

A PNEUMATIC NON-EXPLOSIVE QUICK STOP DEVICE FOR CNC TURNING MACHINE



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PRODUCT DESCRIPTION

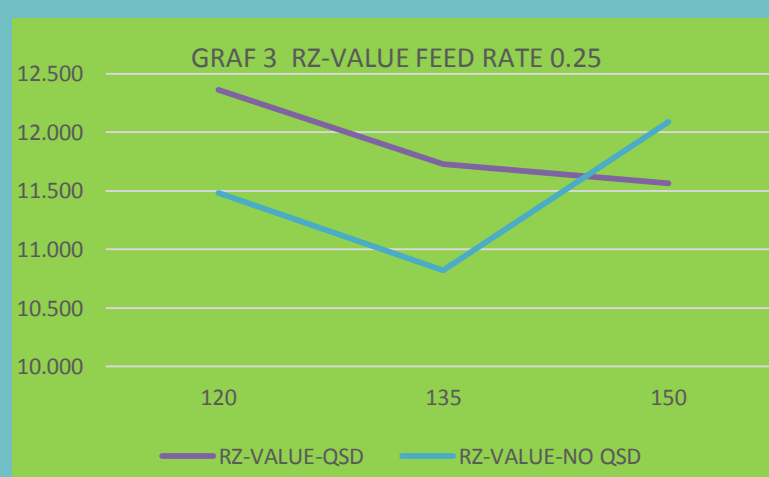
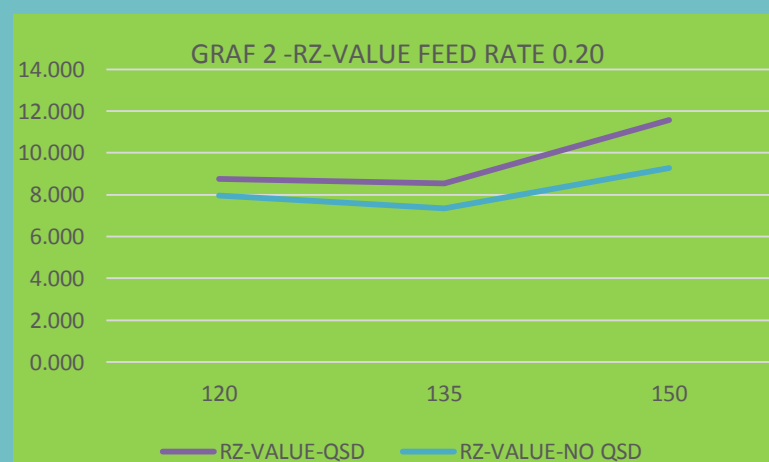
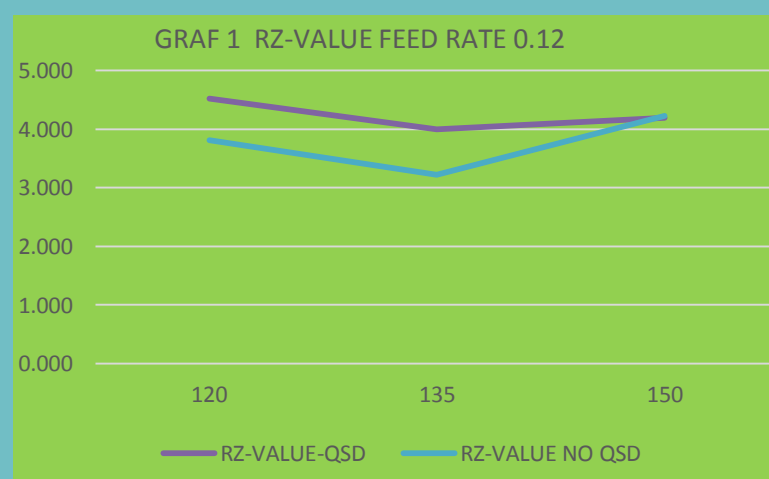
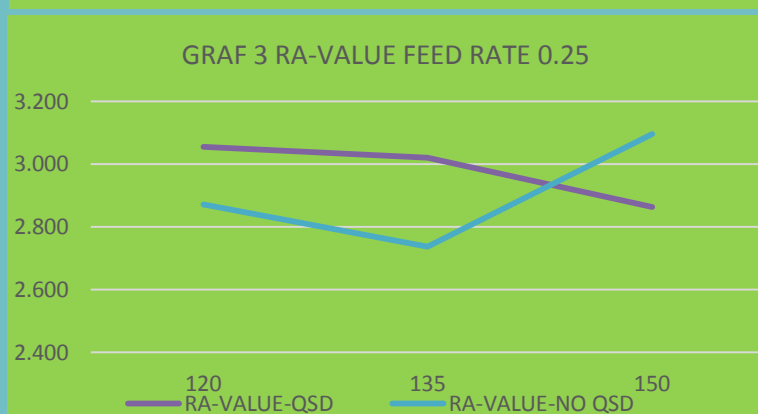
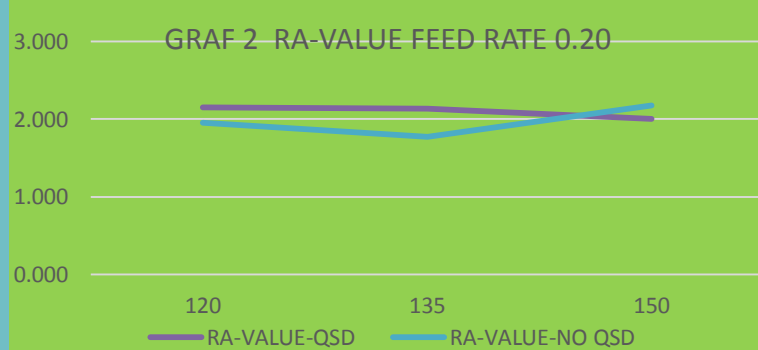
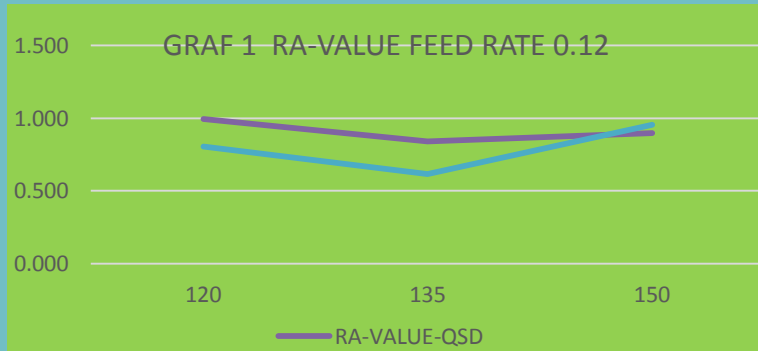
A pneumatic Quick Stop Device (QSD) is a device to collect chip-root sample during machining process. The device will freeze the chip formation during the machining process. The device will have a mechanism to retract cutting tool during machining process. The frozen chip formed will have minimal changes in its geometrical and metallurgical properties, thus can be used for evaluating the performance of the cutting process especially during lubrication. By analyzing the freeze chip formation, the life expectancy of the tool, amount of friction and heat produced can be acquired.

NOVELTY AND INVENTIVENESS

- ❖ A new, simple and effective pneumatic quick-stop device has been developed for the study of chip formation without employing any explosive charges or breaking any shear pins.
- ❖ Operation of the device is very simple and Pneumatic actuator has been found to give reliable performance.
- ❖ Low preparation cost.
- ❖ It is safe to use and easy to handle

RESULTS AND DISCUSSION

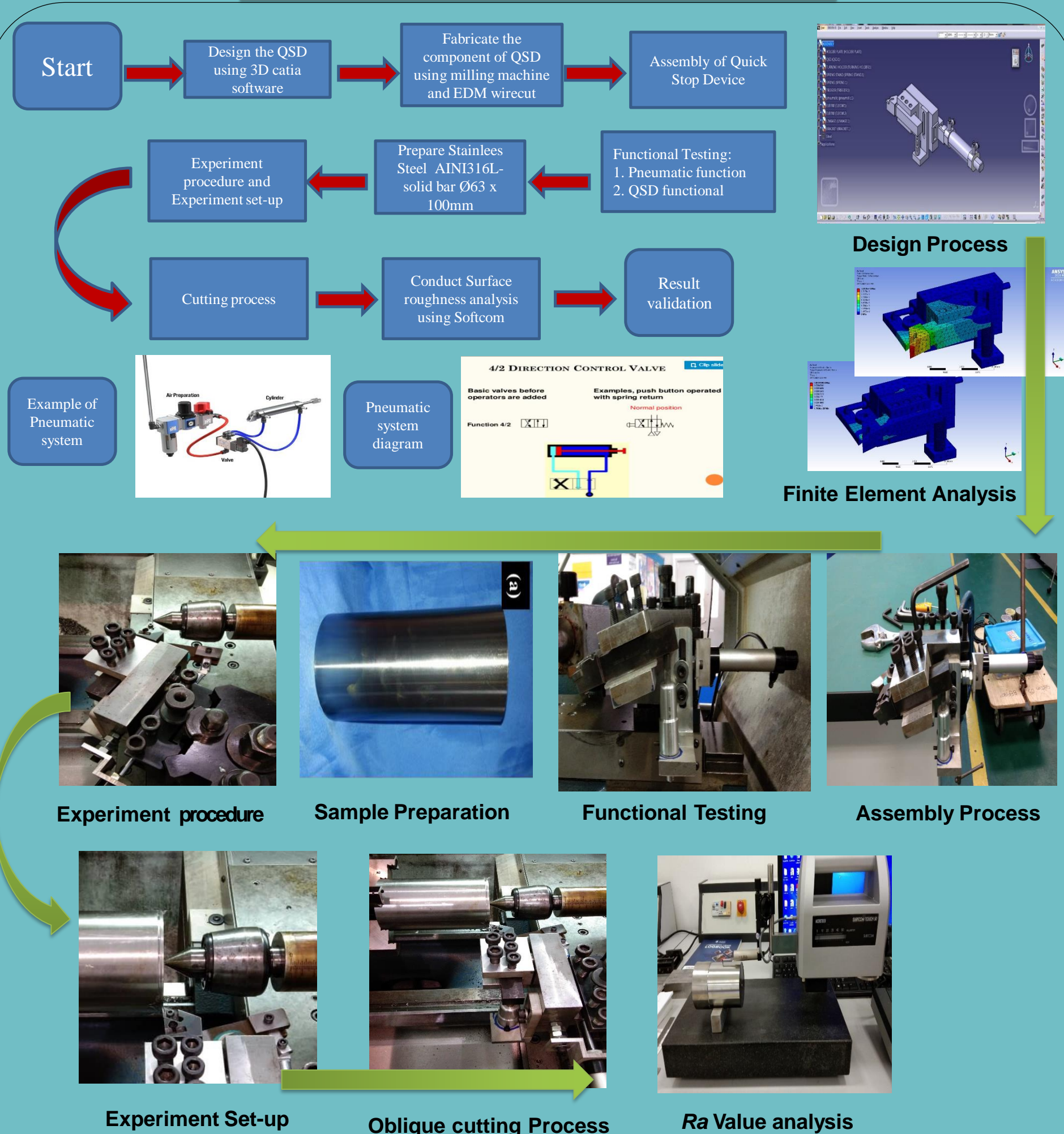
NO OF SAMPLE	CUTTING SPEED	FEEDRATE	DEPTH OF CUT	RA-VALUE-QSD	RA-VALUE NO QSD
1	120	0.12	1	0.993	0.805
		0.20	1	2.150	1.954
		0.25	1	3.055	2.871
2	135	0.12	1	0.841	0.616
		0.20	1	2.139	1.770
		0.25	1	3.019	2.737
3	150	0.12	1	0.898	0.956
		0.20	1	2.002	2.175
		0.25	1	2.862	3.096



NO OF SAMPLE	CUTTING SPEED	FEEDRATE	DEPTH OF CUT	RZ-VALUE-QSD	RZ-VALUE NO QSD
1	120	0.12	1	4.528	3.811
		0.20	1	8.746	7.964
		0.25	1	12.360	11.481
2	135	0.12	1	3.995	3.219
		0.20	1	8.546	7.351
		0.25	1	11.727	10.822
3	150	0.12	1	4.190	4.232
		0.20	1	7.931	9.279
		0.25	1	11.565	12.090

METHODOLOGY

Work flow of the research



CONCLUSION

- ❖ The new simple and efficient quick stop device has been developed for the study of chip formation without the use of an explosive charge pin.
- ❖ The operation of this device has been very easy since the mechanism of this apparatus is purely mechanical. Resetting the device time between applications may be limited to a few minutes.
- ❖ The quick stop device can work well, the manufacturing process also does not require high cost and does not require a long time to complete it.
- ❖ The Quick Stop Device is safe to use and easy to handle

PUBLICATIONS

- Calophyllum-Inophyllum from Pahang Malaysia as Biolubricant Feedstock for Industrial Application, Ch. 39, in Recent Trends in Manufacturing and Materials Towards Industry 4.0, Springer, 2020 (Scopus)
- Tribological Analyses of Modified Jatropha Oil with hBN and Graphene Nanoparticles as An Alternative Lubricant for Machining Process, 76, 2, 2020 (Scopus)
- Study of oil flow rates effects on lubricant oil behaviour during minimum quantity lubrication milling process, Materials Today Proceedings, 2020 (Scopus)