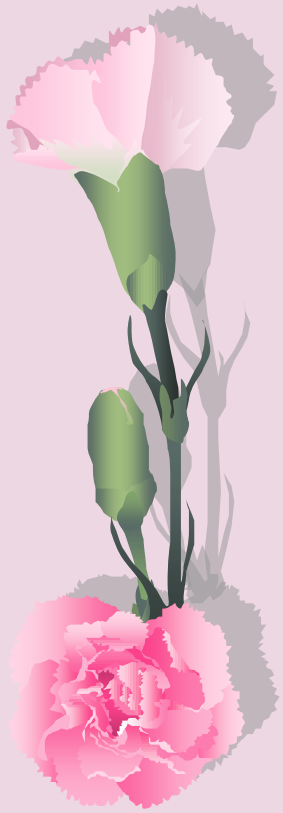
(4) Bore sizes and pump speed are decided

(5) Materials of each part are decided

(6) Maximum allowable suction pressure and maximum allowable working pressure are decided

(7) Design conditions as follows are decided;

Design temperature, design pressure, density, K-value, allowable stress of casing, bolt, impeller, key and coupling



Pump standardization flow

3. Pump standardization flow - details

B. Design specification is decided

(8) Structure as follows is decided;

Casing split, casing structure, impeller, shaft seal, thrust support, bearing, coupling, flushing and cover

(9) Rating and direction of nozzles are decided

(10) Direction of rotation is decided

(11) Clearances are decided

(12) Shaft series and shaft end shape are decided

(13) Numbers of casing boss are decided

C. Hydro is decided

(1) Selection chart is prepared

(2) Typical performance curves are prepared

Pump standardization flow

3. Pump standardization flow - details

D. Details are designed

(1) Calculation of cost

(2) Calculation of Thrust

(3) Sharing of parts with another model

(4) Shaft series

(5) Shaft seal - mechanical seals, gland packing

(6) Coupling

(7) Critical speed and deflection

(8) Cover flange

(9) Shaft strength

(10) Bearing life

(11) Casing thickness (12) Structure drawing is prepared

Pump standardization flow

3. Pump standardization flow - details

E. Technical documents are prepared

(1) Catalog

(2) Performance curves

(3) Deviation list

(4) Outline drawing, pump drawing

(5) Sectional drawing

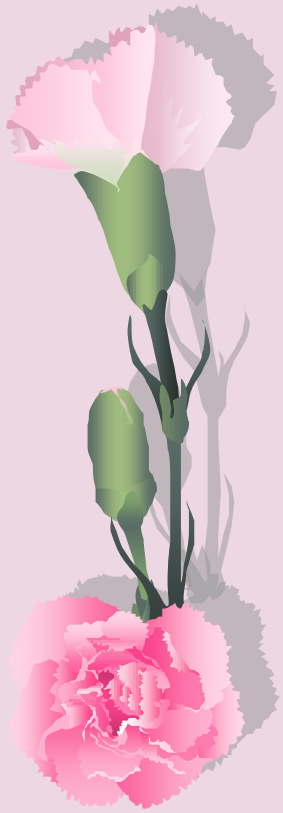
(6) Piping drawing (filling in type)

(7) Bearing detail drawing

(8) Interchangeability list, spare parts list, special tools list

(9) Stuffing box detail drawing

(10) Selection of shaft seals



Pump standardization flow

3. Pump standardization flow - details

E. Technical documents are prepared

(11) Noise data

(12) Technical data as follows;

Volute type, Impeller max./min. diameters, clearance table, weight list, casing inner volume, cooling criteria, casing max. dimension, casing thickness, mechanical seal selection, cut-water diameter, critical speed and deflection, bill of materials, allowable nozzle forces and moments, oil list, spacer length