thompson
COUPLINGS

TCVJ

THOMPSON CONSTANT VELOCITY JOINT

INTERNATIONALLY PATENTED

OPERATES AT AMBIENT TEMPERATURE

REDUCES VIBRATION

WIDER DEFLECTION ANGLES

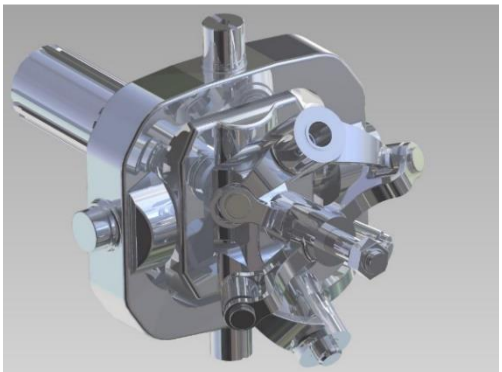
REDUCED ENERGY LOSSES

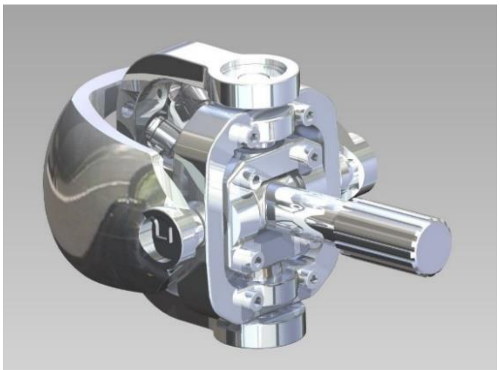
BENEFITS

- Reduced friction, heat, wear, vibration and collateral damage
- Full load continuous operation at high output shaft angles
- Reduced energy losses
- Facilitates new designs with higher output shaft angles
- Runs at near to ambient temperature - durability

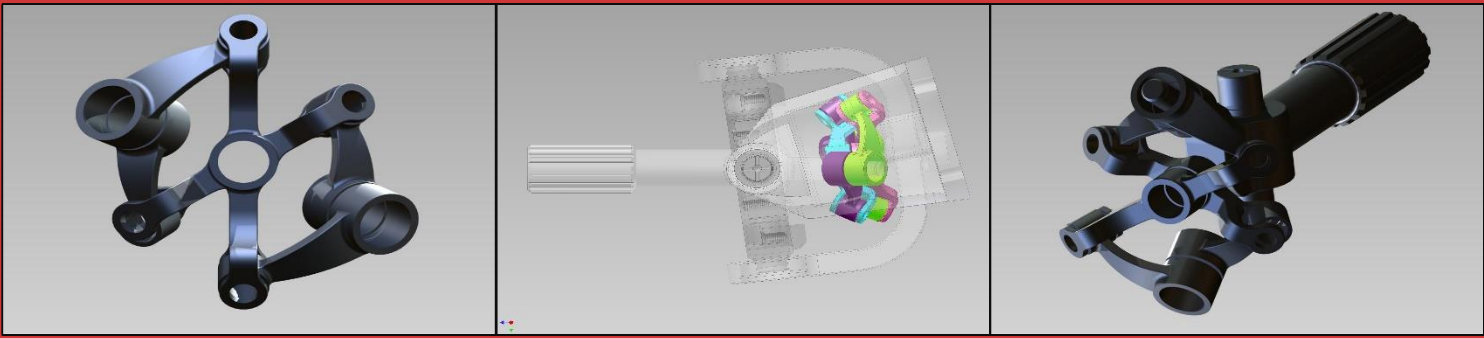
CAPABILITIES

- A true constant velocity joint with no load bearing sliding surfaces that currently operates at angles to 20 degrees with special designs to 45 degrees.





Thompson Constant Velocity Joint (TCVJ)



Graphic of the Thompson Coupling showing the internationally patented, spherical 4-bar linkage centring mechanism.

The Thompson Constant Velocity Joint (TCVJ) is a means of transmitting drive across an angled join between driving and driven shafts with a true one-to-one ratio between the shafts.

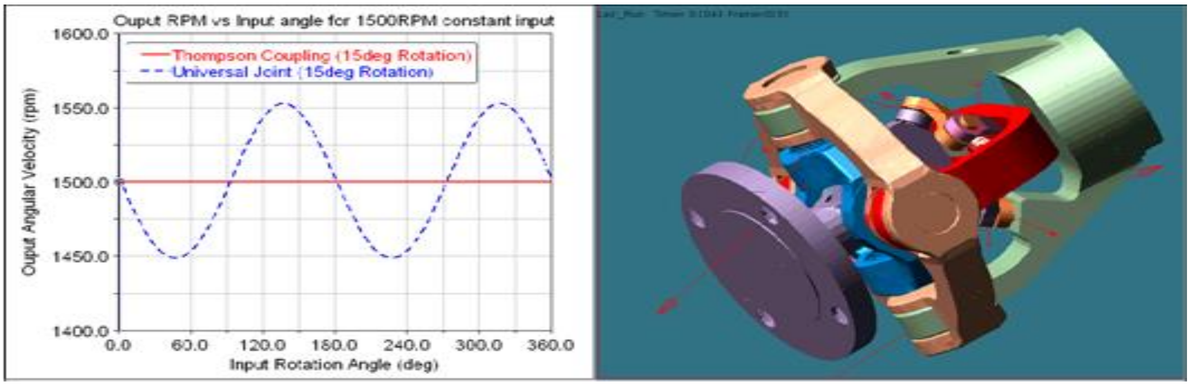
The TCVJ is the first of its type in the world and is registered with the relevant patent authorities worldwide.

The traditional problems associated with driving power around a corner of heat, vibration, loss of power and oscillating shaft speeds that have been inherent in universal joint technologies have all been addressed and overcome by the TCVJ.

Running at near to ambient temperatures, with no inherent vibration in its design, the TCVJ and its associated sliding shaft actually reduces vibrational inputs from gearboxes, reduction units and motors in a way that protects and prolongs the life of the system.

Having no weight bearing sliding elements, the TCVJ has been born out of a re-understanding of the vectoring forces in play in rotating shafts and directional changes. The TCVJ does not need phased or parallel connecting flanges, as has been required for traditional universal joints technology.

Made from forged and cast elements, the TCVJ design is scalable, meeting the differing needs of industry sectors.



The graph above illustrates the difference in output motion of a universal joint (non-constant velocity) and a Thompson Coupling showing true constant velocity. The resultant non-constant velocity motion in traditional couplings produces shaft vibration and additional driveline forces causing increased wear and reliability issues for the power system.

Targeted Markets and Installations

Marine

The TCVJ-2000 is specified as the drive coupling in current production vehicular ferries. In this situation the couplings protect and prolong the life span of both single engine diesel motor power sources and dual system diesel and electric power sources.

Other couplings have been installed into luxury yachts, sports fishing and high-speed transport vessels.

Industry

From electrical power generation to crushing mills and fabricators, opportunities exist where the transmission of drive power is required through either set angles; or, in circumstances where protection is necessary against changing situations. The ease of servicing, cool running and complete lack of vibration in the TCVJ product makes it the solution of first choice in every case.

Transport

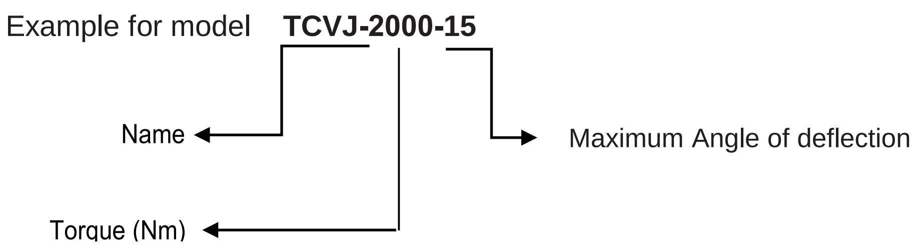
Already running in monorail infrastructure in the public domain, the TCVJ's have proved to be easy to manage and reliable in their work. The initial theoretical requirement of shifting the weight of the motor and gearbox combination has been achieved with ideal outcomes in smoothness of transmission and weight distribution.

Agriculture

Many RFQ's and design proposals have been made for this sector in, predominately, the area of PTO's in heavy, mobile machinery. Harvesters, scarifiers, graders and irrigation and reticulation machinery have all proven to be rich in opportunities where power across changing angles and low maintenance requirements go hand in hand.

Naming Convention and Specifications

Designation explanation:



TCVJ MODELS

The TCVJ-2000-15 model shown has a customized 9 stud flange as required by the customer.

TCVJ's can be supplied with either flange or shaft input and outputs.

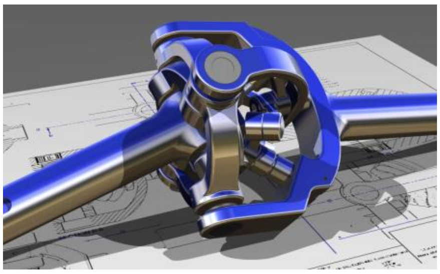
Ready for dispatch – A TCVJ-2000-15 joints with cardan shaft style spline shafts completing the coupling.

This TCVJ-8000-10 was used to power a luxury yacht, allowing the marine architect a choice of engine positions.

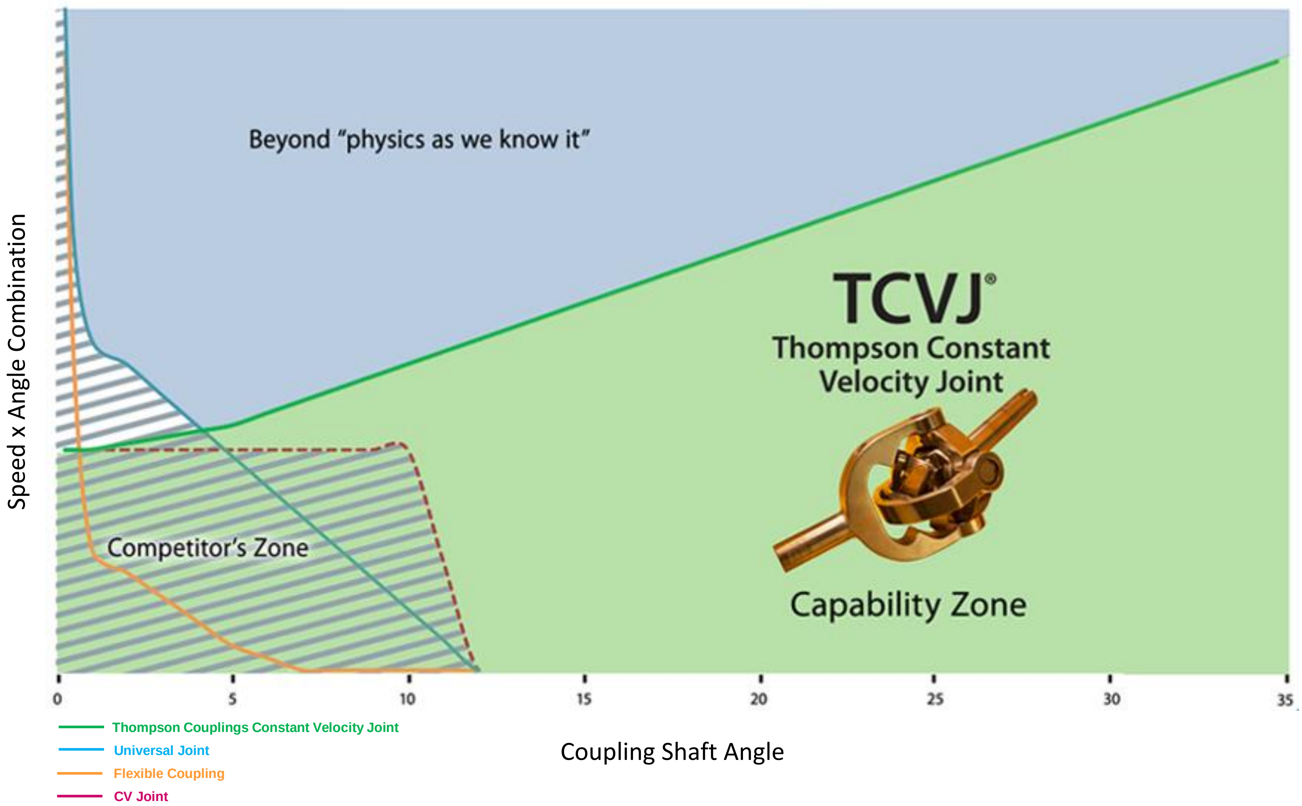
With the engine horizontal, this single joint afforded control over the angle required for the propeller shaft, vibration free.

TCVJ Patented Markets

USA, China, Europe, Japan, India, Russia, Israel, Brazil, Australia, Indonesia, South Korea, Singapore, Mexico, South Africa, Vietnam, Philippines, Canada

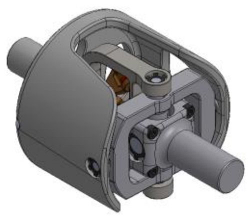
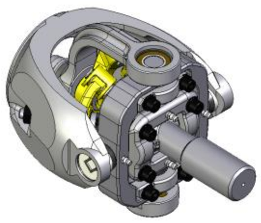
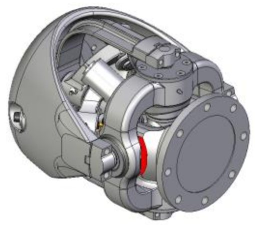


Viability of Various Couplings



Thompson Constant Velocity Joint Specifications*

TCVJ

PARAMETERS	UNITS	TCVJ-50-30	TCVJ-500-15	TCVJ-2000-15	TCVJ-5000-15	TCVJ-8000-10
						
NOMINAL DESIGN TORQUE	Nm	50	500	2,000	5,000	6,350 [3]
MAXIMUM TORQUE	Nm	200	1200	7,700	13,600	20,000
MAXIMUM DESIGN SPEED	RPM	3,000	3,000	2,500	2,000	1,600
FULL ARTICULATION ANGLE	degrees°	30	15	15	15	± 10
L_{10} BEARING LIFE [1]	years	As per customer requirements				
MAXIMUM SERVICE TEMPERATURE	°C	120	120	120	120	120
COUPLING EFFECIENCY [2]	%	> 99.95	> 99.95	> 99.95	> 99.95	> 99.95
MAX. SWING DIAMETER	mm	75	193	260	393	350
OVERALL LENGTH	mm	68	169	225	347	394
WEIGHT	kg	1.0	11.0	22.0	82.5	80.7
ROTATIONAL MOMENT OF INERTIA	kgm^2	0.0011	0.036	0.172	1.47	0.945
SPLINED SHAFT LENGTH	mm	As per customer requirements				
MATING FLANGE CONNECTIONS		As per customer requirements to ISO specifications				

(1) Actual bearing life depends upon a combination of factors. These include equivalent speed, torque and articulated angle. Additionally, shock loads, lubrication frequency and environmental conditions may also affect life ratings.
(2) Efficiency determined from independent testing authority based on a range of angles, speeds and torque loading scenarios.
(3) Initially calculated at nominal torque of 8000Nm at 5°. Increasing articulation angle to 10° yields nominal torque of 6350Nm.

- Numerous special custom designs