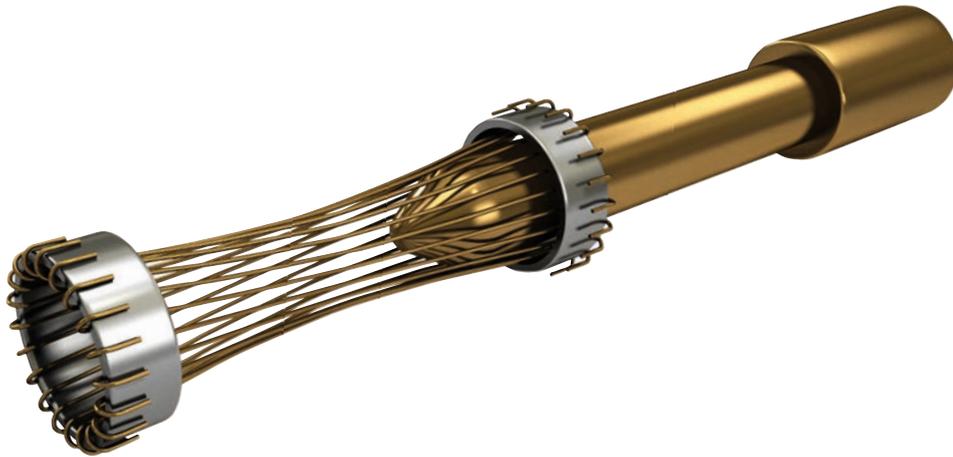


HYPERBOLOID TECHNOLOGY

Smiths Connectors offers an extensive range of superior contact technologies suitable for standard and custom solutions. Hypertac® (HYPERboloid conTACT) is the original superior performing hyperboloid contact technology designed for use in all applications and in harsh and demanding environments where high reliability and safety are critical. The inherent electrical and mechanical characteristics of the Hypertac hyperboloid contact ensures unrivalled performance in terms of reliability, number of mating cycles, low contact force and minimal contact resistance. The shape of the contact sleeve is formed by hyperbolically arranged contact wires, which align themselves elastically as contact lines around the pin, providing a number of linear contact paths.



FEATURE

LOW INSERTION/EXTRACTION FORCES

The angle of the socket wires allows tight control of the pin insertion and extraction forces. The spring wires are smoothly deflected to make line contact with the pin.

LONG CONTACT LIFE

The smooth and light wiping action minimizes wear on the contact surfaces. Contacts perform up to 100,000 insertion/extraction cycles with little degradation in performance.

LOWER CONTACT RESISTANCE

The design provides a far greater contact area and the wiping action of the wires insures a clean and polished contact surface. Our contact technology has half the resistance of conventional contact designs.

HIGHER CURRENT RATINGS

The design parameters of the contact (e.g., the number, diameter and angle of the wires) may be modified for any requirement. The number of wires can be increased so the contact area is distributed over a larger surface. Thus, the high current carried by each wire because of its intimate line contact, can be multiplied many times.

IMMUNITY TO SHOCK & VIBRATION

The low mass and resultant low inertia of the wires enable them to follow the most abrupt or extreme excursions of the pin without loss of contact. The contact area extends 360 degrees around the pin and is uniform over its entire length. The 3 dimensional symmetry of the Hypertac contact design guarantees electrical continuity in all circumstances.

BENEFIT

HIGH DENSITY INTERCONNECT SYSTEMS

Significant reductions in size and weight of sub-system designs. No additional hardware is required to overcome mating and un-mating forces.

LOW COST OF OWNERSHIP

The Hypertac contact technology will surpass most product requirements, thus eliminating the burden and cost of having to replace the connector or the entire subsystem.

LOW POWER CONSUMPTION

The lower contact resistance of our technology results in a lower voltage drop across the connector reducing the power consumption and heat generation within the system.

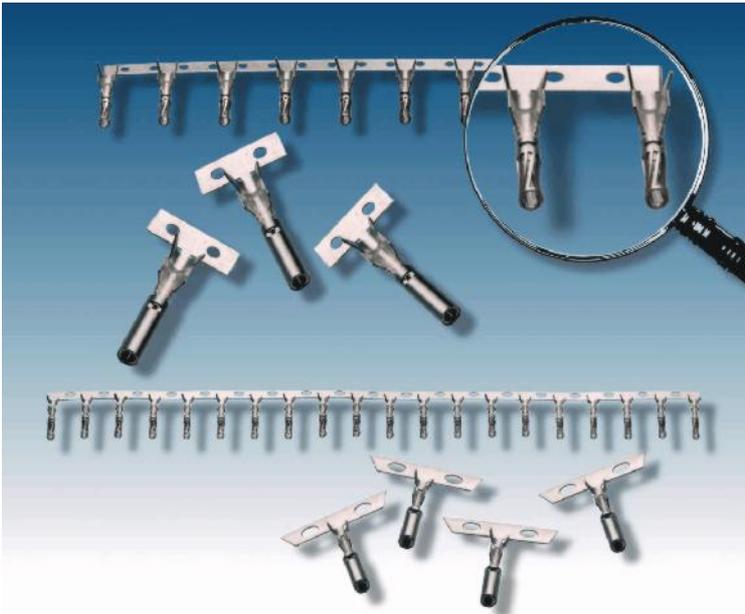
MAXIMUM CONTACT PERFORMANCE

The lower contact resistance of the Hypertac contact reduces heat build-up; therefore Hypertac contacts are able to handle far greater current in smaller contact assemblies without the detrimental effects of high temperature.

RELIABILITY UNDER HARSH ENVIRONMENTS

Harsh environmental conditions require connectors that will sustain their electrical integrity even under the most demanding conditions such as shock and vibration. The Hypertac contact provides unmatched stability in demanding environments when failure is not an option.

Contact technology is what it's all about



The contact technology makes or breaks a plug-and-socket connector. Even the best thought out plug-and-socket connector design can be doomed to fail if an unsuitable contact technology is employed. Hypertac will be using its hyperboloid contact principle for its qualitatively high-grade products.

This involves the use of a socket contact containing a hyperbolically shaped wire cage. If you stretch wires around two metal rings facing one

another and twist these a few degrees against each other, the wires will be stretched more and more diagonally. At the centre point of contact you will find a narrowing of the diameter which decreases hyperbolically towards the metal ring.

If you now insert the connector pin it will displace the wires. The contact cage now wraps around the connector pin as it were and for each wire a line contact with an infinite number of contact points is created. Across the entire circumference of the connector pin can be seen, depending on the contact diameter, a large number of wires. This all around contact ensures optimum contact reliability even under the most severe vibration conditions. Resonance frequencies, that can cause individual wires to loose contact, cannot arise because the connector pin is securely wrapped within the wires. A further advantage: the extremely small contact normal forces lead to smallest possible plugging and unplugging forces and prevent "fretting corrosion" which can occur in the presence of vibrations.

WHAT CONTACT QUALITY DO INDUSTRIAL APPLICATIONS REQUIRE?

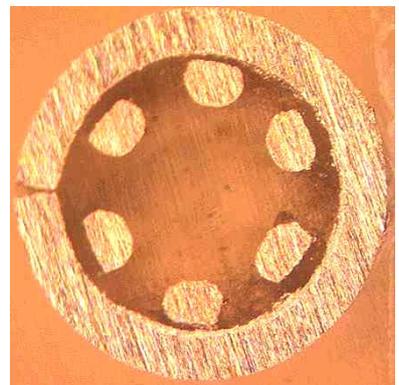
You may well think that this type of complexity is unnecessary for industrial applications. Ever more demanding customer requirements however prove otherwise. The number of applications that are subject to extremely severe vibrations are increasing and even the long established plug-and-socket connectors on the market are failing as a result of electrical or mechanical problems.

Signal interruptions of several nanoseconds, in the rotary element of a positioning drive for example, can lead each time to the total failure of an entire system. With today's complex industrial equipment, even the loss of a few bits in a measurement or control system can lead to enormous costs or loss of quality in the parts being produced. Therefore: contact reliability is becoming more important than ever as serial data streams increase in speed.

MORE ECONOMICAL, BETTER PROCESABILITY FOR THE SAME PERFORMANCE

CIP, the Continuous Improvement Process, is not just a catchphrase but a MUST for every company that has to take up the new challenges of the market everyday. The technical masterpiece - the twisted Hypertac single contact - has been implemented effectively using the stamped/rolled HCS™. The HCS™ component series (1mm and 2mm) can be processed from the roll on standard crimping machines.

The stamped wire cage has the same design characteristics for all the variants: the individual contact ridges have a round shape on the contacting side and therefore are of "wire quality" to the inserted connector pin. It is no exaggeration to speak of wire quality as each wire ridge has a thickness of just 0.2mm! A diffusion barrier made of 1.27µ nickel and a selective gold coating of 0.8µ applied to the contact area round-off the general requirements. All HCS™ contacts are constructed from two parts. The contact body is made



of a copper alloy whereby the stamped wire cage is protected by a high-grade steel outer spring. This high-grade steel sleeve serves as an additional heat sink during operation but also has the task of securing the contact within the contact chamber of the insulating body. It is also worth

mentioning that the HCS™ contact can be exchanged one for one with the standard wire contact. A customer who is currently incorporating Hypertac machined sockets for circular industrial connectors can therefore switch over to this product immediately.

ADVANTAGES FOR THE CUSTOMER ARE OBVIOUS:

Besides a far lower price per contact there are tremendous processing advantages. The contacts are supplied on rolls and can be processed on standard stripper/crimping machines. Hand crimping tools for field applications are also available.

For a conducting crimp, we use the so-called B crimp for the HCS™ contact. For an insulating crimp however, we chose a wrapping crimp which offers excellent roundness and makes inserting the contacts in the contact chamber considerably easier.

The soft design of the contact with its distinctive plug face and lack of primary stop spring offers further advantages. Jamming of the contact when it is inserted in the contact chamber is precluded because neither the coding nose nor the primary stop spring require pre-orientation.

Locking of the contact in the insulating body occurs by means of locking lances in the insulating body itself. That's why we were able to do away with the usual primary stop spring on the contact which again leads to a processing advantage. The typical phenomenon of contacts hooking into one another during cabling doesn't occur.

+++End

