

# Intersel Dowding & Mills



# Products and Services

**Interseal Dowding and Mills** (IDM), is one of the leading specialists in the Gulf Region for the Supply, Overhaul, Refurbishment, Rewinding and Testing of all types of Electrical AC and DC, HV/LV including Traction and MLT Motors, VFD Motors, Generators and Elmagco Baylor eddy current Brakes since 1986.

We repair/ rewind all types of rotating electrical equipment and our services include the following:

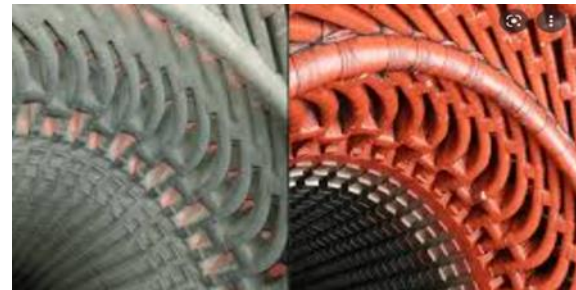
- All types of rotating AC/DC electrical equipment, from low voltage to medium voltage right up to 13.8kV.
- All brands of generator/ alternators, Stamford, Caterpillar, Kato, Leroy Somer, Nidec, Marelli, GE, Baylor, WEG and others.
- Oil and gas drilling industry equipment, including, GE 752, EMD D79, Letourneau C9 Hook, N11 Hook, D6 Swing, AC4 Skidder, AC5 Boom, AC5 Jacking, AC5 Anchor winch, AC2 Raw water tower, GEB20, GEB22, VFD motors, Elmagco eddy current brakes and many others.
- Dynamic Balancing of all rotating equipment including, rotors, impellers, propellers, fans, turbines, draw works drums etc. up to 30 Tons ABRO Balancing Inc, USA.
- Ex and UL motors repaired to IEC 60079-19 (Ex'd', Ex'e', Ex 'de', Ex 'n', Ex 'p').
- Overhauling of Pumps, Gear Boxes & Compressors.
- Overhauling & rewinding of LV and MV transformers.

# Products and Services

- Vibration analysis.
- Thermographic surveys.
- TAN Delta & Partial discharge.
- Health assessment ( i.e. ON-line & OFF-line testing) on rotating machines i.e. Motors & Pumps.
- Site Overhauling, Installation & Commissioning.
- Laser shaft alignment.
- Geometrical alignment such as straightness, squareness, leveling, flatness, bore parallelism etc. up to range of 40 Mtr.
- IN-situ balancing.
- Cryogenic Cleaning Services (Dry- ice blasting )



Hydro generator – before and after

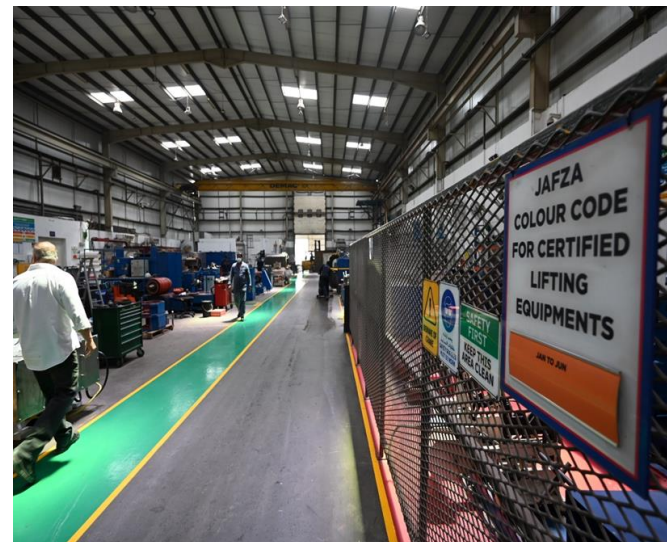


Synchronous motor – before and after



# Workshop Facility

- Our 9568 m<sup>2</sup> facility is located in the Jebel Ali Free Zone in Dubai (UAE).
- We maintain large stock of OEM spare parts with more than 10,000 SKUs.
- The workshop is fully equipped to carry out quality overhauls, repairs, rewinds and testing of motors and generators.



# Workshop Facility



# Workshop Equipment

- 1 x 50t Demag overhead **Cranes**
- 1 x 30t Demag overhead **Cranes**
- 1 x 25t Demag overhead **Cranes**
- 4 x 10t Demag overhead **Cranes**
- Millitorr Eng. Ltd., **VPI Tank**, 2500 mm x 1750 mm
- **ABRO Dynamic Balancing Machine** (Rotors up-to 2.5m in diameter, 6.0m in length, 30t in weight and balancing speed range of 0 –1170 rpm)
- **Schenck Avery Dynamic Balancing Machine** (Rotors up-to 2.1m in diameter, 6m in length, 12t in weight and balancing speed range of 210 – 1680 rpm)

# Workshop Equipment

- 2 x **Baking Ovens** 3 x 3 x 3 meters and 1.2 x 1.2 x 1 meters
- **Sand Blasting** Capability 3 x 3 x 3 meters
- 4 x **Lathes** for basic machining facility
- 2 x Phenix Technologies Motor Test Panels:
  - a) MTS1250R-1000 **High Power** up to 11kV
  - b) MTS200R-150 **Medium Power** up to 1kV
  - c) **ABB** ACS880-107-1170A-7 PN; 1100KW, IN 1170A, with **VFD Testing**

# Workshop Equipment

- PJ Electronics **Surge / High Pot Test Set** - capacity 50 kV
- Hipotronics **dc Insulation Tester** - capacity - 0 to 80 kV
- T & R Equipment Ltd. **Flash Tester**
- North Star High Voltage, **High Voltage Probe**
- Fluke **Combi-Scope**
- Baker **Surge Tester AWAIV** 12 KV (Portable)
- Flir P620 **Thermographic Camera**
- Commtest VB8 **Vibration Analysis Equipment**
- **Laser Alignment Equipment**
- Doble **PD Smart** – Partial Discharge Testing Equipment
- Doble **M4100 Tan Delta Equipment** 12 KV



# Sample Projects Undertaken

## Steel Industry

Remove, repair and refit solid steel up shaft leads. Manufacture and fit silver plated connection pins. Reinstall exciter Rotor and Stator. Align using Laser alignment equipment. Test and Commission - 40 kVA, 11 kV, Synchronous Condenser (Qatar)

## Aluminum Industry

Major overhaul of Stator. DLA testing - 2,813 kVA, 11 kV, Brush (UAE)

## Cement Industry

Complete overhaul of Stator and Rotor and balancing of Rotor - 2,500 kVA, 6,600 V, BBC Induction Motor (Oman)

Complete rewind using preformed coils and winding kits - 2 x 4,394 kVA, 13.8 kV, Alternators (Saudi Arabia)

## Industrial

Complete overhaul - 1,085 kW, 160 / 440 V, BBC, dc Motor (UAE)

## Power Generation

Rewind 2 x Rotors to class "C" Insulation. Testing included overspeed and Balancing, complete assembly and commissioning on site using Laser alignment equipment - 5,330 kVA, 11 kV, ASEA, Generator. Work was carried to the approval of Ewbank International Consultants & Robin Davies.

Remove, re-insulate and refit Retaining Rings (end-bells). Complete assembly and commissioning including on-site Balancing - 42 MVA, 10.5 kV, Elin Union (UAE)

Complete Stator rewind on site - 78 MW, 11.5 kV, Ansaldo (UAE)

Complete Stator rewind - 3,125 kVA, 11 kV, Brush Generator (Oman)

# Sample Projects Undertaken

## Oil & Gas

Dismantle Transformer, rewind 3 x coils, and assemble - 1,050 kVA, 600 / 380 V, France Transformer (Saudi Arabia)

Complete overhaul of dry type Transformer - 1,000 kVA, General Electric, 600 / 480 V, (Oman)

Complete overhaul of 10 Transformers housed in container. Work scope included; inspection, secondary injection of relays, primary injection of circuit breakers, drain oil, test oil and refill - 2,500 kVA, ABB (Dubai)

Rewind Stator (flame proof) to upgrade from 350 HP to 400 HP, including boring out of Stator frame, installing additional Stator

Laminations, press and secure - 350 HP, 3.3 kV, Continental Electric (Qatar)

Overhaul of 4 x Motors in accordance with ABS IV specification - 2,500 kW, 11 kV, GEC (Abu Dhabi)

Complete rewind of Stator and Rotor including dynamic balancing - 1,500 kVA, 600 V, Caterpillar SR4 Alternator (Sudan)

Complete overhaul of 2,000 kVA, 2,400 / 4,160 V, Kato Generator (Yemen)

Complete overhaul including Stator rewind - 750 kVA, General Electric ac Generator (Oman)

Complete overhaul including rewind - 6 pole Rotor of 1,000 kVA, Bemac Generator (Algeria)

Complete overhaul including Balancing - 2 x 480 kW, 6,000 V, Siemens Motors (Fujairah)

## Chemical Industry

Site repairs on flashover at connection end of Stator - 1,420 HP, 3.3 kV, Parsons Peebles (Qatar)

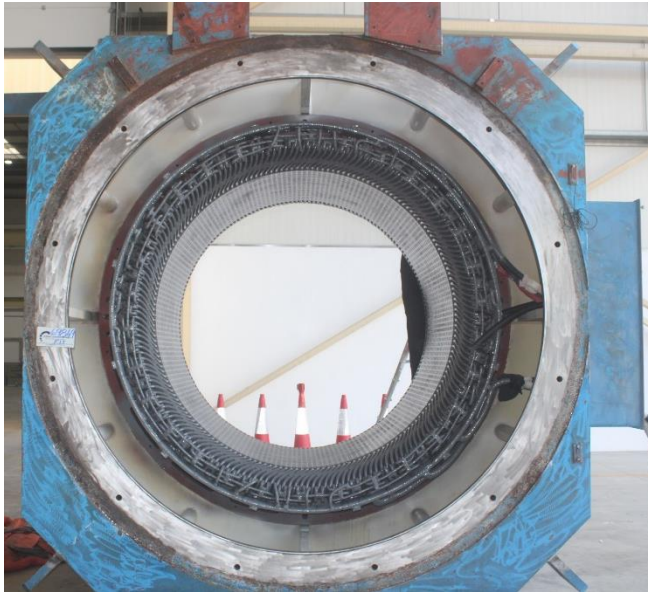
Complete overhaul and rewind of Stator - 200 kW, 6,600 V, Loher Motor (Oman)

## **TMEIC AC Induction motor, 5050kW, 13200V, 300A, 60Hz, 355RPM**



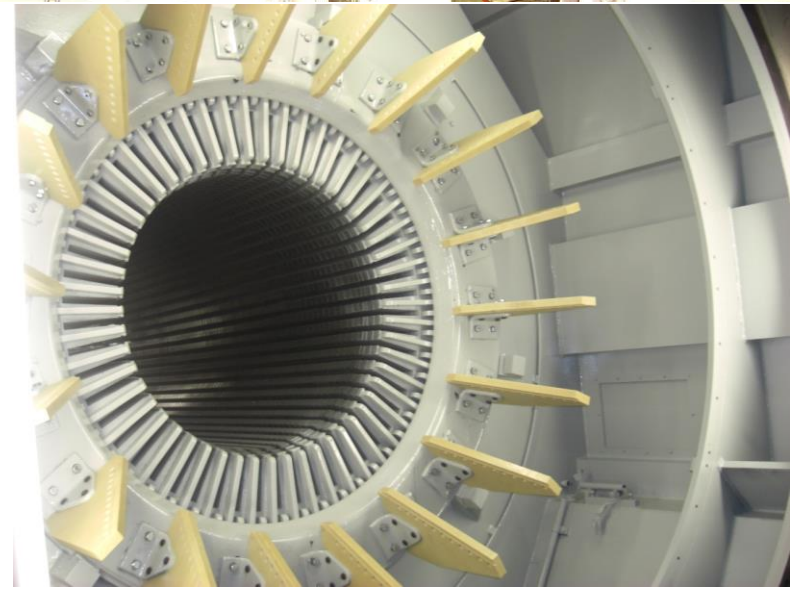
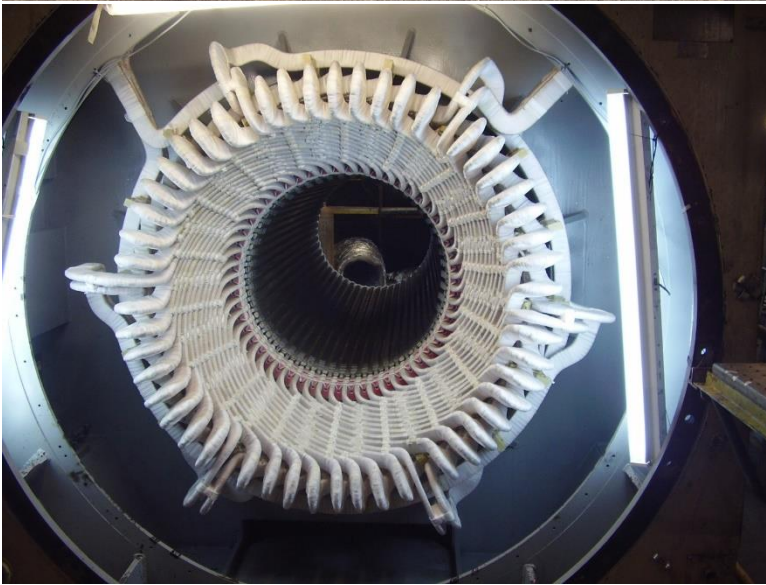
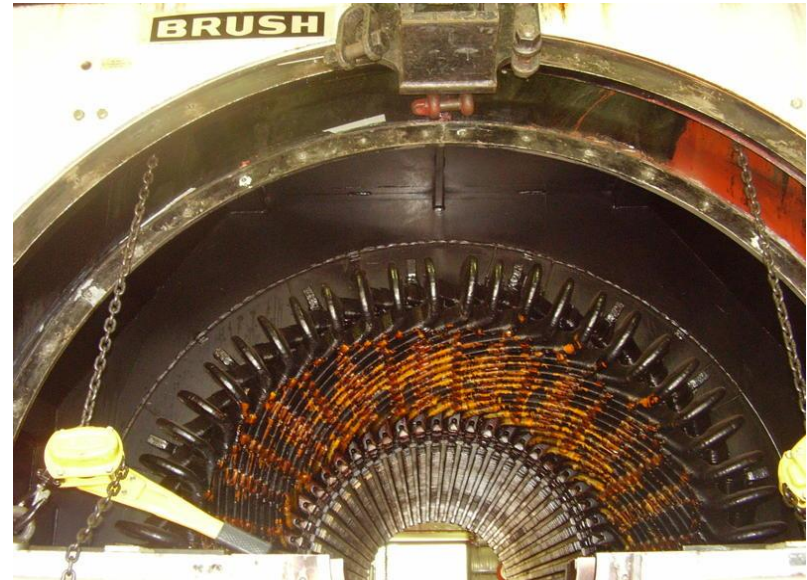


## **TMEIC AC Induction motor, 5050kW, 13200V, 300A, 60Hz, 355RPM**





## Brush 42 KvA Overhaul and Stator rewind



## **3 PHASE INDUCTION MOTOR, Voltage 11000 V Phase 3 Output 2500 KW Insulation class F Current rating 167 A, Frequency 50 Hz, 493 RPM**





**3250kW, 11kV, Amps: 21 PM: 422, Pole: 14, FR. No: 1120D, Frequency: 50Hz, Phase: 3 PH**



**Complete stator and rotor rewind (utilizing existing copper conductors) of a Brush 39,450 kVA (31.6 MW), 13.8 kV, 3600 rpm Turbo Generator**



**Repair damaged core and rewind of generator stator of Leroy Somer 4928 kW, 13.8 kV, 720 rpm Turbine Generator**





## **3 PHASE INDUCTION MOTOR, Voltage 11000 V Phase 3 Output 2500 KW rating 167 A, 50 Hz, 493 RPM**



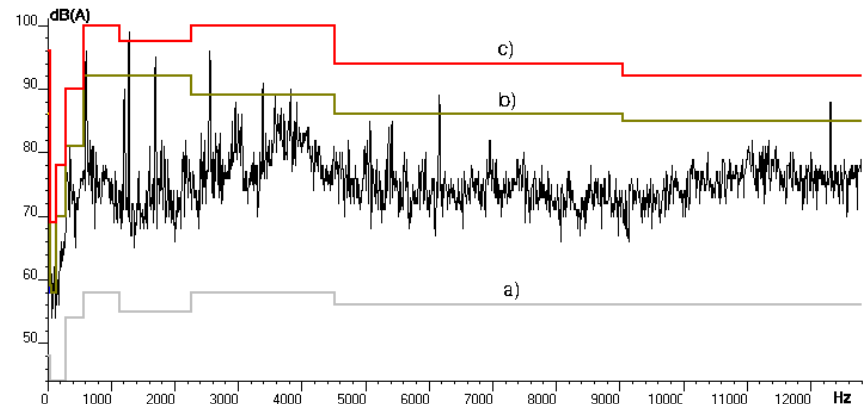
## Removal, overhaul and refit of a 34 Megawatt Brush Turbo Generator



# Other Services

## Conditioning Monitoring:

- Implementation of predictive maintenance programs.
- Testing of new machines against international standards.
- Electric motor and generator testing





# Other Services

## Vibration Analysis:

- Our vibration analysis & condition monitoring surveys use the most advanced data collection and software technology available.
- Our **Commtest vb8 series analyzer** uses **Ascent software** and the for capturing, analyzing and trending the vibration data.
- Monitoring equipment certified for use in ATEX Zone 2 hazardous locations.
- Onsite Vibration surveys, trending, machinery and structural testing including critical speed and acceptance testing.



DIN ISO 10816-3	Group 1		Group 2	
Machine type	Large machines 300 kW < P < 50 MW Motor H > 315 mm		Medium sized machines 15 kW < P < 300 kW Motor 160 mm < H < 315 mm	
Foundation	flexible	rigid	flexible	rigid
Velocity $v_{\text{eff}}$ mm/s rms	11,0	D		
	7,1			
10 – 1000 Hz $r > 600$ rpm	4,5	C		
	3,5			
2 – 1000 Hz $r < 600$ rpm	2,8	B		
	2,3			
	1,4	A		
<div style="display: flex; justify-content: space-around;"> <span><b>A</b> Newly commissioned machines</span> <span><b>B</b> Unrestricted long term operation</span> <span><b>C</b> Restricted long term operation</span> <span><b>D</b> Vibration causing damage</span> </div>				

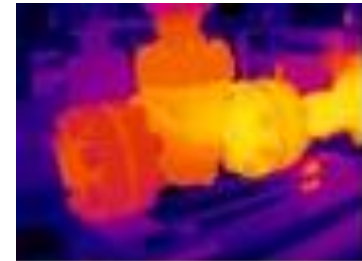
DIN ISO 10816-7	Category 1		Category 2		
Pump type	Rotodynamic pumps with high reliability, availability or security requirements		Rotodynamic pumps for general or less critical applications		$r < 600$ rpm
Power	< 200 kW / > 200 kW		< 200 kW / > 200 kW		0.5 rpm 1.0 rpm 2.0 rpm
Velocity $v_{\text{eff}}$	7,6	D	9,5	D	
	6,5		8,5		
10 – 1000 Hz $r > 600$ rpm	5,0	C	6,1	C	
	4,0		5,1		
2 – 1000 Hz $r < 600$ rpm	3,5	B	4,2	B	
	2,5		3,2		
mm/s rms	A		A		
<div style="display: flex; justify-content: space-around;"> <span><b>A</b> Newly commissioned machines</span> <span><b>B</b> Unrestricted long term operation</span> <span><b>C</b> Restricted long term operation</span> <span><b>D</b> Vibration causing damage</span> </div>					



# Other Services

## Thermography:

- Shows a visual representation of temperatures over large areas for comparison purposes
- Can capture thermal images of moving targets in real time
- Can identify deteriorating components prior to their failure (i.e. those at higher temperature)
- Can measure in hazardous or inaccessible or areas
- Can be used to find defects in shafts and other metal parts
- Test method is quick and non-destructive



# Other Services

## Laser Alignment:

- Fixturlaser GO Laser Analysis Technologies
- CCD technology eliminates the need for rough alignment
- Line laser alignment together with CCD, results in a high degree of accuracy
- Measurements from the Laser Alignment Equipment can be transferred to a PC for reporting.



# Other Services

## Power Factor / Tan Delta Testing:

- M4100 4<sup>th</sup> GEN Offline testing and assessment to confirm insulation integrity and quality up 12kV
- Capacitance testing to measure physical changes that may have occurred to the apparatus
- HV turns ratio testing to detect shorted turns or winding damage
- Leakage reactance/short circuit impedance testing to evaluate winding deformation.



# Other Services

## Partial Discharge Analyzer:

- The digital, highly advanced PD Measurement & Diagnostics System PD-Smart is developed for periodic on-line and off-line PD testing on power apparatus and high voltage insulation systems.
- It is fully compatible to DIN EN 60270, VDE 0434, ANSI and other IEEE-Standards
- Quality testing in regard to PD on HV apparatus and accessories during or after assembling/manufacturing
- PD Measurements during the complete service life of the equipment (while in operation or during maintenance/revision)





# Memberships

**IDM maintains membership with the following organizations:**

- Association of Electrical & Mechanical Trades
- Electrical Apparatus Service Association
- British Standards Institution
- International Association of Drilling Contractors
- Standard Global Services
- Underwriters' Laboratories



# Brand Partners

- Authorized Service Center for Toshiba Mitsubishi Electric (TMEIC) in UAE.
- Authorized Service and Distribution Center for Wabtec (GE Transportation) AC/ DC Motors in MENA region.
- Authorized Service Center for Breuer Motoren in Middle East.
- Authorized Service and Distribution Center for Cummins Generator Technology (Stamford, Newage and AvK) in MENA region.
- Authorized Service and Distribution Center for Marelli Motori in UAE.
- Authorized Service Center for WEG in UAE.
- Approved Service Centre for Caterpillar, NIDEC, KATO, Leroy Somer.
- Approved Service Centre for Keppel LeTourneau Middle East.

# Contact details

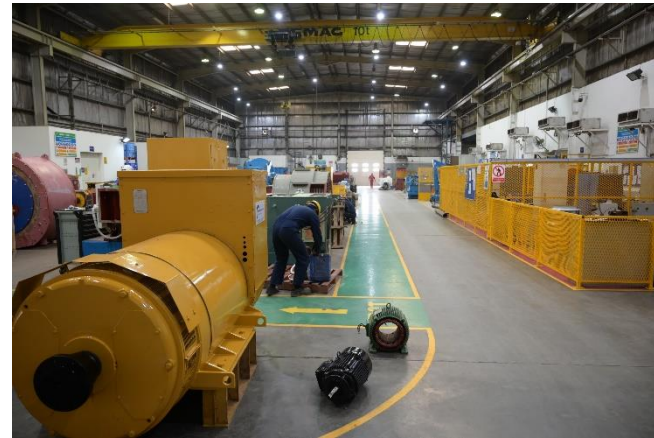
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