



We change the world with Nuts

Company Name : IMJIN ST

Exclusive USA Distributor : PanAmerica Supply, Inc.



A challenge to the new world,
starts with Im-Jin ST Co., Ltd.

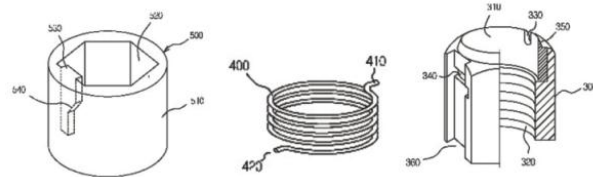
IMJINST



1. Technology Description - What is SAPER LOCK?

Saper Lock is a special reusable self-locking loose-free Nut!!!

By taking advantage of springs inserted in locknuts, we developed a superior self-locking and loose-free nut! It can be reused as many times as needed.

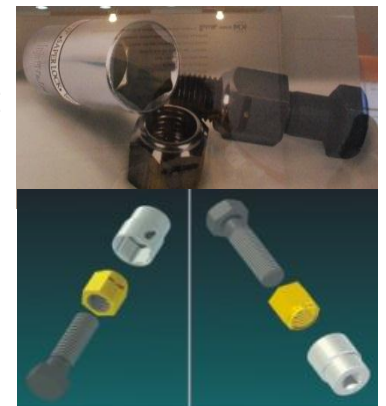


Design Principle : By inserting springs in the nuts.

When you fasten the nuts, the thread and the frictional direction of the spring function will be in positive direction and it is very easy to fasten it.

When you unscrew the nuts, the friction of the spring with the bolts doesn't allow loosening. Clamping force is strengthened .

To undo the nuts, you can use normal tools available anywhere in the market instead of special tool (See Picture on Right).



Easy! Safe! Simple!

1.2. Advantage of Saperlock



Worldwide Patent registered



😊 ANTI-Loose Locknuts

😊 Never Loose!

😊 Simple & Easy

😊 No harm to bolt!

Reusable 😊

Cost saving 😊

NAS-3350 Vibration Test 😊

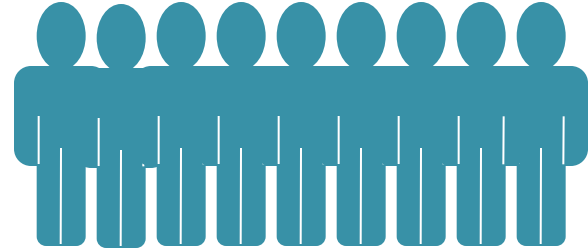
NET (New Excellent Technology) 😊

Easy to understand all our advantages!! Simple but strong!

1.3. COST-Saving effect



VS.



😊 Higher Cost? We say it is Economical and Cost saving!!!

When you use conventional nuts, it will have high labor cost for future maintenance and inspection work. Imagine the cost of dealing with all complaints due to the loosening of nuts.



We guarantee cost-saving and safety effect

1.4. Product Standard

-Approved by KS Standard

-Material : SUS, S45C, SCM415, SCM435 and others

-Plating : Zinc plate, Applied plate, Nickel plate

-Size : M6~M42

Product standard



Products	Size	Pitch	h	H	B	C
Saper Lock	M6	1 0.75	5.0	5.1	10.0	11.5
	M7	1 0.75	5.5	5.1	11.0	12.7
	M8	1.25 1	6.5	6.5	13.0	15.0
	M10	1.5 1.25	8.0	7.6	17.0	19.6
	M12	1.75 1.25	10.0	9.5	19.0	21.9
	M14	2 1.5	11.0	11.5	22.0	25.4
	M16	2 1.5	13.0	11.5	24.0	27.7
	M18	2.5 1.5	15.0	13.5	27.0	31.2
	M20	2.5 1.5	16.0	13.5	30.0	34.6
	M22	2.5 1.5	18.0	13.5	32.0	37.0
	M24	3 2	19.0	16.5	36.0	41.6
	M27	3 2	22.0	16.5	41.0	47.3
	M30	3.5 2	24.0	19.5	46.0	53.1
	M33	3.5 2	26.0	19.5	50.0	57.7
	M36	4 3	29.0	22.5	55.0	63.5
	M39	4 3	31.0	22.5	60.0	69.3
	M42	4.5 3	32.0	25.5	65.0	75.0

2. Development Status

1) Current Development status

- Fully developed and commercially available
- Customer : Korea Railroad / Doosan Infracore / POSCO

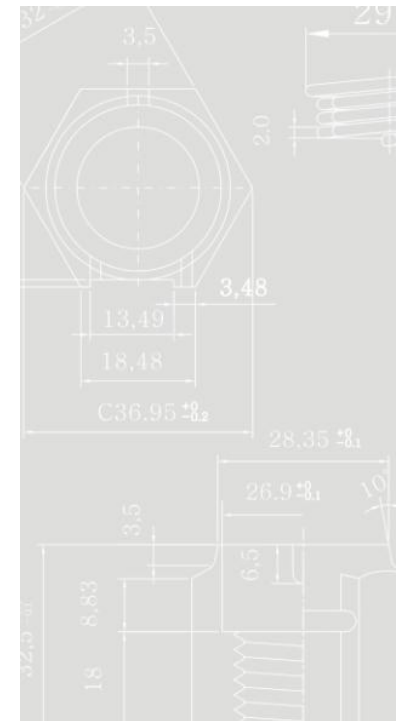
2) What next ?

- We should get prepared for different coatings (e.g. galvanizing for anti-corrosion)
- More test and certificate for further applications (e.g. Aerospace)

3) Certificate

- Vibration Test NAS3350 (US Military Standard)


Further test & certificate for off-shore, air plane, aerospace



IMJIN ST Co.,Ltd



2.1. Vibration Test : NAS3350



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Korea Institute of Materials Science

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531(상남동 66번지)
TEL.(055)280-3000
FAX. (055)280-3333
(4)쪽 중 (1 쪽)

진동충격시험 성적서


성적서번호 : 0970-0009
 의뢰업체명 : (주)임진에스티
 주 소 : 경기도 파주시 백금동 423-7
 대표자명 : 임영우
 품 명 : 풀림 방지 너트 (M22)
 시험 방법 :
 ▷ NAS 3350, 3.4.2.7 Accelerated Vibration
 ▷ MIL-STD-1312, Test 7 Vibration

시험 결과 : 불임 성적 참조
 성적서용도 : 제출용
 비 고 : 이 시험 성적서는 용도 이외의 사용을 금하며 광고, 소송 및 기타 법적
 요건으로 사용할 수 없습니다.

확 인	작 성 자 성 명 : 이 경 희 <i>이경희</i>	승 인 자 성 명 : 이 중 오 <i>이중오</i>
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본 성적서는 의뢰자가 제출한 시험품목에 대하여 시행한 시험 성적임을 증명함.

2009. 7. 31.

한국기계연구원 재료연구소장


KIMS



Test Level (p-p) : 0.45 in (+/- 0.015)
 Acceleration Peak : 20.7063G
 Test Frequency : 30 Hz. (1,800 Cycle/min)
 Duration : 17 min. (30,600 Cycle)
 MIL-STD -1312, Test 7 Vibration Fixture use
 Tightening Torque : 745 N.m

Test completed without change of nuts

Guaranteed quality and No looseness in any circumstances

National Aerospace Standard – the world's most stringent durability test !!!

3. IP Status

1) Patent registered in Korea

- Patent filed and registered in the USA, China, Korea, Europe and PCT in other countries worldwide, valid for one year.

2) Trademark

- Brand Saperlock is registered as trade mark in Korea
- We should prepare for the trade mark in another countries, too

Certificate : NET (New Excellent Technology)

IP : 5 Domestic, 3 International Patents



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Intellectual Properties Under Protection

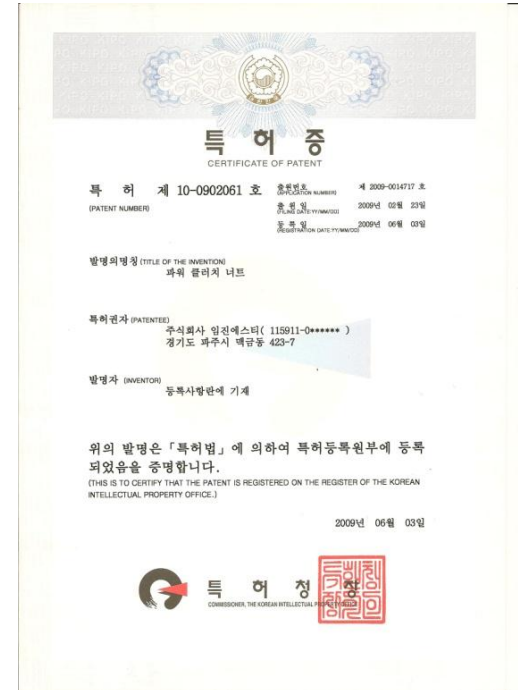
3.1. Certificate



ISO 9001:2008



KSA-Approval(Quality Management)



Patent

Guaranteed Quality / Worldwide patent protection will be good back-up for the sales

4. Markets

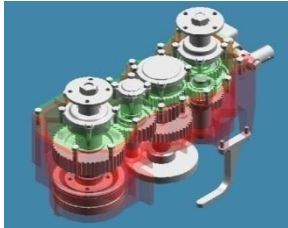
Fastener market segment breakdown in the United States – quoted from Quicklook report

YEAR	2008	2012	2017
U.S.Total	\$11,800 M	\$13,200 M	\$15,000 M
OEM	9,000M	10,200M	11,500M
Motor Vehicles	3,000M	3,350M	3,800M
Electrical/Electronics	970M	1,050M	1,170M
Fabricated Metal Product	1,170M	1,310M	1,440M
Aerospace	1,580M	1,900M	2,150M
All other OEM	750M	860M	990M
MRO/Contrction/Other	2,800M	3,000M	3,500M

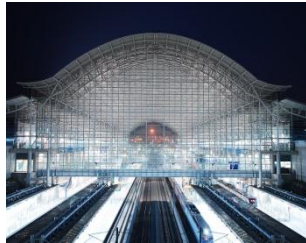
\$80.5 B in global fastener consumption in 2014 in consideration of growth rate

5. Market interest - Application

Automotive



Rail, Tower
Bridge



Train,
Construction
Equipment



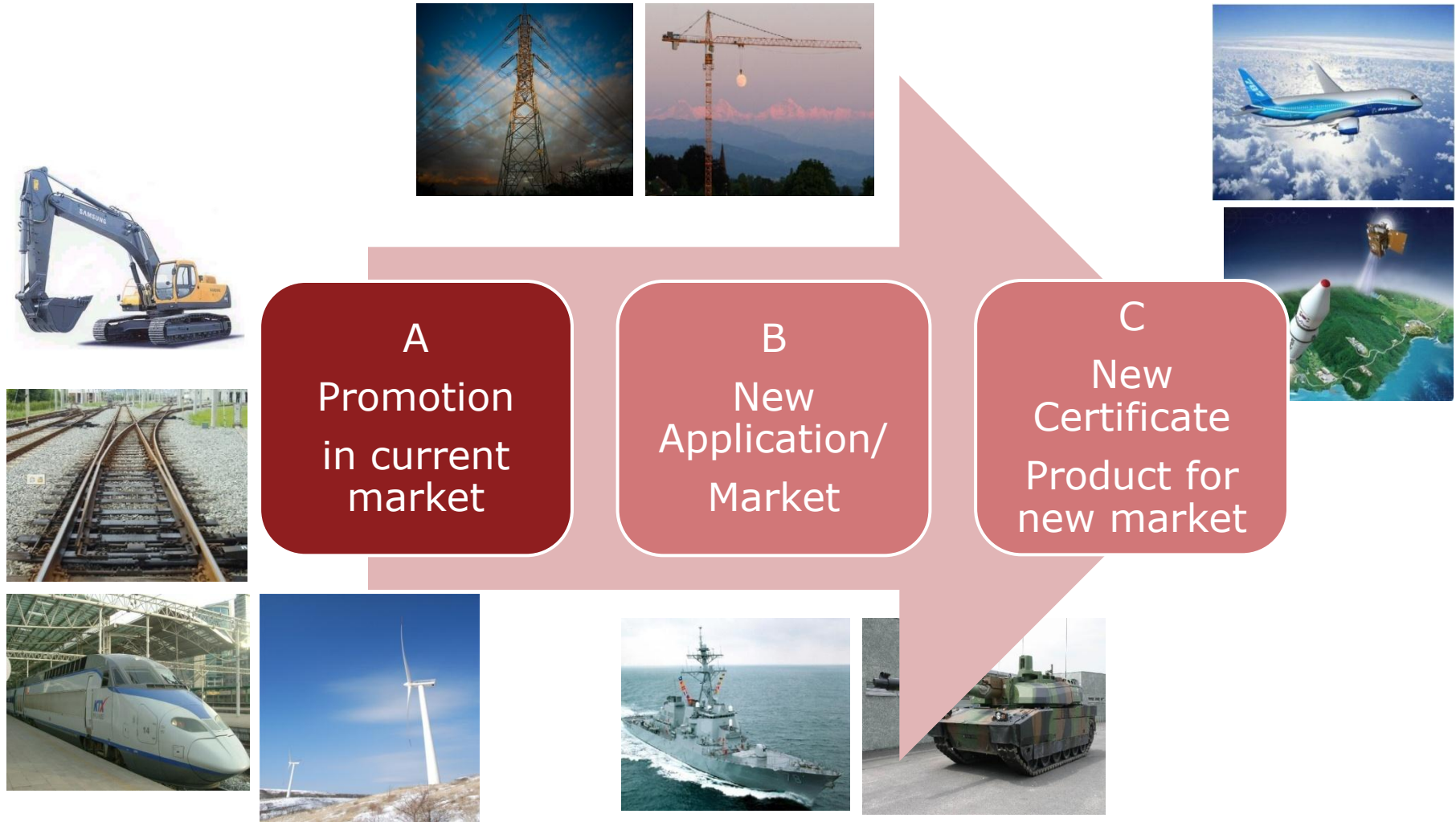
Machinery



Defense
Military



5.1. Market interest – Our marketing PLAN



5.2. Marketing - Our goal of operation spec.

Function Property	Unit	Goal	World's best record (Country/Company)	Weight (%)	Objective test method
					Test name
1. Vibration Durability	hz	40	40 (Japan/Hardlock)	30	NAS 3350
2. Anti-Corrosion	hour	700	250(Japan/Hardlock)	20	KS R9144
3. Workability	%	30	100(Japan/Hardlock)	20	KS R9144
4. Reuseable	number	30	5(Japan/Hardlock)	20	KS R9144
5. Stability	torque	450	440(Japan/Hardlock)	10	KS R9144

How to verify test result

- Test result of Korea Institute of Machinery & Materials (KIMM)
- Test result of Korea Testing Certification (KTC)



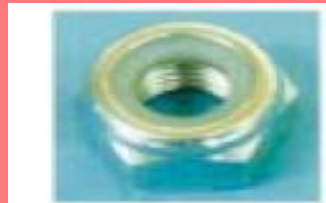
6. Loose-free nuts in the world



(a) Flange nut



All countries



(c) Nylon insert nut



(h) Plate spring washer



All countries



(e) Steel plate insert nut



(b) Double nuts



All countries



(j-2) Eccentric nut (tail)



(d) Slotted nut



(g) Toothed washer



All countries

6.1. Competition

■ Hard Lock : Japan

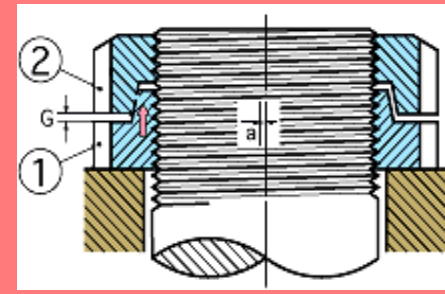
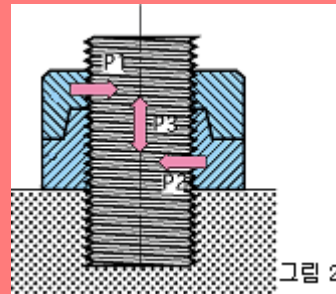
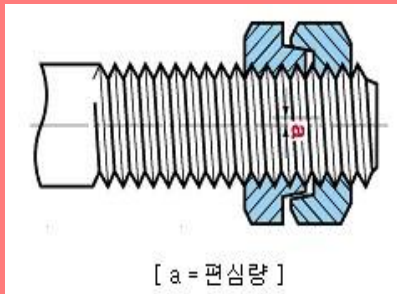
Technology : Wedges effect with double nuts /



Long fastening time



Damage to the bolt due to stress



■ Vib Lock : Sweden

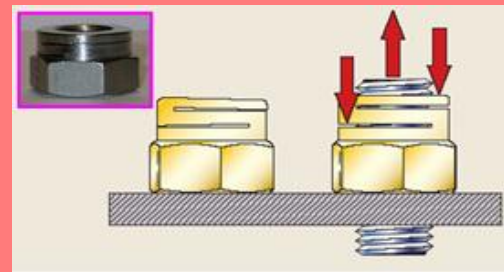
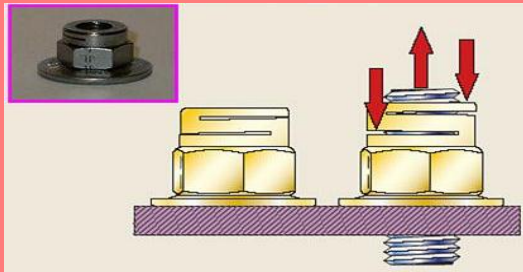
Technology : Slots on the upper side of the nuts hold the bolt thread and thread of the bolts are pushing the thread of nuts.



High price



Too thin slot thickness



7.1. About company

Mission

We change the world with Nuts

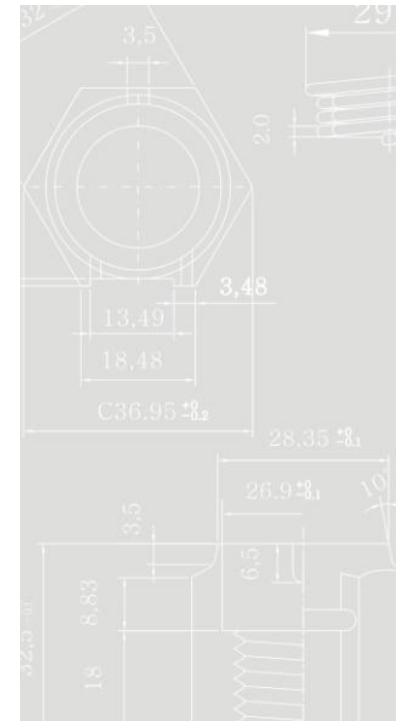
Strategy

Nuts are not Peanuts anymore.

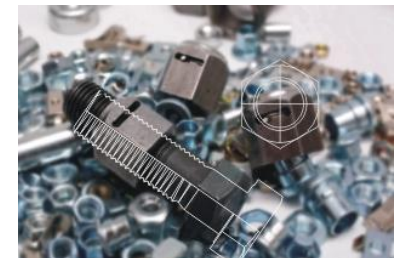
This tiny product could save the customer a fortune, if appropriately used.

Our goal is to supply HIGH-Quality Loose-free nuts and high-end Connecting technology to our customer and contribute to financial profit by maximizing cost-saving effect.

We have 39 years of experience in production



IMJIN ST Co.,Ltd



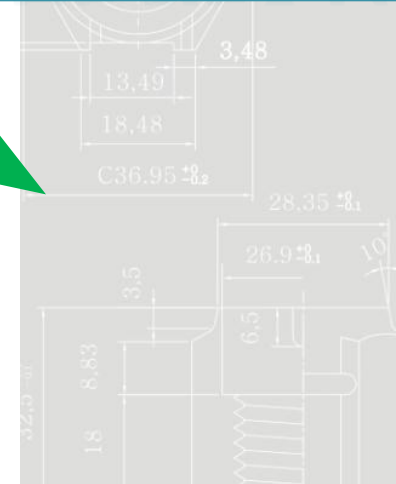
7.2. About company : Brief history - Milestone

2009 Sep : Establishment of R&D
2010 Mar : Certificate of Venture company
2010 Apr : NET awarded
2010 Dec : Bronze medal award by Invention Fair
2010 Dec : Certificate of New Technology for Railroad
**2011 Mar : Agreement with Korea Rail
Network Authority**
2011 Apr : Assigned superior product for procurement
by Korean government

2008 Apr : Factory move and expansion with
new company name IMJIN ST,,
2009 Apr : Certified manufacturer in fields of
components and materials.

1972 Oct : Establishment of company IMJIN / First manufacturer of square nut in Korea
1978 Jul : Enterprise development award by The small and Medium Business Administration

WHAT WILL
BE THE NEXT?.



IMJIN ST Co.,Ltd

