



In Brief: the best dial test indicators are Swiss made. You have 4 commonly available brand names to choose from: **Bestest**, **Compac**, **Interapid**, **Tesatast**. All of these are made by the same manufacturer in Switzerland. There's nothing better on the market, in our opinion. (We should add **Girodtast** which is the only Swiss-made indicator not made by TESA.)

The worst dial test indicators are Chinese, Japanese and - sorry to say - American. We'll let you figure out the manufacturers in question.

### Notes on Manufacturers

**Accupro** vanity dial appears on indicators made in China and Germany. The Chinese indicators are worthless and can not be repaired. The German indicators are the Puppitast series made by Mahr-Federal.

- Repairs: see Mahr-Federal listing, below
- Sales: catalogs
- Parts: from Mahr-Federal for the German made models only
- Information: see Mahr listing, below

**Alina** (Switzerland) indicators were made by Compac until the mid-1960's. They are no longer available and spare parts are exhausted. The Alina Model 88 indicator was a superior version of the American-made Last Word indicator.

- Repairs: not possible
- Sales: discontinued
- Parts: not available
- Information: [contact us](#)

**Baker** (China) indicators are cheap throw-aways for which parts are not available. We have been told that they are somewhat longer lived than other Chinese brands. Replacement contact points are not available but Compac points will fit, in a pinch.

- Repairs: not possible
- Sales: discount catalogs
- Parts: not available
- Information: not available

**Baty** (Swiss) indicators are a vanity dial on Girodtast indicators. (see below)

**Bestest** (Switzerland) has become America's favorite and there's good reason. They're among the very best available; a great value for the money. Excellent repeatability and quick response make them desirable. If there's a drawback, it's that they're prone to damage because of the light construction. Available in black or white, horizontal, vertical or parallel. Except for the name on the dial, they are identical to Tesatast. Distributed in the US by Brown & Sharpe.

- Repairs: Long Island Indicator Service
- Sales: Bestest
- Parts: available on-line
- Information: Bestest

**China** If you're buying indicators made in China, you're scraping the bottom of the barrel. You can't get any worse. Some years ago we were hired to evaluate these indicators for MSC who wanted to know if they were worth importing. Apparently they didn't listen to our advise. Now, of course, they're making a killing selling these. Dovetails didn't fit and brand new .0001" indicators wouldn't calibrate. It turned out that dovetails didn't accept anyone else's attachments because they were oversized. Pass on these and order some Take-Out instead (but skip the chicken feet). Available in catalogs everywhere but don't expect to find any spare parts.

- Repairs: not possible
- Sales: discount catalogs everywhere
- Parts: not available
- Information: not available

**CDI** (Chicago) test indicators are identical to Compac (Switzerland). These were made for CDI in the 1980's. CDI no longer sells them but you can buy the Compac replacements.

- Repairs: Long Island Indicator Service
- Sales: Long Island Indicator Service
- Parts: Long Island Indicator Service
- Information: see Compac below

**Compac** (Switzerland) has been our indicator of choice for over 4 decades. These are sturdier than Bestest and less finicky (and less costly) than Interapid, even though they're made by the same manufacturer. Of particular note are the extra long range of some of the models. Model 215GA (.0001") and 225GA (.0001" vertical) have dials with extra wide spacing between graduation marks. This is a feature that many owners

appreciate. Dials are continuous reading on long range models, balanced on standard range. Contact points will swivel, like other indicators, but you may encounter more friction than you are used to. It's okay to apply the extra force. The indicator's over-sized pivot can take it. Many of the standard range (Series 240) indicators are discontinued, being poor competition for the same manufacturer's best selling Bestest series. Available from Brown & Sharpe distributors. Long Island Indicator stocks repair parts.

- Repairs: [Long Island Indicator Service](#)
- Sales: [Compac](#) page
- Parts: [available on-line](#)
- Information: [Compac](#)

**Craftsman** indicators are sold by Sears but are often times made in the UK in which case they are identical to Verdict indicators. They're not very good (in fact, they're downright awful) but do offer the "pear shaped" contact point which makes them look quite medieval and eliminates the cosine error, in theory.

- Repairs: why would you want to fix it?
- Sales: avoid this one like the plague
- Parts: your guess is as good as ours
- Information: if you know something, let us know!

**Federal** Gage made the worst test indicator you could get stuck with. Blobs of solder were used to hold it together. Mercifully these have been discontinued. The last models named Testmaster were made by Tesa in Switzerland and they're identical to Bestest indicators (see above). These are no longer available from Federal, but you can still buy the Bestest equivalent. The newest indicators are called MarTest (see Mahr-Federal).

- Repairs: no longer possible
- Sales: no longer available
- Parts: some parts may still be available (see [page 191](#))

- Information: no longer available

**Fowler** once relied heavily on English imports such as Verdict indicators. These are about as good as English weather. Nowadays they rely more heavily on Swiss made gages but also offer look-alikes in their effort to remain competitive. Beware of wolves in sheep's clothing: they offer a pathetic imitation of the Bestest indicator and an Interapid look-alike is made in China and sold under the name Xtest. The best mechanical test indicator which Fowler offers is the Swiss made Girodtast. When shopping Fowler, if it doesn't say "Swiss Made" don't buy it.

- Repairs: see Girodtast
- Sales: see Girodtast
- Parts: see Girodtast
- Information: see Girodtast

**Gem** (USA) makes an inferior version of the popular Starrett Last Word Indicator. This would be fine if they were cheaper. There is an odd variation, however: one model has two dial faces, one on each side. This comes in handy in some applications. Some of the newest models have replaceable dove tails. Gem also manufactures a line of indicator clamps and holders.

- Repairs: not worthwhile
- Sales: discount catalogs
- Parts: from the manufacturer or through a dealer
- Information: see their catalog at [www.thomasregister.com](http://www.thomasregister.com)

**Girodtast** (Switzerland) is similar to the old style (1970's) Bestest indicator with some improvements to make them sturdier. In the USA these are sold by Fowler. In Switzerland they are also sold with the name SISO-Tast. If you've ever wanted a Bestest indicator with multiple revolutions, Girod offers several models with extended ranges. If they have a drawback, it's that the contact point is adjustable. You'd think this were an advantage, but for most people it's a nuisance. On the Bestest you simply unscrew the old, screw in the new.

On the Girod-Tast you have to adjust the new point so that the indicator is in calibration.

- Repairs: [Long Island Indicator Service](#)
- Sales: Fowler distributors nationwide
- Parts: hard to find
- Information: [Girodtast](#)

**Interapid** (Switzerland) is the gem of all test indicators. These have the distinctive slanted dial which the other manufacturers have only just begun to copy. Correct readings are obtained when the contact angle is  $12^\circ$ . Undoubtedly this has its advantages as long as the user remembers to take it into account. The revolution counter hand does not have any numbers associated with it. There are just a couple of tick marks showing you that you've gone around once or twice. Dials are balanced and the right side of the dial has a thin black line which will help you determine plus or minus in a mirror set-up. A 4 mm diameter holding stem is permanently attached to the far end of the indicator. Models with 2.8" long contact points tend to have a slower response and should probably only be used to measure .001" (Note: beware of cheap Interapid look-alike ripoffs now being offered in catalogs. They're made in China and they're junk. Insist on the real thing.)

- New features: improved paint job on the body
- Repairs: [Long Island Indicator Service](#)
- Sales: [Interapid](#)
- Parts: [available on-line](#)
- Information: [Interapid](#)

**Johnson** Gage test indicators of the 1950's and 1960's were made by Compac, Geneva. They were the same as those sold under the Alina brand name (see Alina, above). They are obviously long obsolete.

**Kafer** (Germany) (also spelled Käfer and Kaefer) manufactures a complete line of test indicators with one revolution. These are beautifully crafted and come in a box with a clear lid, so you can easily see what you're taking off the shelf. Alas, they do not have identifying serial numbers. An excellent alternative to Swiss-made

indicators but model styles are limited. Parts are available but rarely does anyone stock them.

- Repairs: [Long Island Indicator Service](#)
- Sales: inquire
- Parts: [available on-line](#) (limited)
- Information: inquire

**Kurt** (USA) although located in Minneapolis, these are generic made-in-China imports. They're cheap throwaways although Kurt claims they're of better quality than other Chinese indicators.

- Repairs: never economically feasible
- Sales: Kurt distributors nationwide and some catalog houses
- Parts: Kurt claims to carry parts
- Information: downloadable catalog available at the Kurt.com web site

**Last Word** (USA) Starrett makes this stalwart and ubiquitous test indicator without resorting to toothed gears. Although usually accurate we've seen enough of them that compare poorly with the better built, gear driven indicators to warrant skepticism. The body on older models, being made of iron, rusts easily and will become magnetic (and sticky as a result). Newer models are black anodized. A recent manufacturing change makes repairs impossible if the pivot screw breaks off although the new, one-piece crystal is easy to replace. We do not hesitate to classify this indicator as the worst of its kind.

- Repairs: [Long Island Indicator Service](#)
- Sales: catalogs everywhere
- Parts: [available on-line](#)
- Information: [Starrett](#)

**Lufkin** never manufactured any of their own indicators. In the 1960's they had a vanity dial on the Alina indicator. These tended to have model numbers such as V60X. It was never clear how they managed to usurp

Alina's exclusive rights to these gages and that may have been the reason the line was finally dropped. Repairs are no longer possible due to the obsolete parts.

**MarTest** manufactured in Germany by Mahr-Federal. These are made with classic German craftsmanship and compare favorably—sometimes even better—with Swiss made brands. These test indicators have the contact point length conveniently inscribed on the side of the case. Since some of the best Swiss indicators are now in short supply, this would be an excellent alternative.

- Repairs: [Long Island Indicator Service](#)
- Sales: [page 235](#)
- Parts: [page 72](#)
- Information: [page 235](#)

**Mahr** (Puppitast) manufactured in Germany, part of the pre-Mahr-Federal conglomeration. These are structurally similar to Bestest, Tesatast and Girodtast indicators. The handsome bodies are somewhat sturdier and have textured sides which might, under some circumstances, keep them from slipping out of your hands. The crystal can rather easily be replaced without tools and this is an advantage over Bestest and Tesatast. Discontinued.

**Mercer** manufactured in Switzerland but for some reason the dial sometimes reads "England" (possibly because they are trying to use up old dials). These are manufactured by Tesa for the English market and are identical to Compac indicators (see above) with the obviously different dial. Mercer offers several configurations not found in the Compac line. They are available from Brown & Sharpe distributors by request.

- Repairs: [Long Island Indicator Service](#)
- Sales: see [page 198](#)
- Parts: see Compac
- Information: see [page 198](#)



**MHC** Industrial Supply made in China. Whenever the country of origin is not printed on the indicator dial, you can be assured it's Chinese. For some reason they can get away with that.

**Mitutoyo** new models, completely redesigned, are manufactured in Japan. Some models are available with optically scannable serial numbers on the dial face. The weaknesses of older models have been corrected but in an effort at cost saving, these new models have weaknesses of their own. The new "pocket" models 513-512 and 513-518 are a major improvement in design and construction over the old models and can be recommended. The other models don't compare with their European counterparts. The newer slanted dials which mimic the Swiss Interapid indicator have one significant difference: they are accurate when the contact point is used at an angle of 0°. This could be a source of confusion—and error—in a shop which uses both brands.

- Repairs: [Long Island Indicator Service](#)
- Sales: see [page 128](#)
- Parts: see [page 72](#)
- Information: [Mitutoyo](#)

**Mueller** old models were made in England.

- Repairs: not possible
- Sales: not available
- Parts: not available
- Information: none available

**Nork** indicators were manufactured in Manhattan of all places, by General Howe Mfg Co., Inc. They're a dreadful imitation of the Starrett Last Word indicator although they did have a much more functional reversing lever.

- Repairs: not possible

- Sales: not available
- Parts: not available
- Information: none available

**Parvus** indicators were manufactured in Switzerland and sold in the US with the Alina name on the dial. These were later transformed into the Compac models. You may see the word Parvus stamped on some of the old bodies. Long obsolete (1950's), there are no parts or repair service available.

- Repairs: not possible
- Sales: discontinued
- Parts: not available
- Information: none available

**Peacock** (Pic-Test) manufactured in Japan. This is a meager entry in the test indicator market, designed along the lines of the old model Bestest. Comparison ends there, however. Calibration often has to be fudged by changing the contact point angle on the .0001" model. Newer models contain plastic gears. They are available from some catalog houses but parts are generally unavailable.

- Sales: various catalogs
- Parts: generally unavailable
- Information: 1-408-871-7700

**Shars** generic indicator made in China (see China, above)

**Sisotast** manufactured in Switzerland. This is a vanity dial for the Girodtast indicator. The indicators are identical with the exception of the dial.

- Repairs: [Long Island Indicator Service](#)

- Sales: available in Switzerland
- Parts: not available
- Information: not available

**SPI** (China) manufactured for SPI. These are generally the same Chinese indicators you can buy under any number of other "brand" names. The cheap price gives them away. SPI stands for Swiss Precision Instruments. Don't let this fool you. These are not Swiss and their precision is short lived. (SPI used to offer genuine Swiss indicators with the SPI name. They were made by Compac and you can still get them. See Compac above.)

- Repairs: not possible
- Sales: any SPI distributor including Long Island Indicator (but we won't sell you any of these on purpose)
- Parts: not available. Never have been, never will be.
- Information: you read it here

**Standard** Check-Master manufactured in Poughkeepsie, a long time ago. This indicator was like the Federal TestMaster design only much better. It was elegant and beautiful in comparison. Parts and service are no longer available on this long obsolete item.

**Starrett** (USA) would like us to believe that they are products of the USA. The origins of some of their indicators is vague, however. Model 708 for instance is only marked as "American Made." The revolution counter hand has "0-1-2" markings with no indication of actual travel. On this same model you will have to fuss with the contact angle to find the right spot for accuracy. Half the dial is yellow and half is white. This comes in handy when reading the dial in a mirror. (Yellow does not indicate metric graduations in these models.) None of the Starrett test indicators is in the same league as their European made counterparts and we consider model 811 to be among the worst indicator designs available.

- Repairs: [Long Island Indicator Service](#)
- Sales: distributors and catalogs nationwide
- Parts: limited selection [available on-line](#)

- Information: contact a Starrett distributor in your area

**Teclock** (Japan) You can often buy European-made models for less, and you'll get better quality. Spare parts are not commonly available. These indicators are heftier but feature an inferior execution of the Bestest-style mechanism. The newest models seem to come with plastic bezels. When the crystals are scratched, or the bezel breaks (it will) you won't be able to replace them. None of the Teclock test indicators is in the same league as their European made counterparts.

- Repairs: generally not possible
- Sales: various catalogs
- Parts: not available
- Information: none available

**Tesatast** (Switzerland) manufactured by Tesa are identical to Bestest with all the same good features. The accessories that come with the indicator are different. We have all parts in stock.

- Repairs: [Long Island Indicator Service](#)
- Sales: [Tesatast](#)
- Parts: [available on-line](#)
- Information: [Tesatast](#)

**Testmaster** (USA) an indicator made by Federal Gage and discontinued, mercifully, in the 1970's. This was one of the worst designs and executions of all time. Blobs of solder were used to keep the return spring in place. Unbelievable.

- Repairs: not worth it
- Sales: discontinued
- Parts: obsolete

**XTest** (China) manufactured for Fowler as a rip-off on the high-quality Interapid indicator. They look so much alike in the advertisements that many people are fooled into thinking they're getting a terrific deal on the Swiss indicator. You get what you pay for. In this case, a pathetic imitation.

- Repairs: not possible
- Sales: you're on your own
- Parts: Fowler claims to have parts in stock
- Information: you read it here

<b>Test Indicator Score Card</b> current models (see explanations below)  Indicators sold by Long Island Indicator Service can be accessed by clicking on the (brown) linked manufacturer's name.																		
<i>Brand</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Bestest	C	A	A	A	A	A	A	A	A	B	A	A	A	A	A	B	C	A
Tesatast	C	A	A	A	A	A	A	A	A	B	A	A	A	A	A	B	C	A
Compac	C	A	A	A	A	A	B	A	A	B	A	A	A	A	B	B	C	A
China	C	A	C	C	C	A	A	A	A	B	A	C	A	A	B	B	C	A
Gem	B	B	B	C	A	A	B	A	A	A	A	C	C	A	B	B	C	C

Girodtast	C	B	B	A	A	A	A	A	A	B	A	A	A	A	A	A	C	A
Interapid	C	A	A	A	A	B	B	B	B	A	A	A	A	C	A	B	C	C
Käfer	A	B	A	A	A	A	A	A	A	B	A	A	A	A	A	B	B	A
Puppitast	C	A	C	A	A	A	A	B	A	B	A	A	A	A	C	B	C	
MarTest	C	A	B	A	A	A	A	A	A	B	C	A	A	A	C	A	C	
Mercer	C	A	A	A	A	A	B	A	A	B	A	A	A	A	B	B	C	A
Mitutoyo Pocket	C	A	A	A	A	A	A	A	A	C	A	A	C	A	C	B	C	
Mitutoyo others	A	A	A	A	A	A	B	A	A	B	C	B	A	A	C	B	C	A
Starrett 711	B	B	A	A	C	A	B	C	A	C	A	C	C	B	B	B	C	C
Starrett 708/709	C	B	A	A	A	A	B	B	B	B	B	C	A	A	C	A	B	
Teclock	C	A	C	A	A	A	B	B	A	A	B	B	B	A	C	B	C	
Peacock	C	A	C	A	C	A	A	B	A	B	C	B	A	A	B	B	C	
SPI	C	A	C	C	C	A	A	A	A	B	A	C	A	A	B	B	C	
Verdict	B	A	C	A	A	B	B	B	C	B	A	B	C	A	B	B	C	
Xtest	C	A	C	C	C	B	B	B	B	B	A	C	A	C	A	B	C	

User serviceability

There is typically nothing the user can do to service test indicators other than replace the contact point when it's worn. In some cases, the crystal can be replaced when it's discolored or scratched. Numbers refer to the scorecard above.

(1) **Crystal replacement:** (see "[Do-It-Yourself](#)" for instructions) Only the new Mitutoyo and some Starrett indicators have plastic bezel and crystal combinations which simply snap in place. You may also need to replace the rubber o-ring.

- A = easy
- B = possible
- C = not possible without specialized tools

(2) **Contact point replacement:** (see information on contact point length on [page 21](#)) Only Starrett Last Word and Gem indicators may cause problems. Girodast, Kafer and Starrett (other than Last Word) have a set screw which may have to be adjusted for calibration. All other other indicators are hassle-free. Manufacturers may provide special wrenches or keys which can make removal easier, but you can just as well use a pair of jeweler's pliers.

- A = easy
- B = might be tricky

(3) **Spare Parts availability:** Most manufacturers do not sell directly to end users. It may be necessary to order through a distributor. Distributors may not be eager to sell parts because they tend to be non-lucrative and time consuming.

- A = easily available through Long Island Indicator Service (see [page 72](#))
- B = available from the manufacturer or distributor
- C = availability varies or is not available

(4) **Repairability:** Not only do parts have to be available, but the instrument has to be designed for possible repairs. Furthermore, technicians need to be skilled. While Long Island Indicator and many other repair shops can repair all of these gages, some are more suited to repairs than others. (see [how to send](#) indicators for repair)

- A = easily repaired by Long Island Indicator Service
- B = requires manufacturer servicing
- C = not suited to repair

### Technical considerations

(5) **Accuracy:** All brands offer at minimum an accuracy of  $\pm$  one graduation for their first revolution. Anything which claims to be more accurate is meaningless. Indicators with multiple revolutions become less accurate with each successive revolution. Since test indicators are comparators this again is meaningless. Incremental errors can be corrected to some degree by adjusting the contact point angle.

- A = excellent
- B = good
- C = fair

(6) **Repeatability:** This is a crucial aspect to test indicators used as comparators. Instruments which are dirty or damaged will show bigger variations in repeatability. This is a sign they should be sent in for servicing. Extended range indicators usually show insignificant variations. A new or recently repaired indicator will have the following repeatability:

- A = excellent
- B = good
- C = fair

(7) **Response:** Indicators with extended ranges have extra gears and you'll notice a minor sluggishness when compared to single revolution indicators. In practical situations this is insignificant. Interapid models 312B-15 and 312B-15V with very long points are often slower to respond because of the mechanics of the long point.

- A = excellent
- B = good
- C = fair

(8) **Magnetism:** Spinning motors and magnetic fields will magnetize indicators with iron content. This may



cause the indicator to stick or freeze-up. Running the indicator through a de-magnetizer will be necessary. Most indicators are iron-free for this reason.

- A = non-magnetic
- B = will magnetize slightly and rarely inhibits function
- C = will magnetize to the point of non-function

(9) **Contact angle:** All test indicators except Interapid are designed so that the contact point must be parallel ( $180^\circ$ ) to the measuring surface. Deviations from this will result in a cosine error which can be mathematically compensated. Interapid indicators are accurate when the angle is  $12^\circ$ . Starrett model 708 and 709 must be  $15^\circ$ . These indicators are suited to situations where the body would otherwise get in the way. Some Fowler test indicators have pear-shaped contact balls which in theory eliminates cosine error.

- A = contact angle must be 180 degrees (parallel)
- B = contact angle must be some other angle (from  $12^\circ$  to  $15^\circ$  in some cases)
- C = contact angle is unaffected by cosine error (Fowler)

## Features

(10) **Dovetails:** test indicators need to be fastened to stands or holders of one sort or another. Most models have dovetails which are integral with the indicator body. This usually means they're of the same soft brass and they'll eventually disfigure from repeated clamping and tightening. Some models have dovetails made of hardened metal which is screwed onto the body. It would appear that these are replaceable, but you won't ever have to replace them for wear: you're more likely to rip them off the body and that's probably damage beyond repair.

- A = replaceable dovetails (hardened)
- B = integral dovetails
- C = no dovetails

(11) **Plastics:** in order to save money some manufacturers are resorting to plastic parts, including plastic gears (Mitutoyo, Peacock) and plastic bezels. We find that the all-metal indicators are more durable. Plastic bezels are quick to break. Some structural parts may be made of fiber which is quite durable and is not considered as plastic.

- A = all metal (and/or with structural fiber parts)
- B = plastic bezel
- C = plastic gears or other parts

(12) **Craftsmanship:** some indicator construction shows real skill in manufacturing while others are downright amateurish. There can be variations among models of the same manufacturer. Good craftsmanship does not imply excellence for the task at hand. This is more a question of aesthetics.

- A = outstanding
- B = good
- C = poor workmanship

(13) **Manual vs. automatic reversal:** All modern test indicators can be used in either direction (contact point goes up or down). You can take measurements from below or from above. In the old indicators (ca. 1950-1960) there was a small lever on the side of the body which you had to move one direction or the other so that the indicator point moved up or down. This switch still exists on the Starrett Last Word and some other models. Problems will arise if the switch is not fully engaged. This can easily be overlooked and is a decided disadvantage.

- A = automatic contact point reversal
- B = manual switch on some models
- C = manual switch on all models

(14) **Body finish:** Indicators with a painted body can be problematic when the paint starts to peel, usually due to exposure to solvents. We see this occurring in many older indicators that come for repair. Interapid has apparently switched to a better paint job which doesn't peel like the older models did. Unfinished bodies tend to get rusty. The best indicator bodies have dull chrome plating on brass.

- A = plated body
- B = unfinished body
- C = painted body

(15) **Bezel rotation:** Manufacturers have tried different approaches to making the bezel movable and to keep it attached to the indicator body. The newest trend is to use o-rings which have the advantage that, generally, the bezel is easy to pry off and replace. But, o-rings, while they work well when new, age and

stretch and the bezel won't stay put or turns too easily and can't be adjusted. The better systems use metal springs because they don't change appreciably. They can also be adjusted (although with difficulty) to customize the amount of friction. Often times these springs are hidden from view and have nothing to do with holding the bezel onto the indicator itself. This may very well be the best solution, as in the Interapid and Bestest indicators.

- A = independent metal spring (most reliable)
- B = metal spring which also holds the bezel
- C = rubber o-ring (least reliable, but easy to replace)

(16) **Calibration:** A few test indicators can be adjusted for calibration. Some have contact points with set screws so that, in effect, you can shorten or lengthen the point to adjust calibration. Others have internal cams that can be adjusted. Both procedures require jeweler's screw drivers, good eyes, patience and some intuitive algebraic skills. Since new indicators are factory calibrated, this feature is rarely needed by the end-user but could prove helpful in the repair shop.

- A = mechanism for adjusting calibration
- B = no means of adjusting calibration

(17) **Waterproof?:** Because the contact lever has to go into the indicator body, the test indicator can not be liquid proof. However, some models offer a bit more resistance to the ingress of liquids than others because the entrance into the body is smaller thus fending off liquid sprays; and, the bezels offer a tighter seal. If liquid contamination is an issue, then you may want to consider these factors.

- A = reliably waterproof
- B = a little bit better than nothing at all
- C = not waterproof at all

(18) **Serial Number:** To comply with ISO stipulations and to make identification possible for the employer's records of calibration a permanent serial number is required to be stamped or engraved somewhere on the indicator. Mitutoyo has gone so far as to add a miniature barcode on the dial face which can eliminate errors of transcription.

- A = permanent serial number on indicator body or dial face
- C = no manufacturer's serial number

**We welcome your comments**

Opinions on these indicators, although based on over 50 years of experience with repairs, are nevertheless highly subjective. We welcome your comments on any of these test indicator ratings. If you disagree or have experienced problems which you would like to share please **let us know**.

**[www.longislandindicator.com](http://www.longislandindicator.com)**

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# **Long Island Indicator Service Inc**

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