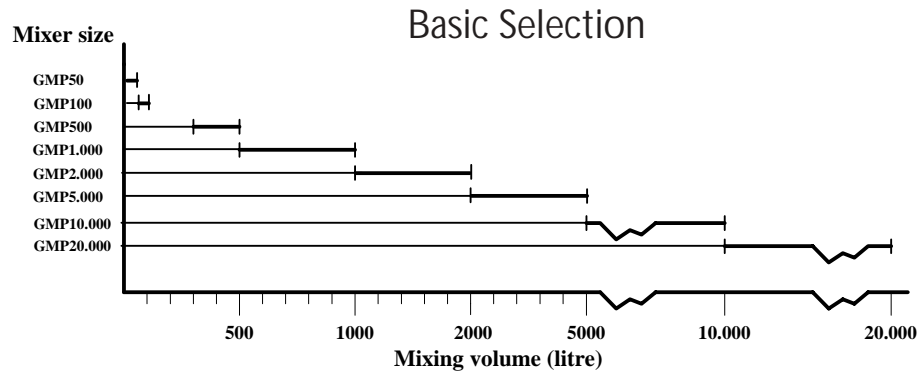




# Selection Procedure

NA-mixers® – the following sizes can be selected from the standard range

GMP 50  
GMP 100  
GMP 500  
GMP 1000  
GMP 2000  
GMP 5000  
GMP 10 000  
GMP 20 000



The diagram is based on the following parameters;

1. General mixing
2. Working viscosity newtonic liquid
3. Speed = 400 rpm maximum
4. Tank proportions =1:1 - 1:2 (D:H). Between these proportions it is possible to get a vortex. Below 1:1 a vortex can not be guaranteed but the mixing is not effected, on the contrary it can be even better
5. The tank has a bottomdished end.

These five parameters can vary from case to case and, therefore, correction factors must be used to calculate the correct sizing volume for the mixer.

## Specific Selection

The mixing characteristics can be split in three main categories

- Gentle blending                      Correction factor        =    1,2
- General mixing                        Correction factor        =    1,0
- Vigorous mixing                        Correction factor        =    0,8

The viscosity of the liquid will have a significant impact on the performance of the mixer. The higher viscosity, the larger mixing head and more energy is used to move the liquid. We have limited the viscosity that can be handled by the mixer to approximately 800 cp.

The correction factor for the viscosity is taken out from the diagram "Mixing capacity vs. viscosity".

Ex. The correction factor for the viscosity of 10 cp is 80% (0,8).

The speed of the mixing head is in all calculations based on the maximum of 400 rpm.

The tank shape has an impact on the wing shape of the mixing head. As long as the liquid body has a diameter as follows: height ratio between 1:1 and 1:2, we can use the standard calculation formula.

The shape of the tank bottom has also to be considered in the choice of mixer type, but basically we are talking about tanks with dished bottom ends. (Be careful with conical tank bottoms.)

## NovAseptic



# How to calculate

## What size of mixer is needed, depending on the viscosity?

If the liquid has a viscosity of 1 cp, the size of the mixer corresponds with the Part No., i.e. 1000 litres = GMP 1000.

For any other viscosity, the following calculation must be made:

$$\text{Formula} \quad \frac{\text{Mixing volume}}{\text{Mix.capacity} \times \text{Corr.factor}}$$

### Case 1

Liquid volume : 1000L  
Viscosity : 25cp (0,68)  
Mixing characteristics : vigorous (0,8)

$$\frac{1000}{0,68 \times 0,8} = 1838\text{L}$$

This means that a GMP 2 000 has to be selected for the application to achieve 100% vigorous blending.

### Case 2

Liquid volume : 350L  
Viscosity : 300cp (0,32)  
Mixing characteristics : gentle (1,2)

$$\frac{350}{0,32 \times 1,2} = 911\text{L}$$

This means that a GMP 1 000 has to be selected for the application to achieve 100% gentle blending.

The result of the calculation shows a fictious number of litres. The higher the viscosity the more power is needed to get 100% mixing capacity. It is implied that the liquid is newtonic.

Mixing capacity vs. viscosity

