

MEA MotorLab 追加軟體功能說明

常用的項目說明：

- Torque Spectrum [扭矩頻譜分析](#)
- Speed Spectrum [轉速頻譜分析](#)
- Torque vs. Speed Oscillations [扭矩對速度震蕩分析](#)
- Harmonic Integral of Speed And Torque Ripples [速度和扭矩漣波調和積分](#)
- Dynamic Torque vs. Speed [動態扭矩](#)
- Friction Torque vs. Speed [摩擦扭矩](#)
- Friction Torque Angle Spectrum [摩擦扭矩對角度頻譜分析](#)
- Cogging Torque Level [齒槽扭矩級數](#)
- Back EMF [反電動勢](#)

■ Torque Spectrum 扭矩頻譜分析

Description : Spectrum analysis of torque ripple *at steady state condition*,

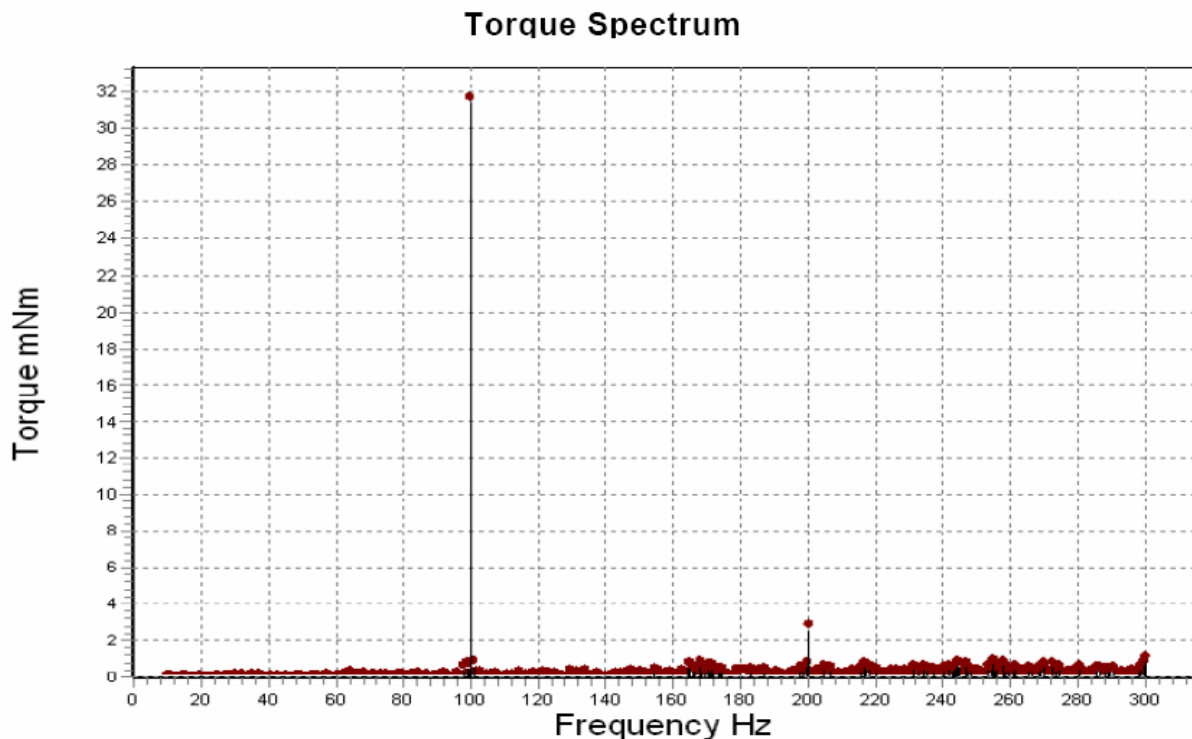
Frequency range from 3HZ up to 6KHZ

描述 : 對在穩態下扭矩漣波，頻率從 3Hz 到 6KHz 的頻譜分析。

Application : Used for detecting **vibrations and noise level**. A peak on specific frequency area can give information for the source of the problem.

應用 : 被用來檢測噪音及振動等級，對特定頻寬峰值將提供噪音振動問題來源訊息。

測試結果圖例



■ Speed Spectrum 速度頻譜分析

Description : Spectrum analysis of speed ripple *at steady state condition*,

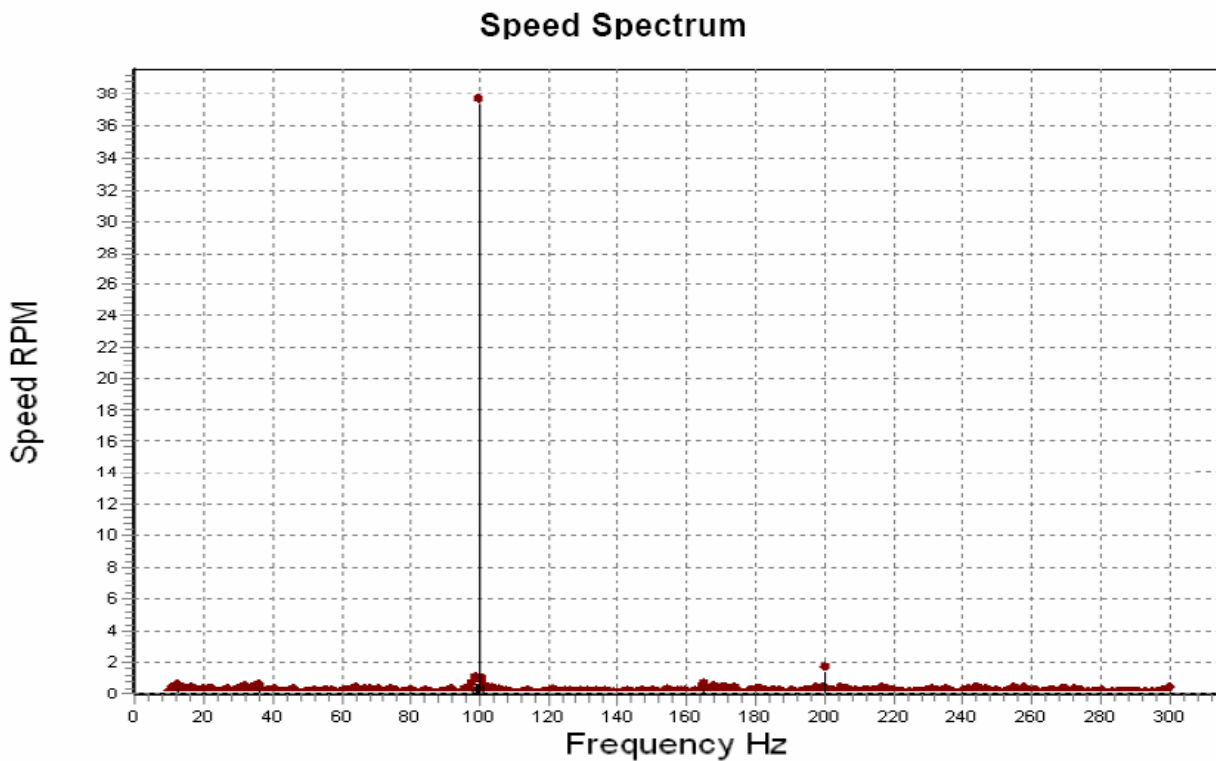
Frequency range from 3HZ up to 6KHZ

描述：對在穩態下速度漣波，頻率從 3Hz 到 6KHz 的頻譜分析。

Application : Used for detecting **vibrations and noise level**. A peak on specific frequency area can give information for the source of the problem.

應用：被用來檢測噪音及振動等級，對特定頻寬峰值將提供噪音振動問題來源訊息。

測試結果圖例



■ Torque vs. Speed Oscillations 扭矩對速度震蕩分析

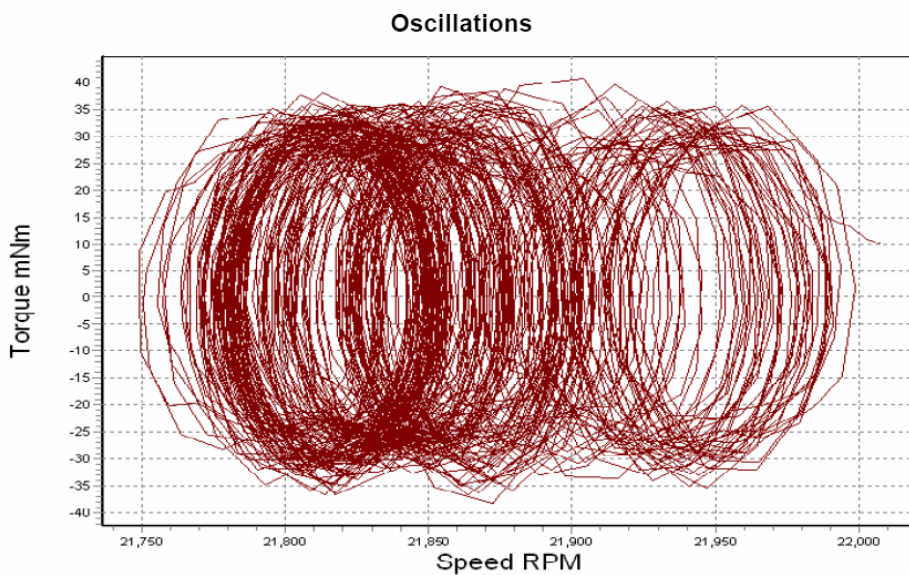
Description: The speed and torque ripple , when the motor is running at steady state condition.

描述：馬達穩態下的速度和扭矩漣波。

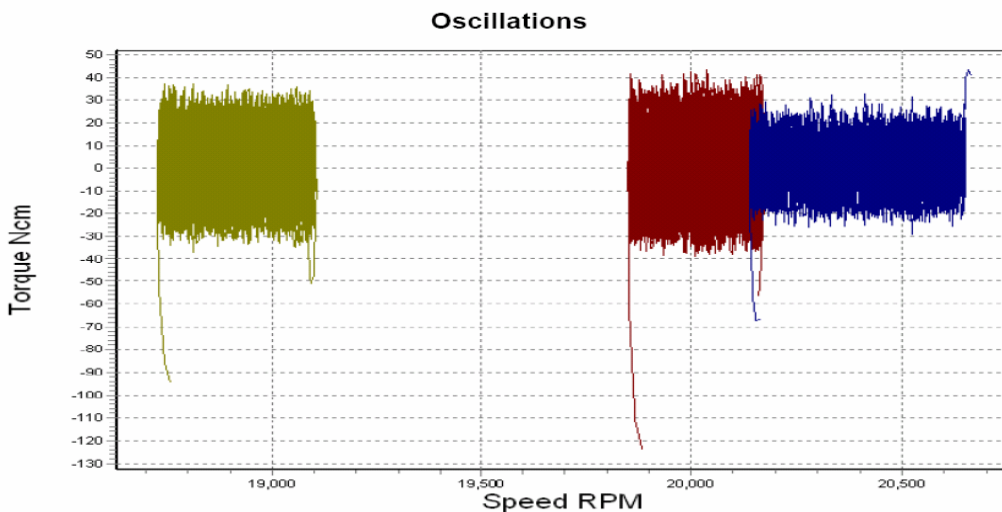
Application : Show the oscillation level of speed and torque 。 Use this test when building a prototype and want to reduce the oscillation level, which is a source for **noise and vibrations**.

應用：顯示轉速及扭力震盪等級使用此測試功能建立原型機標準，及降低因振動及噪音所產生之震盪程度。

測試結果圖例



不同電機之間的對比圖例



■ Harmonic Integral of Speed And Torque Ripples 速度和扭矩漣波調和積分

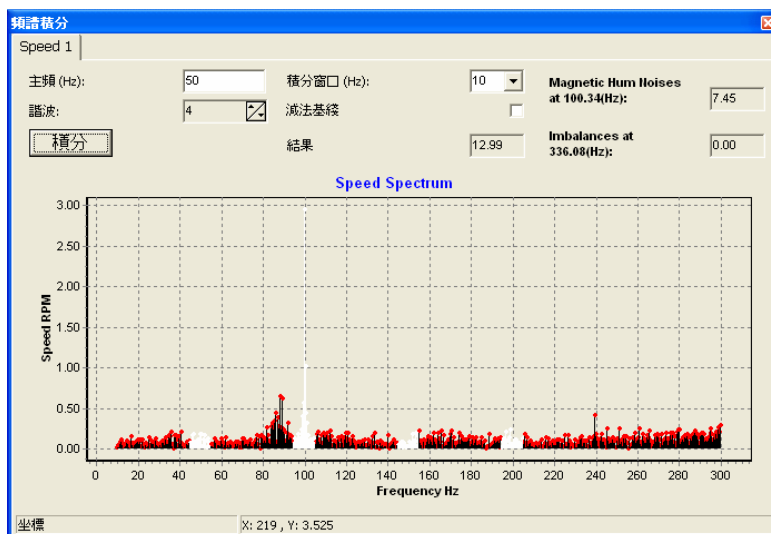
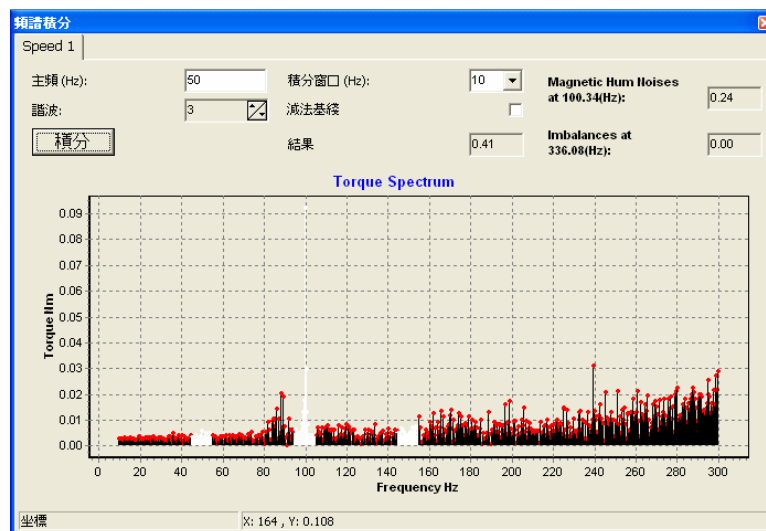
Description : Appear in the double line frequency at 100Hz on 50Hz networks, 120Hz on 60Hz networks.

描述：一般在兩倍基頻下振幅最大。

Application : Used by appliance manufacturer to select the motor manufacturer. Ac single-phase induction motors manufacturer, universal motors. Mainly used by air conditioner and air moving applications.

應用：家電廠用來選擇電機。單項感應馬達，串級馬達還有空調的製造廠。

測試結果圖例



■ Dynamic Torque vs. Speed 動態扭矩

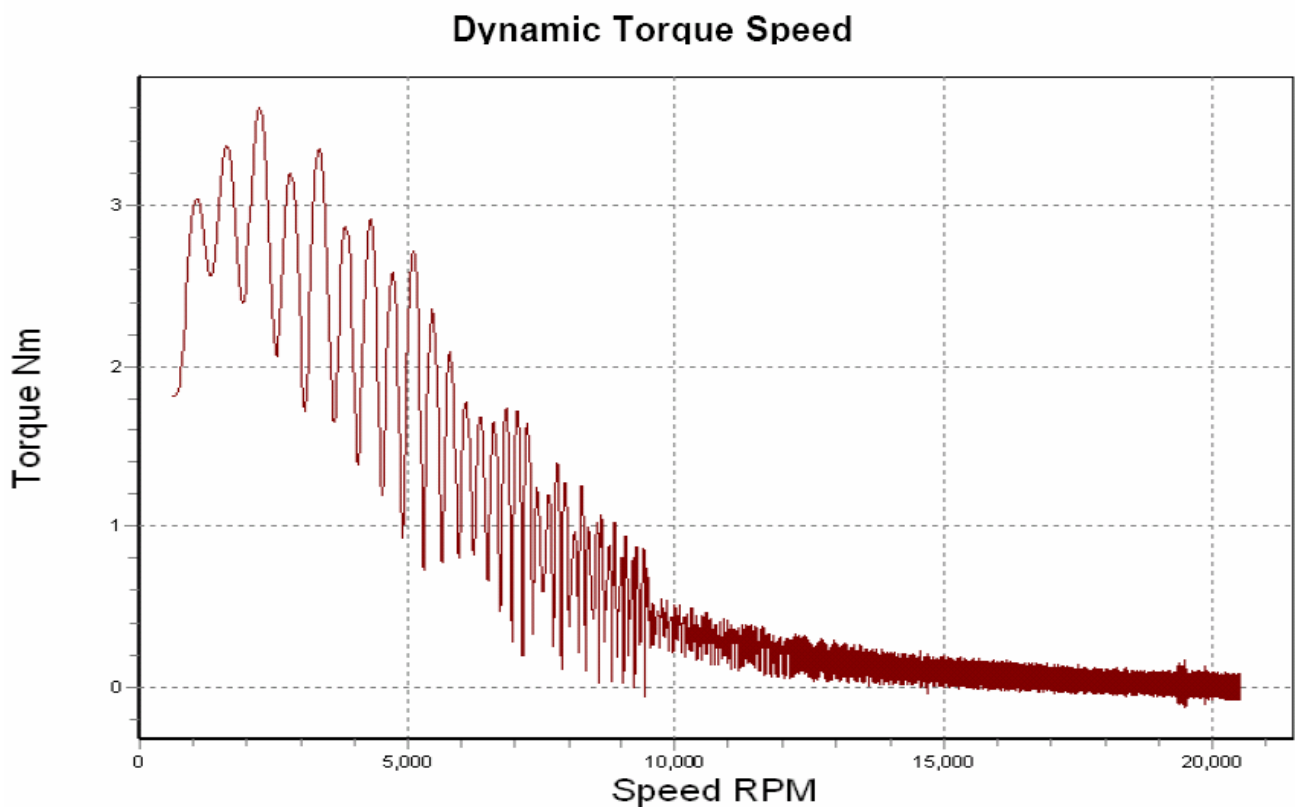
Description: : Torque vs Speed during the motor **acceleration**. Can be used as a very sensitive way to identified defects.

描述: 馬達加速過程中的扭矩和速度曲綫。是個高感度的瑕疵量測方法。

Application: Display dynamic torque vs. speed。Used for detecting problems that can not seen from **static results**. It is a very sensitive test.

應用: 顯示動態扭力對應轉速之關係。可顯現出靜態扭力無法展現之問題點, 為高感度量測功能。

測試結果圖例



■ Friction Torque vs. Speed 摩擦扭矩

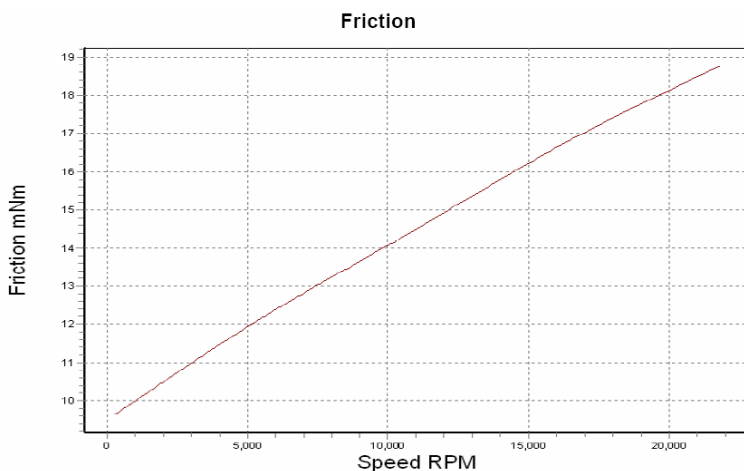
Description: Static friction torque vs. speed curve during the deceleration phase.

描述：馬達在減速階段的靜摩擦扭矩。

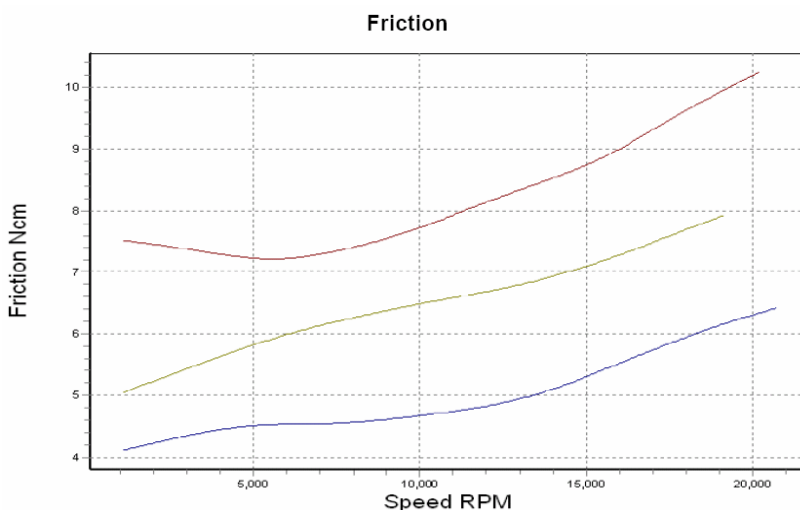
Application : Measure the Friction Torque during the deceleration phase. Reveal motor internal friction due to brushes, bearings, air-gaps and other mechanical parts. Used in the QA laboratories and on production lines. Used for receiving inspection on batch of motors when new batch of bearing is install in the motors or any new mechanical part.

應用：在馬達減速時段檢出馬達內部因碳刷，培林，氣隙及其他機械元件造成之摩擦。應用於量產檢測，檢查培林或機械元件問題。

測試結果圖例



不同電機之間的對比圖例



■ Friction Torque Angle Spectrum 摩擦扭矩對角度的頻譜分析

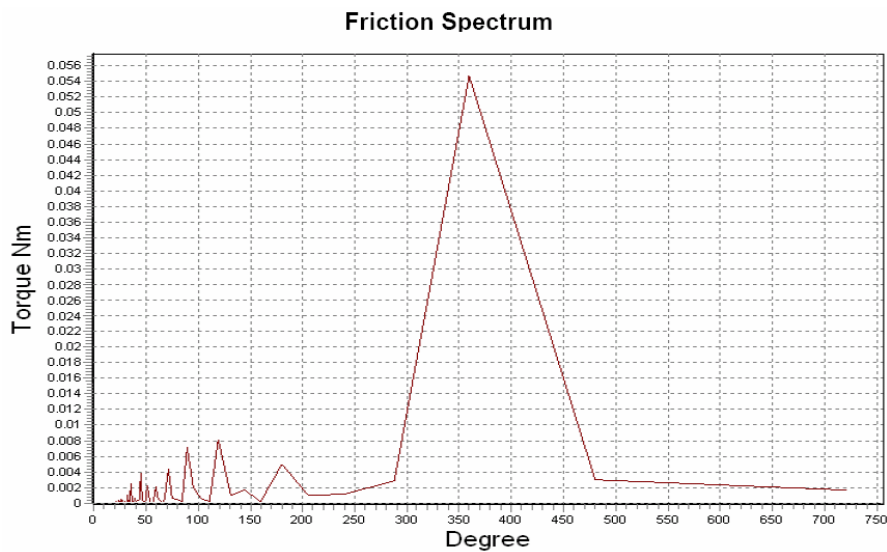
Description : Spectrum analysis of the motor torque friction.

描述 : 摩擦扭矩頻譜分析。

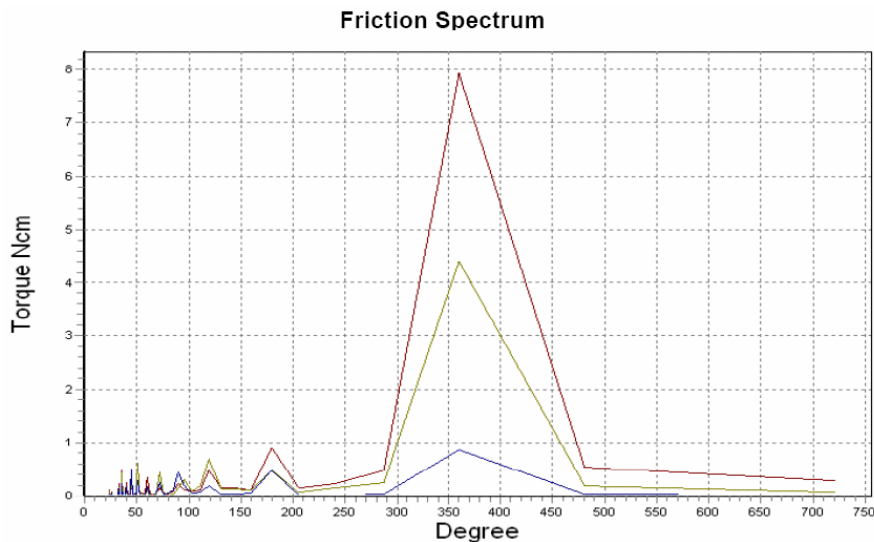
Application : Spectrum analysis of the friction during **the deceleration period**. Customers using this tests to **detect noisy motors and gears**. Peak around specific frequency area give the user an idea for the reason of the fault.

應用 : 減速期間馬達摩擦力頻譜分析。客戶應用此項測試功能檢出馬達及齒輪雜音，可經由檢出峰值之頻寬帶分析馬達噪音原因。

測試結果圖例



不同電機之間的對比圖例



■ Cogging Torque Level 齒槽扭矩級數

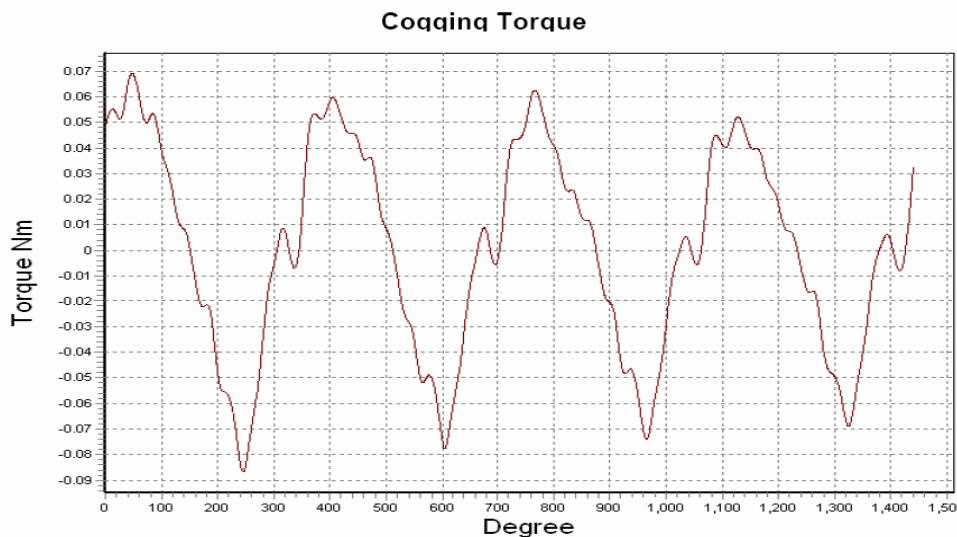
Description : Mechanical-Torque vs degree at very low speed

描述：在轉速非常低的時，機械扭矩和時間的關係。

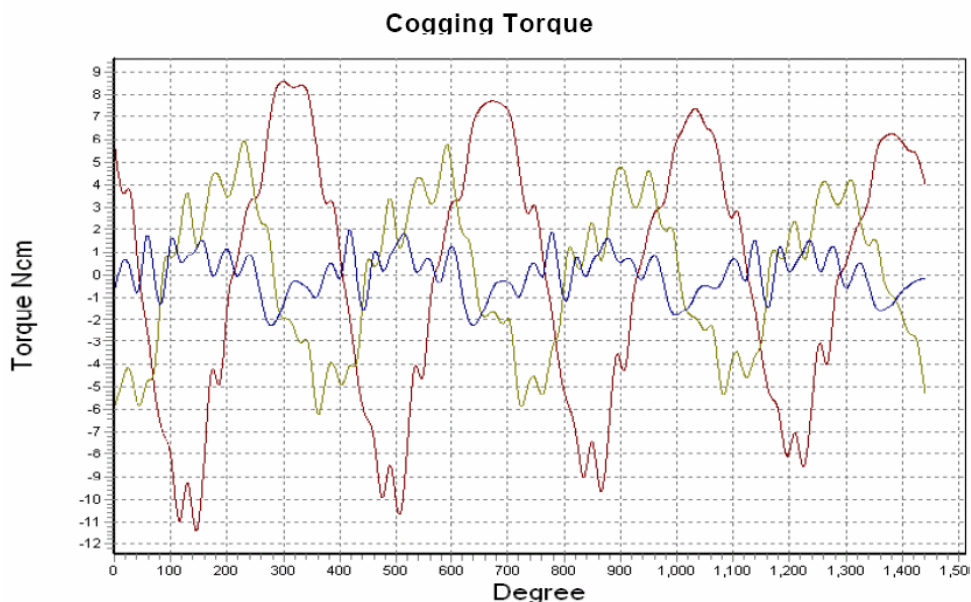
Application : Mechanical-Torque vs degree at very low speed. Important for BLDC and DCPM manufacturer this is a source for **noise and vibrations**.

應用：於極低轉速之下機械扭力對角度之測試。對直流無刷馬達及直流馬達非常重要，其為噪音及振動之來源

測試結果圖例



不同電機之間的對比圖例



■ Back EMF 反電動勢

Description : Display the Back EMF level for all the speed range from No load to 0 rpm 。

描述 : 顯示速度和反電動勢的關係。

Application : Measuring the Back EMF during the **deceleration period**. It is an alternative to the conventional way of driving the tested motor with another motor.

應用 : 於減速期間檢測出反電動勢,有別於以另一個馬達連接帶動被測馬達之傳統量測方法。

測試結果圖例

