

DEFINITIONS

A

ADAPTOR PLATE – A component used to secure the coupling components in *alignment*. It is used to mate components of dissimilar mounting arrangements, for example motor to the pump or gearbox etc.

ADVANCE – The axial distance a taper bored hub is pushed onto the shaft to give the required interference fit, starting from hand tight fitting, that a tapered hub can be advanced to ensure sufficiently tight engagement.

ALIGNED SHAFTS – Two or more shaft that have the same coaxial centres of rotation.

ALIGNING SURFACE – This is the reference point in a coupling assembly that is used to achieve *alignment*. It is also sometimes used as the surface for the dial indicator to read from for the same *alignment*.

ALIGNMENT – Shaft *Alignment* is the procedure of having two or more shafts concentric and aligned to each other, within a specified tolerance. That tolerance is a function of the machine design and purpose.

ALIGNMENT PROCEDURE – There are several ways to achieve shaft *alignment*, including straight edge, dial indicator and laser *alignment*. All methods require their own specific procedure, but effectively ensure that the shafts being aligned are within the required tolerance.

AMOUNT OF UNBALANCE – The degree to which several items are out of equilibrium with each other.

ANGULAR MISALIGNMENT – The angle generated by two non-parallel shaft axes that are not coaxial or aligned with respect to one another.

ANGULAR STIFFNESS – (also **BENDING STIFFNESS**) – A force or moment measurement that will angularly misalign a coupling a specified amount of distance.

ARBOR (refer MANDREL) – A shaft or tube used for mounting a rotating component for either *balancing* and / or machining.

APPLICATION FACTOR. Service factors, also known as application factors or experience factors, are based on the applications and are applied to the customer specified or normal operating torque. These factors are used in the selection of couplings and take into account the prime mover and the driven equipment. This factor accounts for torque loads beyond the nominal conditions that effect operation such as compressor fouling, shock loading, variable loads, temperature etc. The acronym is SF.

ASSEMBLY BALANCE – The act of *balancing* a complete, machined and assembled coupling.

ASSEMBLY CHECK BALANCE – The act of measuring the unbalance of a complete, machined and assembled coupling.

AXIAL DISPLACEMENT (also END FLOAT) – The measurement of the difference in axial positioning of the shaft end during operation.

AXIAL MISALIGNMENT - Relative axial movement of the two *shafts* towards or away from one another, maintaining *parallel alignment*.

AXIAL NATURAL FREQUENCY – The frequency of the spacer component when used between flexible elements within a coupling.

AXIAL STIFFNESS. A measure of the coupling's resistance to axial displacement.

AXIS OF ROTATION. A line about which a body rotates as determined by journals, fits or other locating surfaces.

B

BACKLASH. The circumferential clearance in the flexible element. In some couplings, it provides misalignment capability and ease of assembly. In other cases, it increases wear and slop especially with reversing loads.

BALANCE CLASS – Classification or grading of the extent of unbalance within the coupling.

BALANCE CONSIDERATIONS – Couplings are considered balanced when the centre of its rotation equals the centre of the weight distribution. Usually, special application couplings can be balanced to a predetermined standard as a function of the speed of rotation and the application.

BALANCE TOLERANCE – The difference between the upper and lower acceptable unbalance values.

BALANCING – A method by which uneven weight distribution is checked and corrected, to within agreed limits.

BEAM COUPLING – A coupling where a single or multiple helix is cut in a hollow bar. This forms a curved beam that becomes the flexible element.

BELLOWS COUPLING – A coupling which has a thin cylindrical metal bellows attached to hubs at either end. Bellows may be single or multiple thickness. Hubs can be permanently attached or clamped to the bellows.

BENDING STIFFNESS (refer ANGULAR STIFFNESS) – Measurement of the force or bending moment required to have an angular misalignment of a coupling.

BODY FITTED BOLTS – Also known as BODY BOUND BOLTS. These bolts are machined the length of the bolt to fit neatly into receiving machined bores in each driving flange. The torque is transmitted through this machined section. There are no threaded portions in shear.

BUSHING – A sleeve or sleeve assembly used to adapt a coupling hub to a relevant shaft size. Usually concentric, they are toleranced to suit the application.

C

CHAIN COUPLING – A coupling consisting of two hub sprockets, that are engaged via circumferential duplex metal roller chains or acetal plastic chains.

CLEARANCE FIT – A fit between two components where the inner component is smaller than the outer component in which it fits. It allows the two components to slide relative to each other.

COEFFICIENT OF FRICTION – The ratio of the frictional force resisting the motion of two surfaces in contact to the normal force pressing the two surfaces together. It is usually symbolized by the Greek letter mu (μ).

COMPONENT BALANCE – Where each coupling component or subassembly is balanced prior to assembly as a whole unit.

COMPOSITE COUPLING – These are any types of couplings that have *flexible elements* made from composite materials consisting of glass fibre or carbon fibre and resin mixtures.

COMPRESSION ELASTOMERIC COUPLING – A coupling that transmits *torque* between the two coupling hubs by an *elastomeric flexible element* that is placed into compression between axially extending lugs or pockets in the two hubs.

CONSTANT TORQUE – A drive where the torque does not vary with respect to the speed.

CONTACT PATTERN – A method of determining the amount or extent of contact between two faces, either gears, flat surfaces or tapered surfaces. A contact pattern dye is often used.

CONTACT PRESSURE – The pressure generated by the hub hoop stress set up as a result of the interference fit of hub and shaft.

CONTINUOUS TORQUE RATING – The manufacturers value of design torque capacity of the coupling when considering the power, speed, misalignment, axial movement and sometimes the operating environment including temperature. This is sometimes referred to as “Nominal Torque” and uses a Service Factor equal to 1.0.

COUPLING DESIGNS – Couplings can be designed as manufacturers standard, modified or specials.

COUPLING UNBALANCE – A coupling is in an unbalance condition when it’s centre of gravity does not coincide with the rotational axis. This can be caused by the weight and / or inertial axis distribution.

COUPLING LATERAL NATURAL FREQUENCY – The vibration frequency due to coupling speed and balance condition. Any change in speed results in a change in the lateral displacement

COUPLING REACTION FORCE – The force a coupling exerts on the rotating shafts when misaligned.

COUPLING TORQUE RATING - Refer *CONTINUOUS TORQUE RATING*.

CRITICAL SPEED – The speed of a coupling which excites the natural frequency of that coupling assembly.

CYCLIC TORQUE – System torque which is not constant but displays a periodic oscillating pattern.

D

DBSE –refer *DISTANCE BETWEEN SHAFT ENDS below*.

DEFLECTING ELEMENT – A form of flexible element that accommodates misalignment by material deflection. These elements are spring like and will resist a change in shape with a reaction force. Some examples are convoluted diaphragm, springs, contoured diaphragm, bellows and discs.

DIAMETRAL CLEARANCE – The clearance between the piloting diameters of the coupling’s *external teeth* pilot diameters and *internal teeth* pilot diameters. Also known as TIP CLEARANCE or ROOT CLEARANCE, often in *gear couplings*.

DIAPHRAGM COUPLING – A coupling consisting of one or more *flexible elements* that are attached to the outside diameter of one *flange*, and transfer *torque* through the diaphragm to fasteners attached to the other flange, usually also on the outside diameter but can be elsewhere.

DISC COUPLING – A coupling consisting of one or more flexible disc elements that are alternately attached with fasteners to the opposite flanges. It transfers *torque* through the element tangentially through the bolts.

DISTANCE BETWEEN SHAFT ENDS. The axial distance between the two closest shaft ends of the driving equipment and the driven equipment (i.e. Motor to pump or gearbox etc.) to be connected by the coupling. Flanges, hubs and other connections may vary in position along the shaft – but the distance between the ends of the two shafts is the fixed reference here. They shaft ends generally are not moved.

DOUBLE ENGAGEMENT COUPLINGS - (also known as DOUBLE ACTING) – A coupling where misalignment correction takes place in two different planes, both normal to the shaft axis. It contains two flexible elements, one on each hub. Double engagement deflecting element and sliding or rolling element designs can accept *parallel offset misalignment, angular misalignment* and *axial displacement*. The most common are double engagement gear couplings and the TCAE constant velocity sliding ball coupling.

DYNAMIC UNBALANCE. As distinct from static unbalance, dynamic unbalance is where the condition in which the central principal axis of inertia is not parallel to and does not intersect with shaft axis of the centre of gravity and or the balance weight is not diametrically opposed.

E

END FLOAT – (see AXIAL DISPLACEMENT). The measurement of the difference in position of the shaft end during operation.

ELASTOMERIC ELEMENT. These flexible elements are characterised by the use of an elastomer. There are many types of elastomeric elements that accommodate misalignment through varying degrees of material deflection and sliding motion. Some single flexible element designs may act as a *double engagement coupling*. Reaction forces of elastomeric flexible elements are determined by element configuration, material stiffness, coefficient of friction, and torque. They can be categorised into two general types, compression and shear, based upon the way torque is transmitted through the element. Because of the great variety of designs, some actually fit both categories in varying degrees.

EXPERIENCE FACTOR (refer SERVICE FACTOR and APPLICATION FACTOR). Service factors, also known as application factors or experience factors, are based on the applications and are applied to the customer specified or normal operating torque. These factors are used in the selection of couplings and take into account the prime mover and the driven equipment. This factor accounts for torque loads beyond the nominal conditions that effect operation such as compressor fouling, changes in molecular weight, temperature etc. The acronym is SF.

EXTERNAL GEAR TEETH. Teeth formed on the outside of a coupling hub, normally to engage with internal teeth on an outer sleeve.

F

FACTOR OF SAFETY – Defined as the ratio of material strength over the calculated stress for the coupling application. Often referred to as FS. This is used to determine the size of coupling required for a specific use.

FINISHED BORE – The axial hole machined into a coupling *hub* with dimensional *tolerances* and *surface finish* appropriate for mounting onto the nominated *shaft*. It may be round, but also might be other shapes as well.

FLANGE – A projecting flat rim, collar, or rib on a hub, serving for strengthening or location to another coupling component.

FLANGE COUPLING – A coupling consisting of two hubs, each fitted with a *flange* for location at assembly. The flanges are fitted to the shafts of the driving and driven shafts with the coupling being attached between the flanges.

FLEXIBLE COUPLING – A mechanical shaft connector designed to transmit torque without *slip*, and to accommodate *misalignment* and sometimes axial displacement between driving and driven machines. Some flexible couplings are designed to also transmit axial thrust or forces.

FLEXIBLE ELEMENT – This is the portion of the coupling which allows the coupling to accommodate *misalignment*. There are many varieties of flexible element designs, accommodating various forms of *misalignment*. The design of this element determines the character of the coupling in terms of reaction forces, dynamics and reliability. These designs will specify the characteristics of the coupling in terms of reaction forces, and the forms of *misalignment* that the coupling will accommodate.

FLEXIBLE HUB – A hub which accepts forms of *misalignment*.

FLOATING SHAFT COUPLING – A pair of single engagement couplings connecting a floating center shaft. A floating shaft is a simply supported beam which is supported by the flexible elements.

FLOATING SHAFT CENTRE ASSEMBLY – The removable shaft centre section supported by the *flexible elements*, which may or may not include the *flexible elements*.

FLUID COUPLING – A specific design of coupling where torque is transmitted from the impeller, or input portion of the coupling, to the runner, or output portion of the coupling by using a fluid between the impeller and the runner where all are enclosed within a sealed casing. It is usually a thin oil, but can be a water styled fluid. These couplings have been popular when accelerating high inertia loads (such as conveyors) and have many exotic designs to achieve pre-determined results. The electronic alternatives, Variable Voltage Variable Frequency (VVVF) drives and Inverter drives are taking more of the market previously enjoyed by the fluid coupling suppliers.

G

GAP – The axial distance between two faces, used to locate the coupling assembly. It may be used during the *alignment procedure*. This may be hub gap, flange gap, shaft gap or any combination.

GEAR COUPLING – A coupling that consists of two *hubs*, each with *external gear teeth* that mesh with *internal gear teeth* of the sleeve or sleeves. Gear couplings transmit torque and accommodate angular misalignment, parallel offset (double engagement), and axial displacement by relative rocking and sliding motion between mating, profiled gear teeth.

GEAR HUB – A gear coupling component with *external gear teeth*.

GRID COUPLING – (also known as a SPRING GRID COUPLING) Two flanged hubs with machined slots or grooves in the flanges, connected by a serpentine flexible element usually made from a formed metal bar. Grid couplings accommodate some angular misalignment by the flexure of the formed metal bar element as well as through the relative rocking and sliding motion between mating surfaces.

H

HALF COUPLING – Consisting of all the components of the coupling on one *shaft*. It includes an appropriate portion of the spacer, or of the flexing element where appropriate.

HARDWARE – The fasteners, including nuts, bolts, washers and screws that secure the various coupling components in place.

HEAT MOUNTING – Where heat is applied to the hub to thermally increase the sizes to allow fitment to the appropriate *shaft*.

HUB – The coupling component that is machined for mounting onto a *shaft*.

HUB BORE – (refer THROUGH BORE) - A hub bore is typically a cylindrical (parallel bore) or conical (tapered bore) hole in the coupling hub with axes coincident with the rotational axis of the coupling. It is used to mount the coupling hub onto the driving and / or driven shafts of the coupling assembly. Other shapes are possible, including a *spline bore*, square, polygon etc. to match the shape of the shaft to which the hub is to be fitted.

HYDRAULIC HUB MOUNTING. Where hydraulic pressure is utilised to force a hub onto the mating shaft.

HYDRAULIC HUB REMOVAL. Where hydraulic pressure is utilised to remove a hub from the mating shaft.

I

INDICATING SURFACE – Reference surface for rotational axis for balancing purposes.

INHERENT UNBALANCE – Where tolerances used during manufacture of the component causes the axial rotation to be different to the object's centre of gravity.

INSTALLATION ALIGNMENT RECOMMENDATION – The tolerance suggested by the manufacturer to position one shaft relative to another, to provide optimum service life. The axes of both shafts should be co-linear under normal operating conditions.

INTERFERENCE FIT – A form of joining and location of mating parts such that the joint is secured by friction after assembly.

INTERFERENCE RATE – Comparison of the hub tolerance for an interference fit to the diameter of the relevant shaft.

INTERNAL GEAR TEETH. Teeth formed on the inside of a coupling sleeve, normally to engage with external teeth on a coupling hub.

J

No Entries

K

KEY - A shaft key is (usually metal) used to rotationally connect a shaft and hub, to enable torque transmission to occur.

KEYSEAT – A keyway is the slot groove or pocket in a shaft, to allow a key to be used.

KEYWAY – A keyway is the slot groove or pocket in a hub, to allow a key to be used.

L

LASER ALIGNMENT – A method of shaft *alignment* using a series of beams of light. It can be a highly accurate procedure and is often time consuming to complete successfully, even by experienced operators.

LIMITED END FLOAT COUPLING – Coupling with limitations for axial movement of the *shafts* ends with respect to each other, where no *thrust bearings* are used. Often used with *sleeve bearing motors*.

M

MANDREL (also known as an ARBOR) – A shaft or spindle to which a coupling component is fitted to be machined or balanced.

MANDREL ASSEMBLY – A shaft or spindle complete with bearings or bushings to allow rotation.

MANDREL BORE – A plain bored hole within the mandrel to assist during manufacture, especially the final machining of a bore.

MARINE STYLE COUPLING – A specific coupling with flexible elements contained within the removable centre portion. The design was originally designed for use on marine applications because of the speed and simplicity of replacement or repair.

MASS - the quantity of matter contained within a coupling or component. It is measured by its acceleration under a given force. When considered using gravity, it may also be weight.

MAXIMUM ALLOWABLE TEMPERATURE – The maximum temperature which a coupling or component may reach as designed by the manufacturer.

MAXIMUM BORE – The largest internal bore available for a given external diameter, considering the keyway (if applicable), hub material and application. It will not specify *tolerance*.

MAXIMUM CONTINUOUS MISALIGNMENT – The maximum misalignment (combined angular and parallel) which a specific coupling can withstand continuously. Different manufacturers have alternative methods of stating these values.

MAXIMUM OPERATING SPEED – The maximum design speed for a specific coupling application, as distinct from the maximum speed that the coupling is designed to operate within.

MECHANICAL COUPLING – A coupling which mechanically connects two shafts so that rotational torque may be transmitted.

MINIMUM ALLOWABLE TEMPERATURE - The minimum temperature which a coupling or component may reach as designed by the manufacturer.

MINIMUM BORE – The smallest internal bore, as per the manufacturer’s design and specification.

MISALIGNED SHAFTS – Misaligned shafts occur when two shafts deviate from a coaxial position to each other. It can occur during start up, torque overload, or differing thermal growth within the application.

MOMENTARY TORQUE LIMIT – The maximum torque which can be transmitted momentarily by a coupling before failure or other damage occurs.

MOUNTING FIXTURES – Machines or components which allow a coupling to be connected to a machine for the purpose of balancing.

MUFF COUPLING (also known as a SLEEVE COUPLING). These are the simplest types of rigid couplings. It consists of a hollow cylinder where the inside diameter is the same as the shaft. They are usually secured on the shaft by a gib head key, which also transmits the torque.

N

NATURAL FREQUENCY – The frequency at which an object vibrates naturally when disturbed.

NOMINAL BORE – Engineering term commonly used to nominate the basic bore size. It will not specify *tolerance*.

NOMINAL TORQUE RATING (refer COUPLING TORQUE RATING and CONTINUOUS TORQUE RATING). The manufacturers value of design torque capacity of the coupling when considering the application, Service Factor of 1.0, speed, misalignment, axial movement and sometimes the operating environment including temperature. This is sometimes referred to as “Nominal Torque”

NON-STANDARD BORE – A machined axial hole in the *hub* with dimensions and *tolerances* appropriate for the application. The dimensions will not comply with an appropriate Standard.

NON-STANDARD KEYWAY – Keyways specified which do not conform to appropriate standards.

NORMAL OPERATING TORQUE – Coupling transmitted torque during normal continuous operation.

NORMAL TORQUE RATING (refer – CONTINUOUS TORQUE RATING). The manufacturers value of design torque capacity of the coupling when considering the application, Service Factor of 1.0, speed, misalignment, axial movement and sometimes the operating environment including temperature. This is sometimes referred to as “Nominal Torque”.

O

OIL DISTRIBUTION GROOVE - Grooves in the coupling hub to distribute the pressurised oil to allow installation and dismantling work.

OIL PORT – External connection used to apply pressurised fluids to install and / or dismantle hubs from shafts.

OLDHAM COUPLING – An Oldham coupling transmits torque through mating slots on the centre discs mounted on the hub. They are useful for applications exhibiting parallel *alignment*.

O-RING - A seal in the form of a circular cross section ring, typically made of rubber and used to prevent fluid loss.

O-RING GROOVE – An allowance machined into two mating components which allow a O ring design to be functional.

P

PARALLEL ALIGNMENT - Parallel *Alignment* is the procedure of having two or more concentric shafts aligned to each other, within a specified tolerance. That tolerance is a function of the machine design and purpose.

PARALLEL OFFSET MISALIGNMENT - Offset misalignment, sometimes referred to as parallel misalignment, is the distance between two parallel shaft centres of rotation when they are not coaxial.

PEAK TORQUE RATING – An infrequent and momentary torque rating, which the manufacturer has designed as an allowable overload capacity. Peak torque is based on the material strength, limited number of rotations, maximum continuous misalignment and rated speed. In some couplings, the peak torque could be influenced by the operating temperature, an example is the elastomeric elements.

PILOT – Also known as DATUM LINE, SPIGOTS or REGISTERS. A coupling surface that radially locates a coupling component, assembly or subassembly.

PIN AND BUSH COUPLING – A coupling that containing one flanged hub with pins, which locates in bushings in the mating flanged hub.

POLAR MASS MOMENT OF INERTIA - rotational motion resistance of a coupling or component.

POLAR WEIGHT MOMENT OF INERTIA – The measure of a coupling or component’s capacity to resist torsion when torque is applied.

POWER – Amount of energy transferred per unit time. Normally expressed as Watts, or kilowatts. Power at a specific rpm is torque.

PULSATING TORQUE – The difference in maximum and minimum torque measured over one complete revolution.

Q

No Entries

R

RADIAL STIFFNESS (or LATERAL STIFFNESS) – Quantifying the resistance within a coupling to parallel misalignment.

RATED SPEED - Rated Speed is the speed of the coupling (in R.P.M) at which it produces its rated (maximum) power, considering any and all forms of misalignment present.

REGISTERS (refer PILOTS) - Also known as DATUM LINE, SPIGOTS or PILOTS. A coupling surface that radially locates a coupling component, assembly or subassembly.

REPEATABILITY OF UNBALANCE – A coupling's capacity to register an equal amount of unbalance, after being dismantled and reassembled.

RESIDUAL UNBALANCE – The quantity of unbalance remaining in a coupling or component once balancing to a specified tolerance has been completed. It may be the result of the balance procedure limitations, or the tolerances of the specified standard.

RESONANCE - A vibration resonance occurs when a coupling or component is exposed to an external forced vibration occurring at its natural frequencies.

REVERSING TORQUE - The torque applied in the direction opposite to the original coupling direction of rotation. Reverse torque is a deceleration force to the original direction of rotation.

RIGID COUPLING (or MUFF COUPLING) – A mechanical shaft connector designed to transmit torque without slip. It effectively makes the two shafts connected into one, and will transmit all forces between the two shafts. It can be a flange type, sleeve type, solid or split. It will not accommodate misalignment.

RIGID HUB – A hub that does not accept misalignment.

ROLLER CHAIN – Is made up of a series of short cylindrical rollers held together by side links. It is driven by a toothed wheel, referred to as a sprocket.

ROOT CLEARANCE – (refer to DIAMETRICAL CLEARANCE) - The clearance between the piloting diameters of the coupling's *external teeth* pilot diameters and *internal teeth* pilot diameters. Also known as TIP CLEARANCE or DIAMETRICAL CLEARANCE.

ROUGH BORE – A bore through the coupling hub which may have been machined or cast into the hub. It is the start of machining to suit the finish bore required for the application.

RUNNING SURFACE – A machined surface used as reference for the coupling during balancing.

S

SERVICE FACTOR (SF) - refer APPLICATION FACTOR. Service factors, also known as application factors or experience factors, are based on the applications and are applied to the customer specified or normal operating torque. These factors are used in the selection of couplings and take into account the prime mover and the driven equipment. This factor accounts for torque loads beyond the nominal conditions that effect operation such as compressor fouling, shock loading, variable loads, temperature etc. The acronym is SF.

SHAFT - A shaft is a rotating machine element used to transmit power from a driving machine to a driven machine. It is usually circular in cross section, but can be any cross-sectional shape to suit the application.

SHAFT PENETRATION FACTOR – SPF is the amount, described as a percentage, of the shaft length that penetrates the hub. It is assumed to be free from restraint at the interface between the hub and shaft. Commonly used for calculating torsional stiffness at the interface of the hub and shaft.

SHEAR ELASTOMERIC COUPLING – A coupling in which the *torque* between the two *hubs* of the coupling is transmitted by an *elastomeric flexible element*, working in shear.

SHOT COUPLING – A specific design of coupling where torque is transmitted from the impeller, or input portion of the coupling, to the runner, or output portion of the coupling by using a material between the impeller and the runner. The material in a shot coupling is usually lead shot. These couplings are not common these days.

SHRINK DISC - A shrink disc works by 'shrinking' or squeezing a portion of the mounted component down onto the shaft by means of tapers. Fit clearance between the hub outside diameter and shrink disc are controlled to ensure the hub contracts within its elastic limits.

SHRINK FIT – A shrink fit is where the thermal expansion of the hub allows fitment to the shaft, and thermal contraction allows an appropriate tight fit.

SHRINK FIT / HYDRAULIC REMOVAL – A process where the hub is machined, prior to fitting, to allow high pressure hydraulic forces to remove the hub. The shaft and hub may be either parallel or tapered fit. Hydraulic removal is used where a very tight shrink fit has been required.

SINGLE ENGAGEMENT COUPLING (also known as SINGLE ACTING) – A coupling where misalignment correction occurs in only one single plane, normal to the shaft axis. Single engagement deflecting element, sliding or rolling element designs may accept either angular and / or axial misalignment, but not parallel misalignment. The most common are single engagement gear couplings.

SINGLE ENGAGEMENT GEAR COUPLINGS – A single engagement coupling where the flexible element consists of internal and external gear tooth forms.

SINGLE PLANE BALANCE. Balancing when in a static condition, as opposed to dynamic.

SLEEVE – Outer cylindrical element, usually with Internal teeth as in a gear engagement coupling.

SLEEVE BEARING MOTORS – Motors that use a sleeve bearing rather than a rolling element bearing. Sleeve bearings are stiffer, but cannot take the speeds or loads of the roller bearings. Sleeve bearing motors are normally only fractional horsepower in rating.

SLEEVE COUPLING – A simple rigid style coupling consisting of a tube where the bore is machined to suit the shaft. It may or may not have a keyway, depending upon the application.

SLIDING BLOCK COUPLING – A coupling that consists of two slotted or jawed hubs which engage with each other by means of a mating centre member.

SLIDING ELEMENT (or ROLLING ELEMENT) – A form of *flexible element* within a coupling that allows *misalignment* by sliding or rolling on mating coupling surfaces. Sliding or rolling elements resist change in axial and angular position

mainly as a function of shaft torque and the *coefficient of friction* between the mating surfaces. This means that as the misalignment increases, so do the forces resultant to the elements resisting change. These resultant forces will eventually have a detrimental effect on the bearings and seals of the driver and driven machines.

SLIP – Slip is defined, as a percentage, of the loss of speed between the output and the input speeds. A *Fluid Coupling* can normally be expected to have approximately 3% slip when operating normally.

SOLID HUB – A hub without a bore machined into it. It may have centres drilled into it.

SPACER – A removable coupling centre section which ensures specific axial shaft end separation.

SPACER COUPLING – A coupling that has a *spacer* fitted to provide specific axial shaft separation.

SPACER LENGTH – The physical length of the *spacer* used in a *spacer coupling*. It may or may not be dimensionally similar to the *distance between shaft ends*.

SPEED CONSIDERATIONS – One of the many considerations used when selecting a coupling that is appropriate for the application. The coupling design will have a maximum speed, based upon material, design and balance standards for the application.

SPIGOTS (refer PILOTS) PILOT – Also known as DATUM LINE or REGISTERS. A coupling surface that radially locates a coupling component, assembly or subassembly.

SPLINE - A number of equally spaced grooves, or keyways, cut into a shaft to form a series of external keyways to fit into the spline bore.

SPLINE BORE – A number of equally spaced grooves, or keyways, cut into a hub to form a series of internal keyways to fit the spline.

SPRING COUPLING – A coupling where the flexible link between the two hubs will be a spring attached at either end.

SPRING GRID COUPLING – (also known as a GRID COUPLING) Two flanged hubs with machined slots or grooves in the flanges, connected by a serpentine flexible element usually made from a formed metal bar. Grid couplings accommodate some angular misalignment by the flexure of the formed metal bar element as well as through the relative rocking and sliding motion between mating surfaces.

STANDARD BORE – A machined axial hole in the *hub* with dimensions and *tolerances* appropriate for the application. The dimensions will comply with an appropriate Standard.

STANDARD KEYWAY – Keyways that are machined to appropriate tolerances and dimensions as nominated by a Standard.

STATIC UNBALANCE – Amount of balancing required when in a static condition, as opposed to dynamic. Static is in a single plane only.

STATIC MISALIGNMENT – The condition of the machinery at rest, with misalignment that will not cause damage to any component or assembly or sub assembly.

STRAIGHT BORE – An axial hole, concentric in bore, which has been machined to *tolerances* and *surface finish* appropriate for the application.

SURFACE FINISH – The nature of a surface as defined by surface roughness and texture and comprises the minute local deviations from a perfectly flat surface.

T

TAPERED BORE - An axial hole, conical in bore, which has been machined to tolerances and surface finish appropriate for the application.

TAPERLOCK BUSH - Taper lock bushes form a mechanical joint between a shaft and a coupling hub. Fastening is secured by forcing the included angled taper into the mating component by means of screws. When fitted correctly, a very tight fit can be achieved.

TAPERED LOCKING DEVICE - Composed of two tapered rings, an inner ring, a slit outer ring and a ring nut with locking washer. It is suitable for applications that require reduced radial and axial dimensions. Particularly suitable for applications without screw tightening space.

THROUGH BORE (refer HUB BORE) - A through bore is typically a cylindrical (parallel bore) or conical (tapered bore) hole in the coupling hub with axes coincident with the rotational axis of the coupling. It is used to mount the coupling hub onto the driving and / or driven shafts of the coupling assembly. Other shapes are possible, including a spline bore, square, polygon etc. to match the shape of the shaft to which the hub is to be fitted.

THRUST BEARING – A thrust bearing is a specific type of rotating bearing, designed to withhold an axial load.

TIP CLEARANCE – (refer DIAMETRICAL CLEARANCE) - The clearance between the piloting diameters of the coupling's external teeth pilot diameters and internal teeth pilot diameters. Also known as **ROOT CLEARANCE**, often in gear couplings.

TOLERANCE - The tolerance is the upper and lower limit dimensions of the shaft and / or hub.

TORSIONAL CRITICAL SPEED – This occurs when the shaft rotational speed approximates resonant conditions. In this situation, the **TORSIONAL VIBRATION** of the shaft increases and may cause failures. Torsional critical speed is a critical speed of a whole system rather than a coupling alone.

TORSIONALLY RIGID COUPLING – Torsionally rigid couplings exhibit no elastic torsional deformation while transmitting torque. They do not dampen shock loads, but transfer exact rotational movement between shafts.

TORSIONAL STIFFNESS - Is known as the ratio between torque being transmitted and the angular displacement of the coupling.

TORSIONAL TUNING – The changing of the torsional stiffness of a coupling or shaft by varying the natural frequencies. This can be achieved by altering the distance between supports, or even varying diameters of relevant components.

TORSIONAL VIBRATION - Torsional vibration is angular vibration of a shaft along its axis. It is often caused by variations in torque supplied or absorbed in the system. Causes of torsional vibration are typically gas pressure in internal combustion engines creating peak torques, blade passing frequencies found in pumps and fans, inertial unbalance or irregular torque requirements of rotating equipment.

TORQUE – Twisting moment. It is a function of absorbed power and shaft rotational speed. For coupling selection torque is calculated from the system power and the rotational speed.

TORQUE AMPLIFICATION FACTOR (TAF) - The ratio of the peak torque to the average torque.

TOTAL INDICATOR READING (TIR) – The variation between the highest and lowest readings on a dial indicator when measuring a shaft or coupling rotation.

TRANSIENT TORQUE – Intermittent torque variations during operation. Conditions that produce transient torques are: short circuit torques, electric motor start-ups, process upsets, torque amplification conditions, etc. The transient torque would be compared to the coupling peak torque rating or coupling momentary torque limit.

TRANSITIONAL FIT – Relationship between finished tolerances of a shaft and hub. Transitional can be either in the clearance or the interference ranges.

TRANSMITTED AXIAL FORCE – A force applied to the shaft along the length of the shaft. Some couplings can absorb some of that force, while others transmit the full load.

TYRE STYLE COUPLING – A coupling where the flexible element takes the approximate shape of a tyre.

TWO PLANE BALANCE = Balancing in a dynamic condition, as opposed to static (single plane).

V

VIBRATORY TORQUE RATING – A term for torsionally soft couplings, indicating the maximum torque variations within the coupling's capacity. Usually based around a frequency of 10 Hz.

W

WEIGHT – The mass of a body, considering the effect of gravity.

U

UNBALANCE CORRECTION – Variations in weight added to obtain correct balance, according to specific tolerances.

UNIVERSAL JOINT – (also called a **UNIVERSAL COUPLING**) A shaft coupling capable of transmitting rotational torque from one shaft to another. The shafts need not be collinear, and / or parallel. The shafts can change angle during operation. Please note that the output side of the universal joint will suffer rotational speed variants during operation as a result of the four point universal joint.