

STAHLWILLE.

Tool solutions for aerospace.





Skills of the highest level. **STAHLWILLE Aerospace.**

One of our most crucial end-customer segments is the aerospace industry. It is not only the numerous manufacturers and service companies that place their confidence in STAHLWILLE products, but also the airlines.



Our product focus is on hand-held tools for tightening threaded fasteners, and most of these tools have been designed specifically with the aerospace industry in mind. Specially developed tools made from high tensile strength High Performance Quality (HPQ*) materials are used extensively in jet engine overhaul, the maintenance and overhaul of airframes and on the avionics. Since these tools are entirely cadmium-free, there is no danger of corrosion when they come into contact with titanium components. Apart from high-grade tools, STAHLWILLE also manufactures intelligent aids for organising tools.



The "Tool Control System", for example, uses conspicuous colour coding to warn the technician immediately if any tool in the set is missing. With regard to the aerospace industry in particular, this represents a considerable safety factor. In this field more than any other, a tool "left behind" in a jet engine at the end of the shift is a real hazard.



The fact that the field of tightening and torquing tools is such a key one to STAHLWILLE is underlined by the fact that the company became the first German manufacturer – in 1997 – to be awarded DAkkS laboratory status for torque by the official German Accreditation Body (DAkkS). This means that, at STAHLWILLE, torque wrenches and torque testing equipment can be calibrated and official DAkkS calibration certificates issued in-house. We make a measurable contribution to reducing our customers' expenditure on costly special-purpose tools by extending the range of application of our torque wrenches by means of special adapters and insert tools which enable customers to deal with even the most complex joints. In this way, our business partners benefit directly from our experience and innovative strength in the field of controlled tightening.

Our worldwide logistics network guarantees the rapid, accurate delivery of the products. In addition, we support our customers in the aerospace industry by employing licensed inspectors as application engineers.

For all requirements.

Sets of tools for 13217.

STAHLWILLE's Tool Trolley 13217 is available with specially selected sets of tools to ensure efficient, fast, reliable MRO operations. Our **High Performance Quality (HPQ®)** tools are developed and manufactured in Germany. They combine the tightest manufacturing tolerances with the greatest possible force transmission and durability. Storing the tools in STAHLWILLE's Tool Control System (TCS) combines the highest levels of safety and efficiency with the reassuring feeling that none of the tools has been left in a place that could, at some point in the future, become a safety risk.



Every tool has its clearly defined space. At a glance, you can see where each tool belongs, saving you time and, as a result, money.



The push-out recesses facilitate tool removal and promote faster, more efficient working.



Thanks to the noticeable yellow background, a quick glance at the tray shows instantly if everything is where it should be. If you can see yellow – there's something missing.

Extremely durable.

STAHLWILLE Spline-Drive tools.



STAHLWILLE's Spline-Drive tools have been developed and optimised for use with the high tensile strength threaded fasteners found in a wide variety of aircraft and aerospace applications.

The spline profile as specified in MS 33787 allows for a far greater transfer of applied force to the fastener from the tool by means of radial spline teeth. This is achieved by increasing the surface contact between the fastener and the tool compared with conventional 6 and 12 point fasteners, which simultaneously reduces the surface pressure. As with all STAHLWILLE tools, Spline Drive tools are manufactured to the closest of tolerances resulting in optimised fit and reduced wear and damage to the high cost spline fasteners through slippage.

All of STAHLWILLE's Spline-Drive products are manufactured in-house using a proprietary manufacturing process, resulting in tools which are robust and extremely durable. Through the combination of special materials and manufacturing processes, these products reach a level of quality known as HPQ® (high performance quality). STAHLWILLE HPQ® represents the new benchmark for quality, strength and durability in lightening tools.



Accountability and efficiency at its best. **The Tool Control System.**

Everything in its place and a place for everything. A working environment with interdependent processes and tight schedules requires sophisticated, intelligent and intuitive tool storage. The same holds true for safety-critical maintenance operations, such as aerospace and food processing plants.



The STAHLWILLE Tool Control System combines the highest degree of safety and efficiency with the confidence that no tool is left where it may pose a security risk.

Originally developed for the aerospace industry together with leading aerospace manufacturers, the award-winning STAHLWILLE Tool Control System gives you control over your tools and ensures a high level of organisation and security.



1/3 tray



2/3 tray



3/3 tray

The tray mats are available in a variety of standard sizes.

The use of the signal colour yellow enables the technician to instantly detect if everything is where it should be. If he can see yellow then there is something wrong!

Tools are arranged in chemical-resistant durable yet flexible foam inlays.

Choose from the many standard inlay layouts to create highly functional tool sets or let us design against your specific configuration.



The modular tool tray system.

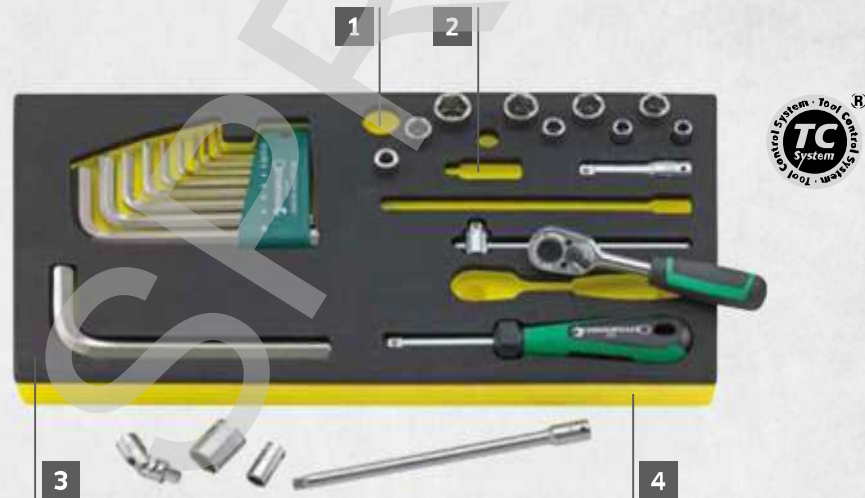
Tool Control System – built-in safety.



Initially, the TCS Tool Control System was developed by STAHLWILLE in conjunction with British Aerospace for the aerospace industry with a view to improving safety. Today, the system is appreciated by employees in the automotive industry and other fields of industry and the trades for its convincing benefits. The system guarantees a high level of organisation and security, protects high-grade, expensive tools from damage and is ideal wherever large numbers of tools are prone to “disappear” – in other words, a real value-for-money investment that will soon pay for itself.

The advantages at a glance:

- With our Tool Control System, the tools are arranged in chemical-resistant special foam inlays with milled three-dimensional cut-outs.
- The signal colour is yellow. A glance is enough to see whether all tools are in their correct places: if you can see yellow, there is something missing.



1

The milled cut-outs for each tool are individually shaped using computer technology to provide each tool with a secure place. Easy to remove thanks to additional recesses.

2

The milled cut-outs enable you to see at a glance where each tool goes. Saves time and money.

3

The inlays are chemical-resistant and extremely flexible.

4

Two-layer, two-colour plastic inlays: the upper half is black and the lower layer is yellow.



Strong, extremely tough and durable. **STAHLWILLE spanners.**

1

Conventional spanners

When force is applied to a spanner, the greatest force acts on the joint between the jaw and the shaft. Standard quality open-jaw spanners do not take this fact into consideration. In the context of normal hard work, this can lead to the tool breaking, causing considerable personal injury.

STAHLWILLE spanners

To reduce the danger of breakage, we add more material where the greatest loads are to be found and take it away from the places that are not under such stress. In this way, we are able to manufacture extremely sturdy, slim and light tools which also facilitate working in confined spaces due to their compact designs.

2

Extremely resilient, remarkably durable

- Drop-forged from high-grade special steels.
- Optimum hardening in continuous furnaces with no scale build-up or skin decarburisation.
- Gentle quenching in oil.

3

Light and easy to handle

- High resistance to bending and low weight thanks to STAHLWILLE's typical double-T profile.
- Snug-fitting, skin-friendly surfaces thanks to STAHLWILLE's rounded finish.

4

Key benefits when tightening and loosening threaded fasteners

- Tougher than any bolt thanks to the forged double hex.
- Thinner than conventional rings - facilitating work in confined spaces.
- Higher than standard nuts - prevents the spanner jamming on the nut.

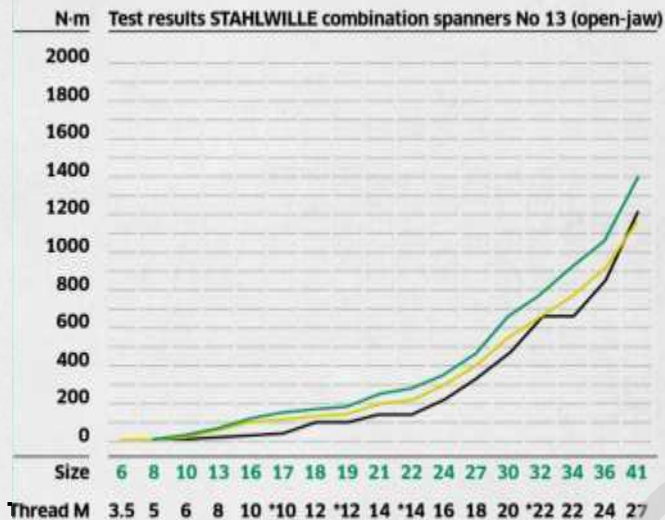
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Quality assured

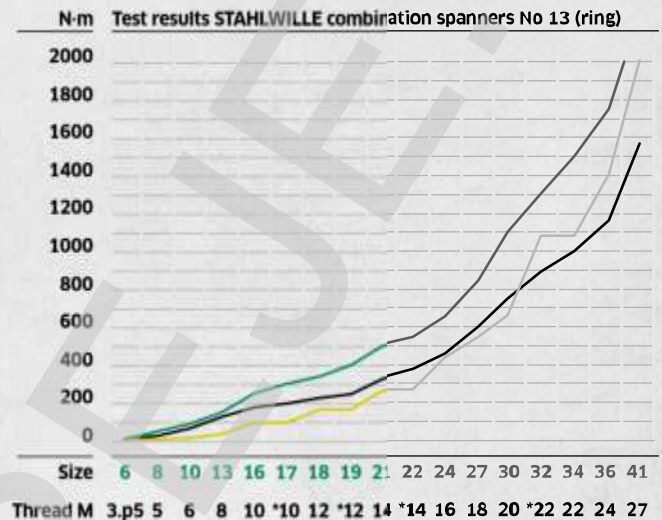
STAHLWILLE's Quality Assurance System was awarded an internationally recognised certificate in accordance with DIN ISO 9001 by the DQS (German Association for the Certification of Quality Assurance Systems).



This one - and the next one:
tailored to fit - perfect
nickel & chrome plating

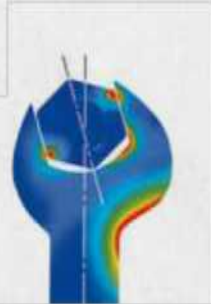


— Test results for STAHLWILLE
 — Test results to DIN 899 or ISO 1711
 — Clamping torque for 8.8 fasteners at 100% tensile yield strength ($\mu = 0.14$)
 *Reference to older fastener thread standards



— Test results for STAHLWILLE
 — Test results to DIN 899 or ISO 1711
 — Clamping torque for 12.9 fasteners at 100% tensile yield strength ($\mu = 0.14$)

1

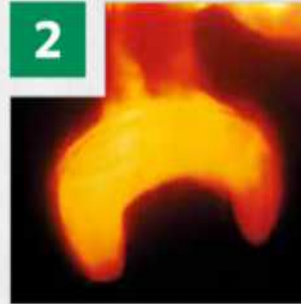


Load zones in standard-quality spanners



Load zones in spanners by STAHLWILLE

2



Open-jaw spanners in oil

3



Absolutely resistant to bending thanks to the double T profile



Snug-fitting, skin-friendly surfaces thanks to STAHLWILLE's rounded finish

4



STAHLWILLE No 8 striking face double hex box spanners are tougher, thinner and lighter



Provide guaranteed safety and efficiency. **STAHLWILLE sets of socket spanners and inserts.**

The professionals in industry and the trades are under pressure to work quickly, accurately and economically. Which is why they make heavy demands on their tools. Due to the numerous technical innovations incorporated in them, STAHLWILLE ratchets and sockets make a valuable contribution to the prevention of both mistakes and injuries.

By using ratchets, adaptors and inserts made by STAHLWILLE, professional technicians are quite simply "making sure". It does not matter whether it is a full set of tools or individual components – users can be sure they will get top-of-the-range quality every time. This is guaranteed by adherence to the closest tolerances during production and stringently applied quality assurance measures in accordance with DIN EN ISO 9001. The legendary reliability and precision of these tools is enhanced by a large number of user-friendly features.



Some sets of STAHLWILLE socket spanners are supplied in sturdy plastic cases.

- Non-slip, ergonomically manufactured 2-component handles facilitate strain-free working.
- Slim-design sockets enable access to awkward places.
- The QuickRelease system ensures full control over the joint between the ratchet, the adaptors and the sockets.
- Sculpted chemical-resistant cut-outs in special PE foam inlays prevent tools rattling and sliding around.



1

Ergonomically designed 2-component handle made of impact-resistant, skydrol resistant plastic.

2

All metal parts are made of high-grade steel (Chrome Alloy Steel, chrome plated).

3

Firm seating and yet easy release of sockets and adaptors.

4

Wear parts can be easily replaced using sets of spares for sockets.

5

Separate pawl to switch from clockwise to anti-clockwise.



Safety advantage 1

STAHLWILLE QuickRelease system

The problem: imagine what happens if a tool falls into an inaccessible place during repair or overhaul work.

The consequences: arduous, costly search and recovery, possibly involving disassembly of an aeroengine or machine.

The solution: the safety lock built into the QuickRelease system prevents damage to workpieces and guarantees secure, rapid connection of all individual components to form a single combined unit. Nothing can get lost because it is not possible to inadvertently release a tool. To release a tool, it is first necessary to press the release button deliberately. Even if you have oily or greasy hands, attaching and separating the individual components is so simple it noticeably smoothes your workflows.



Safety advantage 2

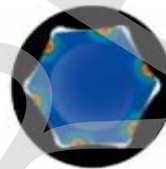
STAHLWILLE AS-Drive

The problem: removing heavily corroded or thermally set fasteners requires the application of considerable force. The socket slips off the head of the fastener.

The consequences: uncontrolled movements cause injuries and damage to both the workpiece and the tools.

The solution: STAHLWILLE sockets are equipped with the AS Drive* profile. This permits high transmission of forces to the heads of nuts and bolts without damaging them. The risk of injury is minimised and the corners of the fastener heads and nuts are no longer damaged.

*AS-Drive = Anti-Slip-Drive



Safety advantage 3

STAHLWILLE HPQ*-inserts

The problem: although there is hardly enough room to move, you still have to apply considerable torque to loosen a stubborn threaded fasteners.

The consequences: many of the sockets available are useless simply because their wall thickness makes them impracticable in awkward places.

The solution: STAHLWILLE HPQ*-sockets are manufactured from selected tough steel alloys. These sockets will not slip off the head of the fastener, nor will they stretch when subjected to heavy loads. Their extremely thin walls and unbelievably high load capacity are simply exemplary. HPQ*-sockets are free of cadmium and are therefore suitable for use on titanium alloy parts and titanium fasteners as used e.g. in the aerospace industry, where safety is a crucial factor. They meet these aerospace standards: E DIN EN 3709, E DIN EN 3710, SAE AS 954-E, S.B.A.C. AS 40505/40606, MS 33787, MIL-W-8982.

* = High Performance Quality



Safety advantage 4

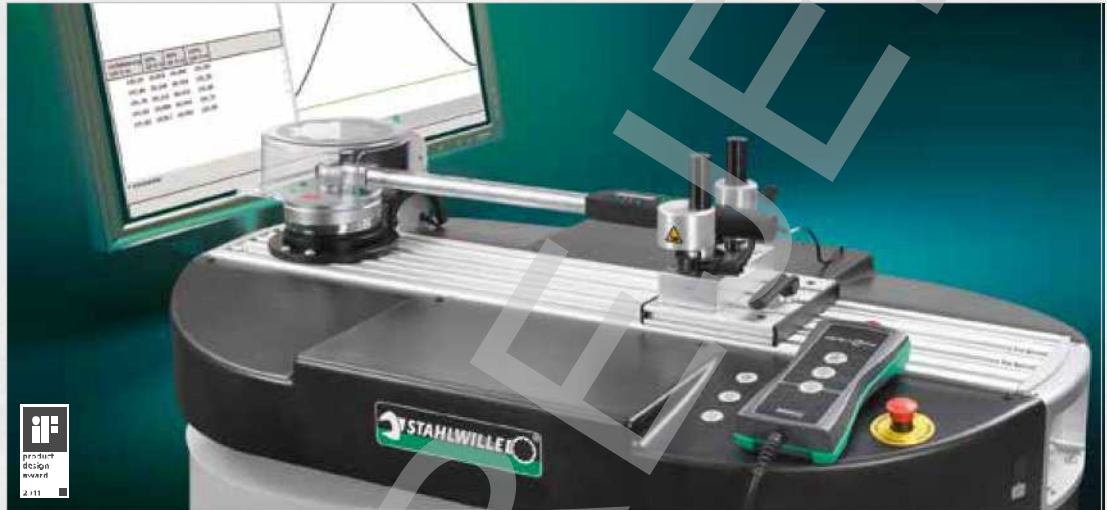
Fine-tooth ratchets without screws or rivets



STAHLWILLE fine-tooth ratchets 415QR N and 435QR N feature a low-maintenance, easy-to-care-for construction due to their screw and rivet-free construction (FOD).



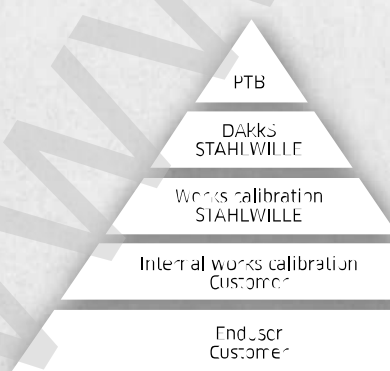
Audited. Documented. Certified. **STAHLWILLE DAKKS calibration laboratory.**



You can ensure controlled tightening, record the results of tightening processes, monitor torque tools.

STAHLWILLE's DAKKS calibration laboratory for torque is accredited by the German Accreditation Body in accordance with DIN EN ISO/IEC 17025: 2005. Which means the specific requirements listed in Technical Specification ISO/TS 16949 relating to testing laboratories are met.

The transfer torque wrenches and torque transducers in use at STAHLWILLE's DAKKS calibration laboratory are subject to regular examination by the German Federal Physics Institute (PTB) in Braunschweig. The accuracy of the torque wrenches must be proved in a series of steps and these must be traceable. Only in this way can the reliability of the readings be guaranteed. During the first stage, the end-user checks the accuracy of the torque tools in-house using suitable calibrated testing equipment. At the next stage, this test equipment is checked in STAHLWILLE's DAKKS calibrating laboratory. This accreditation by the German Accreditation Body (DAKKS) in accordance with DIN EN ISO/IEC 17025: 2005 guarantees the direct link between the measuring equipment and the national standard as laid down in DIN EN ISO 9001: 2008.



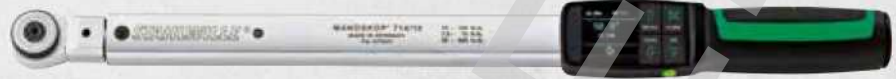
Relationship between the national standard and the equipment





Accurate. Reliable. Safe.

STAHLWILLE torque tools, torque testers.



Quick and easy administration
via SENSOMASTER®.



A wide range of insert tools in
both metric and imperial sizes.

Interchangeable transducers

The measuring range of the torque tester can be extended flexibly simply by changing the transducer for one with a different range.



Our tool solutions.

As individual as your needs.

In work environments where processes are tightly integrated and deadlines are even tighter, it is crucial that every tool has its own place and everything is where you expect to find it. STAHLWILLE's Tool Control System (TCS) combines the highest levels of safety and efficiency with the reassuring feeling that none of the tools has been left in a place that could, at some point in the future, become a safety risk.

By applying our standardised analysis and optimisation processes, we can specify, develop and manufacture the tools you need and combine them, if you so wish, with products made by other well-known manufacturers to create an individual, comprehensive solution in which no tool is superfluous, no storage space wasted and there is no unnecessary weight to be transported.

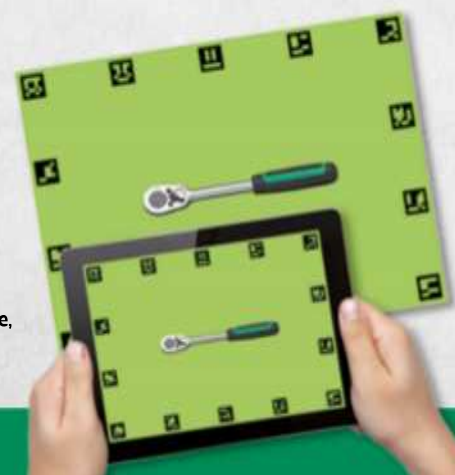
Together with our application consultant, you can use the STAHLWILLE TCS Configurator during the consultancy meeting to generate a virtual view of your choice of tools within the shortest period.

And if you do not find what you are looking for in our Configurator, we can scan your product on-site to enable you to order accurate, bespoke TCS inlays. By combining your tools with matching storage facilities – whether it is the new, highly mobile Tool Trolley made of high-grade plastic through to the iF Product Design Award winning premium Tool Trolley – you benefit in several ways: you profit from optimised protection for your tools to prevent damage, incorrect storage and loss. Applying this high standard of work process organisation offers you noticeably improved process quality with a corresponding contribution to increased productivity within your company.

And what happens if your processes change? It is a simple matter for us to modify the tool positions and the tool compilation to take account of your changing requirements. And to make sure that not a single detail is overlooked in the process, we apply our guaranteed standardised steps for continual improvement.



Our application consultant will scan your specific products on-site to produce accurate, individual bespoke solutions.



1

Efficient inventory compilation with no obligation to buy

- By experienced sales staff
- Jointly with you
- Personally on-site


2

We create a tooling solution

- We select the required tools
- We take your individual special-case solutions into account
- We define the TCS design and storage concept


3

Delivery & support

- Delivery to schedule
- Comprehensive documentation
- Advice and after-sales service



Continuous improvement



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