



Personal protection equipment

► Eye protection



603



► Gloves



604



► Masks



604

► Mats



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SAFETY RECOMMENDATIONS

Your health is important.

Protect yours by using the best quality tools designed for your specific application.

Using tools in the correct manner is your best guarantee.

General recommendations :

These safety recommendations for tool usage reflect good engineering practice and are not intended to be a comprehensive set of rules. They complement, but do not replace, standard precautions to be taken by every user complying with professional guidelines, company procedures and national regulations.

► Personal safety

- **Wear eye protection** for any job involving chips, splinters, sparks, dust, flashes or UV rays.
- **Wear gloves** to protect against cuts, knocks and burns.

► 1000 V insulated tools for electrical safety

- **Never work on or near live components without 1000 V tools.** Only these can provide the insulation required for adequate protection. Plastic handles of other tools are not designed to insulate.

► Sensible precautions

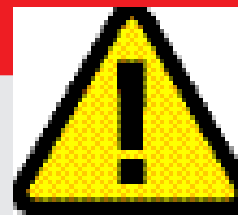
- **Secure balance** especially when pushing and pulling, e.g. tight fasteners.
- **Straight back** and bent knees when lifting.

► Correct tool selection

- **Use the right tool.** Each tool is designed for a specific application and should not be used for other jobs. Only the right tool will ensure safety, comfort and productivity.
- **Never attempt DIY.** modifications to a tool, whether by grinding, welding or heating. Altered specifications could make it unsafe.
- **Do not exceed tool capacities** with inappropriate extensions or impact accessories.

► Tool care

- **Keep tools clean** to prevent risk of slipping and give a more secure grip. Check tools before use for any defects such as excessive wear or breakage. Some mechanisms need regular cleaning and lubrication.
- **Keep and follow manufacturers' operating instructions.** Use the complete contents of any service kits.



▶ Workshop furniture and storage

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Roller cabinets

- Never open more than one loaded drawer at a time, otherwise the unit may tip.
- Do not exceed drawer load capacity.
- Apply the brake when stationary. Close and lock all drawers before moving.
- Do not pull the cabinet towards you, always push it and avoid balancing items on top.

Toolboxes and chests

- Watch your back when lifting heavy containers.
- Do not stand on toolboxes
- Mind your hands and wear gloves. Sharp or rough objects should not be kept loose.

▶ Wrenches

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Sensible precautions

- Secure your balance and pull the wrench towards you rather than push it.
- Wear gloves and eye protection.
- Do not grind, weld or heat your tool. It could become unsafe.
- Check condition of both fastener and tool before use.

Correct tool selection, without overload

- Never exceed tool capacity. Do not use an extension or a hammer.
- Always use the right size for the fastener head.
- Select a ring wrench for high torques. When using an open-end wrench, engage fastener head fully to avoid distorting the nose of the wrench, and work in a straight line.

▶ Sockets

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Personal safety with impact sockets

- Always secure sockets to the machine with locking ring and pin (references given for each socket).
- Never hold a socket or accessory while the machine is turning.
- Wear gloves and eye protection.
- **Never use a manual or simple machine socket on a power impact tool.**

Sensible precautions

- Secure your balance. Pull the tool towards you rather than push it.
- Use only recommended extensions and do not overload.
- Check that ratchet mechanisms engage fully.
- Select 6-point sockets if fasteners are worn or hardened.
- Do not use tools showing signs of breakage or excessive wear.

▶ Screwdrivers

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Personal safety

- Plastic-handled screwdrivers are not insulated, with the exception of 1000V tools.
- Keep your free hand clear when driving home a fastener in case the screwdriver slips.
- Wear gloves.

Correct tool selection

- Avoid using screwdrivers as chisels, levers or punches.
- Avoid damage to fastener heads or tool blades, always select the appropriate pattern.
- Do not modify or heat blades as this will impair performance.
- For extra torque select a screwdriver with a hexagonal bolster.
- Wood-handled through-blade screwdrivers withstand gentle tapping on the end to free seized fasteners.



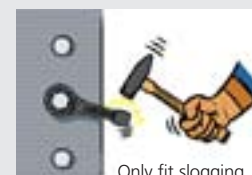
Don't pull behind you.
Nothing balanced on top.



Only one drawer at a time.



Always pull the wrench towards you.



Only fit slogging wrenches.



No metric tools on inch sizes.



Only use impact sockets when locked.



Don't exceed tool capacity or use oversize extensions.



Select the correct pattern :
• Black blades PZ : Pozidriv®.
• Chrome blades PH : Phillips®.



Never use a screwdriver as a chisel or lever.



SAFETY RECOMMENDATIONS



Never modify the shape of a tool

Always use a 1000V insulated tool when working with live components.



Select tools with a guard.



Never use tools with ill-fitting or damaged handles



Never "hard on hard".
Check tool condition before use.

Don't cut wire with metal shears



Don't use an extension for tightening



Never erect guard rails or platforms using clamps.



Fix vice securely to bench.



Don't use a hammer or extension to increase pressure.

▶ Pliers

Personal safety

- Wear eye protection, especially when cutting wire and fitting circlips or rivets.
- Sheathed handles are not insulating. Only 1000V tools are designed for working with live components.

Correct tool selection

- Keep within cutter capacity (wire diameter and hardness).
- Do not modify or heat tips as this will impair performance.
- Cut at right angles and avoid twisting the wire. Use the throat rather than the tip of cutting edges.
- When fitting circlips, use a tool within the correct range and only compress or expand the clip just enough.
- Lock-grip pliers should not be used as a permanent clamp. Components can move due to vibration or shock.

▶ Hammers, impact tools

Personal safety

- Wear gloves and eye protection.
- Avoid striking equally hard surfaces. Do not use a hammer on surfaces exceeding 46 HRC. Use a mallet instead.
- Do not use suspect tools such as hammers with chipped heads, insecure or cracked handles, excessively mushroomed chisels or punch ends. Check handle fit before use.
- Hammering may generate sparks. Do not use hammers in a fire-risk area.

Correct tool selection

- Rule of thumb: hammer head should have a diameter about 10 mm larger than the surface to be struck. Avoid hitting with the edge of the hammer.
- Select chisels and punches fitted with a guard for increased safety and comfort.
- Do not use punches for leverage.

▶ Sawing, cutting, drilling

Watch out for chips

- Wear eye protection and gloves when sawing, cutting or drilling, and when handling sheet metal or metal objects while machining.
- Keep hands away from the cutting path.
- Metal shears are designed for cutting sheet metal, not for wire. Keep within capacities.

▶ Presses and bar clamps

Remain within capacity

- Presses and bar clamps are not designed for permanent clamping and should never be used to construct a guard rail or platform.
- Avoid using bar clamps to hold assemblies subject to vibration or shock, as the joint could work loose.
- Do not use these tools for lifting.
- Always check before use and keep within clamping capacity (do not use extensions or impact tools).

▶ Vices

Personal safety

- Fit the vice securely to a suitably sized support.
- Never use an extension or a hammer to tighten a vice. Avoid clamping hard towards the end of the jaws.
- Do not use the jaws as an anvil.
- Never repair or modify a vice.
- Always wear eye protection and gloves when grinding, sawing, drilling and hammering.

Correct tool selection

- Select a swivel-base vice so that you approach the workpiece from the best angle

Torque control

Sensible precautions for precision tools

- Avoid overloading by applying torques beyond rated capacity.
- Never fit an extension as this would modify lever ratios and give incorrect readings.
- Always store torque wrenches carefully after use.
- Torque wrenches are precision tools. Have yours checked regularly by accredited Facom facilities.
- Read operating instructions before use.
- Do not use impact drivers on torque multipliers. Always use a torque wrench.

Pullers

Personal safety

- Wear gloves, eye protection and safety shoes.
- Pullers generate several tonnes of force during use.
- Ensure correct positioning – centred, in line with the pulling axis and with a good grip on each leg.
- Steady a puller where necessary to avoid rotation during tightening.
- Cover the assembly to contain components if the fitting splits suddenly or the puller slips.
- Do not stand in line with the puller and keep other people away.

Correct tool selection

- Never exceed puller capacity
- Use a 3-leg puller rather than a 2-leg, and select short legs.
- Always check tool condition before use and lubricate the screw. If a leg needs changing, replace the complete set.
- Never modify or heat the legs as this will make them unsafe.
- Do not operate with an impact wrench.
- Use a mallet if the screw needs tapping to unstick a fitting.
- Do not use impact drivers on nut splitters.

Air tools

Personal safety

- Wear gloves and eye protection.
- Wear a dust mask when sanding.
- For intensive use, protect your hearing with ear muffs.
- Consider the safety of bystanders.

Sensible precautions

- Always disconnect tools before fitting drill bits, grinding wheels or impact sockets.
- Keep within accessory rated diameters and speeds.
- Retain original guards (e.g. on grinding tools).
- On impact power wrenches, use only impact sockets with appropriate locking pin and ring.
- Read operating instructions before use.

Working on or near live components

- Only 1000V insulated tools protect from electrical hazards up to 1000V AC. Facom 1000V insulated tools conform to European standard EN 60900 and are individually tested and checked.
- Inspect your tool after each use. Discard if the insulation is damaged.
- Give yourself additional protection by using gloves, mats and anti-UV goggles.

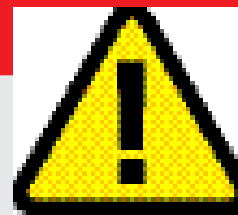
ELECTRICAL AND ELECTRONIC ASSEMBLIES

Personal safety

- Wear eye protection when there is a risk of flying debris, e.g. for wire cutting, stripping, crimping or soldering. Choose wire strippers with off-cut retainers.
- Work with loaded capacitors or live components using antistatic tools (dissipating sheaths).

Correct tool selection

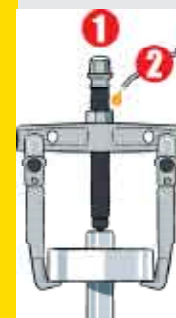
- Do not leave a hot soldering iron on fragile or flammable surfaces. Always use a stand. Do not store a soldering iron while hot. Disconnect after use.
- Use ESD antistatic tools to IEC 61340-5-1 and IEC 61340-5-2 to protect sensitive electronic components.



Careful storage and regular inspection by accredited Facom facilities.



Never fit an extension to a torque wrench.



Always check that the pressure screw is properly centred and legs have secure purchase. Lubricate the screw regularly.



Don't modify the legs of a puller as this will make it unsafe.



Always wear appropriate protective gear.



Always disconnect power tools before fitting accessories.



always lock sockets to the machine.

Facom air tools conform to current standards



1,000V insulated tools must be used when working near live components.

Never use a tool with damaged insulation.



Always rest a hot soldering iron on its stand.



CONVERSION OF MEASURING UNITS

The table below gives the SI unit conversion factors of a certain number of units that do not belong to the SI system. Some of these are still in use in France or abroad, in general or specialised applications Others belong to old systems of measurement that are now obsolete.

Units that are specific to the United States or the United Kingdom are indicated respectively by "US" or "UK" in brackets.

► Symbols and abbreviations

Unit	Symbol or abbreviation	SI unit conversion factor	Physical quantity	Comment
Ampere-hour	Ah	$3,6 \times 10^3 \text{C}$ (exact)	Quantity of electricity	Used for storage batteries
Angström	Å	10^{-10}m (exact)	Length	Wavelength, atomic distance
Bar	bar	105Pa (exact)	Pressure	Fluids
Barrel (US)	bbl	$0,158\,987\,3 \text{ m}^3$	volume	1 barrel (US) = 42 gallons (US).
Calorie I.T	cal _{I.T}	$4,186\,8 \text{ J}$ (exact)	Energy	Quantity of heat
Candela	cd	Basic SI unit	Luminous intensity	
Cheval vapeur (horsepower)	ch	$735,498\,75 \text{ W}$ (exact)	Power	1 ch = 75 kgm/s (exact).
Degree	°	$1,745\,329 \times 10^{-2} \text{ rad}$ (2 /360 rad)	Angle	
Degree Celsius	°C	$T_K = 0^\circ\text{C} + 273,15$ (exact)	Temperature	The origin of the Celsius scale is set by convention at 273.15 K.
Degree Fahrenheit	°F	$T_K = 5/9 (0^\circ\text{F} + 459,67)$ (exact)	Temperature	$0^\circ\text{C} = 5/9 (0^\circ\text{F} - 32)$ (exact)
Electronvolt	eV	$1,602\,177\,33 \times 10^{-19} \text{ J}$	Energy	Atomic and nuclear physics
Farad	F	Derived SI unit $1\text{F} = 1\text{C/V}$	Electric capacitance	
Faraday		$9,648\,70 \times 10^{-4} \text{ C}$	Quantity of electricity	Based on carbon 12.
Fluid ounce (UK)	fl oz (UK)	$2,841\,30 \times 10^{-5} \text{ m}^3$	volume	
Fluid ounce (US)	fl oz (US)	$2,957\,35 \times 10^{-5} \text{ m}^3$	volume	Liquids
Foot	ft	$30,48 \text{ cm}$ (exact)	Length	The symbol ' is also used
Gallon (UK)	gal (UK)	$4,546\,09 \times 10^{-3} \text{ m}^3$	volume	
Gallon (US)	gal (US)	$3,785\,41 \times 10^{-3} \text{ m}^3$	volume	Liquids
Hertz	Hz	Derived SI unit $1\text{Hz} = 1\text{s}^{-1}$	Frequency	
Horsepower (UK)	hp	$745,700 \text{ W}$	Power	The US value of horse power varies according to the field.
Inch	in	$2,54 \text{ cm}$ (exact)	Length	The symbol ' is also used.
Joule	J	Derived SI unit $1\text{J} = 1\text{N.m}$	Energy	Work, quantity of heat
Kelvin	K	Basic SI unit	Temperature	Thermodynamics
Kilogram-meter	kgm	$9,806\,65 \text{ J}$ (exact)	Work	
Kilogram-force	kgf	$9,806\,65 \text{ N}$ (exact)	Force	
Kilowatt-hour	kWh	$3,6 \times 10^{-6} \text{ J}$ (exact)	Energy	Electrical energy consumption
Liquid pint (US)	liq pt (US)	$4,731\,76 \times 10^{-4} \text{ m}^3$	volume	Liquids
Liquid quart (US)	liq qt	$9,463\,529 \times 10^{-4} \text{ m}^3$	volume	Liquids
Litre	l, L	10^{-3} m^3 (exact)	volume	C.G.P.M. 1964.
Lux	lx	Derived SI unit $1\text{lx} = 1\text{lm/m}^2$	Illumination	
Micron	μ	10^{-6} m (exact)	Length	Replaced by micrometer
Mile	mile	$1,609\,344 \times 10^3 \text{ m}$ (exact)	Length	Also called "statute mile"
International nautical mile		$1,852 \times 10^3 \text{ m}$ (exact)	Length	Sea and air navigation
Millimetre of mercury (conventional)	mmHg	$133,322\,4 \text{ Pa}$	Pressure	Equal to 13..595 1 mmH2O. (exact).
Nautical mile (UK)		$1,852 \times 10^3 \text{ m}$ (exact)	Length	Since 1970, the UK nautical mile is equal to the international nautical mile.
Newton	N	Derived SI unit $1\text{N} = 1\text{kg.m.s}^{-2}$	Force	
Ohm	Ω	Derived SI unit $1\Omega = 1\text{V/A}$	Electrical resistance	
Ounce	oz	$28,349\,5 \text{ g}$	Mass	16 oz = 1 lb
Pascal	Pa	Derived SI unit $1\text{Pa} = 1\text{N/m}^2$	Pressure, stress	
Pound	lb	$0,453\,592\,37 \text{ kg}$ (exact)	Mass	
Pound-force	lbf	$4,448\,22 \text{ N}$	Force	
Psi	psi	$6,894\,757 \times 10^3 \text{ Pa}$	Pressure	Abbreviation of "poundforce per square inch".
Radian	rad	Derived SI unit 1m/m	Angle (plane)	The symbol rd has also been used in France
Second	s	Basic SI unit	Time	
Torr	torr	$133,322\,4 \text{ Pa}$	Pressure	1/760 normal atmosphere (exact).
Volt	V	Derived SI unit $1\text{V} = 1\text{W/A}$	Electric potential	
Voltampère	VA	1 W (exact)	Apparent power	Electricity.
Watt	W	Derived SI unit $1\text{W} = 1\text{J/s}$	Power	
Watt-hour	Wh	3600 J (exact)	Energy	Electrical energy consumption
Weber	Wb	Derived SI unit $1\text{Wb} = 1\text{V.s}$	Magnetic induction	
Yard	yd	$0,914\,4 \text{ m}$ (exact)	Length	



What is a standard?

A standard is a reference document providing answers to product-related technical or commercial problems that present themselves repeatedly in relations between economic, scientific or technical partners, etc.

It is drawn up by consensus within standardisation bureaux (or organisations) by all volunteering economic operators.

Standardisation assists dialogue between manufacturers, users, public authorities and other partners.

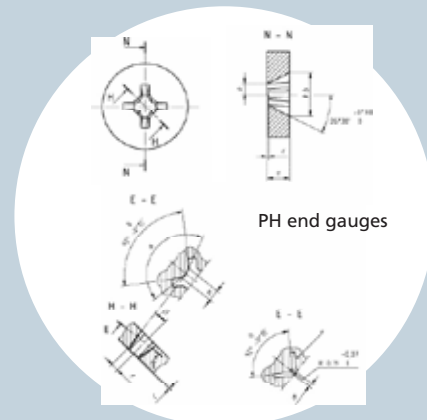
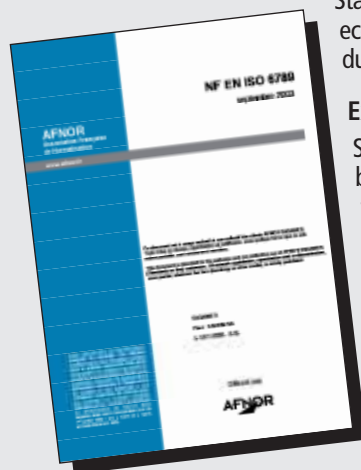
Standardisation is essentially a technical activity serving an economic purpose. It helps to clarify transactions, rationalise production, and assist commercial exchanges.

Extract from European standard NF EN 45020

Standard document established by consensus and approved by a recognised body, that provides, for common and repeated use, rules, guidelines for activities or their results, aimed at the achievement of the optimum degree of order in an given context

ISO/IEC guide 2

A standard is a document established by consensus that provides, for common and repeated use, rules, guidelines for activities or their results, aimed at the achievement of the optimum degree of order in an given context



PH end gauges

DIMENSIONS OF THE PH END PENETRATION GAUGE

End no.	a	b	c	e	f	m	a	B
n°	± 0,005	min.	± 0,025	max.	± 0,005	0	0	+ 0° 15'
	mm	mm	mm	mm	mm	mm	-0,02 - 0° 15'	0
0	0,419	3		2,38	0,284	0,29	-	7°
1	0,648	4,5		2,38	0,493	0,49	138°	
2	1,156	6	0,254	3,97	0,769	1,08	140°	5°45'
3	1,918	8		6,34	1,257	2,07	146°	
4	2,553	10		7,94	1,804	2,71	153°	7°

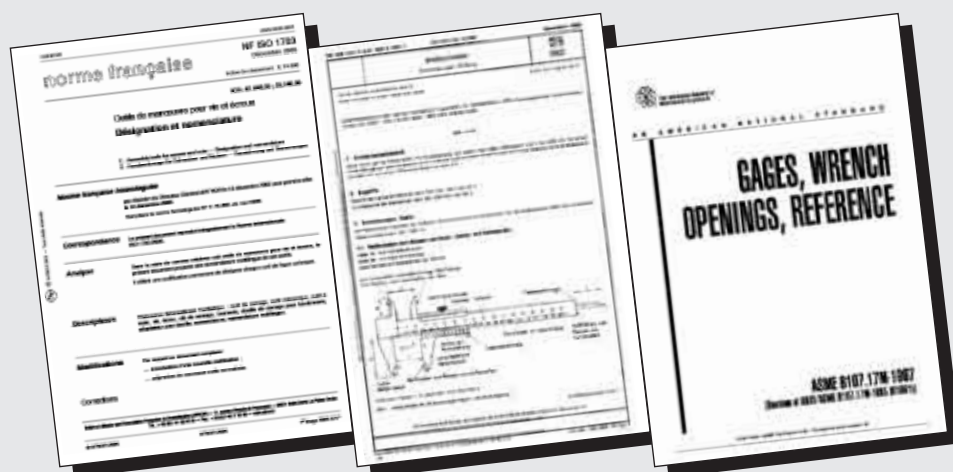
Facom, 30 years of involvement in International standardisation

Facom is actively involved in the various standardisation committees (French - NF, International - ISO or American ASME or SAE) for hand tools.

Facom's involvement at an early stage in the elaboration process allows it to continuously adapt its products to the requirements of future standards and provide tools of the required quality, ensuring greater ease and safety of use.

Facom informs its users by indicating the main standards applying to its tools :

- European and International standards (EN / ISO)
- French standards (NF)
- German standards (DIN)
- American standards (ASME / SAE)



Extracts from the AFNOR standard. Only the full version of the standard has authority. It can be obtained from the Afnor Web site www.boutique-normes.afnor.org

(DIN Standard) Reproduced by permission of DIN Deutsches Institut für Normung e.V. The definitive version for the implementation of this standard is the edition bearing the most recent date of issue, obtainable from Beuth Verlag GmbH, 10772 Berlin, Germany.

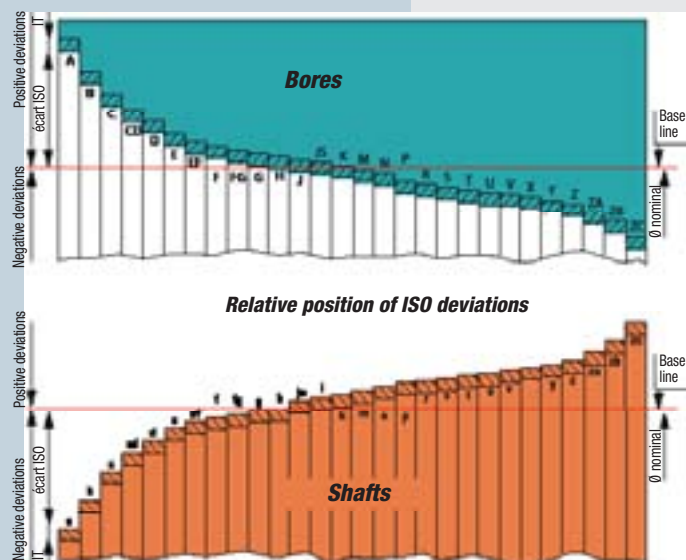
WRENCHES

Designation	Term	ISO standards	Tool	Use
New	Old			
1 1 01 01 0		4229		
1 1 01 01 1	1	Single open-end (691; 1711-1) wrench		
		10102		
1 1 01 02 0	4	Double open-end (691; 1085; 1711-1; 3318) wrench		
1 1 01 03 0	3	Open-end (691) slogging wrench		
1 1 01 04 0	2	Adjustable wrench 6787		
		7738		
1 1 01 05 0	13	Angled (691; 1711-1; 3318) combination wrench		
		7738		
1 1 01 06 0	14	Offset (691; 1711-1; 3318) combination wrench		



Fits are categories of standard toleranced dimensions that are used for assembling two cylindrical or prismatic parts.

Standard designation and markings



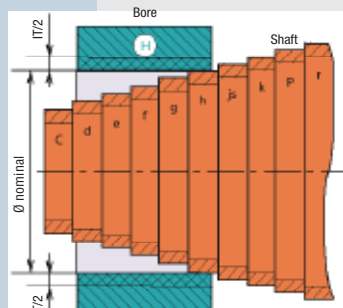
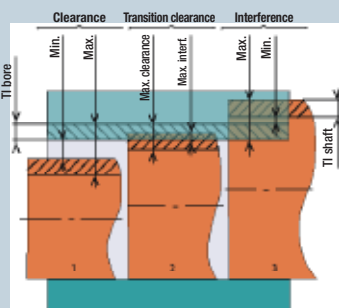
Standard fits

Standard fits (H bore system)									
Type	shaft	H6	H7	H8	H9	H10	H11	Comments	
Moving parts	High clearance	c11						Standard fits for long spans, poor alignment, expansion, etc.	
		c10							
		c9							
		d10							
	Medium clearance	d9						Standard fits for rotating or sliding guides (good lubrication ensured)	
		d8							
		e9							
		e8							
		e7							
		f8							
		f7							
		f6							
Non-moving parts	Low clearance	g6						For high-precision guides	
		g5							
	Adjusted	h9						Can be assembled by hand	For centring and locating, cannot transfer forces
		h7							
		h6							
		h5							
	Highly adjusted	js7						Can be assembled with a mallet (Press recommended)	Parts disassembled without damage
		js6							
		js5							
	Transition fits	k6						Assembled with a press	For transmission of forces
		k5							
		m7							
		m6							
Interference fits	Tight	p6						Assembled with a heavy-duty press or by dilation (shrink-fitting)	Parts damaged when disassembled
		r6							
	Very tight	s7							
		s6							
		t5							
		u6							
		x7							

most commonly used

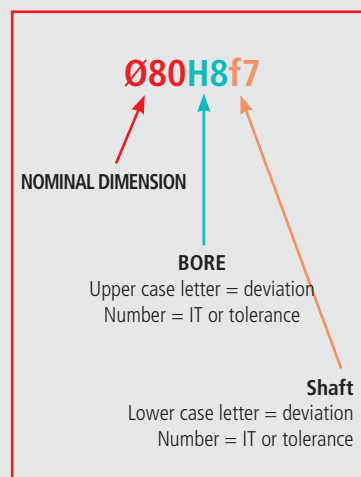
most commonly used (to be known)

Standard tolerance intervals (or qualities)



Main ISO qualities or tolerances (TI) (IT in micrometres : 1µm = 0.001 mm)													
Nominal dimensions (mm):													
ABOVE → TO (INCLUSIVE) →	1	3	6	10	18	30	50	80	120	180	250	315	400
IT5	4	5	6	8	9	11	13	15	18	20	23	25	27
IT6	6	8	9	11	13	16	19	22	25	29	32	36	40
IT7	10	12	15	18	21	25	30	35	40	46	52	57	63
IT8	14	18	22	27	33	39	46	54	63	72	81	89	97
IT9	25	30	36	43	52	62	74	87	100	115	130	140	155
IT10	40	48	58	70	84	100	120	140	160	185	210	230	250
IT11	60	75	90	110	130	160	190	220	250	290	320	360	400
IT12	100	120	150	180	210	250	300	350	400	460	520	570	630
IT13	140	180	220	270	330	390	460	540	630	720	810	890	970

- Clearance fits:**
 $\varnothing 80 \text{ H}8\text{f}7$
 Min. clearance = 0.030 mm
 Max. clearance = 0.106 mm
- Transition fits (clearance or interference):**
 $\varnothing 80 \text{ H}7\text{k}6$
 Max. clearance = 0.009 mm
 Max. interference = 0.002 mm
- Interference fits:**
 $\varnothing 80 \text{ H}7\text{p}6$
 Min. interference = 0.002 mm
 Max. interference = 0.051 mm



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► Lighting safety

It is essential to use the correct light for the situation to avoid tired eyes and accidents at work.

Engineering or maintenance tasks require an illumination of 300 to 500 lux.

Inspection, finishing and painting tasks require an illumination of 750 to 1000 lux.

The light source must be designed and arranged to avoid uncomfortable glare.

► IP ingress protection rating



The IP code indicates the degree of protection against access to hazardous parts, as well as the penetration of solid foreign bodies and of water.

The code consists of two figures (e.g. IP 64), defined right according to NF EN 60529

IP rating: What does it mean?

1st figure Protection of live components against ingress of solid objects		2nd figure Protection of live components against ingress of liquid	
0	No protection	0	No protection
1	Solid objects greater than 50mm diameter cannot penetrate	1	Vertically falling drops of water
2	Solid objects greater than 12.5 mm diameter cannot penetrate	2	Water dripping on the enclosure tilted at 15° from its normal position
3	A steel wire of 2.5 mm diameter cannot penetrate	3	Spraying water at an angle of up to 60° from the vertical
4	A steel wire of 1 mm diameter cannot penetrate	4	Splashing water against the enclosure from any direction
5	Invisible amount of talcum powder deposited when tested in a dust chamber	5	Water projected in jets (6.3 mm) against the enclosure from any direction
6	No talcum powder deposited when tested in a dust chamber	6	Water projected in jets (12.5 mm) against the enclosure from any direction
		7	Immersion to 1 mm
		8	Submersible equipment according to manufacturer's specifications

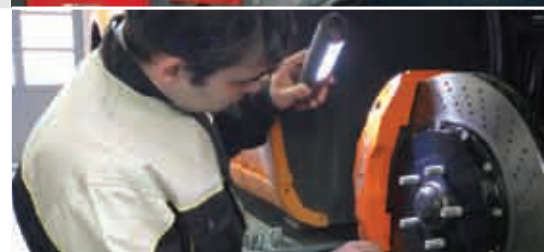
► There are a number of lighting technologies to choose from:

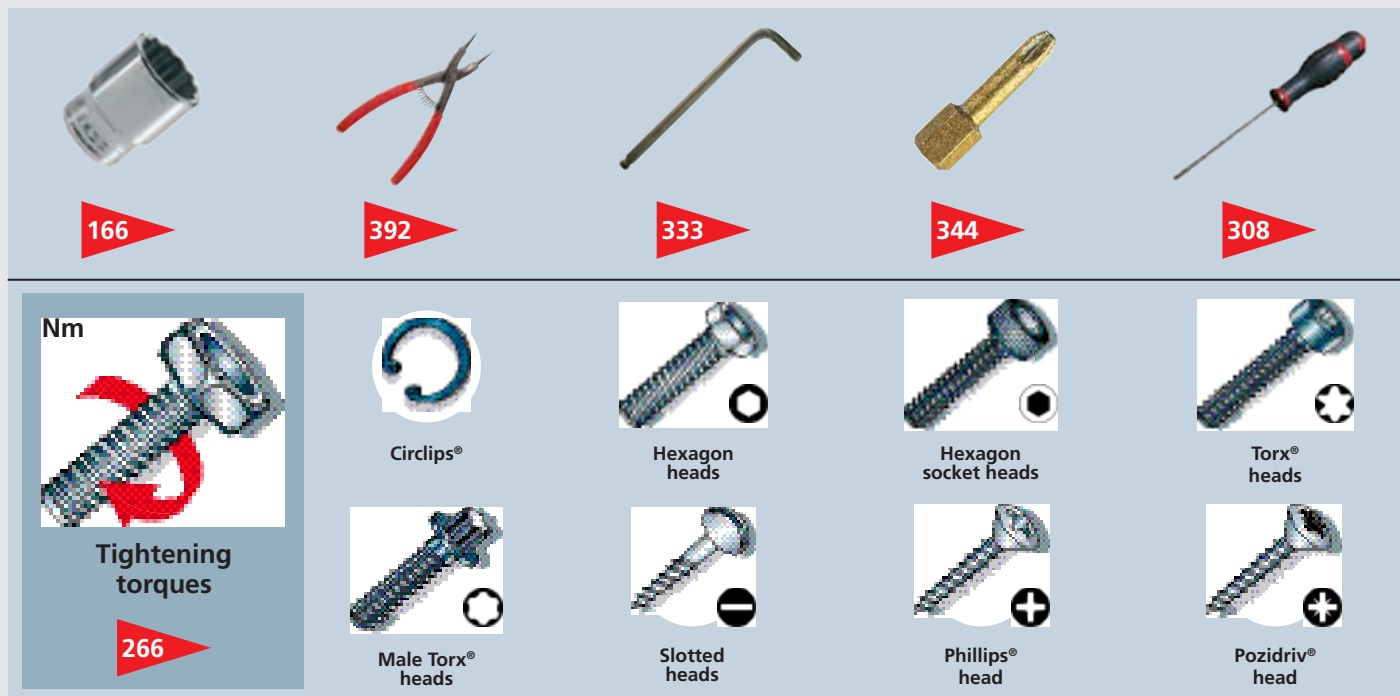
Technology	Advantages	Disadvantages	Lighting power	Facom product
Incandescent lamps	Low cost	Poor impact resistance. High temperature = risk of burns, fire and explosion	200 to 1000 lux	no
Fluorescent and compact fluorescent lamps  IP 55	Diffuse lighting, low temperature, low consumption	Average impact resistance	300 to 400 lux	777 range 564
LEDs IP 64. 	Very good impact resistance, low temperature, very low consumption, long operating life	Cost, concentrated light beam	500 to 1000 lux	779 range 559



Safety recommendations

- Use fluorescent inspection lamps complying with the requirements of EN 60 598-2-8
- For mains powered lights, preferably choose inspections lamps powered at a voltage of less than 50V





► Circlips®

SOLIT SPRING RINGS

External circlips®
For shafts to NF E 22-163

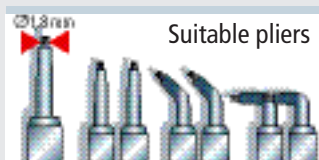


Standard range

3 → 5	2,7 → 4,7	1
6 → 9	5,6 → 8,4	1,2
10 → 13	9,3 → 11,9	1,5
14 → 17	12,9 → 15,7	1,7
18 → 30	16,5 → 27,9	2
32 → 63	31,5 → 58,8	2,5
65 → 82	60,8 → 76,5	3
85 → 120	82,5 → 113,0	3,5
125 → 200	118,0 → 190,5	4

Heavy-duty range

15 → 30	13,8 → 27,9	2
32 → 60	29,6 → 55,8	2,5
65 → 80	60,8 → 74,5	3
85 → 100	79,5 → 94,5	3,5

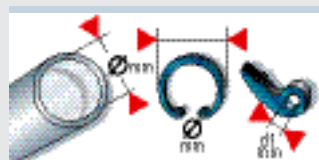


Suitable pliers

Ø	177E.9	167E.9	197E.9
0,9	177G.9	167G.9	197G.9
1,3	177E.13	167E.13	197E.13
	177G.13	167G.13	197G.13
1,8	177E.18	167E.18	197E.18
	177G.18	167G.18	197G.18
2,3	177E.23	167E.23	197E.23
	177G.23	167G.23	197G.23
3,2	177E.32		197E.32

Ø	177E.18	167E.18	197E.18
1,8	177G.18	167G.18	197G.18
2,3	177E.23	167E.23	197E.23
	177G.23	167G.23	197G.23
3,2	177E.32		197E.32

Internal circlips®.
For shafts to NF E 22-165

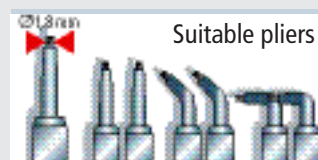


Standard range

8 → 9	8,7 → 9,8	1
10 → 11	10,8 → 11,8	1,2
12 → 13	13,0 → 14,1	1,5
14 → 17	15,1 → 18,3	1,7
18 → 30	19,5 → 32,1	2
31 → 63	33,4 → 67,2	2,5
65 → 82	69,2 → 87,5	3
85 → 120	90,5 → 127,0	3,5
125 → 200	135,0 → 209,5	4

Heavy-duty range

20 → 30	21,5 → 32,1	2
32 → 62	34,4 → 66,2	2,5
65 → 80	69,2 → 85,5	3
85 → 100	90,5 → 105,5	3,5



Suitable pliers

Ø	179E.9	169E.9	199E.9
0,9	179G.9	169G.9	199G.9
1,3	179E.13	169E.13	199E.13
	179G.13	169G.13	199G.13
1,8	179E.18	169E.18	199E.18
	179G.18	169G.18	199G.18
2,3	179E.23	169E.23	199E.23
	179G.23	169G.23	199G.23
3,2	179E.32		199E.32

Ø	179E.18	169E.18	199E.18
1,8	179G.18	169G.18	199G.18
2,3	179E.23	169E.23	199E.23
	179G.23	169G.23	199G.23
3,2	179E.32		199E.32



► Hexagon heads



RELATIONSHIP SCREW DIAMETER/SIZE ACROSS FLATS

For inch to mm conversions, see "Inch dimensions".

Metric sizes (*recommended sizes)



	Standard head Ø mm	Wide head Ø mm	Collar screw Ø mm	Collar nut	Min.	Max.
3,2*	1,6				3,22	3,28
3,5					3,52	3,58
4*	2				4,02	4,12
4,5					4,52	4,62
5*	2,5				5,02	5,12
5,5*	3				5,52	5,62
6					6,03	6,15
7*	4		5		7,03	7,15
8*	5		6	5	8,03	8,15
9					9,03	9,15
10*	6		8	6	10,04	10,19
11*	7				11,04	11,19
12					12,04	12,24
13*	8		10	8	13,04	13,24
14					14,05	14,27
15*			12	10	15,05	15,27
16*	10				16,05	16,27
17					17,05	17,30
18*	12		14	12	18,05	18,30
19					19,06	19,36
21*	14	12	16	14	21,06	21,36
22					22,06	22,36
23					23,06	23,36
24*	16	14		16	24,06	24,36
26					26,08	26,48
27*	18	16	20		27,08	27,48
29					29,08	29,48
30*	20	18		20	30,08	30,48
32					32,08	32,48
34*	22	20			34,10	34,60
35					35,10	35,60
36*	24	22			36,10	36,60
38					38,10	38,60
41*	27	24			41,10	41,60
42					42,10	42,60
46*	30	27			46,10	46,60
50*	33	30			50,10	50,60
54					54,12	54,72
55*	36	33			55,12	55,72
58					58,12	58,72
60*	39	36			60,12	60,72
63					63,12	63,72
65*	42	39			65,12	65,72
67					67,12	67,72
70*	45				70,12	70,72
71					71,15	71,85
75*	48				75,15	75,85
77					77,15	77,85
80*	52				80,15	80,85
82					82,15	82,85
85*	56				85,15	85,85
88					88,15	88,85
90*	60				90,15	90,85
94					94,15	94,85
95*	64				95,15	95,85
100*	68				100,15	100,85
105*	72				105,20	106,00
110*	76				110,20	111,00
115*	80				115,20	116,00
116					116,20	117,00
120*	85				120,20	121,00

Inch sizes



Inch	mm	Heavy series BS.1769 ASME B 18-2-1 18-2-2	Standard series BS.1768 ASME B 18-2-1 18-2-2	BS. 1981	Machined or cast nuts	Thou. inch	mm	BSW BS. 916BSF 1083BSF
						.117	2,97	
						.131	3,32	
1/8	3,17			2		.152	3,86	
						.172	4,37	
3/16	4,76			3-4-5	2-3	.193	4,90	
7/32	5,56					.220	5,59	
1/4	6,35			6-8	4	.248	6,30	
9/32	7,14					.282	7,16	
5/16	7,94			10-12	5-6	.324	8,23	
11/32	8,73				8			
3/8	9,52				10	.365	9,27	
7/16	11,11		1/4		1/4 - 12	.413	10,49	
1/2	12,70	1/4 (1)	5/16			.445	11,30	1/4
9/16	14,29	5/16 (1)	3/8		5/16	.525	13,33	5/16
5/8	15,87		7/16		3/8	.600	15,24	3/8
11/16	17,46	3/8 (1)				.710	18,03	7/16
3/4	19,05	7/16 (1)	1/2					
13/16	20,64		9/16			.820	20,83	1/2
7/8	22,22	1/2						
15/16	23,81		5/8			.920	23,37	9/16
1"	25,40							
1 1/16	26,99	5/8				1.010	25,65	5/8
1 1/8	28,57		3/4					
1 1/4	31,75	3/4				1.200	30,48	3/4
1 5/16	33,34		7/8			1.300	33,02	7/8
1 3/8	34,92							
1 7/16	36,51	7/8						
1 1/2	38,10		1"			1.480	37,59	1"
1 5/8	41,27	1"						
1 11/16	42,86		1 1/8			1.670	42,42	1 1/8
1 13/16	46,04	1 1/8						
1 7/8	47,62		1 1/4			1.860	47,24	1 1/4
2"	50,80	1 1/4						
2 1/16	52,39		1 3/8			2.050	52,07	1 3/8
2 3/16	55,56	1 3/8						
2 1/4	57,15					2.200	56,39	1 1/2
2 3/8	60,32	1 1/2	1 1/2			2.410	61,22	1 5/8 (4)
2 7/16	61,91							
2 9/16	65,09					2.580	65,53	1 3/4
2 5/8	66,67		1 3/4 (2)					
2 3/4	69,85	1 3/4				2.760	70,10	2"
2 13/16	71,44							
2 15/16	74,61							
3"	76,20		2" (2)					
3 1/8	79,37	2"				3.150	80,01	2 1/4 (4)
3 3/8	85,72		2 1/4 (3)					
3 1/2	88,90	2 1/4				3.550	90,17	2 1/2 (4)
3 3/4	95,25		2 1/2 (3)					
3 7/8	98,42	2 1/2				3.890	98,81	2 3/4 (4)
4 1/8	104,80		2 3/4 (3)					
4 1/4	107,95	2 3/4				4.180	106,20	3" (4)
4 1/2	114,30		3" (3)			4.530	115,06	3 1/4 (4)
4 5/8	117,50	3"						
						4.850	123,20	3 1/2 (4)
						5.180	131,60	3 3/4 (4)
						5.550	141	4" (4)
						6.380	162	4 1/2 (4)

For inch sizes
(1) USA ASME B.18-2-2 only.
(2) Except Norway.

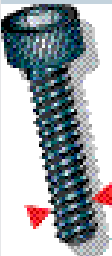



(3) Except Norway.
(4) BSW BS 916 BSF only.



► Hexagon socket heads

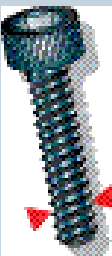

RELATIONSHIP SCREW DIAMETER/HEXAGON SOCKET SIZE





Metric sizes

Ø Screw mm	Cheese head screws ISO 4762	Countersunk head screws ISO 10642	Headless set screws ISO 4026
M1,6	1,5		0,7
M2	1,5		0,9
M2,5	2		1,3
M3	2,5	2	1,5
M4	3	2,5	2
M5	4	3	2,5
M6	5	4	3
M8	6	5	4
M10	8	6	5
M12	10	8	6
M14	12	10	
M16	14	10	8
M18	14		
M20	17	12	10
M22	17		
M24	19		12
M27	19		
M30	22		
M33	24		
M36	27		
M42	32		

Inch sizes


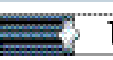


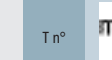
Ø Screw mm		Cheese head screws		Countersunk head screws		Headless set screws	
		"	mm	"	mm	"	mm
n° 0	1,52	0,50	1,27	.035	0,89	.028	0,711
n° 1	1,85	1/16	1,59	.050	1,27	.035	0,89
n° 2	2,18	5/64	1,98	.050	1,27	.035	0,89
n° 3	2,51	5/64	1,98	1/16	1,59	.050	1,27
n° 4	2,84	3/32	2,38	1/16	1,59	.050	1,27
n° 5	3,17	3/32	2,5	5/64	1,98	1/16	1,59
n° 6	3,5	7/64	3	5/64	1,98	1/16	1,59
n° 7	3,5	1/8	4				
n° 8	4,16	9/64	5	3/32	2,38	5/64	1,98
n° 10	4,82	5/32	6	7/64	2,78	3/32	2,38
n° 10	4,82			1/8	3,17		
1/4	6,35	3/16	4,75	9/64	3,57	7/64	2,78
1/4	6,35	7/32	5,55	5/32	3,97	1/8	3,17
5/16	7,94	1/4	6,35	3/16	4,75	9/64	3,57
5/16	7,94					5/32	3,97
3/8	9,52	5/16	7,94	7/32	5,55	3/16	4,75
7/16	11,11	3/8	9,52	1/4	6,35	7/32	5,55
1/2	12,7	3/8	9,52	5/16	7,94	1/4	6,35
5/8	15,87	1/2	12,7	3/8	9,52	5/16	7,94
3/4	19,05	5/8	15,88	1/2	12,7	3/8	9,52
7/8	22,2	3/4	19,05	9/16	14,29	1/2	12,7
1	25,4	3/4	19,05	5/8	15,88	9/16	14,29
1 1/8	28,57	7/8	22,2	3/4	19,05	9/16	14,29
1 1/4	31,75	7/8	22,2	7/8	22,2	5/8	15,88
1 3/8	34,92	1"	25,4	7/8	22,2	5/8	15,88
1 1/2	38,10	1"	25,4	1"	25,4	3/4	19,05

Hexagon keys

333


► Torx® heads

Relationship NF EN ISO 10664 screw diameter / TORX® key

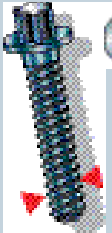

Ø Screw mm	Cheese head ISO 14579/14580	Oval cheese head ISO 14584	Countersunk head NF E 25-107	Oval countersunk head ISO 14583
M2,0	T6	T6	T6	T6
M2,5	T8	T8	T8	T8
M3,0	T10	T10	T10	T10
M3,5	T15 (1)	T15	T10	T15
M4,0	T20	T20	T20	T20
M5,0	T25	T25	T20	T25
M6,0	T30	T30	T30	T30
M8,0	T45	T45	T40	T45
M10,0	T50 (1)	T50	T50	T50
M12,0			T55	

Key pattern identification



T n°	mm
T6	1,65
T8	2,30
T10	2,72
T15	3,26
T20	3,84
T25	4,40
T27	4,96
T30	5,49
T40	6,60
T45	7,77
T50	8,79
T55	11,22

Relationship screw diameter / TORX® socket

Ø Screw mm	Wide collar
M3	E4
M4	E5
M5	E6
M6	E8
M8	E10
M10	E12
M12	E14
M14	E18
M16	E20

(1) ISO 14580



▶ Slotted heads

RELATIONSHIP SCREW DIAMETER/SLOT SIZE

ENGINEERING SCREWS				
Ø Screw mm	Countersunk head NF EN ISO 2009	Oval countersunk head NF EN ISO 2010	Cheese head NF EN ISO 1207	Wide cheese head NF EN ISO 1580
	e x A	e x A	e x A	e x A
M1,6	0,4 x 2,5	0,4 x 2,5	0,4 x 2,5	0,4 x 2,5
M2	0,5 x 3	0,5 x 3	0,5 x 3	0,5 x 3
M2,5	0,6 x 3,5	0,6 x 3,5	0,6 x 3,5	0,6 x 3,5
M3	0,8 x 4	0,8 x 4	0,8 x 4	0,8 x 4
M3,5	1,0 x 5,5	1,0 x 5,5	1,0 x 5,5	1,0 x 5,5
M4	1,2 x 6,5	1,2 x 6,5	1,2 x 6,5	1,2 x 6,5
M5	1,2 x 8	1,2 x 8	1,2 x 8	1,2 x 8
M6	1,6 x 10	1,6 x 10	1,6 x 8	1,6 x 10
M8	2,0 x 12	2,0 x 12	2,0 x 12	2,0 x 12
M10	2,5 x 14	2,5 x 14	2,5 x 14	2,5 x 14

SELF-TAPPING SCREWS			
Ø Screw mm	Countersunk head NF EN ISO 1482	Oval countersunk head NF EN ISO 1483	Wide cheese head NF EN ISO 1481
	e x A	e x A	e x A
ST2,2	0,5 x 3	0,5 x 3	0,5 x 3
ST2,9	0,8 x 4	0,8 x 4	0,8 x 4
ST3,5	1 x 5,5	1 x 5,5	1 x 5,5
ST4,2	1,2 x 6,5	1,2 x 6,5	1,2 x 6,5
ST4,8	1,2 x 8	1,2 x 8	1,2 x 8
ST5,5	1,6 x 8	1,6 x 8	1,6 x 10
ST6,3	1,6 x 10	1,6 x 10	1,6 x 10
ST8	2 x 12	2 x 12	2 x 1,2
ST9,5	2,5 x 14	2,5 x 14	2,5 x 14

WOOD SCREWS			
Ø Screw mm	Countersunk head NF E 25-604	Oval countersunk head NF E 25-605	Round head NF E 25-606
	e x A	e x A	e x A
1,6	0,4 x 2,5		0,4 x 2
2	0,5 x 3	0,5 x 3	0,5 x 3
2,5	0,6 x 3,5	0,6 x 3,5	0,6 x 3,5
3	0,8 x 4	0,8 x 4	0,8 x 4
3,5	1,0 x 5,5	1,0 x 5,5	1,0 x 5,5
4	1,2 x 6,5	1,2 x 6,5	1,2 x 6,5
4,5	1,2 x 8	1,2 x 8	1,2 x 6,5
5	1,2 x 8	1,2 x 8	1,2 x 8
6	1,6 x 10	1,6 x 10	1,6 x 10
7	2,0 x 12		2,0 x 10
8	2,0 x 12		2,0 x 12



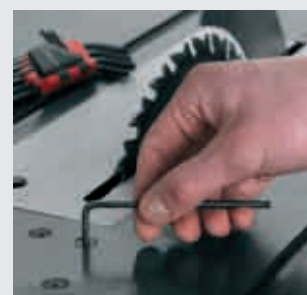
Protwist

308



Bits

344



Hexagon keys

333

▶ Phillips® and Pozidriv® heads

RELATIONSHIP SCREW DIAMETER/PATTERN SIZE



ENGINEERING SCREWS				
Ø Screw mm	Countersunk head ISO 7046	Oval countersunk head ISO 7047	Oval cheese head ISO 7045	Wide oval cheese head NFE 25-122
	N°	N°	N°	N°
M 1,6	0	0	0	-
M 2,0	0	0	0	-
M 2,5	1	1	1	-
M 3,0	1	1	1	1
M 3,5	2	2	2	2
M 4,0	2	2	2	2
M 5,0	2	2	2	2
M 6,0	3	3	3	3
M 8,0	4	4	4	4
M 10,0	4	4	4	-

SELF-TAPPING SCREWS				
Ø Screw mm	Countersunk head ISO 7050	Oval countersunk head ISO 7051	Cheese head ISO 7049	Wide oval cheese head NFE 25-659
	N°	N°	N°	N°
ST2,2	0	0	0	
ST2,9	1	1	1	1
ST3,5	2	2	2	2
ST4,2	2	2	2	2
ST4,8	2	2	2	2
ST5,5	3	3	3	3
ST6,3	3	3	3	3
ST8	4	4	4	
ST9,5	4	4	4	

WOOD SCREWS			
Ø Screw mm	Countersunk head NF E 25-601	Oval countersunk head NF E 25-602	Round head NF E 25-603
	N°	N°	N°
2,5	1	1	1
3	1	1	1
3,5	2	2	2
4	2	2	2
4,5	2	2	2
5	2	2	2
6	3	3	3



FACOM guarantees its products against faulty materials or workmanship under the conditions defined below.

► Implementation of the guarantee

The FACOM guarantee takes the form of an exchange or repair limited to replacement of the faulty parts in accordance with the terms and conditions specified below.

The faulty product must be returned to the Facom Distributor, failing which repair under guarantee may be refused.



This guarantee includes the parts and the labour provided by the Facom After Sales Service or the approved Distributor.

All repairs are guaranteed six months parts and labour. This guarantee only applies to the components changed during the previous repair, with the exception of consumables.

In line with its policy of continual product improvements to meet user needs and technological developments, Facom may upgrade or discontinue the models shown in its catalogue without notice and without entailing any obligation on its part to repair tools or equipment sold previously. Those items no longer included in the range will then be replaced by a technically equivalent product or a credit note will be issued.

► Conditions of application of the Facom guarantee

Unless otherwise specified, the Facom guarantee applies to all tools under normal conditions of use.

The guarantee excludes the following :

- Consumables (i.e. products that become deteriorated or damaged during use). These include, but are not limited to, drill bits, saw blades, abrasive discs, knife blades, files, batteries, driving bits, etc.
- Normal wear and tear (in particular of wearing parts), failure to use the product for its intended purpose or in accordance with our instructions, neglect or inadequate maintenance on the part of the user.
- Defective operation due to modifications or repairs not carried out by Facom's After Sales Service or that of its approved Distributors. Defective operation due to causes external to the Product (theft, dropping, lightening, flooding, fire, damage during transport, product not returned in its original packaging, etc.).

The guarantee period takes effect from the date of purchase by the customer from the Facom customer-distributor. A copy of the invoice proving the date of purchase from the distributor may be requested in the event of a claim under the guarantee. In the case of technical products covered by a limited guarantee type D, it shall systematically be supplied by the User Customer together with the serial number where one is indicated on the tool.

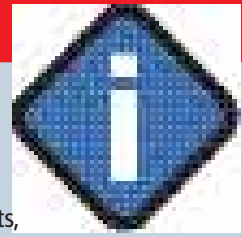
The guarantee will apply for the period indicated in the price list applying on the date of purchase.

Where the Product is no longer covered by the guarantee (expiry of the guarantee period, guarantee inapplicable for the reasons given in paragraph 2) yet is repairable, this repair will be carried out only after acceptance by the User of the repair estimate.

The application of the guarantee will not give rise to any kind of indemnity or damages for any reason whatsoever.

► Types of guarantee (price list column G)

- **Guarantee type E** : the tool will be exchanged free of charge, in accordance with the conditions of implementation and application of the guarantee (cf. paragraphs 1 and 2 above) and without limit of time.
- **Guarantee type R** : the tool will be repaired or replaced with a repaired tool in a similar condition in accordance with the conditions of implementation and application of the guarantee (cf. paragraphs 1 and 2 above) and without limit of time.



- **Guarantee type D** : this guarantee is subject to a time limit. The guarantee period is specified by a figure after the D. It applies mainly to technical products or machines. In accordance with the conditions of implementation and application of the guarantee (in particular the exclusion of wearing parts - cf. paragraphs 1 and 2 above), this guarantee covers the repair and replacement of defective parts, free of charge, during the period of validity.

In the event that Facom is no longer able to exchange a product under guarantee with another having the same reference, it undertakes to provide a technically equivalent product or to issue a credit note if no corresponding product is available.

The type of guarantee applying to a product can be determined simply by referring to the current price list (column G) available at any Facom distributor. For certain product references, the type of guarantee is indicated on the packaging or in the accompanying documentation.

Those items for which no guarantee type is specified (column G empty), are covered only by the statutory guarantee.

Each item of a set continues to be covered by its own guarantee Jurisdiction. Applicable legislation

► Jurisdiction. Applicable legislation

In the event of problems concerning the application hereof, the User can contact :

In France : - Facom Customer Services, 6 and 8 rue Gustave Eiffel, 91420 Morangis.

Outside France :- The Facom subsidiaries listed on page 868 of the Catalogue and on the Facom Web site www.facom.fr

- Facom distributors



Any dispute in relation to the interpretation or execution hereof that cannot be amicably resolved between the parties will be subject to French law and the sole jurisdiction of the Paris Courts.

► Territorial extent

The Facom contractual guarantee applies in all countries in which the product is officially sold and distributed.

► Statutory guarantee

Irrespective of the Facom contractual guarantee, the User is also covered by the provisions of articles 1641 to 1649 of the French Civil Code relating to hidden defects.



A

Adaptor, offset, 1/2"	223
Adaptor, power-assisted screw-driving	361
Adaptor, socket for torque wrench	292
Adaptor, socket, 1/4" square drive	359
Adaptors, motorcycle spark plug	740
Aids, cleanliness, roller cabinet	81
Air jet	597
Air-line connector and gauge	784
Ammeter, clip-on	650
Ammeter, clip-on, automotive	733
Angle reader	455
Anti-theft bar, roller cabinet	80
Automotive electrical tools	732
Axle stands	718

B

Back-pack	118
Bag, leather	117
Bar clamps	621
Bar, angle 3/4"	235
Bar, ratchet 1"	240
Bar, ratchet 3/4"	236
Bar, wrecking	606
Bars for wrenches 91A, 92A and 97	154
Base, magnetic, for dial gauge	429
Batteries for portable power tools	573
Battery filler	737
Beam, puller	546
Beam, separator	550
Bevel, builders	455
Bevel, engineers	436
Bit 1/2"	227
Bit 1/4"	189
Bit 3/4"	238
Bit 3/8"	202
Bit driver	330
Bit driver, «Micro-Tech®»	691
Bit driver, folding	354
Bit driver, magnetic	358
Bit driver, ratchet	330
Bit drivers, ratchet, 1/4" to 5/16"	359
Bit holder	358
Bit holders with lock-ring	360
Bit holders, spring clip	359
Bit holders, spring clip for 5/16" bits	360

Bit set	354
Bit set	354
Bit set, impact	365
Bit set, impact, 1/2"	249
Bit set, impact, 3/8"	245
Bit sets	354
Bit, 1/4"	345
Bit, 1/4", High Perf'	355
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Bit, impact, 1/2"	364
Bit, impact, 3/4"	253
Bit, impact, 5/16"	362
Bit, Micro-Tech®	692
Bit, reaming bit	812
Bit, square head	345
Bit, square head	350
Bit, Torq Set	348
Bit, Tri-wing	348
Bit-holder, impact	363
Bit-holders, 1/2"	223
Bit-holders, 1/4"	185
Bit-holders, 3/8"	199
Bit-holders, CDX	209
Bit-holders, impact, 1/2"	249
Bit-holders, impact, 3/8"	245
Blade, hacksaw	486
Blade, shrinking	809
Blade, utility knife	508
Bleeder, brake and clutch	768
Body repair tools	792
Bolt cropper	503
Brake bleeder plugs	770
Brake tools	767
Brush	703
Brush, metal for brake calipers	772
Brush, wire, steel	606
Brushes	703

C

Cabinet with folding doors	98
Cabinet, drawer fittings	99
Cable cutter	504
Cable cutter, steel	504
Cable cutter, VSE 1000 V insulated	657
Calipers, digital	421
Calipers, vernier	424
Calipers, vernier, brake	767
Camber adjuster	788
Car radio removal tools	739
Carry tray and holder for roller cabinet	82
Cart	123
Case, leather	116
Case, service	111

Case, soft	118
Cases, plastic	110
Caulking gun, air	595
Chalk line reel	452
Chalk, marking	453
Charger, portable power tools	572
Chest, «construction»	123
Chest, maintenance	120
Chest, roller	77
Chest, roller	77
Chests for CHRONO.XL roller cabinets	73
Chests for JET.XL roller cabinets	70
Chests for roller cabinets	119
Chisel, power	592
Chisel, power, panelbeaters	799
Chisels	478
Chisels, bodywork	798
Chisels, cape	478
Chisels, sheathed	474
Chisels, sheathed	474
Clamp, hose	751
Clamps, sleeving	635
Clutch system tools	759
Collet clamp, cylinder head	753
Composite angle grinder/cutter, air	589
Compressor holder	783
Compressor, ring, ratchet	757
Compressor, spring	777
Connector, fish tape	640
Copper brake pipe cutter	774
Coupler 1/2" to 3/4"	184
Coupler 1/2" to 3/4"	223
Coupler 3/4" to 1"	237
Coupler 3/4" to 1", impact	254
Coupler 3/8" to 1/2"	199
Coupler 3/8" to 1/2", impact	244
Coupler CDX to 1/2"	208
Coupler, 1 1/2" to 1", impact	258
Coupler, 1/2" to 3/8"	222
Coupler, 1/2" to 3/8", impact	250
Coupler, 1/2" to CDX	222
Coupler, 1" to 3/4"	241
Coupler, 1" to 3/4", impact	257
Coupler, 3/4" to 1/2"	236
Coupler, 3/4" to 1/2", impact	253
Coupler, 3/8" to 1/4"	199
Coupler, 3/8", impact	244
Coupler, CDX to 3/8"	208
Couplers, set of 3 from 1/4" to 1/2"	185
Crimper	629
Cross brace	784
Cross brace, HGV	835
Cross brace, VSE 1000V insulated	659
Crowbars, crook beak	606
Cutter	499
Cutter, battery terminal	737
Cutter, pipe	610
Cutter, spot weld	801
Cutters, diagonal, CPE series	379

Cutters, diagonal, G series	386
Cutters, diagonal, TE series	384
Cutters, end, CPE series	379
Cutters, end, G series	386
Cutters, low-effort	411
Cutters, plastics	409
Cutters, VSE 1000V insulated	654

D

Deburrer	613
Deburring – Chamfering tools	613
Desoldering braid	711
Die stock	495
Die, crimping	632
Die, split	493
Disc brake piston winding-back tools	771
Dividers, calipers, compasses	437
Document holder, for roller cabinet	81
Dolly, curved head	808
Dolly, panelbeaters	807
Dolly, panelbeaters	808
Door kit, JET.XL workbench	75
Drawer unit	98
Drawer unit for workbench	91
Drawer, workbench	91
Dressers	806
Drift punch	475
Drift punches for spring pins	475
Drifts	470
Drill bit, cone	496
Drill bit, cone, for stud extractors	553
Drill bit, masonry	497
Drill bit, metal	495
Drill bit, stepped	497
Drill bit, stepped, bodywork	813
Drill bit, stepped, PG and ISO	647
Drill, air	582
Drill-driver, battery	
powered 13 mm / 14.4 V	573
Driver, stud	554
Driveshaft tie, metal	791
Dual-gauge brake pressure tester	768

E

Easotork wrench charger	287
End accessories, torque wrench	296
End accessory, «crowfoot», for torque wrench	299
Engine timing kit	761
Engine timing kits	761
Engine timing tools	760
Engine tools	740
Engraving pen, pneumatic	596
Exhaust system chain pipe cutter	758
Exhaust system tools	758
Extension 1/2"	222
Extension 1/4"	183

Extension 1"	241
Extension 3/4"	236
Extension 3/8"	198
Extension, chamfered 1/2"	222
Extension, chamfered 1/4"	184
Extension, chamfered 3/8"	198
Extension, flexible, 1/4"	184
Extension, flexible, 3/8"	198
Extension, impact 1/2"	250
Extension, impact 1"	256
Extension, impact 3/4"	253
Extension, impact 3/8"	244
Extension, impact, 1 1/2"	258
Extension, insulated	662
Extension, locking 1/2"	221
Extension, locking 1/4"	183
Extension, locking 3/8"	197
Extension, locking, CDX	207
Extension, recoil, air line	599
Extractor, broken stud	553

F

Fastener removal tool	796
File	486
File card	487
File, contact	729
File, diamond	729
File, knife	490
File, milled	490
File, milled, bodywork	811
File, needle	492
File, round, for chainsaw	491
File, special for brake calipers	772
Filter, air tools	597
Filtration tools	723
Fish tapes	637
Flange press, brake	773
Flanged, brake line	773
Flanging press	613
Flanging tools	613
Flanging tools	613
Flywheel stay	764
Fork separators	789
Forks, spring compressor	780
Frame, milled files	811

G

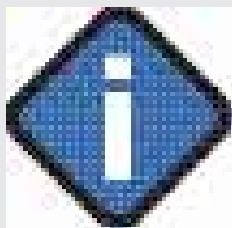
Gauge	459
Gauge well remover	746
Gauge, depth, digital	422
Gauge, depth, mechanical	426
Gauge, feeler	458
Gauge, feeler for spark plugs	728
Gauge, liquid	456
Gauge, outage and innage	456
Gauge, outage and innage	457
Gauge, radius	458



Gauge, screw pitch	459
G-clamp	620
G-clamp, arc-welding	620
Glasses, safety	603
Gloves, electrical insulating	666
Gloves, insulating	605
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Grinder, straight, air	586
Grinder, valve	754
Gun caulking, bodywork	826
Gun, bonding	636
Gun, grease, air	617
Gun, heat	605
Gun, heat, bodywork	797

H

Hacksaw frame	484
Hacksaw frame, Micro-Tech®	701
Hacksaw frame, VSE 1000V insulated	657
Hammer, claw	467
Hammer, claw	467
Hammer, club and sledge	467
Hammer, dead-blow	469
Hammer, dinging	466
Hammer, dinging, square face	466
Hammer, electricians	467
Hammer, engineers, graphite handle	463
Hammer, engineers, wood handle	464
Hammer, joiners	467
Hammer, panelbeaters	805
Hammer, slide	549
Hammer, soft-faced	469
Hammer, welders	466
Hand crimper and punch	813
Hand punch	813
Handle, file and rasp	487
Handle, hinged 1/2"	220
Handle, hinged 1/4"	182
Handle, hinged 3/4"	236
Handle, hinged 3/8"	196
Handle, sliding 1/2"	220
Handle, sliding 1/4"	182
Handle, sliding 1"	240
Handle, sliding 3/4"	235



Handle, sliding 3/8"	196
Handle, sliding, CDX	208
Head lamp, LED	559
Hex nut setter, magnetic	350
Hexagon key set, for safety fasteners	334
Hexagonal key set	342
Hexagonal key set, folding	335
Hexagonal key set, ring	336
Hexagonal key set, sleeve	334
Hexagonal key set, wallet	337
HGV and industrial vehicle tools	827
Holder, bottle, for roller cabinet	81
Holder, paper roll for roller cabinet	81
Holder, windscreen, for roller cabinet	82
Hole punch hydraulic jack	648
Hole punch, ISO sizes	643
Holesaw	498
Holesaws	498
Hook, spring	703
Hook; snap	641
Hooks, CKS, for wall panels and cupboards	94
Hose clamp, screw-type	751
Hose remover	747
Hose remover, large diameter	747
Hose, air, braided	599
Hydraulic hole punch equipment	645
Hydraulic ram oil	826
Hydrometer, acid	737
Hydrometer, anti-freeze	750

I

Identification tags, sheet	82
Impact adaptor 1/2" to 3/4"	250
Impact adaptor 1" to 1 1/2"	257
Impact adaptor 1 1/2" to 2 1/2"	258
Impact wrench, 1/2", 19.2V battery-powered	572
Impact wrench, 19.2V battery-powered for wheels	785
Indicator, dial	429
Indicator, digital	423
Injector, dummy	742
Inspection creepers	719
Inspection lamp, cordless LED	562

Inspection lamp, cordless LED, Pocket	560
Inspection lamps	564

J

Jack, bottle	718
Jack, hollow, for pullers	537
Jack, lifting	718
Jack, separator, for pullers	538
Jack, trolley	717

K

Key, hexagon, folding sets	335
Key, hexagonal, extra-long, spherical head	338
Key, hexagonal, long	338
Key, hexagonal, long, spherical head	337
Key, hexagonal, short	339
Key, hexagonal, tee-handle	341
Key, hexagonal, VSE 1000V insulated	659
Key, long hexagonal, ring sets	336
Key, Resistorx	340
Key, short hexagonal, ring sets	336
Key, Torx	340
Key, Torx, folding set	335
Key, Torx, ring set	336
Key, Torx, roll set	337
Keys, hexagonal	333
Knife, utility	506
Knife, VSE 1000 V insulated	657
Knives	512

L

Lead, insulated	705
Letter, marking	453
Level, engineers	448
Light, pen	563
Limiter, surge 12 V	736
Limiter, surge 24V	837
Line, sounding	456
Load balancer, crane	719
Lubricant, fish tape	638
Lubrication tools	721

M

MacPherson clamp separator sets	776
MacPherson strut tools	783
Magnetiser-demagnetiser	331
Mallet, wood	468
Mask, face	604
Mat, insulating	667
Mat, rubber, for roller cabinet drawers	82
Measure, tape	442
Measure, tape, long	446
Memory protector	736
Micrometer	426

Micrometer, digital	422
Micrometer, mechanical	426
Mill, end	800
Mirror, inspection	703
Mirror, swivel, flexible	704
Module, «Micro-Tech®» electronic pliers	683
Module, 1000 V insulated screwdrivers	320
Module, bodywork	811
Module, cylinder head tools	229
Module, disc brake	771
Module, drum brake servicing	772
Module, files	488
Module, flare-nut wrench	774
Module, Hex key, tee-handle	341
Module, impact driver	367
Module, impact tools	477
Module, measuring and marking-out	439
Module, metrology	427
Module, milled files	812
Module, oil change and filter	722
Module, pliers	414
Module, Protwist screwdrivers	310
Module, pullers	527
Module, riveting	616
Module, saw, tape measure and files	485
Module, screwdriver bits	355
Module, sheathed drift punch	473
Module, sheathed drift punch, chisel	474
Module, socket, impact, 1/2"	246
Module, sockets and bits	755
Module, sockets, 1/2", with long-reach bits	229
Module, spark plug	730
Module, tools (range)	84
Module, TORX sockets, wrenches and bits	755
Module, wheel nut tightening	784
Motometer adaptor for compression tester	741
Multi-functional bodywork support cradle	815
Multimeter, automotive	733
Multimeter, digital display	650

N

Nail sets	476
Nail sets, sheathed	473
Nibbler, air	594
Nibblers	502
Nippers	408
Nut setter, hexagon	350
Nut spinner, socket	156
Nut spinners	156
Nut spinners, hexagon	343
Nut spinners, Torx	342
Nut spinners, Torx, sleeve set	334
Nut splitter	555
Nut starter	702

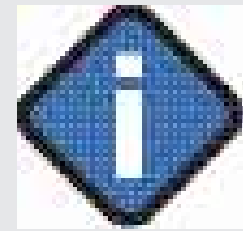
O

Oil cans	617
Oiler, spot	702
Organisers	109
Overalls, mechanics	602
Overgloves	666

P

Panel, vertical, for roller cabinet	80
Partitions, roller cabinet drawer	82
Paste, lubricating for hole punch	647
Pencils	453
Pipe benders	609
Pipe cutter, plastic	612
Pivot knob, torque wrench	298
Plastic component removal tool	797
Plier, crimping, checking gauge	630
Pliers wheel weight	788
Pliers, 1000 V insulated	388
Pliers, bending for brake lines	774
Pliers, brake-spring	772
Pliers, circlip	392
Pliers, circlip	392
Pliers, combination, CPE series	381
Pliers, combination, G series	387
Pliers, combination, TE series	385
Pliers, connector	411
Pliers, crimping	629
Pliers, crimping for insulated terminals	629
Pliers, crimping for insulated terminals	738
Pliers, crimping, for cable terminals	632
Pliers, crimping, for coaxial connectors	633
Pliers, crimping, for Ethernet connectors	634
Pliers, crimping, for open-barrel connectors	632
Pliers, crimping, for SUB-D connectors	634
Pliers, crimping, for telephone connectors	633
Pliers, crimping, for tubular terminals and sleeves	631
Pliers, crimping, HGV	836
Pliers, crimping, hydraulic	631
Pliers, cylinder head	753
Pliers, driveshaft tie	791
Pliers, electrical engineers	377
Pliers, electronic, antistatic, Micro-tech®	683
Pliers, electronic, Micro-tech®	674
Pliers, fish tape pulling	638
Pliers, Flat nose, CPE series	383
Pliers, Flat nose, G series	387
Pliers, Flat nose, TE series	385
Pliers, for automatic fuel line clips	746
Pliers, fuel-line	747
Pliers, half-round nose, CPE series	381
Pliers, half-round nose, extra-long reach	410
Pliers, half-round nose, G series	387
Pliers, half-round nose, TE series	385
Pliers, hand-brake	772

Pliers, insulating for mats	668
Pliers, lock-grip	400
Pliers, lock-grip, automatic	404
Pliers, lock-grip, bar clamp	407
Pliers, lock-grip, bodywork	813
Pliers, lock-grip, compact	405
Pliers, lock-grip, large-capacity	403
Pliers, lock-grip, metalwork	406
Pliers, lock-grip, single setting	406
Pliers, lock-grip, trigger release	400
Pliers, locking-wire	399
Pliers, motorists	410
Pliers, multigrip	372
Pliers, outside snap-ring	398
Pliers, pipe bending	609
Pliers, piston ring	757
Pliers, piston ring, HGV	830
Pliers, plastic tie	635
Pliers, PSA exhaust collars	758
Pliers, ring	700
Pliers, round nose, CPE series	383
Pliers, round-nose, 1000 Volt insulated	391
Pliers, spark plug lead	728
Pliers, spring clip	748
Pliers, stripping	626
Pliers, stripping, 1000 Volt insulated	391
Pliers, stripping, CPE series	383
Pliers, stripping, TE series	385
Pliers, trim clip removal	796
Pliers, twisting	399
Pliers, valve stem seal	754
Pliers, valve stem seal	754
Pliers, VSE 1000V insulated	654
Plug, dummy heater	741
Plumb bob	452
Pneumatic lubricator oil	598
Point, square	439
Polisher, angle polisher	591
Power lever	606
Power lever, suspension	776
Precision knife with interchangeable blades	701
Probe, lambda	651
Probes, cable for electrical readings	734
Protractor	436
Protractor attachment	300
Protractor attachment	829
Protractor attachment, cylinder head	756
Puller, 2 sliding legs	539
Puller, 2 slim legs	541
Puller, 2 wide legs	543
Puller, 2 wide self-gripping legs	542
Puller, 3 slim legs	528
Puller, 3-leg, heavy duty	529
Puller, 3-leg, outside, heavy duty	531
Puller, battery terminal	737
Puller, hydraulic, heavy-duty	536
Puller, hydraulic, medium-duty	533
Puller, pump, BMW	764



Puller, spreader, bearing cage	545
Puller, spreader, inside	546
Puller, timing and injection pump pulley	766
Puller, tip-type, inside grip	547
Puller, universal 3-leg, reversible	525
Puller, yoke	544
Pullers	520
Pulley stay	766
Pulling eye, fish tape	639
Pulling grips	638
Pump, desoldering	710
Pump, grease	617
Pump, hydraulic, for hole punch	646
Pump, hydraulic, hand-operated	537
Pump, injector test	752
Pump, injector test	752
Pump, mechanical	778
Pump, vacuum/pressure	746
Punch set, numbers	454
Punch, centre	476
Punch, centre, automatic	476
Punch, centre, automatic, sheathed	474
Punch, centre, sheathed	473
Punch, gasket	514
Punch, hole, hydraulic	645
Punch, letter	454
Punch, PG hole sizes	642
Punches/dies, ISO	644
Punches/dies, PG	643

Q

Quick connector, pneumatic	599
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R

Rasp	491
Ratchet handle, torque driver	292
Ratchet, 1/2"	218
Ratchet, 1/4"	180
Ratchet, 1"	240
Ratchet, 3/4"	233
Ratchet, 3/4", HGV	828
Ratchet, 3/8"	192
Ratchet, CDX	207
Ratchet, pneumatic	580
Ratchet, VSE 1000 V insulated	662



Ratchets, torque wrench	296
Reel, electric cable	565
Reel, plastic	638
Reel, tropic-proof steel	640
Refractometer	737
Remover, power fuse	738
Remover, windshield-wiper arm	823
Rest, cylinder-head	753
Retriever, claw	702
Retriever, magnetic	702
Retriever, magnetic, flexible	704
Retriever, mechanical, flexible	704
Rifflers	488
Riveter, air	596
Riveter, blind nut	615
Riveter, hand	614
Riveting sets	616
Roll bag, nylon	110
Roller cabinet connection kit	73
Roller cabinet wheel kit	73
Roller cabinet, CHRONO.XL	72
Roller cabinet, JET.XL	69
Roller cabinet, JET.XL, heavy-duty	70
Roller cabinet, JET.XL, safety range	71
Rubber stretcher, exhaust	758
Rule	431
Rule, engineers	434
Rule, folding	451
Rust remover, needle	596

S

Sander, angle, air	589
Sander, belt, air	585
Sander, belt, bodywork	819
Sander, disc, air	582
Sander, disc, air	588
Sander, disc, air	817
Sander, vibrating, air	584
Sander, vibrating, bodywork	818
Saw, circular, air	593
Saw, sabre, air	592
Saw, sabre, bodywork	799
Scissors	511
Scissors, precision	701
Scraper	500
Scraper, glued joints	754

Scraper, three-square	800
Scraper, three-square, precision	701
Screw holder	331
Screw starter	331
Screw starter	331
Screw starter, flexible	729
Screw, hydraulic, for pullers	537
Screwdriver bit sets, 1/2"	227
Screwdriver for terminals	322
Screwdriver set, «Micro-Tech®»	693
Screwdriver set, Isoryl	323
Screwdriver set, Protwist	310
Screwdriver set, slotted	
and Phillips® heads	318
Screwdriver set, wood-handle	326
Screwdriver, 1000 V insulated	660
Screwdriver, ceramic blade,	
Micro-Tech®	691
Screwdriver, flexible, clamp	748
Screwdriver, impact	366
Screwdriver, Isoryl series	325
Screwdriver, Micro-Tech® series	690
Screwdriver, miniature	690
Screwdriver, multi-blade	328
Screwdriver, offset	332
Screwdriver, pneumatic	581
Screwdriver, Protwist series	310
Screwdriver, spiral ratchet, 1/4"	330
Screwdriver, tuning	704
Screwdriver, voltage-tester	331
Screwdriver, watchmakers	696
Screwdriver, wood-handle	326
Scriber	429
Scriber	438
Separator, ball-joint	789
Separator, ball-joint	789
Separator, ball-joint, HGV	834
Separator, bearing	550
Service station cabinet	52
Set, pins, for belt tensioner	765
Set, pliers	413
Set, sleeve, hexagonal keys	333
Set, sockets and accessories, 1/2"	210
Set, sockets and accessories, 1/4"	174
Set, sockets and accessories, 1"	239
Set, sockets and accessories, 3/4"	230
Set, sockets and accessories, 3/8"	190
Set, sockets and accessories, CDX	205
Shears, metal	500
Shears, universal	510
Sheathed drift punches	472
Shelf, magnetic + paper roll holder	
for roller cabinet	81
Shelf, pivoting for roller cabinets	81
Side cupboard for roller cabinet	80
Single-point injection kit	745
Socket 1/2"	225
Socket 1/4"	186
Socket 1"	242
Socket 3/4"	237
Socket 3/8"	200
Socket set, 1/2"	210
Socket set, 1/4"	174
Socket set, 1"	239
Socket set, 1000V insulated	663
Socket set, 3/4"	230
Socket set, 3/8"	190
Socket set, CDX	205
Socket set, impact, 1/2"	250
Socket set, impact, 3/4"	254
Socket set, VSE 1000V insulated	663
Socket sets 1/2"	210
Socket sets 1/4"	174
Socket sets 3/4"	230
Socket sets 3/8"	190
Socket sets, 1"	239
Socket sets, 1000V insulated	663
Socket sets, CDX	205
Socket sets, impact, 1/2"	250
Socket sets, impact, 3/4"	254
Socket, CDX	209
Socket, diesel engine piloted injector	751
Socket, diesel heater plug	731
Socket, hub-nut protractor	790
Socket, impact, 1 1/2"	257
Socket, impact, 1/2"	246
Socket, impact, 1" "Trailer"	256
Socket, impact, 1"	255
Socket, impact, 3/4"	252
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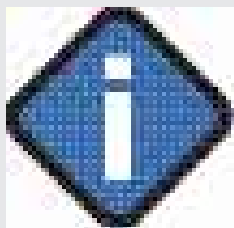
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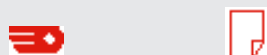
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MOD.A3	85
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MOD.BJ	730
MOD.BJB	730
MOD.BRA	730
MOD.BSA	730
MOD.CAR	811
MOD.CAR1	811
MOD.CDX	85
MOD.CG	473
MOD.CG1	474
MOD.CH	229
MOD.CPE	414
MOD.DF	771
MOD.E	85
MOD.J1-MOD.J7	85

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MOD.LIM	488
MOD.MET	427
MOD.MI	465
MOD.MT1	683
MOD.NS	246
MOD.NS260	367
MOD.PC1	394
MOD.PC2	396
MOD.PR	414
MOD.R	84
MOD.S1	85
MOD.SHP	755
MOD.TE	414
MOD.TX1	755
MOD.U306	527
MOD.U46CL	722
MOD.VE	414
MOD.Y105	616
MODM.	N > 87
MODM.440	N > 87
MODM.A	N > 87
MODM.CG	N > 473
MODM.CPE1	N > 414
MODM.MI1	N > 477
MODM.MI3	N > 477
MODM.MI4	N > 478
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MODM.S1A	N > 87
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MP	487

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N.553D - N.558D	597
N.560D - N.642	598
N.708	786
NB - NBA - NBB	599
NEX	364
NG	259
NGA	258
NH.14A	249
NHX.14A	365
NJ	244
NJ.237A	364
NJ.263A	363
NJ.1300F - NJ.2000F	574
NJ.240A	244
NJ.260-NJ.262	366
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NKB	253
NKD.A	252
NK.1000F	577
NK.1101E	578
NK.143	790
NK.2000F	578
NK.209A-NK.218A	253
NK.230A-NK.240A	253
NK.232A	254
NK.300	259
NK.500	254
NK.990F	577
NM.A	255
NM.LA	255
NMB	256
NM.1000F	578
NM.1010LF - NM.1200F	579
NM.209A-NM.215A	256
NM.232A	257
NM.240A	256
NM.300	259
NP	282
NS	246
NS.LA	247
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NS.1800F	575
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NS.1800FE	577
NS.230A - NS.232B	250
NS.240A	250
NS.260A	367
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NS.500A - NS.500AU	251
NS.550A	250
NS.557-04	598
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NSAL.3	785
NSB	247
NSHM	248
NSTX	248
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PAM	489
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PL	84
PL.249	106
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RT.VSE	665
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R.120A	182
R.140A	182
R.142	182
R.150A	180
R.151-R.158A	180
R.151AVSE	665
R.161	180
R.2A-R.3A	174
R.200P	298
R.203A-R.205E	278
R.208-25	277
R.210AVSE	666
R.209-R.217	183
R.216	184
R.222	182
R.227	182
R.228	183
R.229A	183
R.232	184
R.235	185
R.236	182
R.240A	184
R.245	185
R.248-25D	289
R.250A	290
R.300B	275
R.301A-R.306	272
R.344DA	289
R.345P	289
R.372-R.373	296
R.400AVSE	666
R.410-R.450	174
R.446-25	289
RAB	491
RD	489
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RS	210
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RT.40	188
RTX	188
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S.HLA	225
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S.LAVSE	662
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S.40	226
S.110	220
S.120A	220
S.121AVSE	662
S.140A-S.145	220
S.143A-S.158A	219
S.151	218
S.151C	219
S.151R-S.151RN	219
S.151AVSE	662
S.152	298
S.156	290
S.161	218
S.161C-S.161RN	219
S.171	218
S.200P	278
S.202A	279
S.203	278
S.203E	298
S.205E	279
S.206-S.217	222
S.208	277
S.210RC-S.217RC	221
S.210-215AVSE	662
S.228	220
S.229A	220
S.230 - S.234	222
S.236-S.237	223
S.240A	222
S.248	289
S.250A	290
S.284	298
S.300B-S.320B	275
S.305P	299
S.306	272
S.345P	289
S.372-S.373	296
S.382-S.383	297
S.420-S.900	210
S.400AVSE	663
S.401AVSE	663
S.446	289
SE.1A	755
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SJ.	207
SJ.H	208
SJ.120	208
SJ.171-SJ.174	207
SJ.210R-SJ.215R	207
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SJ.232	208
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SM.150C-SM.150RN	219
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SM.161-SM.171	218
SM.171RN/SM.171-04	219
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ST.VSE	662
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STG	487
STU	488
STX	226
SV.J5	755
SV	228
SV.LJ6A	229
SV.40	228
SX	228
SXM	227

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T.273	721
T.33A	721
T.84	791
T5	401
TA-U.89/0606	780
TRI	490
TRO.5,6EM	491

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U.102T	524
U.103A	524
U.13L	753
U.14	541
U.16	834
U.17	789
U.179A	784
U.18	834
U.2	549
U.20	529
U.23	545
U.25A	759
U.27	530
U.28	546
U.3	537
U.30	546
U.32T	538
U.232	N > 540
U.301	541
U.301BJ1	524
U.301L-M-P	N > 542
U.302	528
U.306	526
U.306M	549
U.310	527
U.310-230N	528
U.312	534
U.312H	N > 533
U.320	531
U.320H	536
U.330	531
U.330H	536
U.33A	538
U.34-U.35	543
U.42	544
U.43	753
U.46	723
U.46ACL	722
U.46PL	831
U.48	N > 723
U.49A	548
U.49L	549
U.49P	547
U.51B	546
U.52	544
U.53	550
U.54A	754
U.60B	531
U.66A	538
U.89H	778
U.89J	780
U.89M	779
U.J	523
UA.444A	788
UM.300	812

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V.482	590
V.490A - V.492	591
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V.582F	590
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V.690F	580
V.750A	593
V.770F	592
V.775F	593
V.781	595
V.801F	595
V.820	596
V.850F	594
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V.910F	580
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V.999A	597
VE.3	413
VFA	499
VM	587
VM.600 - VM.624	587

WA	778
WA.21	826
WV.M401	778

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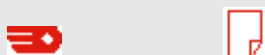
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Y

Y.103B	615
Y.105B	614
Y.107	615
Y.113B	615
Y.116B	615
Y.135	615
Y.M46	616
Y.RIV	616

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12	296
13	297
18	299
20	298
22	145
31	144
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39	133
40LA	135
40R	132
41	134
41L	135

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43	159
44	143
45	146
46.VSE	658
50	151
51A	151
54	150
55A	147
55A.VSE	658
57	149
59	148
59TX	149
64	140
65	141
65.PE	142
65.PEJ13	355
66A	155
66TX	155
67	137
67F	139
67S	138
70A	158
71.VSE	659
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74T	157
75	152
76	153
77A.PL	835
80.JL7	343
81.JL7	343
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83H.JP	337
83.AVSE	659
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89R.JM	335
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89S.JP	334
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94T.VSE	659
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117	165
118	165
119	163
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121A	608
125A	163
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133A	608
134A	607
135A	607
136A	608
137A	609
138A	609
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140	697
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152.Y	698
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160A	154
163	628
165.1	627
167E	393
167G	395
169E	393
169G	395
170A	373
171.20EL	411
173A	628
176A	375
177E	393
177G	395
179E	392
179G	394
180	374
180.VSE	654
181	N > 373
182A.CP	375
183.20CPE	381
184.J	412
185 - 195.G	387
185 - 195.VE	389
185.20AVSE	656
185.28EG	410
185-195.CPE	381
185-195.TE	385
186	410
187.CPE	381
187.G	387
187.TE	385
187.VE	390
187.AVSE	655
188.16AVSE	655
188.16TE	385
188.CPE	383
188.G	387
188.VE	390
189.17AVSE	656
189.17CPE	383
189.17VE	391
190.16AVSE	655
190.16VE	389
190.CPE	379
190.G	386
191A.22EL	411
192.CPE	379
192.G	386
192.TE	384
192.VE	388
192.AVSE	654
193 - 195.CPE	381
193 - 195.VE	390
193.16AVSE	655
193.16G	387

194.12	377
194.17AVSE	656
194.17CPE	383
194.17VE	391
194.17CPE	628
194.TE	385
195.20AVSE	656
196	772
197E	394
197G	395
199E	393
199G	395
200C	N > 463
200H	465
200P	298
202A	279
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203	278
203H	467
204	467
205C	N > 463
205E	279
205H	465
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208	277
209	468
210.MH45	468
211.MH26	805
212A	469
213H	466
214	470
214A	279
215H	467
216	469
217.G	471
217.R12	472
217E	472
221	493
222	496
222A.T	495
223	497
225	800
227	493
229.TT	499
229A	496
229A.ST	497
230	801
231	500
232	500
233A	439
234	438
235.J1	N > 500
236	439
237	494
237.J1	N > 500
238	611
238A.16	774
238A.32	612
239	614
240.M	614
242	614
243	613
243.244J1	614
244	610
245.J1	514
245A	515
245A.C	514
246	475
246.J	476
247	476
247.249JS12	476
247.265JT10	476
247G	477
248	475
248.J	476
248D	289
249	475
249.G247GJ12	473
249.GJ	473

249.J	476
249G	472
250A	290
251A	475
251A.J	476
252	479
252.254JS4	479
254A	479
255G	473
256	476
257	476
257.G	474
258	478
259	478
259.P	478
260.P	478
262A	479
262A.JS4	479
263	478
263.265JS5	479
263.G	474
263.P	478
265	478
265.G18	474
268-269	606
270.A	487
270A.MA	606
271A	620
272A	621
274	621
275	621
276	729
277	729
283	619
285	553
286A	554
287B	555
289	555
292A - 293A	454
300B	275
306A	272
306R	273
306U	273
307A	450
307AM	449
309M	450
310B	450
311A	450
320	450
325	613
329	500
334	611
335	612
336	612
337A.2	611
338B.1	610
344A	609
347	613
372	702
373	617
374A.20	617
376A	616
377A-378A	617
379A-380	617
391.16AVSE	654
391.16CPE	379
391.16G	386
391.16TE	384
391.16VE	389
395	409
396	410
400.JT1	704
401- 421	377
401.MT	680
402.MT-403.MT	682
405	377
405.MT-407.MT	674
405.E-407.E	684
410	411

411A	398
412	504
412.AVSE-414.AVSE	657
413	505
415.MT	675
415.E	685
416	377
416.MT	676
416.E	686
417.E	686
417.SPE	687
417.PMT	678
417.SPMT	679
418.MT	678
419.E	688
419.MT	679
420.E	688
420.MT	680
421	377
421.MT	680
422.MT	682
423.MT	683
424.MT	683
425	377
425.E-426.E	685
425.MT-426.MT	675
427.E	687
427.MT	677
428.MT	678
429.E	687
429.MT	677
430.MT	677
431.E	688
431.LE	689
431.LMT	681
431.MT	680
432.E	689
432.LE	689
432.LMT	682
432.MT	682
433.LE	689
433.LMT	683
434.E	688
434.MT	679
435	377
435.E-436.E	685
435.MT-436.MT	675
437.E	688
437.MT	679
438-439	700
440	N > 129
442	377
442.MT-443.MT	681
446	289
449I	630
449.Z1A	738
449.Z3A	634
455B	635
467-469	398
470	397
470.MT	700
470E	398
475A	397
477-497	396
479-499	396
480.ECG	375
481.40	376
482	376
484	375
485	376
490.SE	396
491	N > 409
495A	N > 408
500	403
501 - 506	403
502A	406
503	407
504A	406
507A	405

509	405
511	403
512	407
513	406
514	407
516	403
517	406
518	813
520A	407
521	408
580	N > 404
582.7	N > 404
599	485
601	485
602.AVSE	657
603E	484
605.B	485
606A	485
607.MT	701
609A	498
660A-666A	486
700	735
701A	652
705	735
709	652
711	650
712	651
712-1	734
714	733
750	829
751.K-751.T	757
777A	564
778A	750
779.CL	562
779.FRT	559
779.PC	N > 561
780A	750
781	737
784B	737
785	737
789.5	836
795A	430
796B	429
800A-801A	444
801A-801A.EX	445
802.B2	451
803	432
803.SR	432
804	728
804.AM	458
804.U	458
805	424
805.M	425
805.S	425
806	426
806.F	427
807C	427
809	434
809.J	428
811	426
812	428
813B.S	437
814	459
815A	426
816	425
817	436
818	434
819	435
823	438
825.MT	702
826.0	702
826.1	704
826.2	704
827	702
827B	704
828	704
829	704
830A	494
831	495



832	495	935	750	2092.M120A	29	629933	640	985761	627
834	703	947A	709	2092.M130A	27	629941	640	985762	627
835	703	980	N > 510	2092A	77	629950	640	985763	635
836	563	982	502	2099.GR	76	629968	641	985764	635
837	331	985	502	2120.E18	44	629976	639	985765	635
838.CX58	625	990	503	2120.M110A	31	629984	638	985801	643
839	710	996	505	2132.EL30	39	629992	638	985817	643
840	512	997A	504	2132.EL31	39	631013	513	985818	643
841	511	1001A	706	2138.EL29	38	640083	117	985820	643
841.1-841.3	701	1002A	706	2138.EL33	41	640171	635	985824	643
841.4-841.7	511	1003A	707	2138.EL34	42	640180	513	985826	643
843	513	1024.25	707	2138.EL35	43	643743	646	985829	643
844.D	N > 506	1075.G	N > 709	2143.M	53	653255	646	985836	643
844.R	506	1116B.BW	708	2144A	788	658689	649	985894	630
844.S18	N > 507	1130	711	2145.MAG1	57	661600	649	985894	738
844.S18L	509	1150.MT	702	2146.MAG4	57	661618	710	985895	632
844.S9	507	1195	711	2163.E16	46	661626	710	985896	633
844.S9L10	509	1200-1202	430	2163.RFCL	49	663621	648	985897	633
844.SE18	507	1222	618	2174.MAG5	58	664499	644	985898	632
844.TTL	N > 508	1223	619	2180.SE	47	664501	644	985899	633
844.TSL	508	1230	707	2180B.VSE	668	664510	644	985901	634
844.TRL	N > 509	1260	606	2184C.VSE	669	664528	644	985902	633
844.TCL	509	1262H	467	2185C.VSE	668	664536	644	985912	505
844C	507	1263H	468	2187C.VSE	669	664544	644	985913	631
845.1	701	1300	N > 421	2201	N > 93	669273	637	985914	632
848	708	1300.C2	423	2201.M120A	29	673838	629	985915	632
850	811	1320	N > 421	2201.M130A	27	678006	647	985916	632
851B	811	1350	N > 422	2201.MS1	52	678014	647	985917	632
859H.28	466	1355	422	2202XL	N > 93	693687	644	985918	632
860H	466	1365	423	2205	92	693695	643	985919	632
861D	805	1500.A	N > 88	2208.EL32	40	693708	644	985920	632
862D.60	806	1801.J2	734	2208.EM41A	35	693716	643	985921	632
863D.60	806	1802A	705	2210	92	693898	498	985922	632
864D.60	806	1803A	705	2216	93	697434	644	985923	632
866D	805	1804B	705	2220A	123	697485	644	985925	505
867D	806	1813	700	2224	76	697493	644	985933	643
868D	805	1816	701	2225.A1	82	697354	644	985936	625
870A	807	1817	701	2235.AT	91	697362	644	985944	646
870B	807	1820.AVSE	657	2238.EM40A	32	697371	644	985945	648
871B.45	807	1830	703	2245	91	697389	644	985946	648
871B.55	808	2000.AA1	N > 88	2250	90	697397	644	985957	624
872A	808	2000.AB1	N > 88	2600.A2	82	697418	644	985962	625
874A	808	2000.AB32	N > 89	2701	123	697469	645	985964	625
875	809	2000.BB1	N > 89	2800.A8	82	697477	645	985966	631
876A	809	2000.BBM140A	25	2930	99	697506	645	985968	643
877A	809	2000.BBM150A	23	2935A	99	697514	645	985969	643
880	501	2000.BBM160A	21	2937A	98	697522	645	985972	643
882A	501	2013.M	61	2938A	98	697531	645	985974	643
883	500	2024.M	61	2939A	98	697549	645	985978	643
884	501	2026.M100A	31	2940A	98	697590	643	985984	643
885	554	2029.BUR1	37	3067	448	697602	643	985995	643
887A	502	2029.EM41A	35	3071.200	448	697611	643	986001	643
891A.PL	809	2029.INFO	36	5112	456	697637	643	986005	643
893	443	2038.BUR1	37	5116	456	697645	643	986009	643
895A	809	2038.EM40A	32	5117	456	697653	643	986007	630
897	N > 442	2038.INFO	36	587110	649	702571	649	986008	630
902	808	2046.JA	50	629731	637	703064	641	986014	633
906A	808	2046.SG3A	48	629757	637	703099	641	986015	633
908A	807	2046.SG4A	47	629773	638	703232	117	986022	633
909A	807	2049.M	61	629781	639	793936	N > 626	986026	633
910A	744	2050.E15	46	629790	639	985510	648	986051	647
911B	741	2050.E17	45	629802	639	985524	634	986052	645
911D	741	2050.LT3	32	629829	638	985548	636	986058	627
912	740	2050.M110A	30	629837	638	985734	643	986059	627
914	746	2060.LT3	32	629845	637	985753	630	986062	648
916	752	2061.EM41A	35	629853	637	985754	633	986075	635
921	N > 749	2068.MV9	59	629861	637	985755	633	986095	631
		2068.UV12	60	629888	638	985756	633	986103	626
		2070.E18	44	629896	639	985757	632	986104	626
		2070.M120A	29	629909	640	985757	632	986105	626
		2074.M130A	27	629917	639	985758	633	986107	647
		2074.M140A	25	629925	639	985760	628	986108	646

► Quickly find your product via :

• The product contents



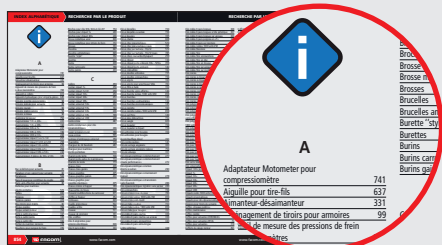
1

• The alphabetic index



861

• The alphanumeric index



854

• Go straight to new products



$\mu = 0.15$ tableau de

mm	ISO mm	mm	Cs	Fo
1,6**	0,35	3,2	0,075	234
2**	0,40	4	0,159	388
2,5**	0,45	5	0,330	648
	0,50	5,5	0,57	972
	0,70	7	1,30	1 68
	0,80	8	2,59	?
		10	4,49	

Torque control guide

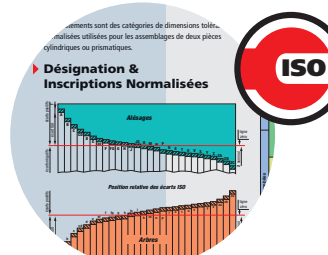
267

abréviations

Symbole ou abréviation	Facteur de conversion en unité SI
Ab	$3,6 \times 10^6$
A	10^3
bar	105Pa
l	$0,158 987 3 \text{ m}^3$
cal	4,186 J
cal	unité SI de base
ch	735,498 75 W
°C	$1,745 529 \times 10^3 \text{ rad (2\pi/360 rad)}$
°C	$75 - 0^{\circ}\text{C} = 273,15$
°F	$75 - 32 (0^{\circ}\text{F} = 259,87)$
eV	$1,602 177 33 \times 10^{-19} \text{ J}$
F	unité SI dérivée $1\text{F} = 1\text{CV}$
ft ³ (UK)	$2,841 30 \times 10^{-3} \text{ m}^3$
ft ³ (US)	$2,957 35 \times 10^{-3} \text{ m}^3$
ft	30,48 cm
ft ³ (UK)	$4,546 09 \times 10^3 \text{ m}^3$
ft	$3,785 41 \times 10^3$

Measurement units

844



Mechanical adjustments

846

pondance diamètre de vis
EN ISO 10664 et clé mâle TO

ISO 14579-14580	ISO 14584	ISO 14585	ISO 14586
M2,0	T6	T6	T6
M2,5	T8	T8	T8
M3,0	T10	T10	T10
M3,5	T12	T12	T12
M4,0	T16	T16	T16
M5,0	T20	T20	T20
M6,0	T25	T25	T25
M8,0	T30	T30	T30
M10,0	T40	T40	T40
M12,0	T50	T50	T50

Screw and circlip standards

848



Safety advice

840



Facom and standards

845

2^e chiffre

parties sous la pénétration des solides	Protection des parties sous tension contre la pénétration de liquides
0 Pas de protection	0 Pas de protection
1 Une sphère de diamètre 50 mm ne pénètre pas	1 Gouttes d'eau tombant verticalement
2 Une sphère de diamètre 12,5 mm ne pénètre pas	2 Chutes de gouttes d'eau sur enveloppe inclinée à 15° de sa position normale
3 Un fil d'acier de diamètre 2,5 mm ne pénètre pas	3 Eau tombant en pluie avec un angle inférieur ou égal à 60° de la verticale
4 Un fil d'acier de diamètre 1 mm ne pénètre pas	4 Arrosage de toutes les directions sur l'enveloppe
5 Un fil d'acier de diamètre 0,5 mm ne pénètre pas	5 Arrosage à la lance (6,3 mm) de toutes les directions non visible sur l'enveloppe
6 Une chambre d'essai	6 Arrosage à la lance (12,5 mm) de toutes directions sur l'enveloppe

Lighting standards

847



Contact

868




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