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Уважаемый господин Топчаев,

Благодарим Вас за Ваше письмо от 19 февраля с.г. и этим письмом ответим на вопросы по испытанию гранулометра Микрон. На остальные Ваши вопросы будем отвечать в ближайшее время отдельным письмом.

Приглашаем Вашего специалиста в Финляндию в Отдел Электроники А/О "Оутокумпу". Ваш специалист будет проводить испытание гранулометра Микрон на обогатительной фабрике Ваммала нашей фирмы. Таким образом, он будет работать и в Эспоо и в Ваммале.

Предлагаем провести испытание с 24 апреля по 25 мая 1988 г., и организуем Вашему специалисту поездки в Финляндии, питание и жилье за свой счет.

Если Вы будете предварительно прислать испытываемые устройства нам, просим направить их в адрес:

А/О Оутокумпу
Отдел Электроники
Риихитонтунте 7 - 9
02201 ЭСПОО

В упаковке и отправочных документах просим Вас записать "знак Киминкинен".

Прилагаем к этому письму составленную нами программу испытания. До испытания мы ожидаем получить от Вас соглашение о конфиденциальности, которое мы будем подписать.

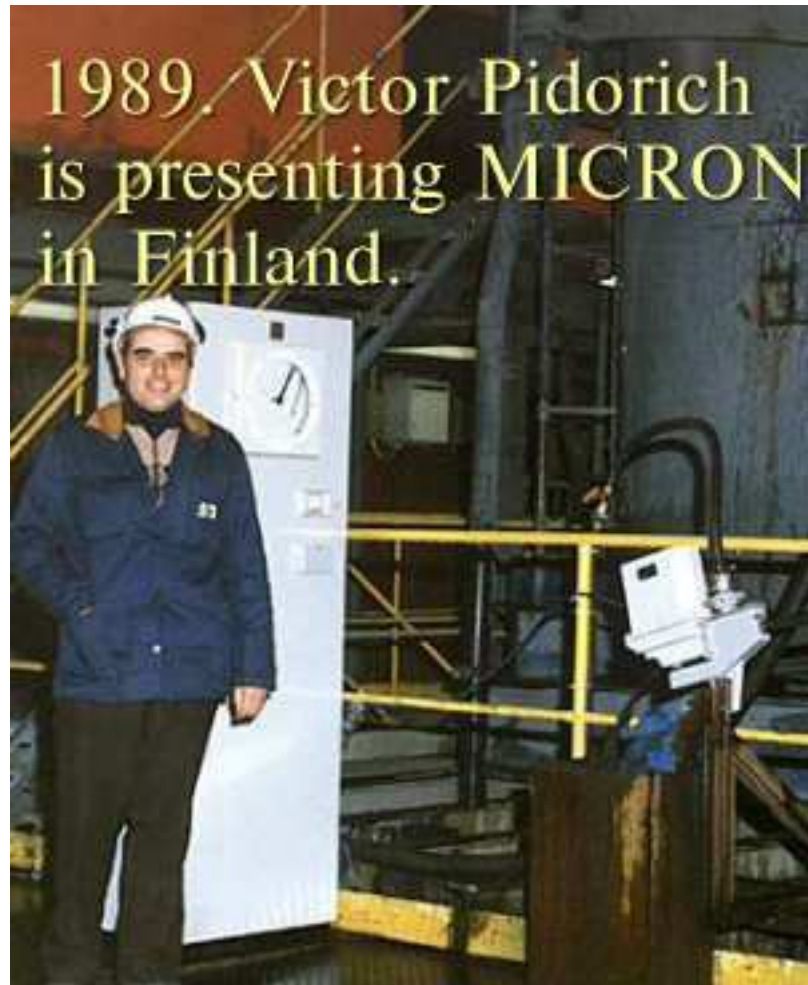
Надеемся, что сможем провести испытание Микрона в предложенный срок и с успехом.

С уважением

А/О "Оутокумпу"
Отдел Электроники

Петер Вук Хунд
генеральный директор

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Batteries				
VOLTA, S. NIKOLAI, S. NIKOLAI	FINLAND, FINLAND, FINLAND, FINLAND	POSTIPAINA, HELSINKI		



OUTOKUMPU MINTEC

Boost Plant Profitability with
PSI -200 Particle Size Indicator

A photograph of a yellow PSI-200 Particle Size Indicator unit in the foreground. In the background, there is a large industrial grinding mill with a blue and orange structure, set against a grid pattern.

The PSI -200
Is the Efficient, Low Cost, Minimal
Maintenance Solution for Better Grinding Control

 **outokumpu electronics**
An Outokumpu Mintec Company

Enhancing Profitability Through Tighter Grinding Control

Whether you choose to monitor and manually control a single mill, or optimize the metallurgical performance of multiple mills, the PSI 200 Particle Size Indicator will increase the profitability of your operation.

The economic performance of gold, base metal, industrial mineral and other ore beneficiation plants are strongly influenced by the quality and consistency of their grinding control. The operating efficiency and profitability of processes such as flotation, leaching, CIP, phosphate digestion, magnetic separation, thickening and filtering all benefit when the milling process is stabilized. Particle size measurement can play a major role in the stabilization process. It permits the consistent production of an optimal grind despite variations in mill feed rate,

ore type or hardness. Precise grinding control enhances throughput, recoveries and grades while preventing over consumption of energy, chemicals and grinding media.

The Outokumpu mining group places considerable emphasis on instrumentation and automation. It was the first company to install on-stream analysis and digital based process control in its concentrators. The importance of measuring particle size has always been recognized, however, the high capital and operating cost of the available ultrasonic and laser equipment inhibited its use.

Outokumpu's electronic group, Outokumpu Mintec Automation, was instructed to develop an affordable parti-

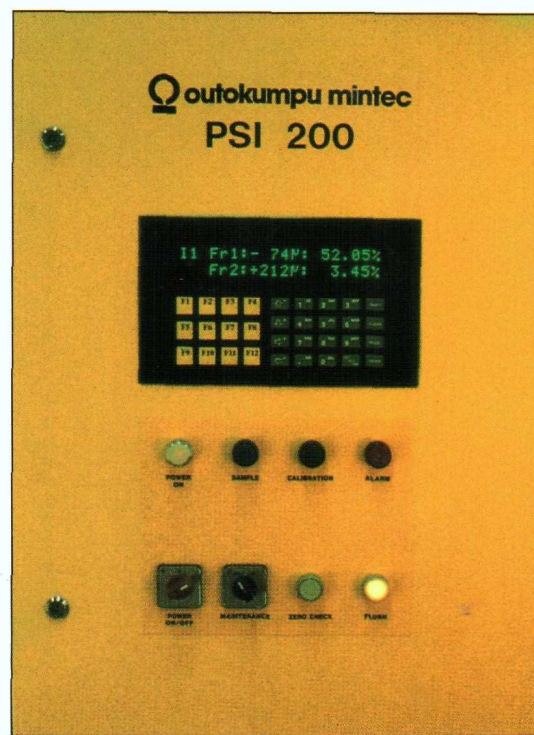
cle size analyzer. The specification stipulated that it must be accurate, rugged, reliable and require minimal maintenance. It also had to be suitable for interfacing to a computer based process control system. Outokumpu Mintec Automation embarked on three avenues of research. One investigated the use of laser sensors, another ultrasonic techniques, while the third developed a mechanical measurement method.

In 1991, after extensive testing on Outokumpu's own plants, we introduced the PSI 200. The mechanical design was chosen and it met and exceeded the criteria set out in the specification.

PSI 200's UNIQUE MEASUREMENT PRINCIPLE

When Mintec Automation first introduced the PSI 200 some people were skeptical. They could not understand how such a simple measurement principle could work. Fortunately, because of our track record, as the world's largest manufacturer of on-stream X-ray analyzers, many people wanted to try the PSI 200 despite its unique measuring technique. Within a relatively short period more than 150 units were sold. Many customers placed repeat orders because they were impressed by the PSI 200's accuracy and reliability.

The unit's innovative sensor has a reciprocating caliper that operates like a micrometer. As the slurry flows through the measuring sensor individual particles are randomly gripped between the faces of a piston and anvil. Each time the caliper closes, it accurately measures a particle and the data is stored.



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Run of the mill

Arguably, the most significant contributor to the greater efficiency of tumbling mill operations has been control technology, suggests Kyran Casteel

For many years now, metal mining companies such as Outokumpu have argued that establishing optimum grinding conditions for different types of ore and various feed rates, then maintaining precise control of the grinding operation, makes the best use of the expensive energy delivered to the mill. Not only that, well controlled mill output translates into greater plant throughput downstream, higher recoveries, improved concentrate grades and a reduction in operating costs. In recent years, research workers and numerous development teams (including Outokumpu's own) have been improving control technology to achieve these objectives. And further progress can be expected on this front too, as research into newer techniques such as neural computing continues. Presently, both specific process control units and general industrial control systems and equipment are being applied to grinding circuit control. Here are just three examples.

[Finnish finesse](#)

[Cosmic control](#)

[InTouch with platinum](#)

Finnish finesse

Outokumpu Mintec has developed the Grindcon family of integrated milling control facilities for very small to large operations. The Finnish company says the Grindcon concept is based on distributing advanced environmentally hardened, competitively priced instrumentation and control hardware that is complemented with intelligent application software.

Fundamental to this strategy is the ability to detect under- or over-grinding, so continuous particle size measurement is indispensable. For this purpose Mintec developed the PSI-200 particle size indicator which, the company says, employs a simple yet innovative direct measurement technique. In tests within Outokumpu processing plants the performance of this device has compared favourably with ultrasonic, laser and other particle size measurement systems. Typically accuracies