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THIRTY YEARS OF THE GOLDEN TROWEL®

(LAS VEGAS) The Golden Trowel® Award was born unceremoniously thirty years ago as a joke over a working lunch in the offices of The Face® Companies in Norfolk, Virginia. The group of engineers and consultants had, by then, spent more than a decade developing what are now known as the F-Number System (FF/FL), Fmin, the first concrete floor profileograph, the Dipstick® and many of the placement procedures that were, even at that early date, resulting in substantially flatter and more level floor slabs.

It was 1990 and both ACI and ASTM had recognized F-Numbers. Face's flat floor technologies were becoming more widely employed. Suddenly, a thought came to one of the diners. "I've got an idea," he said. "We ought to set up a competition for the flattest floors in the world and call it the Golden Trowel." Everyone laughed, for about three seconds. Then there was pregnant silence. The merits of an objective, measurement-based contest for the highest quality flatwork were instantly obvious. It would give the best finishers a way to prove it. The competition would drive up quality.

Fast forward to today. The Golden Trowel is the most sought-after award in the industry, drawing entries from around the world. The results from the 2019 competition, announced today at the World of Concrete in Las Vegas, provide the best evidence ever that quality has improved to a degree that none of those present for the birth of the contest ever imagined three decades ago.

The best floor in the world back in 1990 wouldn't even be considered for a Golden Trowel today. And North America no longer dominates the awards. Four World Records were set in this year's contest, by contractors from Japan, China, Australia, and Brazil. North America was shut out.

Golden Trowels are awarded in several different categories, based on how the floor was initially struck off, how wide the floor castings are, how much shake-on hardener or steel fibers are used, and other factors that influence flatness and levelness. Golden Trowel Gold Plates are awarded to the winner in each category, while Golden Trowel Silver Plates recognize truly outstanding entries that did not win.

Why are floors so much better? People continue to learn how to use existing concrete placing and finishing tools to better advantage and are passing it on to the new generation of concrete finishers. Concrete floor consultants are learning what works and what doesn't and are teaching the best practices. And not least, batch plants are being held to high standards on the concrete that they deliver to the field.

The tools available are better than they were, even just a few years ago. The Laser Screed, first introduced by Somero Enterprises, revolutionized the way concrete could be struck off. As laser screeds got better and better, and as people learned the best ways to use them, the flatness and levelness of floors improved dramatically even as daily output was significantly increased. The use of pans on power trowels, and tandem riding power trowels also were a boon. New devices for spreading shake-on hardeners were introduced, allowing floors incorporating dry shakes to approach the flatness and levelness of floors placed without dry shake.

All have made a big difference. But, so has striving for excellence and for the recognition that comes from being the best in the world – a winner of the Golden Trowel.

2019 World Records

The **Shimizu Corporation** from Japan built a 400-meter speed skating rink over Styrofoam insulation in Hachinohe, Japan that was 68,344 ft², more than four times larger than an NHL-size hockey rink, and made it more flat and level than any hockey rink ever made before. It seems that the thickness of concrete over the cooling pipes is especially critical for speed skating rinks because the ice temperature varies with thickness and skating speeds vary directly with the ice temperature. Since concrete thickness varies with levelness, their aim was to make the concrete surface as level as possible. Because of the difficulty associated with this kind of placement, in the past no one had ever been able to produce a full-size hockey rink with an FL Number (levelness) better than 71. Shimizu developed two completely new techniques specifically for this project to help them control both flatness and levelness on this project. The result was a surface that measures FF 74.9 and FL 81.6, which is a World Record, and a levelness number that is 10 points better than anything before.

Another world record was produced by **Shanghai WellRock Engineering Co.** at Harbin Medisan in Suihua, China. F_{min} Numbers relate to how a vehicle such as a High-Bay-Narrow Aisle lift truck traveling over a fixed path on the floor will react to the floor. Because VNA warehouses need to be very flat and level, F_{min} Numbers tend to be higher than most FF and FL Numbers. In 1999, a Golden Trowel was awarded for a floor that was F_{min} 95. In the early 2000s, the winning F_{min} number was higher, but still below 120. In the last 15 years or so, the world's best F_{min} floors have risen to around F_{min} 170-180. The highest F_{min} Number on record until today was F_{min} 205, achieved by Keystone Concrete. This year, Shanghai WellRock produced a world record floor for a high-bay, narrow aisle warehouse with an average F_{min} Number of an almost incredible F_{min} 245.38, 40 points higher. And by the way, this floor included 5 Kg dry shake/m² & 15 kg/m³ steel fibers, making this achievement even more impressive.

A third world record was won by **Europiso Comercio de Pisos Industriais** from Brazil for their Wet-Screed/Hand Screed project at CD Bresco Londrina. This floor was over 105,000 square feet and included 4 Kg dry shake/m², and measured FF 115.2 / FL 60.8, beating the previous world record by 10 points. Hand screeding a floor is hard and tedious work. It is an amazing fact that they were able to do this over a huge 105,000 square feet.

The fourth world record was won by **S&C Services**, an Australian company for producing a fiber-concrete Laser Screed floor with 77-ft wide bays, measuring FF 165.5 / FL 116.9, which broke the previous world record by 80 points. There are many great concrete floor companies using laser screeds nowadays, so this category is perhaps the hardest one to win. To win this hotly-contested category by 80 points better than the previous world record is nothing short of fantastic.

A total of 137 different contractors from North and South America, Europe, Central America, Asia, and Australasia have claimed the 336 Trowels awarded in the contest's history. Not only are there four new world records this year, but of all the companies winning Golden Trowels this year, *none of the four world record winners had ever competed in the Golden Trowel contest before!* Each of the other winners of both Gold and Silver plates had competed and won previously in the contest.

Other 2019 Golden Trowels

Producing concrete floor surfaces for ice rinks is a challenge. The concrete is placed over multiple layers of Styrofoam insulation and over cooling pipes that will create the ice surface above the concrete. This year, **Vee-Jay Cement Contracting** from St. Louis, Missouri, created a set of three ice rinks made for the same customer and did an outstanding job. Before this year, there had been only one full-sized rink with better F-Numbers. Amazingly, Vee-Jay was able to maintain the high FF and FL Numbers for not just one rink, but all three. This is Vee-Jay's 5th Golden Trowel award.

The **George J. Shaw Company** from Kansas City, Missouri, was tasked with making a very large elevated deck which was cut up into many different parts, some with different elevations. Because of the configuration of the surface, it was not practical to use a small laser screed like a Copperhead, so all 140,000 ft² was hand screeded. These are excellent results for a very large hand-screeded slab on metal deck. This is GJ Shaw's 3rd Golden Trowel award.

Alhaphiso Tec. Em Pisos from Sao Paulo, Brazil is no stranger to the Golden Trowel contest, having won 8 trowels before this year, mainly in the Laser Screed category. This year, they produced a super-large Laser Screed floor at GTIS CA-35 Bloco 200 that was more than 600,000 ft² and 70 ft wide that measured FF 101 and FL 62.3, which is a superior result for a floor this large, especially one that incorporated dry shake. This marks their 9th Golden Trowel award.

2019 Silver Trowels

Silver Trowels are a sort of “Distinguished Honorable Mention” category. Silver Trowels are not awarded in every category, but as you will see below, sometimes a floor that would have won a Golden Trowel, or might even have been a World Record, is overshadowed by an even more spectacular floor the same year. This kind of a floor deserves recognition and is awarded a Silver Trowel.

In addition to the Super Large Laser Screed floor described above, **Alphapiso** also produced another Laser Screed floor which was somewhat smaller, but still quite large, over 250,000 ft², in bays that were 50-70 ft wide, with dry shake, resulting in a fantastic FF 124.4 and FL 71.1 and winning them a 10th Golden Trowel award. ***In any other year, this floor would have been a world record***; the only reason that this award is a Silver Plate is because of the S&C (Australia) world record this year in this category.

In addition to being world-class with a Laser screed, **Alphapiso** also knows how to hand-screed floors. They produced a hand-screeded floor that was over 50,000 ft², again with hand-cast dry shake, that had the third highest ever FL Levelness Number. This also would have been the third highest ever combined FF + FL Number and would have won a Golden Trowel, except that Alphapiso had the misfortune to produce the floor this year, the same year that Europiso produced their world record in this category.

BCI Concrete, from Backus, Minnesota, produced an NHL Size Ice Rink over Styrofoam with a great FF of 90.0 and FL 51.4. This would have been a Gold Trowel, except for Vee-Jay’s exceptional trio of rinks this year. This is BCI’s second Golden Trowel award, both for ice rinks.

Full-Tilt Constructors, of Sanford, Florida, seems to specialize in super-large and ultra-large 96-ft wide Laser Screed floors. They produced a floor that measured FF 95.6 / FL 66.9. These are great numbers for any size floor, but this floor is nearly a million square feet. It is very hard to keep making superior quality floor for day after day; this is an example of how it can be done if you are among the best in the business. This is Full-Tilt’s third Golden Trowel award. It would have rated a Gold Trowel, except for Alphapiso’s Bloco 200 floor.

The Golden Trowel[®] Asia

Over the first 25 years of the Golden Trowel contest, we had winning entries from North and South America, Australia, and Europe, but not one from Asia. Because we noted that floors in Asia were generally neither as flat nor as level as floors in the west, and because floors in the west were constantly improving, it appeared to us that Asia might never catch up to the rest of the world without some incentive. For this reason, the Face Company inaugurated the Golden Trowel Asia contest in 2015. The Golden Trowel *Asia* is a special award available only to contractors in Asia, for producing the flattest and most level floors in all of Asia, excluding the rest of the world. The first Golden Trowel Asia was awarded in 2015; three more were awarded in 2017, five in 2018, and seven more this year. Winners have come from China, Thailand, Singapore, Japan, and Malaysia. It is apparent that the contest has had an effect, because as noted above, we had two world records this year from Asia, one from China and one from Japan.

2019 Golden Trowel Asia Awards

Shanghai WellRock Engineering Company produced a floor at Taicang, China to a German DIN standard that was over 10,000 ft² using concrete with both dry shake and steel fibers. This floor was measured essentially as an elevation tolerance with a narrow allowable elevation envelope, and resulted in 99.9% of the floor within 3/8 inch of the same elevation.

Because of poor soil conditions in the area, **B.S.Y. Construction** had a giant project (over 900,000 ft²) in Chachoengsao Thailand that required constructing an elevated floor supported on piles. This is a type of floor that is essentially unknown in the USA. The closest thing to this type of floor that we typically see is an unshored elevated deck. ACI rules say that because the deck will deflect due to the weight of the concrete floor, only FF is reported on elevated unshored decks. However, in this case, both FF and FL were measured and reported as FF 63.7 and FL 40, which is excellent under these conditions.

Chengdu Keyixin Technology Company produced a large and very wide floor in Pinghu, China that measured FF66.9/FL 66.3, using a Somero Laser Screed. While these numbers are nowhere near what is being done today in the west, it is a very close second to the best that has been recorded in Asia.

In Singapore, **Mitramas Pte** produced a narrow aisle floor to F_{min} tolerances that averaged to over F_{min} 126. This is higher than the F_{min} projects in the USA that won Golden Trowels as late as 2010, demonstrating that they are not far behind.

2019 Silver Trowels (Asia)

PT Multibrata Anugerah Utama, also known as “MAU” is the first company from Indonesia to win a Golden Trowel Asia award for their 253,000 ft² Copperhead-on-elevated-piles project in Cikarang, Indonesia that measured FF 57 / FL 42.2.

The **Chengdu Yiheng Materials Company** produced an 82 ft-wide 225,000 ft² Laser Screed floor for the Chengdu Dongbai Logistics Park in Chengdu, China that measured FF 66.1 / FL 59.1. This floor used both a heavy dose of dry shake and steel fibers. The only reason this is not a **Golden** Trowel Asia is because of Chengdu Keyixin’s Laser Screed floor in Pinghu, China.

Finally, **Channakorn Engineering Company** produced an almost 290,000 ft² Laser Screed floor at the KRC Warehouse 2 in Siracha, Thailand that was FF 59.7 FL 62.7

The images below show the brass plates that are attached to the winning 2019 Golden Trowel trophies. Plates for 2019 Golden Trowel Asia awards are also shown on following pages.

Golden Trowel® *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**
Shanghai WellRock Engineering Co., Ltd.
Harbin Medisan Suihua, China **WORLD RECORD**
F_{min}: LLevel 250.7 LFlat 306 TLevel 180.9 TFlat 244 **FACE**®
5 Kg dry shake/m² & 15 kg/m³ steel fibers • 7 Aisles, 294 linear m

This is the flattest and most level Narrow-aisle warehouse ever measured. Not only that, but with dry shake and steel fibers too. This is a first-time Golden trowel winner.

Golden Trowel® *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**
Shimizu Corporation
Speed Skating Rink • F_F 74.9 / F_L 81.6 **WORLD RECORD**
68,344 ft² • Hachinohe Nagane Skating Arena Hachinohe, Japan **FACE**®

This is a world record for skating rinks over 15,000 ft². This rink is more than 4 times the size of a standard NHL hockey rink. Shimizu is a first-time Golden Trowel winner.

Golden Trowel® *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**
S & C Services
Laser Screed 24m Wide Bay • F_F 165.5 / F_L 116.96 **WORLD RECORD**
9,664 m² • Fisher & Pykle Perth, Western Australia **FACE**®

This is the flattest laser screed floor ever placed, regardless of size, anywhere on earth. It is also the most level laser screed floor larger than 100,000 ft² ever placed. This is a first-time Golden Trowel winner.

Golden Trowel® *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**
Europiso Comercio de Pisos Industriais
Wet Screed/Hand Screed • F_F 115.2 / F_L 60.8 **WORLD RECORD**
9,777 m² • 9.7m Wide Bay • CD Bresco Londrina Londrina, PR Brasil **FACE**®

Hand screeding is physically demanding and tedious, and almost always results in relatively poor FF and FL Numbers. It is almost never done for floors larger than 100,000 ft². Like all the other world records this year, this is a first-time Golden Trowel winner.

Golden Trowel [®] *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**

Vee Jay Cement

3 Ice Rinks over Styrofoam • F_F 82.8 / F_L 68.4

48,000 ft² • Centene Community Ice Center Maryland Heights, MO

FACE [®]

This was a set of three ice rinks made for the same customer. Before this year, there had been only one full-sized rink with better F-Numbers. Amazingly, Vee-Jay was able to maintain the high FF and FL Numbers for not just one rink, but all three. This is Vee-Jay's 5th Golden Trowel award.

Golden Trowel [®] *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**

George J Shaw Construction Co.

Hand Screeded Unshored 93 ft wide Slab on Metal Deck • F_F 55.2

140,000 ft² • Papillion Data Center Springfield, NE

FACE [®]

This very large elevated deck was cut up into many different parts, some with different elevations, and it was not practical to use a small laser screed, so it was hand screeded. These are excellent results for a large hand-screeded slab on metal deck. This is GJ Shaw's 3rd Golden Trowel award.

Golden Trowel [®] *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**

Alphapiso Tec. Em Pisos Inds. LTDA

Somero Laser Screed 21m Wide Bay • F_F 101 / F_L 62.3

56,447 m² • 4 Kg/m² Dry Shake • GTIS CA-35 B200 Cajamar, SP Brasil

FACE [®]

This project is quite large, over 600,000 ft², and only five super-large floors like this ever had higher F-Numbers. This is Alphapiso's 9th Golden Trowel award.

Golden Trowel® (Silver Plate) Awards for 2019 (Worldwide)

Golden Trowel® *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**

Full-Tilt Constructors

Somero Laser Screed 96 ft Wide • F_F 95.6 / F_L 66.9 **FACE**®

These are great numbers for any size floor, but this floor is nearly a million square feet. It is very hard to keep making superior quality floor for day after day; this is an example of how it can be done if you are among the best in the business. This is Full-Tilt's third Golden Trowel award. It would have rated a Gold Plate, except for Alhapiso's Bloco 200 floor.

Golden Trowel® *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**

BCI Concrete

NHL Size Ice Rink over Styrofoam • F_F 90.0 / F_L 51.4
17,000 ft² • Hopkins Pavilion • Hopkins, MN **FACE**®

This would have been a Gold Plate, except for Vee-Jay's exceptional trio of rinks this year. This is BCI's second Golden Trowel award, both for ice rinks.

Golden Trowel® *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**

Alhapiso Tec. Em Pisos Inds. LTDA

Somero Laser Screed 15-21m Wide Bay • F_F 124.4 / F_L 71.1
24,017 m² • 4 Kg/m² Dry Shake • GTIS CA-35 B300 Cajamar, SP Brasil **FACE**®

Before this year, there had never been a laser screed floor over 100,000 ft² with an FF (Flatness) over 122. This floor would have been a world record for FF except that S&C Services from Australia also entered this year's contest and smashed the existing world record. This is Alhapiso's 10th Golden Trowel award.

Golden Trowel® *In Recognition of Excellence in Construction of Flat & Level Concrete Floors* **2019**

Alhapiso Tec. Em Pisos Inds. LTDA

Wet Screed/Hand Screed 9.7m Wide Bay • F_F 94.6 / F_L 59.8
4,874 m² • 4 Kg/m² Dry Shake • Assai Atacadista Sezefredo Sao Paulo Brasil **FACE**®

This floor has better FF (Flatness) Numbers, and better FL (Levelness) Numbers than Alhapiso's own 2018 floor, for which they won a Gold Plate. The only reason this one is not Gold is because of the floor built this year by Europiso Comercio de Pisos Industriais, coincidentally also from Brazil. This is Alhapiso's 11th Golden Trowel award and is their third this year alone.

[®] *In Recognition of Excellence in Construction of Flat & Level Concrete Floors*

Golden Trowel Asia **Shanghai WellRock Engineering Co., Ltd.**

2019

Elevation Tolerance • >99.9% elevations within 9.8 mm • 932 m²
5 Kg/m² dry shake & 25 Kg/m² steel fibers • Skechers Warehouse Taicang, China



[®] *In Recognition of Excellence in Construction of Flat & Level Concrete Floors*

Golden Trowel Asia **B.S.Y. Construction Co., Ltd.**

2019

Copperhead on Elevated Piles 18m wide • F_F 63.7 / F_L 40.0
83,916 m² • WHA E-Commerce Park Chachoengsao, Thailand



[®] *In Recognition of Excellence in Construction of Flat & Level Concrete Floors*

Golden Trowel Asia **Chengdu Keyixin Technology Co., Ltd.**

2019

Somero Laser Screed 30m wide • F_F 66.9 / F_L 66.3
5 Kg/m² dry shake • 16,846 m² • Feirui Airlines Pinghu, China



[®] *In Recognition of Excellence in Construction of Flat & Level Concrete Floors*

Golden Trowel **Mitramas Pte Ltd**

2019

F_{min} LLevel 158 LFlat 138.9 TLevel 103.9 TFlat 104.2
AMCOR Singapore • 10 Aisles, 300 linear m



® In Recognition of Excellence in Construction of Flat & Level Concrete Floors

Golden Trowel Asia **PT Multibrata Anugerah Utama** **2019**
Copperhead on Elevated Piles 30m wide • F_F 57.0 / F_L 42.2
23,490 m² • PT Satria Piranti Perkasa Cikarang, Indonesia **FACE®**

® In Recognition of Excellence in Construction of Flat & Level Concrete Floors

Golden Trowel Asia **Chengdu Yiheng Materials Co., Ltd.** **2019**
Somero Laser Screed 25m wide • F_F 66.1 / F_L 59.1
20,838 m² • Chengdu Dongbai Logistics Park Chengdu, China **FACE®**

® In Recognition of Excellence in Construction of Flat & Level Concrete Floors

Golden Trowel Asia **Channakorn Engineering Co., Ltd.** **2019**
Somero Laser Screed 24m wide • F_F 59.7 / F_L 62.7
26,730 m² • KRC Warehouse 2 Siracha, Thailand **FACE®**