



PRECISION

AUTO ENGINEERS

"A JOURNEY OF ENGINEERING TO PERFECTION SINCE 1963"



SPECIALISED IN BIGGER DIAMETERS & LONGER LENGTHS

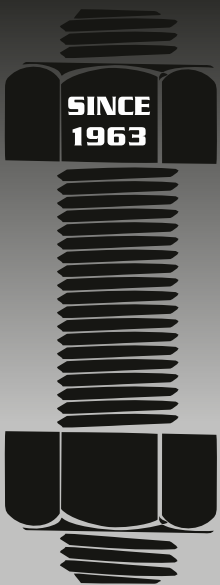


B7 STUD BOLTS
HEAVY HEX BOLTS

100 PERCENT
TRACEABILITY



PETROCHEMICAL
FASTENERS



Stud Bolts are mainly used in Oil & Gas sector and follows ASTM A193, for high temperature, high pressure service and A320 for low temperature service.

BOLTING & NUT GRADES

ASTM A193	B6	B8M class 1 & 2	ASTM A194	2H	8M
	B7	B8T class 1 & 2		2HM	8A
	B7M	B8C		4	8MA
	B8 class 1 & 2			7	8T
ASTM A320	L7	L43	ASTM A453	8	8C
	L7M			660A	660D
ASTM A453	660A	660D		660B	
	660B				

DIAMETER & LENGTH CAPACITY :

4 mm to 170 mm for BOLTS & 200 mm for STUDS
Length upto 3.5 Meters

CHEMICAL COMPOSITION OF FEW GRADES :

	ASTM A193 B7/B7M		ASTM A320 L7/L7M		ASTM A193 B16	
	Range	Variation Over/Under	Range	Variation Over/Under	Range	Variation Over/Under
Carbon	0.37 - 0.49	0.02	0.38 - 0.48	0.02	0.36 - 0.47	0.02
Manganese	0.65 - 1.10	0.04	0.75 - 1.00	0.04	0.45 - 0.70	0.03
Phosphorus	0.035 max	0.005 over	0.035 max	0.005 over	0.035 max	0.005 over
Sulfur	0.040 max	0.005 over	0.040 max	0.005 over	0.040 max	0.005 over
Silicon	0.15 - 0.35	0.02	0.15 - 0.35	0.02	0.15 - 0.35	0.02
Chromium	0.75 - 1.20	0.05	0.80 - 1.10	0.05	0.80 - 1.15	0.05
Molybdenum	0.15 - 0.25	0.02	0.15 - 0.25	0.02	0.50 - 0.65	0.03
Vanadium	-	-	-	-	0.25 - 0.35	0.03
Aluminium	-	-	-	-	0.015 max	-
Nickel	-	-	-	-	-	-
	ASTM A193 B6		ASTM A193 B8 CL1 & CL2		ASTM A193 B8M CL1 & CL2	
	Range	Variation Over/Under	Range	Variation Over/Under	Range	Variation Over/Under
Carbon	0.15 max	0.01 over	0.08 max	0.01 over	0.08 max	0.01 over
Manganese	1.00 max	0.03 over	2.00 max	0.04 over	2.00 max	0.04 over
Phosphorus	0.040 max	0.005 over	0.045 max	0.010 over	0.045 max	0.010 over
Sulfur	0.030 max	0.005 over	0.030 max	0.005 over	0.030 max	0.005 over
Silicon	1.00 max	0.05 over	1.00 max	0.05 over	1.00 max	0.05 over
Chromium	11.5 - 13.5	0.15	18.0 - 20.0	0.20	16.0 - 18.0	0.20
Molybdenum	-	-	-	-	2.00 - 3.00	0.10
Vanadium	-	-	-	-	-	-
Aluminium	-	-	-	-	-	-
Nickel	-	-	8.0 - 11.0	0.15	10.0 - 14.0	0.15

Why Prefer Us???

There are three main traits that effect the overall quality of Petrochemical Fasteners

- **Quality of Raw Material**
- **Heat Treatment**
- **Traceability & Quality Management**

we do, **Salt Bath Heat Treatment** :

In salt bath heat treatment process, materials are immersed in LIQUID media, i.e. MOLTEN SALT for hardening and tempering. Material is not in contact with air, so it prevents

- **Scaling** (Formation of Iron Scales)
- **Oxidation** (Reaction of Oxygen at Metal's surface)
- **Decarburization** (Reduction of carbon content in Metal)

Further, the material is subjected to automatic preheat as, a thick layer of salt film adhering to surface first melts upon immersion of material which prevents

- **Heat Shock**
- **Cracking due to distortion**

Heat is transferred over the entire work piece uniformly so one side will not heat faster than the other. The temperature of the material cannot be higher or lower than the bath's temperature control. It is advantageous as it imparts

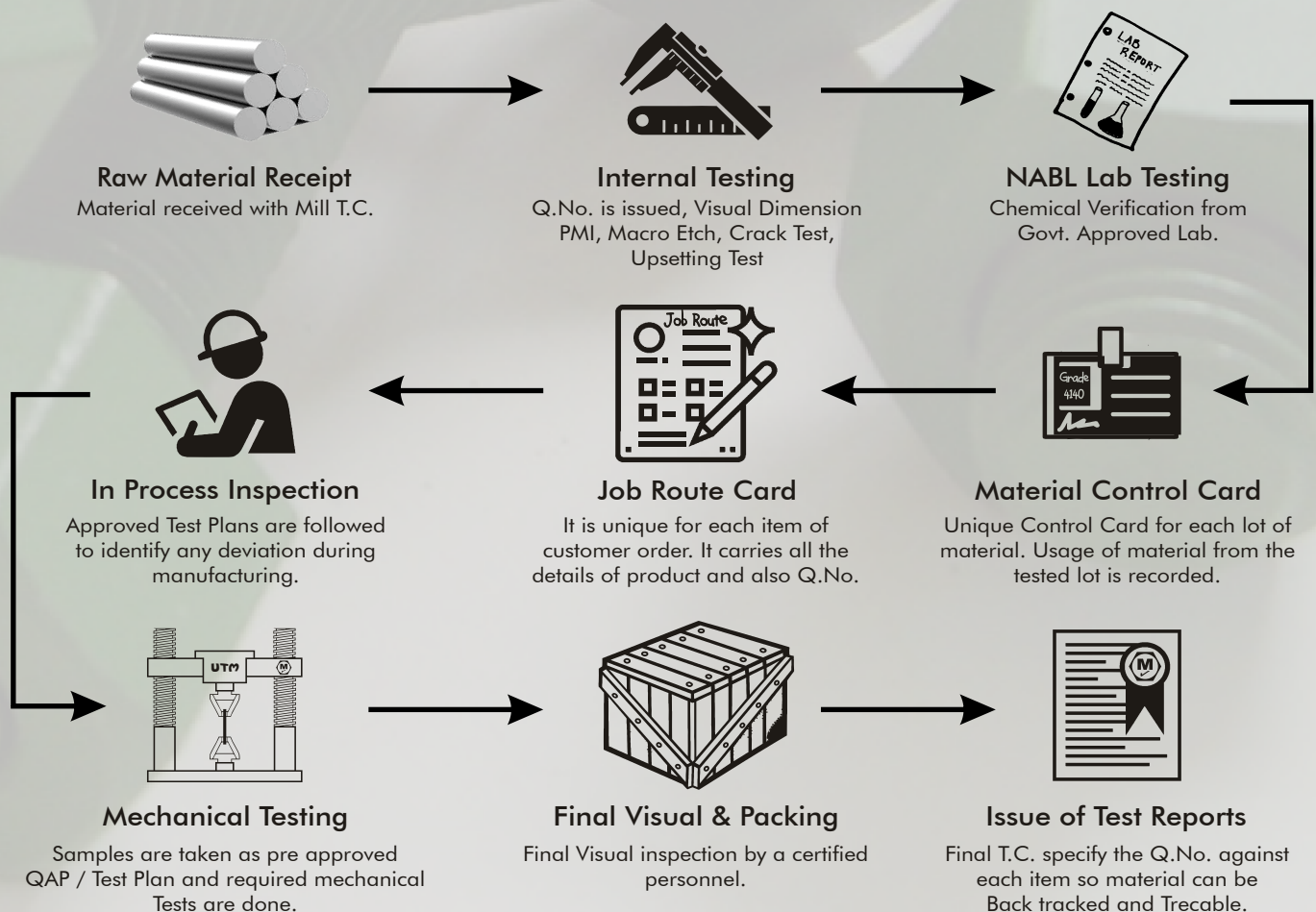
- **Uniform Hardness**

The weight of the molten salt is 2 to 3 times higher than water, this creates buoyancy and leads to decrease in immersed piece weight by 20 to 30 percent. It is advantageous as it leads to

- **Work Distortion to Absolute Minimum**

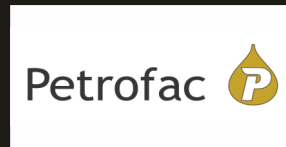
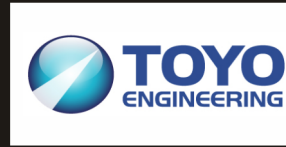


P.A.E Traceability & Quality Management



ACHIEVEMENTS

We are on the approved list of some of the World's renowned companies, some of which are...



Works :

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