

Example

Utility value analysis for synthesis reactor/ vacuum mixer dryer/ bioreactor/ fermenter

Weighting

Points awarded by the investor.  
The number 10 means very good fulfilment

1: unimportant  
10: very important

Supplier A

Supplier B

Supplier C

Supplier D

	1: unimportant 10: very important	Supplier A	Supplier B	Supplier C	Supplier D
<b>Flexibility:</b>					
<b>How important is it that the process system works just as well at low fill level as at nominal fill level? The nominal filling is not the gross volume of the appliance. The nominal filling is the maximum permissible quantity in litres that can be filled into the equipment. This utility value analysis is only correct if the nominal volumes of the appliances (A), (B), (C) and (D) are the same.</b>					
Good performance even at 75% filling level					
Good performance even at 50% filling level	10	8	5	9	6
Good performance even at 30% filling level					
Good performance even at 20% filling level					
<b>How important is it that the system can also be used for difficult, poorly flowing products?</b>					
Good mixing effect with moist products that flow well					
Good mixing effect with slightly sticky products					
Good mixing effect with clumping wet products					
Good mixing effect with sticky and lumpy products	10	6	7	8	8
Good mixing effect with highly viscous wet products					
<b>Degree of residual emptying: If a system always produces the same product, it is generally irrelevant whether product residues remain in the system after emptying. If a system is to produce with low or no contamination, it is important that the machine empties the produced goods from the machine as completely as possible.</b>					
less than 0.5 % residue may remain in the apparatus after emptying					
less than 2 % residue may remain in the apparatus after emptying	8	4	8	5	5
less than 4 % residue may remain in the apparatus after emptying					
<b>How well the appliance can be cleaned "externally"</b>	6	5	5	5	4
<b>Access to the inside of the system: Mono-production systems are operated for years without being cleaned. To ensure accessibility, fitters have to dismantle parts of the plant. In other cases, large inspection doors/manholes are installed. Accessibility is then ergonomic and convenient.</b>					
Accessibility is not very important					
Accessibility is possible but not very convenient					
Good accessibility (large manhole at the top, lid can be tempered)	10	6	7	4	8
Very good accessibility (manhole on the side. Flap designed as a displacement body, low dead space and heatable). Flap with hinge and translation guide.					
<b>Some mixing systems are only designed for gentle mixing processes. Other mixing systems are designed for deagglomerating mixing. They only work at high speeds. Still other mixing systems can realise both mixing processes depending on the requirements.</b>					
Gentle mixing with low energy input					
Intensive, deagglomerating mixing with high energy input					
Both operating modes are possible: gentle mixing and aggressive mixing.	10	9	9	9	8
<b>The heat exchange takes place either with water, steam or thermal oil. The larger the heat exchanger surface that comes into contact with the mixture, the higher the efficiency</b>					
Very large specific heat exchanger surface	10	10	7	7	6
Medium-sized heat exchanger surface					
Small heat exchanger surface					
<b>Supplying a mixer shaft with thermal fluid is complex. Rotary feedthroughs are required. These must be sufficiently dimensioned. Sometimes, temperature control of the mixing tool is omitted for cost reasons. The mixing tool is then heated indirectly via the mixing material. This can lead to undesirable caking and clumping.</b>					
Only the mixer shaft is tempered					
the mixer shaft and all arms are tempered					
the mixer shaft and all arms and spirals are tempered	10	8	8	8	8
<b>Due to the installation situation, there is only limited space available</b>					
Little vertical installation space required	5	7	7	7	3
Little horizontal installation space required					
<b>The gearbox is a very expensive component. Oversizing extends the service life and reduces the strain on the shaft seal. The larger the hollow shaft of the gearbox, the lower the stress on the shaft seal</b>					
the permissible torque of the gearbox is sufficiently dimensioned					
the permissible torque of the gearbox is sufficiently dimensioned, but somewhat oversized					
the permissible torque of the gearbox is high and oversized	10	9	7	6	9
<b>Motor size: A higher drive power can increase operational safety, especially with poorly flowing mixes</b>					
low power					
Average power	10	7	7	7	6
Great performance					
<b>Quality and service life of the shaft seal: The thicker the mixer shaft, the lower the elastic deformation. This increases the service life of the seal. Pressure and vacuum-tight shaft seals are very expensive, especially with large diameters. The decisive factor is the shaft diameter in the seal</b>					
Diameter of shaft seal small					
Diameter of the shaft seal medium					
Large shaft seal diameter	10	6	8	8	9
<b>For the price/performance comparison, it is important that the same type of seal is provided. The list is from top (very expensive) to bottom (simply inexpensive)</b>					
the shaft seal is a mechanical seal lubricated with gas					
the shaft seal is a mechanical seal lubricated with liquid (white oil)					
The shaft seal is a multiple lip seal made of PTFE. It is mounted on the shaft and can compensate for radial deflections	7	10	10	10	10
The shaft seal is a multiple lip seal made of PTFE. It is rigidly installed and cannot compensate for radial deflections					
the shaft seal is a multiple stuffing box packing					
<b>How can the supplier's performance be assessed? Does he have process engineering expertise? Can it implement customised adaptations in terms of design?</b>					
the process apparatus is customised and designed precisely for the task at hand					
everything takes place at the manufacturer's plant: process engineering, design, strength calculation and production	10	10	5	9	5
Production takes place in external workshops					
Production takes place in external workshops abroad					
<b>How would you rate the performance of customer service?</b>					
Supplier has existed for more than 40 years	10	9	8	7	5
Supplier has less experience					
<b>Utility values</b>		<b>1047</b>	<b>979</b>	<b>995</b>	<b>929</b>
in %		100	94	95	89