

## Over 65 years In the Front of Technology

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### Flat Brick Arches Flat Brick Arches, Sven M Nilsson, Symposium RILEM, Milan 1962

In 1962 when I signed the license contract with the Brick Industry I received \$50,000 in cash and went straight down to the car dealer and bought my dream car, a Citroen Break. The rest I put beneath Ingrid's pillow.



#### International Standard Method To measure and recording the Shear strength and Deformation properties of clays

I had recently begun as researcher at Chalmers University of Technology. My professor, Hjalmar Granholm asked me to went out to Surte to observe a vane boring. I was met by a large three legged crane, three men and a whole lot of rods and tubes. In between there men managed to do 2 - 4 tests per hour. Really boring indeed?

They started by driving down a one meter long  $\emptyset$ 85 mm tube in which the vane as well as one meter  $\emptyset$ 20 mm rod was inserted to get free from mud. Each rod was in a slide bearing in the tube. The vane was then turned via the  $\emptyset$  20 mm rod until the breaking force was obtained.

On my way home I got the idea to remove the outer tube all together and instead measure the forces around the  $\emptyset$  20 mm rod first and then around the rod and the vane together. This was solved by using a slip coupling above the vane. Turning the rod, up on the ground, the rod turned first and after 15° the vane followed. I realized what a difficult project this would be from mechanical point of view as I had limited knowledge in mechanics. I asked my colleague Per Jonell to help me and started the company Jonell & Nilsson 1958.

With the new vane borer, one man could do 15 tests per hour. The measuring accuracy was much higher than with the old one and the clay deformation properties.

#### The academic "duck pond".

The assistent professor of Geotechnics explained bluntly that" all vane boring is on current accounting so most likely there will be none who'll buy your vane borer.



### Penetration test with continuous recording of tip pressure

In order to examine the soil layers a method by the name "weight boring" was in use. It was developed by Swedish Railway (SJ) around 1917. The head of the State's Geotechnical Institute (SGI) described it, during a lecture at Chalmers University, as "the most antique method known to technology". But of course there were people at SGI as well as consultants that had become accustomed to "weight boring" and who wouldn't accept our new boring method. It was hard going initially! But then my colleague at Chalmers, Sven Hansbo, was starting a Geotechnical department at Jacobsson & Widmark. He ordered four complete sets of vane borer and penetration borer.

Somewhat later we received an order for 24 sets from the Road Department and so the story goes. Previously all geotechnical fieldwork had been done on current accounting. Sven Hansbo launched a price list with set prices and gave fixed quotations. This invoked rather vigorous criticism from the establishment and he was nearly expelled from the Swedish Geotechnical Society (SGF). A few years later Hansbo was professor at Chalmers as well as president of SGF. The next step was to motorise the field work. Initially we mounted the equipment on tractors and later we developed a tracked vehicle.

#### In one decennia we raised the geotechnical fieldwork from the 19th century level it was on to modern and efficient way of operating which, today, is well-established.

In 1970 I sold Nilcon Geotechnics to Peter Örtendahl and Per Jonell who, skilfully and successfully, continued developing the technology in their company GEOTECH.











### Cohesion Piles New method for calculation of Cohesion Piles

T. Fellenius carried out a series of pile tests at the Railway Station in Gothenburg in 1955. He tested Equal thick and conical piles with the root up or down and in various combinations. He found that a conical pile with the root upwards was 40% stronger than one with the tip upwards and 30% stronger than an equally thick pile. The differences were presumed to be due to disturbances in the clay at different types of piles and methods. When testing with Nilcon's vane borer even the clays deformation properties is acquired. In my new method the deformations in the clay around the pile as well as in the pile itself is observed. I introduced a shift module which could be acquired from the vane boring. It got the name, Sven Nilsson's shift module.

My method made clear with full akribi how cohesion Piles work. Fellenius test results got a completely natural and unequivocal explanation. In Gårda, Gothenburg, a 35 meter long pile, 9+8+18, was load tested. Accor ding to Fellenius method with C=1 the capacity was 109.0 tonnes. With my metod it was calculated to 90.9 tonnes and the test result was 90.0 tonnes.

#### "Academical duck pond".

Fellenius sent a letter to professor Sven Hansbo, where he claimed that his analysis and

#### ANALYSIS conical piles.

 $D = D_0 + kx$ 

In the analysis carried out, we have assumed that the pile diameter is constant. It is common for wooden piles, however, that the diameter varies from root to tip. This tapered shape can have a major impact on the carrying capacity and we must therefore study this case closely,

If the pile top diameter is  $\mathsf{D}_0$  and growth k the diameter  $\ \mathsf{D}$  can be written,

.....(3:15)

As showed in §2 the offset shift module was roughly inversely proportional to the diameter, which can be expressed if  $K_0$  is the offset for the diameter  $D_0$ 

$$K = \frac{K_0 * D_0}{D_0 + kx}$$
(3:16)

The three basic equations (3:1), (3:2) and /3:3) will then look like the following,

τ =	$\frac{K_0 * D_0}{D_0 + kx}$	 (3:17)

$$\frac{\varphi}{lx} = \frac{\sigma_p}{E_p} \tag{3:18}$$

 $\frac{D_0 + kx}{4} * \frac{d\sigma_p}{dx}$ (3:19)

and the differential equation (3:4) becomes,  $d\tau^2 = 2k + d\tau = 4K_0D_0$ 

$$\frac{1}{dx^2} + \frac{1}{D_0 + kx} * \frac{1}{dx} - \frac{1}{E_p (D_0 + kx)^2} * \tau = 0$$

It is difficult to find a general solution to this differential equation and for the further analysis we shall therefore use differential calculation. Such can be done in two steps. In the first step, one starts from a presumed  $\sigma_p$  – distribution and receives  $\varphi$  according to the relation (3:18). In the next step the  $\tau$  is calculated according to (3:17) and new values on  $\sigma_p$  is obtained according to (3:19). The values for  $\sigma_p$  converge relatively quickly towards the final values.

conclusions were correct and that my metod was unsupported. Two meters away from the lecture room sat Bergfelt, professor of bridge construction. He couldn't be bothered to enter the lecture room, but sent a letter to Hansbo where he claimed it was his method, without being able to, with a single word or sketch, back this claim. The college, except for Bergfelt, gave me seven, the highest mark.



### Wind loads on brick walls Sven M. Nilsson. TEGEL Nr. 2, 1963

In 1963 I developed a new, simpler and more reality based method for calculating the brick wall strength due to wind loads. I also suggested constructive methods to strengthen brick walls. Then, in 1969, professor Anders Losberg and Sven Johansson, both at Chalmers, published that very same method, without with so much as a word mentioning that I'd developed it. That 's what happens in the "academical duck pond". In TEGEL nr. 2, 1967 this was corrected by Jürgen Magdalinsky in "How to dimension brick walls for wind loads".

#### Konstruktiva åtgärder för att förstärka tegelmurar

I [6], [8] och [9] beskrivs några metoder att förstärka tegelmurar. Några av dem nämns här kortfattat.

I början av 60-talet uppfördes en lagerbyggnad i Jordbro med fasad av dubbel <sup>1/2</sup>-stensmur. Spännvidden var 11 m och höjden 9 m med fri kant upptill. De båda <sup>1/2</sup>-stensväggarna bringades att samverka med hjälp a ven plattjärnsstege i liggfogen [8].



I [6] föreslås för samma ändamål armeringsstege enligt figur 22, vilket förefaller enklare. Sådana stegar kan erhållas med rostfritt skjuvjärn.

I [9] beskrivs en byggnad med dubbel skalmur där kramlorna inlagts i 45° vinkel för att bringa de i övrigt oarme-





Fig. 24.

rade 1/2-stensväggarna till samverkan. Det torde dock vara mycket osäkert om kramlorna verkligen blir inlagda i rätt vinkel. Bättre förefaller en fjärilskramla enligt [6] vara. Se figur 23.

För att ta upp vertikala moment i en dubbel <sup>1</sup>/<sub>2</sub>-stensmur skulle man önska sig en vertikal »skjuvkramling». En sådan antydes i [6]. Se figur 24. Det torde dock vara svårt att i praktiken få en sådan kramla korrekt inmurad. Med hänsyn till yttermurens temperaturvariationer måste en sådan dubbelmur dessutom vara fritt upplagd så att den är oförhindrad böja ut och därigenom ta upp skillnaden i temperatur genom krökning. Sådana temperaturskillnader kan givetvis även göra sig gällande för



spinn partorna, una vie nyckel sigh. Sammafarningeris kas vi silonda koost tera, att boutlinjetooien med fordel skulle ke na användai fie beräkning ar teznoversalbel; tat marveek, fin vis förskälgike bie dock i vädere isktnagas tilb forhållanderas närens klarlagat och större experimentellt underlag i hillins.

'rin konstruktionsyspankt mitter man ofta pro

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### International Standard

For testing the Compressive- and Tensile strength of Concrete



#### International Standard For testing the Compressive- and Tensile strength

#### TENSILE STRENGTH AND COMPRESSIVE STRENGTH OF CONCRETE DETERMINED ON THE SAME CUBE(1)

S. NILSSON

SUMMARY deals with a method of determining the tensile be compressive strength of concrete on the same cube, rength is determined by means of a splitting test en r that, the cube is turned 90°, and the cube strength

the resurts of comparative tests relations the common method of cube strength deter re shown that there is no difference be

Cube or cylinder is a question that has been vip-orously debated in recent years. The cylinder seems to be the favourite for the time being, and is recom-nected and the second second second second second world shared to be used to determine the famile strength of concrete. However, it has subse-quently been shown by Krister Cederwall and the present writer that the tenale strength of concrete on be determined equally well from a cube [1]. For this purpose the cube is loaded in the same way as the cylinder in the Brazilian test with line loads along the curters of two opposed faces a illustrated in figure 1a. The tensile strength which splits the cube, can be cube loads, and which splits



#### RÉSUMÉ

résistance Cet article decrit une méthode de détermination de la fance en traction et de la résistance en compression du sur un même cube. La résistance en traction est détei au moyen d'un essai de fendage sur le cube. Aprés qu fait subir une rotation de 90° au cube dont la résistan déterminée comme d'habitude.

Un tableau donne les résultats des estais compar ette méthode et d'après la méthode habituelle de ion de la résistance d'un cube. Ces essais ne mon ifférence entre les deux méthodes.

when it comes to determining the tensile strength by means of apliting tests. One advantage is that is strength in any desired direction. Another is that is used as applied to the cube need not be accu-ately centred. The lateral position of the line load strength in utilizate load.

(') The first part of this paper has been published in the HILEM Bulletin, n°11, June 1901.

**RILEM BULLENTIN** no 11, 1961 och no 17,1962

Mixture cement: sand: coarse aggregate	Wcr	er <sub>bens</sub>	Δ %	a'ante	Δ%	o <sub>caba</sub>	Δ%	$\frac{\sigma_{cubo}^{i}}{\sigma_{cubo}}$
1: 1,9: 1.9	0.31	48.2	8.1	705	0.0	702	4.2	-1.00
1: 2.9: 2.6	0.48 0.49 0.52	34.3 34.8 30.4	0.5 6.9 2.8	475 473 441	1.0 0.2 1.4	468 458 429	0.6 5.1 3.2	1.01 1.03 1.03
1: 3.5: 3.1	0.61 0.62	23.6 24.7	12.9 3.2	346 323	0.8 1.2	349 342	0.5 4.9	0.99 0.94
1: 2.9: 2.6	0.63	27.0	12.7	334	3.9	335	6.8	1.00
1: 4.0: 2.3	0.63	24.4	7.2	321	3.5	332	4.5	0.97
1: 3.5: 3.1	0.64	20.7 22.3	9.8 5.7	341 320	1.6 1.8	327 320	1.2 6.3	1.04 1.00
1: 4.0: 2.3	0.66	26.2	5.2	324	1.3	312	8.5	1.04
1: 3.5; 3.1	0.68 0.69	23.6 23.4	0.2 1.7	302 275	0.8 3.5	296 288	3.0 3.3	1.02 0.95
1: 4.0: 2.3	0.69	27.8	0.5	284	3.0	288	7.4	0.99
1: 5.4: 4.6	0.74 0.79 0.91 1.05	22.7 22.8 16.4 12.9	7.1 13.1 6.2 16.7	229 233 165 118	2.6 14.7 8.9 2.7	259 231 173 126	3.3 5.3 4.5 2.4	0.88 1.01 0.95 0.64
			8.2		4.5		4.7	0.99 ±4.3 %

BULLETIN RILEM Nº 17

Structural Engineering at Chainers University of Technology. Each text series included six cubes. On three of these the compressive strength was determined in the usual way, while the other three were tested first for tensile strength and then for compressive strength and strength of the concrete varied as shown in the table. The coarse aggregate used consisted of 16-22 mm gravel. The cubes were made in steel moulds in which two opposite faces were formed by flat ground tseel plates. When the cubes were aub-jected to compression, these faces were in contact with the flat pressure plates of the test apparatus. No intermediate liming of filling was used. In the cube splitting test the load was applied by means of a 20 mm wide steel rule.

20 mm wide steel rule. The average value for the whole series of the relationship  $\frac{5}{1000}$  was 0.09  $\pm$  4.3 %, and the mean variation configuration was 0.09  $\pm$  4.3 %, and 4.7 % respectively for the two methods of testing. This above that there is no difference between the two methods as regards either absolute values or dispersion. Finally, when it is a matter of the practical employment of the above type of test a certain amount of practice is of course needed in order to be able to

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DÉCEMBRE 1952

# unload so that the cube is not split completely in two. This applies particularly in the case of high compres-sive strengths, above about 450 kg/cm<sup>2</sup>. These prac-tical difficulties can however be eliminated by the application of deformation control to the test appa-ratus or by the use of a low rate of loading (0.5-1.0 tons/ssc.). The table shows the results of comparative deter-minations of the compressive strength oblained for cubes which had previously been used for deter-mination of tensile strength of uncracked cubes. The table results of uncracked cubes. The factures for strength of uncracked cubes.

DECEMBER 1962

the compressive strength of uncracked cubes. The figures for strength given in the table are average values of three tests. The variation coefficient  $\Delta_{\psi_0}^{e}$  is given in the columns following these average values, and at the foot of the table the variation coefficients have been pooled. The last column shows the relationship between the compressive strength of "cracked" cubes  $\sigma_{inte}$  and uncracked cubes  $\sigma_{outer}$ 

#### REFERENCE

NILSBON, S. — « The Tensile Strength of Concrete Deter-mined by Splitting Tests on Cubes », Rilem Bulletin, No. 11, June 1961.

### Sealing Foam Got a worldwide product 20 years to late!

In the spring on 1967 I and Lars-Erik Karlsson mixed polyol and isocyanate in a plastic bottle, shook it, and sprayed out the polyurethane foam ferments and expands. The method was patented.

Rockwool in Skövde took care of the marketing but the problem with a much to short storage time resulted in the produkt not reaching a sufficient big market.

#### We were doing it 20 years too early!

Now the storage time problem has been solved and sealing foam has become a worldwide product.



### Nilcon Prefab System It started 1959 in Åmål at George Björhag´s Betongkonstruktioner AB

In 1965 DIÖS och BPA had already been in media about the new revolutionizing building system. BPA had acquired Betongkonstruktioner i AB 1965 and Diös had their Uppsala factory ready by 1966. But we had large and difficult issues to get the production to work and we were out of money. The pressure on both Diös and BPA was so immense that they had to lend me about 10 million SEK - without security!

We worked as slaves, towards the end for 20h/day for months and the last day of May we finally get it to work at the factory in Uppsala. The first ones I called were two particularly nervous directors at BPA.

Then everything got going at a remarkable speed!







Öxnehaga, Husquarna, 2000 flats

Klaraberg, Hisingen, 2000 flats





S:a Valsätra-Gottsunda, Uppsala, 2600 flats



Rosengården i Malmö. 2000 flats

### The world's most rational building system My idea concept, Nilcon's Achilles heel

The building system went as a travelling exhibition around to all Riksbyggen's departments in Sweden. The piling for the test house had just begun when the chairman of the builders union, Knut Johansson, who later become Minister of Building, came out with a delegation to stop the construction. It was too rational- it would lead to unemployment!!



#### Either way it came to several "downgraded" versions of "the new system"

The building rate in Klaraberg was very high with 0.83 man-hour/m<sup>3</sup>. The total architect and consulting cost was 1.6% of the total building cost - RECORD!

Normally it is at least the double for the building rate and 10-folds for architect and consultant costs.

Architects, consultants and builder weren't exactly Nilcon's friends!



KLARABERG, Hisingen - RECORD! 2000 flats



Flexible and optional layout which up to this day, is the only "flexible" project on a large scale. 2600 flats

### Gothenburg-born idea spreading across the world

The ''Nilcon element'' is invented by, dr. Sven M Nilsson. Factories are being built on license based on his system in Europe and USA. In Finland there's going to be Scandinavia's largest Element Factory to produce the Nilcon Element. Cementa and Diös, both in Sweden, also have licenses.

Many millions, not to say billions, get wasted in Sweden. Not least in Gothenburg where the foundation circumstances are particularly problematic and several other factors a part as well resulting in large costs on the ground works. But there are ways of avoiding these large cost. As shown, among other things, by a thesis at Chalmers University of Technology on initiativ of Riksbyggen. The building costs could be significantly lower. In Kärra, Riksbyggen have saved 8 million SEK (1973) in an area with 2000 apartments. There have been up towards 100 000 apartments built in Gothenburg since 1960!

BPA-Riksbyggen produce the Nilcon element on licens. The pros are, according to CTO Sören Eriksson at Riksbyggen's planning department, that, among other things, you get longer bearing length of up to 10 meter. You need no bearing walls into the flats and gets possibilities to a flexible layout. The living rooms can be made considerably bigger than through conventional element building.

### Finland - Nilcon's Flagship

Europe's two largest element factories with total capacity of about 800 000 m2/year. 20 000 flats, office buildings, butcheries, industrial buildings, small houses, huge potatoes warehouses and piggeries for the Sovjet Army, Rovianiemi Steelwork among others.



Insurance company in Myrismäki



Serial type buildings built in a number of places in Finland





Post Office in Tammerfors

### The Fins build efficiently and with high quality



Single and multi-family serial type buildings



One-family home with NILCON's heating and ventilation system.



Bathroom with sheet metal walls on a 8cm concreta slab.Weight 1 ton. 10 000 units/year.



NILCON's heating and ventilation system. A method to dimensioning was developed and tested on full scale .

### In Norway there were a lot of schools and offices



Factory in Hönefoss



Railway to Trondheim



Telemark school



Gummerud school



Flöjsbonn youth school, Oslo



Even the transport equipment was developed by Nilcon



University in Trondheim



Social office in Voss

Highest productivity and quality in element production!



Nilcon Oy, Helsingfors



Top slab.30-60 mm. 3-6 m/min.



Sweeping, oiling, net laying



Gables



Stock 200x40 m



Kasett 250 - 450 mm. 2.5 - 4 m/min



Automatic slab cutting



Net production

Highest productivity and quality in element production!



Top slab for floor = 40 mm, for roof = 30 mm • Bottom slab = 25 mm • Element length up to 21 m



Slab lift. 200 m2/hour



Mounting jigg • Height+/- 2,Width +/- 1 mm





Kassett lift. 200 m2/hour



Dutch report. C = NILCON. The highest measured productivity.



Twice as high compressive strength as anyone else in a serial concrete element production.

### The Netherland in Center of Europe

Europe's largest construction company, Nederhorst United was our licensee.



Dutch factory in Breda



In the Netherlands a lot of long elements and airplane hangars etc.



Grand project in Oberhausen, Germany, for Neue Heimat, the world's largest developer at that time.

### FRANCE in Center of Europe



Apartment house at La Defence, Paris. Arkitekt: Le Corbusier



The factory at Marolles sur Seine.



But the longest element in Sarajevo 21 m!



Very long elements in France.

### NILCON and U.S President Carter



Ingue acoustical broak plus the sound ap-ing properties of the rock wool in-tion batt produce a sound frammission s (STC) of 58 decibels and an impact lation class (IIC) of 58 decibels, making floor approximately 250 times more re-ant to transmission of impact and vitra-tiones interspittles than a six-inch solid

#### rated structural mech

egration of the structure and the subsystem is made possible by t tion of the cover from the lower ral portion in conjunction with the nobstructed area in each element

erior space, the floor plenum is used to liver warm air during the winter and cool during the summer. Sufficient zonion is

Thermal insulation of roof element

to the project to satisfy t xpcsures.

designed into the project to satisfy the dif-terent wall exposures. During the heating season, warm air is introduced into one or two elements in a zone from either a central supply or an indi-vidual unit. This warm air not only flows the length of the element through the secaration lings re of the lingoft e and greater co

#### ntegrated solar subsystems

The second phase of the solution t ergy crises is the development of a energy sources. Solar energy is or most promising alternate sources able. The Nilron swettern adapts to ergy crises energy sour most promis able. The N

 any rem or born passive and active solar energy systems.
As more effective and efficient active so-lar systems are produced, solar energy will become a primary source of energy for building HVAC. In such systems, large masses are used on beach. building HVAC, in such systems, ia masses are used as heal storage ri-voirs. The concrete mass of a Nilco system has thermal storage capac on the Nilcon system in Europé hav that solar heating would continue to

and heat storage ca ated with triple glaze shutters, efficient co reduce heating and coo s than one-hall the pres according to research weden. Solar collectors

President Carter signing the energy plan. The NILCON element is on the centrefold as a good example of how energy can be saved.





Saint Paul, Minnesota



### Outstanding thermal and sound insulation In the U.S. NILCON's thermal and sound insulation was outstanding



FIRST FULLY INTEGRATED HVAC SYSTEM

Nilcon is the first pre-cast, pre-stressed concrete structural element which can be fully integrated with the mechanical system. Substantial savings can be gained on any project by utilizing Nilcon elements as the air distribution system, eliminating much of the duct work.

The key to the Nilcon distribution system is the separation of the upper and lower parts of the element by neoprene cylinders. This allows air to flow freely in all directions through the floor of an entire room, resulting in a uniform floor temperature which is slightly awarmer than room temperature during the heating cycle and slightly cooler than room temperature during the cooling cycle. Diffusers move the air into the room along all exterior walls in a quiet, draft-free system which maintains an ideal uniform temperature distribution throughout the room.



The great fuel-saving performance of Nilcon roofs is obtained by filling the element at the factory with inexpensive mineral wool insulation. Let us show you how to **reduce** roof losses **60%** to **80% below** the new energy code and **save money every year**.



#### NILCON PRECAST CONCRETE...



...THE QUIET FLOOR AND ROOF SYSTEM THAT GIVES YOU THE "COMPETITIVE EDGE" IN QUALITY BUILDING



General Contractor Gunnar I. Johnson Bloomington, Minn Architect ERG Architects Savage, Minn.



"In dealing with so many different types and ages of people each day, our hotel is exposed to a variety of sounds and noises. I have been externely impressed with the acoustical characteristics and sound isolation qualities of the Nilcon Precast Concrete floors and roof. Our customers really appreciate the privacy and quietness."

> Dave Breid, Manager Cricket Inn

### SARAJEVO - The 1984 Winter Olympics with NILCON



The huge Congress Hall, Sven and Ingrid in the front.





Kassett handler



Net Production

Assembling fixture

### SARAJEVO - NILCON didn't make it through the war









### The last nail in the coffin!

The factory management from 1980 said "You look just like you did 28 years ago". Flattering?

On our way home we picked up Anna (14) and Sara (12) in Venice. I proudly told them about the flattering comment, upon which Anna said "were you so old vanish and crooked back then as well!"

### PM-LUFT and Heat Recovering

It really started back in 1973 with our unit for NILCON's heating and ventilation system. On the spring of 1977 I met Bertil Svensson, the owner of PM-LUFT. He suggested me to contact Anders Karlsson, the CEO of PM-LUFT and so "the COIN BANK" was borne which was the recovery unit of NILCON's system.

After some time of deliveries of rotors we got problem with the glueing. We had to exchange a considerable amount of rotors and strengthen with spokes. One sunday, on the way back from Kvänum, after delivering rotors, I got the idea of "groove and tongue" and understood that this could give a new dimension to the heat exchanging as well.

On the new years eve of 1979 I and my three sons rolled up the first rotor. PM-LUFT tested it, to a rather mediocre result. But I saw the possibilities and the solutions and went up to Anders to discuss the development. Anders kept me in suspense all the way until we stood at the exit. He then looked me into my blue eyes and said "Sven, we`ll go for it". A very decisive moment for NILCON as well as for PM-LUFT.

We had a working machine already 1982 and produced rotors. In 1983 PM-LUFT took over the machine and has now produced over 200 000 perfect rotors without any reclamations.

PM-LUFT was a small company when we started but has now grown to become Europe's leading company in the ventilation and recovery industry. As their main market is now global the PM-LUFT company changed its name to SWEGON.

#### The "Coin Bank"







### True Energy Saving

Up until today Swegon has produced over 200 000 units. It represents several nuclear reactors in yearly energy savings! Very much workshop compared with the distorted and reality absent climate debate.







### The green summer olympics of 2008 with ECOCAT

At the end of 1986 I got an inquire by Emissionsteknik if the technology behind the heat recovery rotor could be used to catalyst carrier of stainless steel bands. Emitec, a Siemens subsidiary, had just started using metal carriers which they welded together at 1140°C by a method developed by NASA. The catalyst was tested at up to 1050 °C with heavy vibration. Maximum 1% of the precious metals are allowed to fall off. A truly difficult and interesting challenge which, probably, none thought that I'd manage.

Already in 1990 our catalyst for SAAB 900 had been approved and a factory in Karlskoga was built. But suddenly Penser, the owner of ECA-Nobel, got some problems and sold Emissionsteknik and the project was cancelled. Ecocat was then forced to go a incredible journey in between the different large catalyst companies before finally, in November 2000, ending up with the Finnish company Kemira Metalkat OY. In 2004 the name was changed to ECOCAT OY.

Its an extremely difficult establishment that we have to fight against. We've received many low-blows but we 've hit back where it hurts a fair few times. For example we won an international catalyst competition in regards to the city of Honkong's vehicles. Then we got a contract to deliver large catalytic converters to SCANIA.

And then, with the 2008 green olympics - Ecocat in all gas-operated vehicles!

To day ECOCAT has production in Finland, Italy and India and is the largest producer of metal catalyst carrier.

Ecocat catalyst system like Swegon's recovery system, are based on our ECO-flow. An Expanding, Circulating and well Organised gas flow which is a revolutionising development of gas flow in small channels. Its described in more detail in the Catarsis presentation.



#### http://www.ecocatindiavikas.com/overview.html

#### APPLICATIONS



Piaggio Porter 600

Ecocat India is an exhaust gas catalyst manufacturer supplying after treatment system to vehicle & engine manufacturers to meet Euro IV, V & VI emission norms. We supply complete catalysts with substrate, coating and canning for different applications e.g. Petrol, Diesel, CNG, LPG, BI-Fuel, SCR & Urea Mixers, VOC Catalyst, Particle Oxidation Catalyst & DPF. In addition to Catalysts we enable efficient System design with our expertise in selection, design & calibration of system elements.

#### Ecocat India Coating for various applications

- Coated DPF (Pt), (Pt/Pd)Pd/R
- CNG catalysts (λ=1 & lean, Pt Pd, Rh etc.)
- Urea hydrolysis catalysts.



Turbulent Flow Metallic Substrates

### CATARSIS® - The Real Cleansing

Catarsis is a newly developed revolutionizing system for Catalysts as well as for Heat/cold/moisture recovery which will be presented separately.



### The Board for Technical Development - 1982 Inventor Price

Say ''Sven Melker Nilsson'' in leading industry- and government circles in Tokyo and you'll get a big smile and probably the word ''Kållered'' as a reply.

He's a world celebrity, this doktor from Gothenburg who get inventors price and write bigger contracts than most builders thanks to his Nilcon system. He's a discrete in regards to personal prestige. There are distinctions in between personal self-affirmation and fighting spirit for the sake of an idea. He's good at the latter, Sven Melker, as those of us saw who were gathered in the lecture hall where the Board of Technical Development were handing out their yearly inventor price to Sven.

Minister of Industry, Nils Åsling, was there to harangue and to hand out money and diploma. But Sven seized the opportunity during a small chat, which probably was intended as a courteous introduction, to put the minister of industry up against the wall and bring up the industry 's as well as the building industry's issues. He's truly got opinions on the fact that Sweden allows itself to build "more expensive and slower" as opposed to rational and efficient only as a remedy for unemployment issue. But it 's like putting band-aid on to not see the disease.



Swedish Journal no 13, 1982:

"The fantastic Sven Melker Nilsson praised by Minister Nils Åsling. Puts Kållered on the world map".

#### A keen duellist.

He formulated himself keenly and daringly and it was with obvious joy that Åsling entered the duel. I think one can safely say that it's very typical of Sven to, when invited to Stockholm to get a honorary prize for one of his many inventions, not fall for the temptation to just smile, be happy and polite.

He does not compromise on his straightforward honesty concept and I think it was just that which made us ask who he really is, this man from Gothenburg with un-thought of dimensions. Who fought with razor sharp weapons for his idea of how Swedish industry could be vitalised- but yet seemed completely uninterested in any kind of personal celebrity-hood. I eventually learnt to realise that what he really cares most about is what is said in Kållered and Mölndal, and perhaps a little bit in Finland as well which he think is Europe's prime example of how to quickly get a country's industry and export going - and of course Tokyo is interesting. Because he's put Kållered on the map.

#### Kållered in Tokyo.

We should clear this thing up with Kållered directly. He was travelling to present the s.c. Nilcon System which, as many of you, who are reading this are living with, though you may not know it. Many building companies have used this rational method with building concrete elements where you have an unusually big degree of "completetion" so basically all that 's left to do is to start painting! (Its so rational that its dangerous for those who want to extend working opportunities instead of going with new projects which, according to Sven, is the way to go!)

During one of those travels he thus got to Tokyo and was received longer and more politely in the highest industry and government circles than most Swedish business representatives. Japanese politeness posed the question: Is there anything we can do for you? Yes, and what does Sven ask for if not to pinch in the name Kållered on the world wall map! So now it sits there and is known in the inner circles of Tokyo. He likes gimmicks like that being genuinely Gothenburgian in heart and minds.

When we met I was to learn a little bit as to why he had been chosen to receive these well-renowned inventors prize which STU hands out.

It started of being an interesting lesson in this building technique and that, in regards to building, was exciting because we are all part of it, if not in other things then definitely in our dwellings. And it sure soounds important: With this building method architects get large, flexible areas to work with, without need for large amounts of bearing walls inside the flat. And sound as well as heat insulation already in the elements. That was one of the inventions that Chalmers University dr. Nilsson received his prize-money for. But to him that 's already an old invention.

#### Now it's about heat recovery.

Right now heat recovery is the important thing and my main interest. And for this the world as a whole is interested.

One invention which Sven is credited for is a vane borer for testing the strength and deformation qualities of clays. His vane borer is to day International Standard. And that's something which earthquake prone areas values in order to keep track of if one dares build at all in certain areas. It always feels interesting when you see the practical effect of inventions which have started in the brain and on a drawing table.

We had dinner together during which the newly honoured dr. Nilsson was to elaborate on some of his opinions and ideas. I was increasingly confirmed in my opinion that he was crystal clear and rational - so rational that I had to ask if he had any time at all to fit in some s.c. private interests or if he only dedicated himself to inventions and technology litterature. - Yes, I windsurf of course, he said, and started a short but visual monoloque of the charm of windsurfing. He always learns something new about wind and water which can become recovered heat when he surfs around the West coast.

#### The endless theology.

As is often the case at the dinner table one gets into conversation about metaphysical issues and eventually theology is there as a unending topic of discussion. I said to the windsurfer by my side that "this with theology is perhaps not your domain". - Yes, it probably is, Sven said. I 've always been in a pentecost congregation in Gothenburg and Mölndal, and that 's where I have my definite rootedness in life, me and my family both which is constituted of my wife Ingrid and five children. - Do you have time to go to church?- Its dreadful how many stupid questions sometimes come out of your mouth before realising how wrongly you 've vaulted. Of course one has time to go to church!

-Yes, naturally I go most Sundays and a few times during the week since we have a symphonic band for which I am the leader. I can assuredly say that I'd rather been inclined to think that he was sitting at his drawing table during the evening, rather than go to his church to play with his symphonic band.

#### The Orchestra leader Nilsson.

But it didn't take long before it stod clear that its the inner certainty and integrity as well as the prestige-less attitude had its roots in a life approach which taught Sven about proportions in life. There are important and fun thing - and that's where inventions in technology and construction belong - but also life view and faith - and that's something he prioritizes without even reflecting. It flows like a current through the entire existence.

Some time after this first meeting I came across a couple of magazines. In one of them I read about a company, Sven's, involved in the new type of regenerative heat-recovering wheels- a product which surely has the potential of revolutionising the heat-recovering in the future. And there was also a list of his merits.

In the other magazine there was an article, written by music professor Göte Strandsjö, "Whole-hearted effort". Where Göte goes through a whole list of different kinds of important efforts done among youth relating music, not the least efforts by various churches. In a column the story is told, with great admiration, about an effort by a congregation. "In Mölndal there is a Pentecostal church dedicating themselves to a Symphonic band effort. Sven M Nilsson is the name of the driving force. Sven Nilsson has been particularly interested in small children and has reached surprisingly good results. I've listened prtly to parts of the orchestra and partly to the whole orchestra and must say that I am highly impressed. Its truly music being presented. Soft, clean, stimulating and rhythmical. Sven Nilsson's effort with the orchestra in Mölndal and particularly the lovely effort with the children deserves attention from brass bands around this country.

Here's seemingly more to be done than previously understood. New possibilities." So according to Göte Strandsjö, the expert in this field.

I have to admit that I called a colleague with which I'd had a conversation about the inventor Sven M Nilsson. We'd both been highly impressed by his achievements in this field. I read to him the article about Sven M Nilsson specially caring about the children. He was quiet for a while and then saidwhich authority should one speak to in order to give him a new prize? Is it the department of education?

He probably does 't need so many prizes. Sven. He's got so much joy with what he does. And his commitment is not just musical. Its about a will to let the music interest serve the effort of the congregation among people and show that music is, too. a way to find God.

There is no point in asking Sven what's the most exiting thing in life. Inventions that succeed, new ideas, wind-surfing, the church-service with a good day for the symphonic band, an evening at home with the family and a pile of books. Perhaps Mozart, him being the favorit in wonder, at the ready.



### Mölndal's Environmental Prize 2006



Datum

Ert datum

Vår beteckning §D Dnr 471-0275/07 Er beteckning

MILJÖ- OCH HÄLSOSKYDDSKONTORET

Handläggare, direkttelefon Kristina Sund, 031-315 17 01 E-post kristina.sund@moIndal.se

#### Motivering Miljöpriset 2006

#### Sven Nilsson, uppfinnare och entreprenör, Nilcon AB i Kållered

#### Inledning och bakgrund

Sven Nilsson, tekn. Dr, började för 50 år sedan som forskningsingenjör inom byggnadsteknik vid Chalmers i Göteborg. Under 1964-66 uppehöll han professuren i Byggnadsteknik med grundläggning. De först patenterade produkterna från vår pristagare var geotekniska instrument som vingborr och trycksond. Dessa bägge betraktas idag som oumbärliga vid markfältarbeten, och är standard i industriländerna. Sven Nilsson utvecklade byggbranchens elementbyggandet under 1960-70-talet med stor framgång. En stor del av "miljonprogrammets" boståder byggdes i Sverige och i åtta utland med Svens metod på licens till dessa länders största byggföretag.

I snitt ett patent per år har han löst ut sedan femtiotalet, vilket visar på anmärkningsvärd uthållighet och begåvning. Många av patenten har kommersialiserats antingen genom det egna företaget "Nilcon AB" i Kållered eller genom licensförsäljning till i huvudsak europeiska tillverkare som ex. Ecocat OY i Finland och Swegon i Kvänum. Några andra licenstagare finns så lång borta som i Asien och USA.

I det följande beskrives några energi- och miljömässigt viktiga uppfinningar från Sven Nilsson.

#### Roterande värmeväxlare

Sven Nilssons roterade värmeväxlare uppvisar ca 20 % högre verkningsgrad än konkurrentprodukter på marknaden och licenstagaren, Swegon, har därför kunnat expandera kraftigt till den ledande tillverkaren av ventilations- och värmeåtervinningsenheter. Den totala årliga energibesparingen av Svens Nilsson roterande värmeväxlare är i storleksordningen 20 TWh, ett par kärnkraftsreaktorers kapacitet.

#### Katalysatorbärare

Sven Nilsson har uppfunnit en ny typ av konkurrenskraftig metallkatalysatorbärare med låg vikt kombinerat med högeffektivt utnyttjande av katalysatorns mycket dyra ädelmetaller. Det ger 30-50 % besparing av ädelmetaller och vikt jämfört med konventionella katalysatorer.

Den här katalysatorn finns idag i både tunga fordon och personbilar över hela världen. Scania exv. har den i alla sina tunga lastfordon Alla gasdrivna fordon i " den gröna olympiaden" i Beijing 2008, kommer att vara utrustade med Svens katalysatorer. Staden Honkongs fordon har sedan länge använt Svens katalysator. I USA går ca 3 000 bussar sedan 1996 med Svens katalysator.

#### Kompletta teknologiska linjer.

I Nilcons fabrik vid Bangårdsvägen har, sedan 1963, utvecklats och tillverkats kompletta teknologiska linjer för alla Svens uppfinningar.

#### Sammanfattning

Utformningen av både katalysatorn och den roterande värmeväxlaren är uppbyggt kring en revolutionerande idé om att skapa och utnyttja turbulens med endast måttlig ökning av tryckfall. Det vår pristagare har gjort är att han på ett innovativt och uthålligt sätt klonat byggbranschens "spont och not" och förädlat till avancerade metallkonstruktioner.

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FÖR MILJÖ- OCH HÄLSOSK YDDSNÄMNDEN

Kristina Sund Miljö- och hälsoskyddschef

Macintosh HD:Users:sven:Desktop:MiljöprisB 2006.doc

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### Mölndal's PK Symphonic Band



Orchestra leader 1972 - 1987. Started the first non-conformist Symphonic band. 50% women - quite unique in the completely male dominated brass-music at that time!

### Ingrid - My first and greatest "Invention"

On the island of Öckerö the world's most dashing women was to be found. She's taken care of me and given me the possibilities of making my ideas reality. Given me five wonderful children and which has led to fourteen just as lovely grandchildren.







By the star Camping Camps Elysee

I'm Ingrid in the rain...

Nilssons's Quintet 1975 - Bosse, Karin, Lasse, Lena and Per



Christmas 2000