

The Future of Chinese and Taiwanese Fastener Industry

by Zhon-Wen Peng / 彭宗文

两岸紧固件行业的未来

An Outline of the Fastener Industry

It has been a really long history for the fastener industry. Its production of low-to-high levels of products can be processed through the traditional handiwork and the high-end automation; in mass production, on the other hand, it includes mainly low-to-medium products. It is indispensable for every industry and is closely connected to human life. Compared to other industries, the fastener industry is not at a very large scale, which is particularly a feature of this industry. However, it has become a growing industry with a complex array of products.

In terms of the global fastener production, it is mainly concentrated in Asian countries, especially China and Taiwan, while the production of highly technical products with high added values are mostly in Western countries, which shows an **imbalanced distribution**. Such a situation has lasted for several years, marking the origin of technical innovation and the monopoly of technology. The gradual evolution from the mass production of fasteners to becoming major fastener export origins around the world is a big step for China, Taiwan, and other developing countries. However, **such a long term imbalance is not normal**. Nevertheless, the Western countries are still “not willing” to see the prosperous development of these countries in low-to-medium levels, not to mention their getting into the higher ones, which can be perceived through lots of protective measures against the fastener imports from China during these years. The initiative was due to their trying to retain the dominance in the market. This is how the current global fastener industry is organized.

Factors for the Technical Development of the Fastener Industry

Basic theories, technical applications, products, and manufacturing technology are all major factors for the development of the fastener industry.

a. Technical innovation of fasteners must rely on basic theories and technology

Fasteners are basically for “fastening”. Riveting and thread engagement are both the primary fastening ways at present, especially thread engagement. Thread engagement is a very complicated way of fastening and is still being researched. Theories and applications have been systematically established (VDI 2230) in Europe since mid 20th

一、紧固件行业的基本格局

紧固件行业是古老的行业；其生产方式从原始手工到高度自动化并存；其低、中、高档产品并存，量则以低、中档为主；它为所有工业不可或缺、与人类生活密切相关；在工业界，其总体规模有限。这些是本行业的基本特点。

而现在，它已成为一个产品琳琅满目、总体蒸蒸日上行业。

但在全球，其产量主要集中于亚洲，特别是中国大陆、台湾地区。而技术、高附加值产品、高技术装备则集中出自西方，呈现出一种**扭曲的分布状态**。此种状态已持续多年，它标示出技术创新的源头及其对技术的垄断。中国大陆、台湾地区以及各发展中国家及地区的紧固件行业从入门到大量制造紧固件，并逐步成为面向全球出口供应紧固件的主要地区，是一种巨大的进步。然而，这种**长期扭曲并非正常**。即使如此，西方仍没有“心甘情愿”地让其在低、中档领域随意发展，遑论转轨高档领域了，近些年对中国大陆紧固件出口的频繁贸易制裁就是明证，根本动因是它们力图保持控制。

这是当今全球紧固件行业的基本格局。

二、紧固件行业的技术发展要素

基础理论与应用技术、产品、制造技术与装备为紧固件行业技术发展的三个基本要素。

1. 紧固件技术创新离不开基础性理论与技术

紧固件的根本功能是“连接”。铆接和螺栓（螺纹连接）是迄今为止最主要的连接方式，且螺栓一直为其主流。螺栓是一种复杂的连接方式，其机理至今仍在被探索、研究中，而涉及它的最主要的理论与应用方法，早在上世纪中期（或许更早）即由欧洲系统地完成（VDI 2230等），并已成为世

century (or even earlier) and have become the classic theories of global thread engagement. Without these theories, the technology for thread engagement in the world would have been at the level decades ago. In addition, theories and applications of technical research for materials or plastic forming have consolidated the base for manufacturing cold formed fasteners widely used. Similarly, without these basic technology, it would be impossible for the fastener industry to reach the current manufacturing level with high efficiency, quick speed, and automation. **These theories and technology offer indispensable guidance for the innovation of fasteners, manufacturing technology, and equipment.** However, any technical theory can be further improved, and so do those for fasteners.

b. Innovation of fasteners is determined by demand

There are several types of fasteners to satisfy the demand of industries. Although they are really tiny, they play an irremovable and must-have role. It greatly depends on the continuous innovation of products in the industry; otherwise, only general screws and nuts can be used in the world. It can be easily seen that products with certain features are continuously developed, though the types of fasteners have been too many to be listed, which then resulted in the vitality of the current fastener industry, and which also represents that the fastener industry will never see its end. Obviously, **if there is innovation in the industry, there comes forth the new demand, and vice versa.**

c. Coexistence of products, techniques, and facilities is an important feature of the fastener industry

Generally, design and innovation of any mechanical product require the assistance of techniques and facilities, namely craftsmanship. Different from most mechanical products produced with mature techniques and facilities, **design of fasteners cannot be processed separately without techniques and facilities** due to the requirement for mass production and speedy manufacturing. In some cases, the mass production of fasteners is impossible without certain techniques and facilities. Or, in some other cases, some products can only be produced with certain techniques and facilities. Most of the current fastener manufacturing cannot be without the assistance of cold forging and high-speed cold forging facilities, which has formed a relationship of coexistence among R&D and facilities. This relationship is a key feature of the fastener industry.

Another coexistence is shown among techniques and facilities. More sophisticated cold forming techniques and higher level of cold formers with more stages can be one of the examples. **If the fastener forming technology cannot be fully handled, a practical fastener manufacturing facility cannot be created, and vice versa.** Accordingly, ways for manufacturing fasteners can be continuously updated and fastener



界螺接技术理论的经典。假如没有这些理论,世界螺接技术仍将在几十年前的水准徘徊。此外,材料、塑性成型等理论及技术的研究应用,为如今广泛应用的以冷成型为主的紧固件制造奠定了坚实基础,同样,没有这些基础技术,紧固件行业欲达到今天这样高效、高速、高度自动化的制造水准,也几乎是不可能的。这些**基础性理论与技术,为紧固件产品、制造技术与装备的创新提供了不可或缺的引导或指导作用。**但是,任何技术理论都不可能“发展到顶”,不可能停滞不前,紧固件的基础性理论与技术也必定还会有新的突破。

2. 需求决定紧固件产品创新

现在紧固件产品可谓“繁花似锦”,在满足各工业行业种种色色需求上,虽只是小小的配角,却扮演着一种无法被割舍甚至被依赖的角色。这有赖于行业在产品创新上持续不断的努力,否则,世界将总是停留在普通螺钉、螺母时代。可以发现,尽管紧固件产品的花色、品种已经多到难以计数,然而,具有某些新功能的产品仍在不断涌现,正是这种无穷的趋势,造就了今天世界紧固件行业总体的繁荣,也预示这个行业将是一个永不会衰落的行业。不言而喻,**只要有工业的创新,就会有对紧固件的新需求,只要有新的需求,就必有紧固件产品的创新。**

3. 产品与工艺及装备的共生现象是紧固件行业的重要特点

一般而言,任何机械产品的设计与创新,都离不开以什么方法、用什么装备来制造,即所谓设计的“工艺性”。而与大多数机械产品主要利用已成熟的方法和装备来制造不同,紧固件产品必须极大量、高速制造的特点,使得其**产品设计往往与方法(工艺)和装备密不可分。**甚至如果没有某种方法与装备,某类紧固件的大量制造根本就没有可能,反之,或者某种方法与装备就是专为某类产品制造而研发。现在,紧固件的制造绝大多数都已离不开冷镦工艺与高速度的冷镦装备,产品研发与方法装备之间实际已经形成一种共生关系,谁也离不开谁。这种产品与工艺及装备的共生现象,是紧固件行业的重要特点。

manufacturing facilities with more functions can be continuously developed.

3. Driving Forces and Concerns in the Fastener Industry

a. Many driving forces exist to push the development of the fastener industry but with different concerns

Although the global fastener industry continues to find its balance in ups and downs, its general prosperity and continuous technological improvement leave nothing to be doubted. What force made the prosperity and progress? The author thinks that “benefit” would have been the important factor while ways for seeking “benefits” might have been distinguished as for visual benefits and for expected results in the future.

Seeking benefits is to gain economic benefits. In a world still dominated by market economies, it is a matter of course.

However, people who see the visual benefits only care about the short-term benefits. They only care if they can get the benefit in a short time. Many fastener industries are of this kind. As the entry barrier to low and medium levels of fasteners is rather low, this trend is more prevalent in China. They are trying hard to look for cheap labor force, low costs, etc. Over the past few years, developed countries, Taiwan, and China have been transferring their productivity of low-to-medium levels of products to developing countries, China, and inland China respectively, in order to obtain higher economic benefits, which is also “seeking the short term benefits” and which simultaneously aroused the aggressiveness of the importing countries and industries, pushing the development of the local fastener industry. Obviously, technology owners tend not to export their high-end technology while the technology importers can only try to make profits through the increase of production, which will thus increase the total production of the global fastener products but show difficulties to importing countries in technological improvement. It is very obvious that **the active effect of seeking short term benefits is mainly demonstrated on the growth of total production** and has done little to the technological progress. **The technological development of some companies or countries may be delayed** due to their focus on short term benefits. Accordingly, seeking short term benefits is a short-sighted behavior and is the only choice for those with less technological abilities. When there is no profit to earn, they may turn to another business or be kicked out of the industry.

“Forethought planners” also go after quick benefits, but in contrast they put more focus on long-term and sustainable profits. Furthermore, they utilize quick profit as the means to earn sustainable development. One of the most significant approaches is to look for “technology”, and the point of this is to locate the ownership of a certain technology because the owner will reap long-term benefits and attain dominance.

另一种共生现象体现于方法与装备之间，越来越复杂的冷成型工艺与工位更多以及复杂程度更高的冷成型机，正体现出这种共生。若不充分掌握**紧固件成型技术，真正实用的紧固件制造装备不可能产生**，反之亦然。正因为如此，紧固件制造方法得以不断更新，专用性越来越强的紧固件装备也得以不断发展。

三、紧固件行业的发展动力与问题

1. 紧固件行业的发展不乏动力但着力点各异

尽管世界紧固件行业一直处于此消彼长的变动与不平衡之中，但在总体上繁荣且技术不断进步却是无疑的。造就这种繁荣与进步的动力何在？笔者以为，不外一个“利”字。但求“利”方式却有“逐近”与“谋远”之别。

求“利”，以获取经济利益为目的。在当今市场经济占主导地位的世界里，是无可厚非、“天经地义”的。

然而，“逐近”者看重近期利益。其投入以能否快速获利为转移，往往避开难以近期获利的投入。以逐近利为主要目的的紧固件企业比比皆是，由于低、中档紧固件门槛较低，因而这种趋势在中国大陆更盛。极力寻求低廉劳动力、费用等乃其主要方式。若干年来，发达或较发达国家（地区）向发展中国家（地区），中国台湾向大陆，大陆沿海向内地等等都在转移其低、中档产品的生产能力，以获取更高的经济利益，也是一种“逐近”。但这也同时刺激了输入国家、地区企业的积极性，带动了当地紧固件业的发展。无可讳言的是，技术拥方总是吝于其较高端技术的输出，技术输入方或有意或无奈地更关注以扩大数量来获利，从而推动了全球紧固件产品生产总量的提高，但输入地区的技术发展却是步履艰难的。显然，**逐近利趋势的积极作用主要表现于总量的增长**，对技术进步贡献有限。具体到企业、地区乃至国家，则可能因吝于难获近期利益的技术发展投入，反而**可能延误其技术的发展**。因而，单纯的追逐近利是一种短视，也是技术能力薄弱者无奈的选择，当无利可图时，或选择转行，成为行业的过客。

“谋远”者也同样追逐近利，却更看重长期、持续地获取利益。把近期利益主要作为谋求长远、持续发展的一种手段。其最重要的手段则是“求技术”，“求技术”的动因在于追求技术的拥有权，**拥有技术既可获得长远利益，又可获得支配权**。其行为是具有远见的、持续的，常选择坚守而不轻言放

Forethought planners are provident, perseverant, and do not walk away easily. Technology owners are more advantageous in technical upgrade, and such synergistic effect will reinforce the level and capability for technical development. This is the reason that companies in developed countries and regions spare no efforts in seeking new technology.

Developing countries and regions seem to have noticed the importance of technology. Over the years, Chinese fastener industry has been calling for developing high-end products and walking away from the role of low-end product maker, but it is too indulged in reaching the target to make a thorough plan. Coupled with lower technical basis, limited understanding, prevailing opportunistic actions, and other background factors, it has less confidence, determination, and motivation to see afar.

b. Self-driven Innovation is the Only Way to Avoid Monopoly

The prosperity of the global fastener industry as a whole proves that it has abundant power to drive development. The problem is the fact that in reality developing countries and regions focus on “higher volume” via mid/low-end products whereas developed countries and regions focus on “higher quality” via technology and high-end products. This results in geological difference in technology, or the so-called “technological segregation” in metallurgical term, meaning a certain region (the West) owns critical technology and others are being dominated. This phenomenon is proved by the export price gap between developed and developing regions. Actually, the fastener industry is not the only case because almost all technology driven industries in the world share the same problem. This explains that the problem is not at all impossibly caused by certain individuals or companies, but that the phenomenon is becoming a gradual and long-lasting trend fundamentally driven by “exclusive technology”, which is the universal rule of this world.

Undoubtedly, regulations of “exclusive technology” are the fair and fundamental driving power to foster technological development. However, as they protect the rights of innovators, they may also lead to technological monopoly. Although regulations of “compensated transfer” also exist to push technological transfer, multiple factors still impede this type of transaction. In reality, the fact that western countries increasingly control and monopolize technology in various industries is a common scene on a global scale. Thus, such regulations are more favorable to stronger technical competitors. Technology owners are more empowered to gain more and better technology, but they are less willing to sell their technology. It is not hard to discover that low-end and

A certain region (the West) owns critical technology and others are being dominated.

关键性技术集中为某些地区（西方）所有，其他地区则处于其掌控之中。

弃。而且，越拥有技术，越有利于提高技术，这种迭加效应，将更增强其技术发展的水准与能力。这正是发达国家、地区的企业较不吝于长远投入的根本原因。发展中国家、地区似乎已经认识到了这一点，多年来，中国大陆等地区的紧固件业界就一直在发出要“发展高端产品”、“摆脱低端地位”的呼声，但其着眼点或较多偏重于对结果的期望。鉴于技术基础薄弱、认识所限、短期行为盛行以及环境因素等等，而较少“谋远”的信心、决心与行动。

2.打破垄断的唯一出路只有自主创新

世界紧固件行业总体繁荣证明它的发展不乏动力。问题在于，在现实中，发展中国家、地区着力于“扩量”（低、中档产品），发达国家、地区则着力于“提质”（技术与高档产品），因而在技术上存在明显的地区差异，借用冶金行业术语，可称之为“技术偏析”，即关键性技术集中为某些地区（西方）所有，其他地区则处于其掌控之中。存在多年的发达与发展中地区紧固件出口价格悬殊现象，证明了这种态势。其实，在这一点上，紧固件行业并非特殊，可以说，世界上几乎所有由技术推动的行业，无不如此。这种具有普遍性的局面说明，它并非也不可能由某些个人或企业刻意造成，而是一种趋势或潮流。形成这样局面的过程是逐步而长期的，其根本因素正是“技术专有”这种世界公认的规则。

毫无疑问，“技术专有”规则是促进技术发展的根本动力，而且它在形式上也是公平的、一视同仁的，是利于技术发展的规则。然而，它在保护技术创新者权益的同时，也可能导致技术垄断。虽也有“有偿转让”规则以推进技术的转移，但种种因素会阻碍这种买卖。实际上，全球在紧固件以及其他很多工业行业，这种以西方为主的垄断与控制已十分普遍，而且还在不断强化之中。于是，这种规则更有利于技术上的强者，拥有技术者更有能力发展获得更多、更好的技术，且吝于出售。太多事实表明，可以买到的，总是低端的、过时的技术。技术专有规则对于人类之利确实远大于弊，但**钱并不能买到一切技术**。因此，在“技术专有”的现实环境之下，冀图通过“买技术”以实现技术进步打破垄断是此路不通的，**真正的出路唯有自力创新**。



outdated technology is always the most commonly seen and available on the market. Regulations of exclusive technology do bring mankind more benefits than drawbacks, but they bring to the downside that **money alone cannot purchase all technology**. Consequently, under the current environment, it is not feasible to avoid monopoly by “purchasing technology” to improve the technical level. Self-driven innovation is the only way out of this dilemma.

4. Future of the Fastener Industry in Taiwan and China

a. Taiwanese and Chinese fastener industries experience different development but share similar approaches

Due to social and historical background, Taiwan precedes China in developing the fastener industry with higher performance as a whole. Taiwan mainly relies on introducing technology from overseas countries. Because of smaller domestic demand, Taiwan must heavily depend on export. It accumulates plentiful experience in production and management, and shows undeniable existence to the world. However, introducing overseas technology also leads to difficulties in its development for high-end products, technology, and equipment. A solid proof is that, over the years, Taiwan mainly exports mid to low end products and pricing has been low.

For the last 30 years, Chinese fastener industry has been growing rapidly with substantial improvement in the product level. Its products mainly imitate Western designs, and its manufacturing technology is introduced from Western countries and Taiwanese production equipment. In addition, a large number of Taiwanese fastener companies established operations in China over the past 10 years, further elevating the overall technical level of Chinese industries. China currently shows much more progress in the increase of volume, which is proven by the fact that China still exports a large amount of products in spite of enormous domestic demand. China shares similarity with Taiwan in that it mainly produces and sells mid to low end products, with pricing lower than those in Taiwan. This signifies that Chinese overall performance level is lower than that of Taiwan.

The fastener industries of Taiwan and China both depend on introducing overseas technology. Product specifications are based on foreign techniques, and manufacturing technology is acquired by purchasing equipment. However, self-driven technology, products, and equipment are much less.

b. Future prospect

Taiwanese market has smaller domestic demand for fasteners, not to mention its demand for high-end products. Therefore, its domestic demand is in no way the fundamental driving force for developing high-end products and techniques. It is standing on the cross road between “mid/low end” and “high-end”. To choose one of them will depend on different judgments in the development of export markets of various industries. Switzerland, in spite of its smaller geographical size, develops its watch-making ability to it fullest. This is a typical example of focusing on exporting high-end products.

In contrast, China stands in a completely different circumstance. It has



四、两岸紧固件行业的未来

1. 两岸紧固件行业发展状况不同但其途径相似

由于环境、历史不同，台湾紧固件行业发展早于大陆，且总体水准较大陆为高，其技术来源则主要依靠引进。基于其内需很小，而势必以依靠出口为主。它积累了丰富的生产、管理经验，在较短时间内，成为全球同行不可忽视的力量。不过，以引进西方技术为主的方式，致使其向高端（产品、技术及装备）发展颇显困难，多年来其出口产品以中低档为主，而价格则一直处于较低水准即为明证。

大陆紧固件行业在近30年来，发展可谓迅猛，纵向比较，水准有大幅度提升。其产品主要仿自西方设计，制造技术主要靠引进西方以及台湾的制造装备获得，加之近十余年来大批台湾同行企业落户大陆也提高了大陆行业的总体水准。但进步主要体现于量的增长，在大陆偌大的内需之下，行业还有巨量出口，即为明证。产品档次则与台湾相似，一直以低、中档为主，且价格还在台湾之下，表明其总体水准逊于台湾。

两岸的紧固件行业，都主要依靠引进而发展，产品样式则以国外技术的为主，制造技术主要靠买设备获得，而真正自主创新的技术、产品、装备寥寥。

2. 两岸紧固件行业的未来

台湾的紧固件内需很小，其高端产品需求必然更小，因而内需不可能成为发展高端产品以及技术的基本动力。在“保持低中档产品为主格局并做得更好”或“向高端产品及技术发展”二者间偏重何者，取决于对行业的发展取向以及对出口市场、自身能力

enormous domestic demand for low-to-high end products. It is under pressure from the demand and is eager to get rid of being controlled. It is inevitable that China has to level up low-to-mid end products, in the meantime developing high-end products and technology. This is also a trend for the industries and the political environment. The problem is how to make the first move.

c. Suggestions on technical upgrade

As I have years of experience in the fastener industry, I would like to share a few ideas.

1. Leading corporations and entrepreneurs in both Taiwan and China having visions and wishing to avoid monopoly should be the main driving force for technical innovation (in products, production, and equipment). This is the very reason that Western countries are able to succeed.
2. Basic technical theories are the foundation for innovating products, production and equipment. If one cannot harness this foundation, he or she can only imitate others. Both Taiwan and China should move forward without underestimating themselves.
3. Creation of innovative fasteners can only be expected from the demand for innovation of the entire products as a whole, which are still monopolized by Western countries and strangled by introduced technology. Therefore, both Taiwan and (especially) China must turn to develop "self-owned brands" and "self-designs". Without them, the innovation of products will lose support from the market.

的判断,二者都有其合理性。小小的瑞士把钟表做到极致,就是一个以高端产品出口为主的成功例子。

大陆的情况则完全不同,其对低、中、高端产品的内需都十分巨大,存在需求压力和摆脱控制的强烈愿望。无疑需在巩固提高低中产品水准同时,发展高端产品与技术,行业愿望与政策环境都会倾向如此,问题是如何迈出这一步。

3.关于两岸紧固件行业面对技术升级的几点思考

作为置身本行业多年的过来者,愿就此以一点拙见供同行参酌。


- (1) 两岸同行具有远见、渴望摆脱被控制局面的**主力企业和企业家,应当成为技术(产品、制造技术与装备)创新的主要推动力**,这是西方同行得以成功的根本原因。
- (2) **基础性技术理论是产品、制造技术与装备创新的基础**。不能掌握并创新这一基础,难以进行产品、制造技术和装备的创新,或只能跟人学步。两岸同行亦当有所作为,无须自愧不如。
- (3) 紧固件产品创新只能伴随整机产品的创新需求而产生。在世界整机创新主要由西

Yushung Metal Products Co., Ltd


宇声金属制品有限公司


● 100% raw materials purchased from ISO certified manufacturers ● 360 days shelf life of the products ● All logistics services provided


Bronze Fastener Manufacturing Expert



Material: Silicon Bronze, Phosphor Bronze, Aluminium Bronze, Brass, Monel, Copper, etc.









Main Products: Wood Screw, Machine Screw, Nail, Bolt, Stud, Washer, Nut, Threaded Rod.

YUSHUNG
Metal 1995

Address: Sanshan Indl Zone, Nanhai, Foshan, Guangdong, 528251, China
Tel: 86-757-81813165 Fax: 86-757-81285289
Email: info@yushung.com Web: www.yushung.com

4. Fastener innovation should be integrated with innovation of the entire products, and it can precede or synchronize with the development of innovation of the entire products. **Fastener companies should become the main force for product innovation and fully cooperate with companies that manufacture the entire products.** Chinese industries manufacturing entire products are undergoing the initial stage of self-driven innovation. For instance, Chinese automobile industry, which uses a large amount of high-end fasteners, is also undergoing this stage. Accordingly, now is the time for both Taiwan and China to develop products and innovative techniques.
5. Technical innovation of the fastener industry should combine with the cooperation with the academia, and the industry should look for support from the government. The industry should cooperate in separate divisions, and share results under proper market conditions to avoid repetition. It should also make short-term and long-term plans corresponding to industrial requirements. By the way, industry re-arrangement and its cooperation with the academia are also effective examples for Japanese fastener industry.
6. Taiwan and China have been cooperating with each other since before, and Taiwan is more advantageous in technical innovation and experience, so **Taiwan and China should work with each other to open up a new prosperous future.** □

方垄断的情况下,在两岸现生产的以引进技术为主的整机中,所用高端、重要紧固件产品同样已为引进技术控制而难以涉足。因而,中国大陆与台湾,特别是大陆,有赖于整机业整机的自主创新,即所谓发展整机的“自主品牌”、“自主设计”,无此,紧固件产品创新将失去市场支撑而成空谈。

- (4) 紧固件产品创新需与整机创新需求密切结合。宜超前或与整机创新同步开展, **紧固件企业应成为产品创新主力并于整机企业充分合作。**当下,正是大陆整机行业自主创新的起步阶段(如紧固件高端产品应用量极大的汽车行业),是大陆也是台湾紧固件行业开展产品、技术创新切入的良机。
- (5) **紧固件行业技术创新需与学、研院所合作;应努力争取、取得政府的政策支持;**应实行市场条件下的行业分工合作与成果共用,以规避重复;应有行业性的、持之以恒的远期近期结合的规划、计画(产、学、研结合以及行业规划、计画是日本同行的可以借鉴的有效经验)。
- (6) 两岸同行已有若干合作体验,而总体上台湾在技术创新理念、经验等方面又优于大陆,因而, **两岸同行在技术创新方面有必要放眼长远、互补长短、形成合力,打开联合创新的共赢局面,创造共同繁荣的未来。** □



M16-IM15001W
16 V Cordless Impact Wrench
150 Nm (1327in-lbs)

M16-RG4801
16 V Cordless Rivet Gun
1 sec (approx.)
11000N(stroke)

General Use ● In Production Line ○

	2.4 3/32"	3.2 1/8"	4.0 5/32"	4.8 3/16"
Aluminium/Steel	●	●	●	●
All Steel	●	●	●	●
Stainless/Steel	●	●	●	●
All Stainless	●	●	●	●

MAX20
LITHIUM ION
M20-IM18001W
Cordless Impact Wrench

180 Nm
(1600in-lbs)

6.0Ah



Web: www.heracles-tools.com
 E-mail: info@heracles-tools.com
 Skype: xanaduking
 Mobile: +86-186 1613 0881


www.facebook.com/heracles.tools