

THE FEJMERT MIXER

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BRIEF COMPANY & MIXER HISTORY

The company was founded in 1940 by Mr. Erik Fejmert, when we started out manufacturing equipment for centrifugal casting of concrete pipes. As it turned out Mr. Fejmert was not very pleased with the quality of concrete available from the type of mixers used at that point in time, which in his mind had detrimental effects on the finished product.

So what did he do?

He set out designing a totally new type of mixer, and during a trial period of several years numerous tests were conducted, during which it could be established that speed is an essential factor when wanting to produce high quality concrete. The work of Mr. Fejmert resulted in the worlds first compulsory pan type mixer.

In 1953 the Fejmert Mixer was put in serial production and it was indeed successfully launched with a demand exceeding the supply by far. In order to meet the great demand the Fejmert Mixer was produced in thousands under license outside Sweden in the years following the introduction. And with time the Fejmert Mixer has found its way to every corner of the world.

Through time we have pioneered in various fields, adding new equipment and machine types of which can be mentioned the following more significant developments:

- Hoisting skips
- Steam injection equipment
- Automatic wash-out equipment, the Fejmert Quick-cleaner
- Rubber wear liners
- New, lighter rotor in 1982 with a unique rubber compression pad spring system
- Introduction of the FP-RM range of mixers for readymix concrete in 1987
- Knife type outer scraper
- And most recently a new, improved version of the flexible mounting of the mixing arms in 1999

Today, Mr. Fejmert is no longer with us, but we are, and always have been, trying to put his legacy to best use, foremost by maintaining an open dialog with our clients. As we see it, it is only by staying in close contact with our clients, taking into consideration their every day experience with our product, that we can become better at what we are doing, trying to supply the best possible mixer.

MIXER TYPES

The "S" Range of Mixers

This was the model originally developed by Mr. Fejmert, and although it has seen a number of improvements and changes through time, the basic concept is still the same.

This range of mixer is foremost targeting the Concrete Products and Precast Industry.

The "FP-RM" Range of Mixers

The FP-RM model of mixer was introduced in 1987 with focus on the Readymix Industry. It was developed in close co-operation both with Swedish and English Readymix Companies.

The basic design and mixing concept is the same as the S range mixer, but the FP-RM range of mixers are all, except for one model, fitted with stronger electric motors, which in combination with a higher rotor position and a slightly lower speed allows these mixers to accept a larger batch.

These mixers are designed for the production of what is generally called slurry type concrete (concrete with a slump measure of 10mm or more), i.e. concrete of not so stiff consistency.

Mixers for other Applications

The two foregoing models are the only ones which can be described as specific and special models in their own right, but adaptations to better suit certain applications are sometimes being made. The mixing of residual ashes at domestic waste incineration plants and coal power plants, the preparation of glass batch raw materials and also foundry sand represent applications for which the mixers are adapted to a larger or smaller degree.

DIFFERENT APPLICATIONS

The Concrete Products and Precast Industry

It is still within this sector that the bulk of the Fejmert Users can be found, and the Fejmert Mixer has probably been used and proven suitable for every imaginable type of application.

Some specific examples:

- Concrete pipes
- Paving products
- Garden products
- Farming products
- Support walls

- Prefabricated/prestressed bridge girders
- Hollow core floors
- Prefabricated wall panels

- Coloured products
- Products containing fibres

- Mixes with coarse and fine aggregates
- Both wet and dry mixes

This list could be made very long, but what you really need to know is that the Fejmert Mixer is highly suitable for any type of concrete or precast product.

The Readymix Concrete Industry

The Fejmert Mixer has been used on major construction projects all round the world, and it has established itself as a very attractive alternative in the Readymix Concrete Industry.

Some specific examples:

- Dams
- Bridges
- High-rise buildings
- Harbour walls

As a matter of interest RMC Readymix UK Ltd. have after starting to use our mixers in 1987 more than thirty (30) of the models FP-1,5-RM and FP-2-RM in operation.

The Glass Industry

The first mixers were supplied to the Glass Industry in the middle of the fifties, and ever since then we have had the pleasure of supplying this Industry with mixers on a regular basis. However, following a corporate decision some 4-5 five years ago the Glass Industry is now much more actively targeted, and we have great hopes for it becoming a more substantial parts of our business in the not too distant future.

The Fejmert Mixer would undoubtedly be suitable for use in every type of Glass Application, and here are examples of products for which it already has been employed:

- Container Glass / Bottles / Flint Blown Ware
- Fibre Glass
- Glass Insulation
- Fine Table Ware
- Light Bulbs
- Ripple / Crude Glass
- Household Glassware
- TV-Glass
- Artistic Glass

The Ash Mixing Industry

AB Fejmert Patent have been involved in the supply and installation of mixers for various ash-mixing purposes for almost fifteen years now. The main proportion of these mixers have been installed in Coal Fired Power Stations and Domestic Waste Disposal Incineration Plants. During this period of time we have linked up with a number of clients, amongst which the most well known probably is ABB Ahlstom Power (former ABB Fläkt Industri and ABB Environmental Systems) in Sweden, and abroad.

This type of client conducts rigorous reviews of their prospective suppliers, both in terms of the company and the product supplied. These procedures reflects the extreme care with which their clients chooses suppliers, which must be of the highest possible standard. At Power Stations and Incineration Plants there is virtually no room for errors, and dependability as well as homogenisation capacity of the equipment supplied must be extraordinary good.

Since the end of the eighties we have been on the ABB list of preferred suppliers, which is something we are very proud of. We have concluded a number of projects in close co-operation with ABB, and other clients, all of them very interesting. Se below for a summary of these Fejmert Mixer projects:

Sweden:	Six S-750, Two S-1125, One S-1500, Two S-1875, Four S-2250, One S-3000 and two S-4500
Denmark:	One S-500, Two S-1500 and Four S-4500
Finland:	One S-3750
England:	One S-2250 and Three S-3750
The Netherlands:	Two S-3000
Spain:	Two S-2250
Czech Republic:	Two S-4500
Canada:	One S-350 and One S-1875

The Dry Mortar Industry

Although a rather small sector it deserves to be mentioned since one should be aware of the possibility to use the Fejmert Mixer also in this field.

The Fejmert Mixer has been employed for the mixing of dry mortar both in Sweden and abroad, including coloured mortar as well as standard bag and big bag production.

The Refractory Industry

This is a further, limited sector, but still worth while knowing about. Refractory products can include moulds used at steel mills and bricks for the lining of furnaces for instance. A further refractory related product is the material which is used in the production of safes, i.e. the material which is injected into the walls of safes.

The Foundry Industry

A very limited number of mixers have found their way to the Foundry Industry, where they are being used for the mixing of mould sand.

THE DESIGN AND CONSTRUCTION OF THE FEJMERT MIXER

A – Mixing Pan

- The mixing pan is welded to a sturdy, self-supporting girder construction. This design allows the plant support engineer to choose support points at his liberty.
- It is possible to have up to four discharge doors, normally located at 90° to each other. It is quite possible to deviate from the 90° if a prospective client should so wish, and we only ask you to contact Fejmert in order to discuss such requirements.
- Please note that the discharge door A6 is fitted with a shrink fit to the shaft A7 and it requires heating before dismounting or mounting.
- In order to ensure a satisfactory operation of the discharge door the guide rail A5 and wear-ring A23 should be kept clean.
- From model S-3000/FP-2,5-RM the machines are normally delivered in a split condition, which means final assembly is made on site, approximately 1-2 days. The assembly is very much straight forward and carried out in accordance with written instructions from Fejmert.

B – Mixing Pan Cover

- As standard the mixing pan is divided in cover sections to be opened by hand;
 - 3 Sections Models S-150 – S-350
 - 4 Sections Models S-500 – S-1125
 - 6 Sections Models S-1500 – S-2250 / FP-1,5-RM – FP-2-RM
 - 8 Sections Models S-3000 – S-4500 / FP-2,5-RM – FP-4-RM
- If required, we can adapt the mixing pan cover to suit customer requirements, i.e. larger or smaller sections for instance.
- Any type of flanges for material inlets and the venting of air can be included in the scope of supply from Fejmert.
- In order to prevent accidental access to the machine, cover sections to be opened can be fitted with safety switches.

C – Electric Motor(s)

- Models S-150 – S-750 are fitted with one electric motor.
- Models S-1125 – S-4500 / FP-1,5-RM – FP-4-RM are fitted with two electric motors.
- On mixers S-150 – S-2250 / FP-1,5-RM – FP-2-RM the electrical connection is made to the junction box provided and fitted on the side of the mixing pan.
- On mixers S-3000 – S-4500 / FP-2,5-RM – FP-4-RM the electrical connection is made directly to the junction boxes on the electric motors.
- Fejmert uses only top quality electric motors from ABB Motors.
- When having two motors it is essential that the starting of the motors is made simultaneously over one timer. Starting can be either direct-on-line or Star/Delta.

D – Gear Box

- The gear box is a three-step construction, allowing a direct transmission of the force from the electric motor(s) to the rotor, with very little loss of power.
- From a maintenance point of view the gear box is a light burden, insofar that it requires only regular greasing of the oil seals D15 and the bearings in the gear box top. This procedure is greatly facilitated by the gathering of these grease functions at one single point at the base of the mixing pan.
- The complete gear box unit with electric motor(s) can be removed upwards by dismantling the top cover plate B6 and the rotor lid EC2.
- Note that the drive flange D36 is fitted with a shrink fit requiring heating prior to removal or mounting.
- All bearings on shafts in the gear box are fitted with a press fit.
- From a clients point of view our gear box arrangement offers the client outstanding reliability of operation.

EC – Rotor with paddle equipment

- The rotor features a unique flexible mounting of the arms in the form of a steel plate reinforced rubber compression pad system. This system ensures that the mixing arms EC32 can move sufficiently to avoid material being stuck between the mixing paddle EC33 and the bottom, and in addition it is interchangeable between all the arm positions.
- To cover the bottom of the mixing pan the rotor has:
 - Mixing arms EC32 with mounting plates for the mixing paddle with various angles.
 - Arm mountings EC23, 24, 25 and 48 turned differently.
- To ensure that the materials mixed are moved in a cross-current braiding action the rotor is fitted alternatively with inner respectively outer paddles, i.e. paddles moving the materials from the centre of the machine towards the periphery of the pan and vice versa.
- The rotor is fitted with inner EC16 respectively outer scrapers EC62 with the purpose of keeping the inner and outer walls clean.

F – Liners

- All mixer models are fitted with hardened, exchangeable wear liners.
- Normally all of the bottom plates are changed at the same time.
- When it comes to the outer F9 and F8 respectively inner liners F10 and F12, they are normally changed ring/set by ring/set.

G – Operating Devices for Discharge Door

- As standard the Discharge Door is pneumatically operated and the following ram sizes are fitted:
 - 100 / stroke 400: S-150 – S-500
 - 125 / stroke 400: S-750
 - 160 / stroke 400: S-1125
 - 160 / stroke 500: S-1500 – S-2250 / FP-1,5-RM – FP-2-RM
 - 200 / stroke 700: S-3000 – S-4500 / FP-2,5-RM – FP-4-RM
- Electro-pneumatic or –hydraulic valves and positional switches don't form part of the standard scope of supply, but can of course be included.
- As an alternative the Discharge Door can be hydraulically operated – contact Fejmert for quotation.
- As a second option the Door can also be operated by means of an electric motor, which allows a larger opening degree, which can be desirable in some cases.
- If the operation is pneumatic or hydraulic a guard is fitted over the ram and for all three options the Discharge Door segment is also fitted with a guard as accident prevention.

H – Paddle Positions

- The H-sections is available for all mixer models and gives for each machine information about:
 - The number and position of paddles.
 - Length of the console/bracket EC18.
 - The number and type of arm mountings.
 - The number and type of mixing arms.
 - The number of discharge accelerators fitted.

LC – Discharge Accelerator

- The discharge accelerator is a spring-loaded device which operates in such a manner that when the mixer is charged with materials, the pressure of these materials pushes the discharge accelerator in towards the centre island, in order to that it does not interfere with the mixing. Once the mixer is discharging, and the level of concrete is sinking, the discharge accelerator is pulled out and consequently pushes the material out towards the discharge door.
- The discharge accelerator is mounted from mixer model S-1500 / FP-1,5-RM:
 - One accelerator: Models S-1500 – S-2250 / FP-1,5-RM – FP-2-RM
 - Two accelerators: Models S-3000 – S-4500 / FP-2,5-RM – FP-4-RM

Q – Quick Cleaner

- Fejmert was the first mixer manufacturer to develop an automatic cleaning device and in its current form it offers the user great advantages, reducing the requirement for manual cleaning to a minimum.
- The system is made up of one or two fixed manifolds with spray nozzles, plus a rotating manifold with spray nozzles on the rotor, for cleaning of the mixing pan and rotor.
- The quick cleaner is connected to a high pressure pump of the centrifugal type and the following approx. sizes are recommended:
 - 120 l/min – 25 kp/cm² Models S-350 – S-1125
 - 150 l/min – 25 kp/cm² Models S-1500 – S-2250 / FP-1,5-RM – FP-2-RM
 - 200 l/min – 25 kp/cm² Models S-3000 – S-4500 / FP-2,5-RM – FP-4-RM
- Pumps can be included in the scope of supply from Fejmert, but does not form part of the standard supply.

SH and SL – Steam Injection

- Fejmert offer two types of steam injection systems, in the form of low or high pressure versions. In short the systems are made up of an insulated main steam pipe around the mixing pan to which either pneumatically or pressure operated steam injection valves mounted in the lower section of the mixing pan are connected.
- Steam injection is used for instance when having to operate in extreme cold weather conditions, with even snow and ice present in the aggregates. When building our current factory the concrete was made in a Fejmert Mixer fitted with Steam Injection, and the work was carried out in temperatures down to minus 24 degrees Celsius, with both snow and ice present in the aggregates. Furthermore the Steam Injection can be used with the objective of speeding up curing times. A temperature increase of approximately one degree Celsius per second can be achieved with these systems.
- The steam generator and controls do not form part of the standard scope of supply from Fejmert, these parts are as a rule sourced locally.

U – Hoisting Skip

- The Fejmert Hoisting Skip is of an extraordinary sturdy design known for its operational reliability and fitted with a hoisting gear motor of the well known brand SEW Eurodrive.
- Standard track inclination is 65 degrees but variations are possible.
- The basic execution gives a track length with a measurement of 1000mm between the bottom of the mixer and the top of the skip bucket when it is in the charging position. The track can be extended and there is an additional charge per meter for this.
- Normally the electric hoisting gear motor is positioned more or less directly below the mixer, but depending on the plant layout alternative positions are possible, for instance at the top of the track.
- Along the track are fitted four (4) limit switches for the following functions:
 - **Charging position** at the bottom of the track where filling of the skip bucket takes place.
 - **Waiting position.** The waiting position is used in such a way that it allows the skip bucket, when filled, to travel to this position and wait for the previous batch to be discharged from the mixer, and then move on to the discharge position, thereby saving some time.
 - **Discharge positions.** As indicated we have here two switches, of which one is serving as a safety switch in case the first one should fail.
- In addition to the foregoing switches there is also a slack rope switch mounted at the top of the track, which is there to cut the power if the charging position switch fails and the rope slackens to prevent it from being wound back up again.
- Travelling speed is normally approximately 20m/min, but should have a very long track we can offer the option of using a two-speed motor for double the speed downwards, i.e. 40m/min. The use of a two-speed motor requires the fitting of an additional limit switch, mounted before the charging position switch, with the purpose of slowing down the bucket to normal speed.

UV – Electrical Weighing Unit

- A Weighing Unit consisting of weighing bridge, load cell, metering device and digital display can be incorporated into the hoisting skip.
- In all its simplicity this system is highly accurate and works in the following manner. Once the skip bucket has reached the charging position, which is likewise the weighing position in the weighing bridge, the weight is transferred via a very small movement of the weighing bridge via the weigh levers UV2 and 3 to the load cell UV10. There must be no mechanical contact between the main track and the weighing bridge track section, and also there must be some free space underneath the weighing bridge, at least 10mm.

THE FEJMERT MIXING PRINCIPLE / MIXING SYSTEM

We are now coming to the part I believe will interest you the most, what I have called the Fejmert Mixing Principle or Mixing System.

What are we trying to achieve when mixing concrete?

Spontaneously many people will say that we want to see a homogeneous blending of the materials mixed, and stop there. And yes, that is very correct, but we want more than that, we require also an optimised utilisation of the bonding properties of the cement. And it is here the Fejmert speed comes in, because by using a high rotor speed you ensure a thorough hydration of the cement grains.

With speed you create friction not only between the mixing paddles and the cement grains, but also between the aggregates and the cement grains, thereby allowing as much water as possible to penetrate and dissolve the cement grains, thereby creating a highly workable concrete.

What is actually happening is a sort of crushing action of the cement grains, providing access for the water to the cement grain core and the consequent utilisation of the bonding properties of the cement as fully as possible. Because it is only when in contact with water the chemical composition of the cement changes, growing new substances like tentacles from the surface of each cement grain, which embed themselves in gravel and rock to form the solid mass we call concrete.

If you think about it, it is quite logical really. You only have to imagine a slow moving mixer compared with a fast moving one and it becomes quite apparent to you. With a slow action, many of the cement grains will remain as dry clinkers and will therefore not contribute to the quality and workability of the concrete.

A further advantage with a high paddle speed is that weaker particles in the aggregates will be crushed, particles which would be a potential weak point in the finished structure or product.

I assume you are all familiar with the drum type mixer occasionally used in the Ready Mix Industry. Just as an example, in comparison with such a mixer type you will actually reach considerably increased values of compressive strength with a Fejmert Mixer, using the same amount of cement per cubic meter in concrete of the same consistency - see diagram enclosed.

The utilisation of the bonding properties of the cement when mixing concrete is, if not always, at least often overlooked and very seldom discussed for some reason. And in our mind it deserves to be put more in focus.

Having the high paddle speed is all very well, but it also has to be combined with the right number of mixing devices (read mixing paddles) sized, shaped and positioned carefully in order to achieve the desired homogenisation of the batch.

This part is really a kind of balancing act, because what you want to achieve is not that simple, and there is much more to it than meet the eye at first instance. If you implement a system with the wrongly sized, shaped and positioned mixing devices you can get:

- Mixing devices just cutting through the concrete mass without creating a mixing action.
- Alternatively you will get mixing devices creating too much resistance and thereby pulling with them the concrete mass around the mixing pan, with the consequent result of no mixing action.

What you want to achieve is a well balanced combination of both the cutting-through and pulling-with action, meaning the surface area of each mixing paddle projected in the direction of travel must be just right in combination with the number of mixing paddles used.

Then we have come to the mixing action in the horizontal and vertical plane, which means the mixing devices must be angled in such a way that the materials are moved sufficiently both in the horizontal and the vertical plane. Furthermore there has to be a moving action from the inside to the outside, and vice versa.

In the Fejmert Mixer all of the foregoing is present, in the form of rhomboid shaped mixing paddles, carefully positioned and angled, alternatively as inner and outer paddles, creating a crosscurrent braiding action which roll and fold all materials into a perfect blend.

Take the time to study this in other mixers whenever an opportunity arises, and you will be amazed at what you will come across. I myself have seen mixers, or what they claim to be mixers, with paddles just stuck straight down without being angled at all. That's not what I would call mixing technology.

To further describe the working intensity of the Fejmert Mixer we use what we call "worked mass per time frame". A FP-1,5-RM mixer does for instance generate a working intensity of 1500 kg. worked mass per second, or 45000 kg. after 30 seconds working of the mass, i.e. 13 times the whole mass.

In Sweden we have a set of rules laying down a minimum mixing time of maximum 90 seconds applied to static batch mixers. A specific model/brand of mixer can be granted exemption from these rules provided it has undergone officially supervised tests according to Swedish Standards SMS 769 and SMS 770. The testing procedure is aimed at establishing the spreading of the cement content expressed as the coefficient of variation, and depending on the result the mixer can be approved for either 75, 60, 45 or 30 seconds mixing time.

A 1500 litre Fejmert Mixer has undergone this test and for your information it has been granted exemption from the standard minimum mixing time of maximum 90 seconds, down to 30 seconds for both concrete of the slurry type (slump measure 100-150) and for stiff type of concrete (Vebe Meter 20-10).

ADVANTAGES OF THE FEJMERT MIXER

SECTION 1: - SELECTION CRITERIA

The most important criteria when selecting a mixer is the mixing action, i.e. the quality of the mix, or at least it should be so. The Fejmert mixer has proven its capacity to delivery a high quality homogeneous mix, not only with numerous clients, but also when submitted to stringent and official tests carried out in Sweden.

Tests have been carried out with a Fejmert Mixer model S-1500 according to Swedish Standards:

SMS 769 = Comprising concrete mixers in which concrete is mixed batchwise

SMS 770 = Determination of the mixing capacity of concrete mixers in which concrete is mixed batchwise:

Further details of SMS 770 and the procedures followed can be found on enclosure **No. 1**.

The tests carried out gave the following results;

- The Fejmert Mixer S-1500 fulfils the requirements for a minimum mixing time of 30 seconds for **concrete type No. 1**.
- The Fejmert Mixer S-1500 fulfils the requirements for a minimum mixing time of 45 seconds for **concrete type No. 2**.
- The Fejmert Mixer S-1500 fulfils the requirements for a minimum mixing time of 30 seconds for **concrete type No. 3**.

Requirements with regard to the coefficient of variation according SMS 770 for the different concrete types and mixing times are:

Concrete type No. 1, 30 seconds mixing time = 6%

Concrete type **No. 2**, 45 seconds mixing time = 8%

Concrete type No. 3, 30 seconds mixing time = 8%

Although the tests and the results thereof refers specifically to model S-1500, they may still serve as a valid indication of the mixing capacity of the full range of Fejmert Mixers.

User Advantages: Security in terms of a consistent quality of products produced, a minimum of rejects, combined with a high production capacity!

SECTION 2: - COMPARATIVE TESTS - AN EXAMPLE

In connection with investigations into the usage of a suitable mixer for the production of an ash and cement based stabilizer product conducted by *Cementa of Sweden, comparative tests were carried out between the Fejmert mixer and mixers of the planetary type, i.e. of the Skako and Haarup type.

The conclusions of the tests were in the favour of the Fejmert Mixer, with the consequent **recommendation from Cementa to use this particular brand of mixer for the task at hand.

* Swedens largest cement producer

** This recommendation resulted in the installation of four Fejmert Mixers model S-4500 in Denmark, i.e. two twin installations.

User Advantages: Assurance in terms of using a widely accepted mixer brand, both amongst the smaller concrete products manufacturers as well as large international companies!

SECTION 3: - OUALITY PRODUCTION

Although not yet certified, Fejmert have fully implemented the Quality Assurance System ISO 9001.

User Advantages: Consistent quality of all parts, as well as the complete end product!

SECTION 4: - PRODUCT & COMPANY FEATURES

Section 4:1 - Speed of Rotor - Gear box - Mixing action

Due to the construction of the Fejmert Mixer, the desired high paddle speed is permitted, resulting in an intensive working of the materials mixed. The generously dimensioned, centrally placed gear box, allows a direct transmission of the driving force to the mixing paddles with very little loss of power. The Fejmert gear box also serves as, when using a high paddle speed, necessary effective shock-absorber.

User Advantages: The bottom line for the user of a Fejmert mixer is a homogeneous mix, in a short time, resulting in a high quality product produced!

Section 4:2 - Rotor - mixing action

For further intensification of the working of the mass, the number and arrangement of the paddles must be adapted to conform with the *speed of the paddles, in such a manner that the materials are thrown in specially developed tracks. This part has been continuously developed by Fejmert and we can today present a rotor meeting the most stringent demands.

Today's rotor is equipped with a "spring system" with moulded rubber compression pads, equal for all mixer arm positions, which simplifies the spare parts handling considerably. This system allows a quick action of the mixer arms, ensuring they stay in the most effective mixing position, as well as minimizing the wear rate on liners and paddles.

The actual "spring-part" of the system is adjustment-free, and any adjustments of paddles and mixing arms having to be carried out can be done with ordinary hand tools in the mixing tank area without the need to dismantle the rotor or cover, which may be the case for many competitive brands.

The spring units are easily accessible and quickly dismantled and replaced. Thus keeping the shut down time to a minimum. Necessary parts can thereafter be changed in the dismantled unit in the plant work shop, where the service staff have easy access to machinery and tools etc.

*All Fejmert Mixers operate with a peripheral speed of approximately 3,5 meter per second, measured at the tip of the outermost paddle.

User Advantages: The paddle speed in combination with the arrangement of the paddles, ensures the capability to deliver a homogeneous mix, in a short time - which means high production capacity and quality production for the User!

Section 4:3 - Robust and dependable construction

The generally robust construction of the Fejmert Mixer in combination with the special gear box arrangement, ensures a long and dependable working life of our machines. A fair number of our mixers are still in operation after thirty to forty years of duty.

User Advantages: Trouble-free production – Economically attractive for a prospective client!

Section 4:4 - Discharge accelerator - Mixing cycle

All Fejmert Mixers from size S-1500 and larger are equipped with one or two discharge accelerators. The discharge accelerator is "activated" during the discharging process. As the level of material is gradually sinking in the mixing pan, the accelerator is pulled out and at the same time pushes the material out towards the discharge door, thus keeping the discharging and mixing cycle time at a minimum.

User Advantages: This means high production capacity for the user!

Section 4:5 - Feimert Quick-cleaner - Cleaning

As an option the Fejmert Quick-cleaner can be fitted, a high pressure cleaning system with fixed and rotating sets of spray nozzles facilitates and shortens the manual cleaning time.

User Advantages: This means time-saving for the user!

Section 4:6 - Equipment from subcontractors

Equipment not manufactured by ourselves, such as electric motors, pneumatic cylinders, valves, limit switches and bearings etc., is purchased from well known subcontractors supplying the highest quality products within their field of application.

On our list of subcontractors can be found;

- BEVI Motors
- SEW Eurodrive
- Parker Pneumatic
- Telemacanique
- SKF
- SSAB (Swedish Steel)

User Advantages: The above means security for the user!

Section 4:7 - Manufacturing in Company

Manufacturing is carried out in our own works. This gives us the ability to control the quality of our product in detail, with the added flexibility of being able to adapt the mixer to suit special requirements of the prospective client.

User Advantages: Quality control and flexibility on our hand - means security and flexibility for the prospective client!

Section 4:8 - Straight forward Technology

The Fejmert Mixer represents a pretty straight forward technology, easy to grasp and understand for the user.

User Advantages: This means the user himself can perform most jobs, if not all, having to be carried out on the machine, without having to contract outside services - time- and money-saving for the user!

Section 4:9 - Maintenance & Service

Maintenance and service are considered to be easy on our mixers, and are carried out in accordance with maintenance plans supplied by us.

User Advantages: Easy maintenance means little time spent on the task - time-saving for the user!

Section 4:10 - Lubrication

Lubrication is also considered easy on our mixers, with few and easily accessible lubrication points, and is carried out in accordance with lubrication plans supplied by us.

User Advantages: Easy lubrication means little time spent on the task - time-saving for the user!

Section 4:11 - Parts availability 1

Most items are stocked in our works, available on the day. If not stocked, parts can be manufactured with very short notice, simply due to the fact that we manufacture all parts in company.

Furthermore we maintain an all year round service, without any breaks for summer holidays, which can be the case for other manufacturing companies.

User Advantages: This means security for the user!

Section 4:12 - Parts availability 2

A fair number of our mixers are still in operation after forty years plus and we do supply also these mixers with parts.

User Advantages: This means long term security for the user!

Section 4:12 - Documentation

Our mixers are extensively documented including spare parts list with exploded views, detailed users manual and various assembly instructions.

User Advantages: This facilitates the handling of our equipment and the identifying of required parts as well as the contacts between the user and ourselves or our representative!

SECTION 6: - COST OF INVESTMENT

Due to a highly specialized production facility, geared only towards the manufacture of mixers, the Fejmert mixer can be offered at a very competitive price.

User Advantages: Low cost of initial investment means that cost of investment is lower per unit produced - a better competitive edge for the User!

Enclosure No. 1, Page No. 1

SMS 770 IN SHORT

2 Testing

2.1 Mixing

The test shall be carried out in accordance with alternative and concrete types as per table 1 – alternative a or b according to the choice of the mixer manufacturer. The concrete type shall have the composition, and be given the consistency as per table 2.

Table 1

Alternative	Concrete type according to table 2
a	1 and 2
b	2 and 3

Table 2

Concrete type	Consistency	Cement content kg/m ³	Cement type	Aggregates	
				Screening Mesh size max	Border line curves according to diagram
1	L Low viscosity	300	std.	38	1
2	P Plastic	350	std.	16	2
3	SS Very stiff	350	std.	16	2

2.2 Sampling

When the mixer is discharging the batch, shall from each batch a number of eight samples of 3 litres each be taken. Each sample must be representative for its eighth of the batch. The test must comprise a minimum of 3 batches of each of the concrete types tested.

2.3 Determination of cement content

Determination of the cement content of each of the samples is made by wet-screening of the fresh concrete mass combined with weighing in pycnometer vessel.

2.4 Calculation spreading of the cement content

The eight values of cement content (kg/m³) from the tests are designated:
a, b.....g and h.

The arithmetical average *m* is calculated:

$$m = \frac{(a + b + \dots + g + h)}{8}$$

The standard deviation *s* is calculated:

$$s^2 = \frac{a^2 + b^2 + \dots + g^2 + h^2 - 8m^2}{7}$$

The coefficient of variation *v* is calculated:

$$v = \frac{s}{m} \times 100\%$$

Enclosure No. 1, Page No. 2

Consistency declaration

Type No. 1 = Slump measure 100-150mm

Type No. 2 = " " 20-50mm

Type No. 3 = Vebe 20-10, using Vebemeter, or Rounds 56-28, using Thaulowmeter with
falltable