Körting Hannover AG

Körting
Ejector Technology
onboard ships

for more than 140 years

How it works

Jet pumps, also called ejectors, are a fluidic-type apparatus which can be utilised to pump, mix and dose liquids, gases, vapours and solids. The drive is provided by liquids, gases or vapours set under high pressure and not by electricity or a mechanical drive unit.

The velocity and pressure variations represented in the following diagram are regulated within the ejector in accordance with fluidic statutes which state that an increase in flow velocity will result in a reduction of system pressure.

The point of lowest pressure engendered after the motive nozzle is employed hereby to suck the infeed medium into the ejector. By means of impulse exchange taking place between suction flow and motive flow, between point 3 and point 4, both mediums are intensively intermixed and then in the following diffuser, point 4 and 5, they are slowed down in velocity to such an extent that the desired mixed pressure is achieved at point 5. The difference between the absolute suction point 2' and mixed discharge pressure (point 5) generates the delivery head.

This short discourse on the principals of bilge-ejector technology already demonstrates that the essential development, fabrication and sales points for this technology are to be found in the individual calculation of the flow channels and that only so can the desired optimisation of performance be achieved. By comparison, each and every standardised ejector system leads to an extreme loss in efficiency.

Körting Hannover AG is the oldest manufacturing works worldwide for individually manufactured ejector technology. With its many years of experience in the production field and its continual further development activities, Körting Hannover AG guarantees that the ejectors manufactured here are in conformity to the fullest extent with the above given requirements.

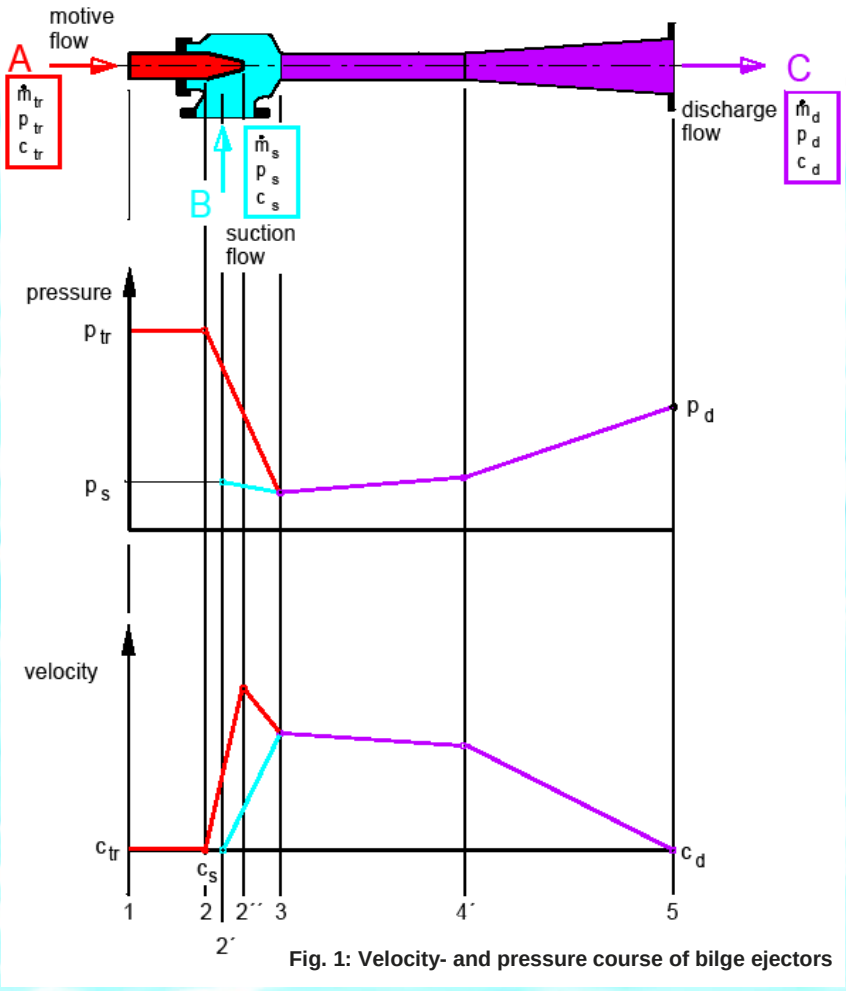


Fig. 1: Velocity- and pressure course of bilge ejectors

Background & philosophy

Worldwide our company develops, fabricates and markets practically all types and construction forms of ejectors. The pressure range in which these ejectors are employed reaches from the vacuum zone (0,01 mbar abs.) up to system pressures of approx. 300 bar abs. The main use for ejectors in shipbuilding is as bilge-ejectors. Of essential advantage here is their self-priming operation mode, absolute safety for dry running and the fact that they hardly ever need any maintenance.

A performance-optimised design and freedom from maintenance are two indispensable characteristics and, for ships operators, absolutely essential criteria. Both of these two terms stand for reduced operating costs and practically 100 % availability. However, this ideal situation will only come into being if the ejectors, as carried out by Körting, are designed and manufactured for the particular application case in question.

It is just not possible to achieve such a performance-optimised ejector design with the usual supply of standardised catalogue ware, as is the case with many rival products. Operators using such cheap technology end up paying through increased follow-up costs – power consumption and service charges – an inflated total sum.

Under these aspects, the only help here for the purchaser of a new ship is to provide a precise and well thought out makers list.

In spite of the fact that optimisations have been carried out over decades it is still possible to find innovations which can further improve this time-tested technology.

Fig. 2: Bilge-ejector type “L”

Fig. 3: Bilge-ejector type “S”

How to fit with pipewok

Continual research and development to improve the data basis are only one of many ways to achieve improved serviceability for the user. Externally visible modifications are also characteristic of technical progress. It is usual practice to integrate ejectors into the connecting pipeline by means of flanges or threaded connections.

However, with this connection technology it is not normally possible to individually consider regionally well-known and preferred flange forms such as DIN, ANSI, JIS and VG and others. Here, Körting Hannover AG offers a ground-breaking technical solution. Different flange forms can be realised as freely selected slip-on flange systems for the same ejector bodies.

Furthermore, developments in pipe connection technology over the past few years have advanced significantly. In shipbuilding, the so-called Grip-couplings have conquered a defined field of application.

Advantages of this connection technology are the elimination of welded joints, the compensation of elongations in length in the pipe system as well as of lateral displacement. Here too, Körting Hannover AG has discovered a new solution for the integration of ejectors in this connection technology - the development of construction type C for this purpose.

Fig. 4: Bilge-ejector type “C”

Correct certification

If an inspection by a classification body is demanded for an ejector destined for installation on board ship, then this will mean an individual inspection procedure in the manufacturer’s works by the corresponding body.

This inspection usually consists of a checking of the technical data, of the dimensions as well as a visual inspection and a hydraulic test. The classification society Germanischer Lloyd (abbr. GL) now also demands a hydraulic performancetest. A special inspection procedure had to be developed for these individually designed ejectors. Of particular emphasis here is that in the meantime Körting Hannover AG, as the first and only company worldwide, has been granted the corresponding classification authorisation.

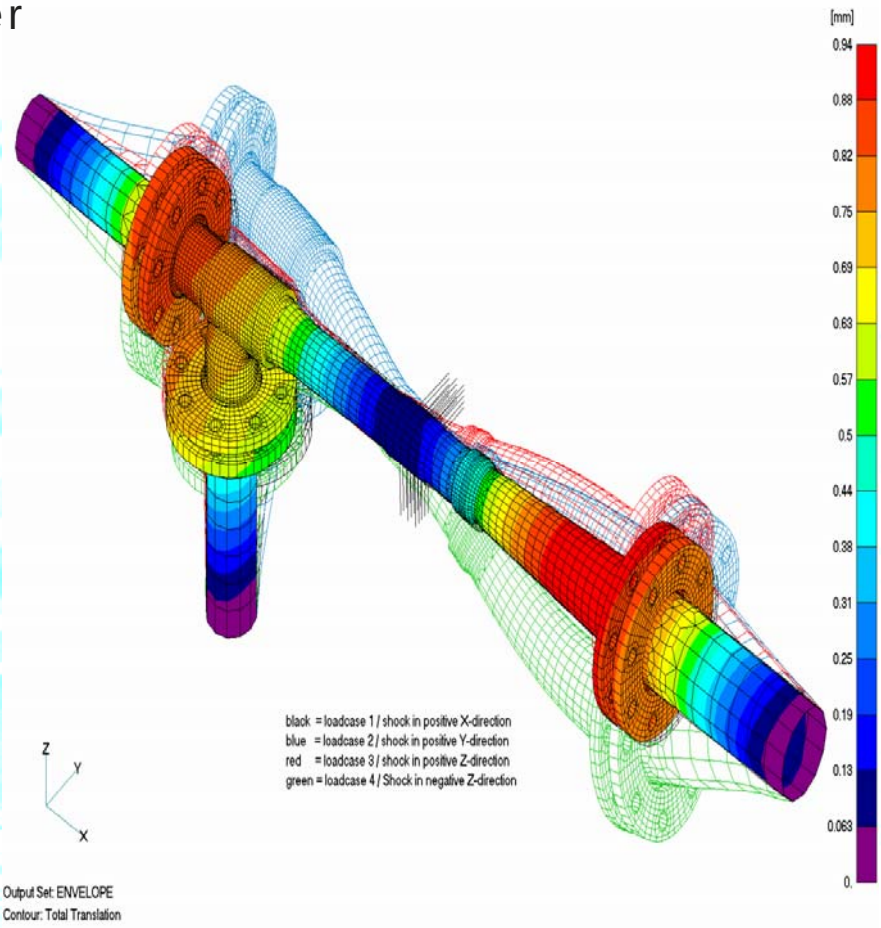
approved & recognized by GL

Application & power

At the beginning of this article we pointed out the possibility of utilising ejectors as vacuum units. Compressed air, liquids and also vapours (steam) can be made use of here as drive mediums. Typical application cases here are compressed air driven vacuum ejectors which serve for the start-up evacuation of non self-priming mechanical pumps.

Today, Körting Hannover AG considers itself to be a company that holds market leadership worldwide for the application of ejectors in shipbuilding on account of its superior competence in the field of research and quality. The manufactured products fulfill the high demands of civil as well as military requirement profiles in their entirety.

All the usual tests and documentation, calculations and practical proofs for shock and vibration resistance and real blast tests will be fulfilled in the latter case.



The rich and varied experiences gained during Körting Hannover AG's long history now allow the company to dispose over a multitude of different constructional forms for ejectors which can be manufactured from diverse types of materials. In this way, Körting ejectors fulfil all technical requirements of the shipbuilding industry demanded today.

As a manufacturer of renown, Körting Hannover AG produces and sells precisely manufactured products and considers itself obliged to be a reliable partner for its customer's right from the planning stage up to the actual application. This forms the main focal point of the company's sales activities. Körting Hannover AG is active on all continents and has a worldwide extensive net of experienced sales partners who establish and keep in close contact with the regional customers.

The employees of these partner companies are tested frequently and put through a continuous programme of technical training, so representing a valuable source of advice for the users of ejector technology. No other company in this pump sector can offer its customers such a worldwide extensive service in comparable form. Körting sales agents are present in all countries with shipbuilding activities and are always available when an in-depth consultation on application possibilities is required.

Questions & answers

The majority of the important parameters governing the application of ejectors may be found compiled in the „Handbook for Ejectors in Shipbuilding" which can be made available to interested users on demand. This source of information is a documentation tailored to meet user requirements and, apart from technical facts, also presents manifold impulses for practical applications of ejectors on board ships. Practically tested applications may be found, for example, in the bilging out of void spaces via sounding pipes or in solutions for overcoming suction heads > 9 m by means of deep-suction equipment and other applications.

Körting Hannover AG sets worldwide standards in ejector technology with more than 140 years of experience in production and R&D work.

- "The original is always the best" -

Your personal hotline:
kulp@koerting.de

Körting Hannover AG

Division S
Jet Ejectors
Vacuum Technology

Badenstedter Straße 56
D-30453 Hannover
P. O. Box 91 13 63
D-30433 Hannover

Phone: +49 511 2129-0
Fax: +49 511 2129-223
Internet: http://www.koerting.de
E-Mail: st@koerting.de