DYNA-MESS Fatigue Testing Machine
Technology & Service Agreement

DYNA-MESS 动态试验机
技 术 及 服 务 协 议

Demand-side: OTSUKA MATERIAL SCIENCE AND TECHNOLOGY (SHANGHAI) CO., LTD.
Supply-side: DYNA-MESS PRÜFSYSTEME GMBH China office

需方： 大冢材料科技（上海）有限公司

供方： 德国 DYNA-MESS 公司 中国办事处

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Code:
Signing date:

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编号：
签订日期：

Technical configuration and function review catalog:
技术配置及功能综述目录：

I Commodity name, Type and Quantity
产品名称，型号 及数量

Commodity 产品名称	Type 型号	Quantity 数量
DYNA-MESS Fatigue Testing Machine Testing **DYNA-MESS** 动态试验机	TP 5 HF	1

II Specific equipment Configuration and Accessories

具体设备组成及附件

Fatigue Testing Machine:

动态试验机配置：

DYNA-MESS Fatigue Testing Machine:

- Fatigue testing machine class 1 according to DIN EN ISO 7500-1.
- Compression tests with static, slow motion and swelling loading.
- Special design cylinder for dynamic testing
- Electronic measuring of force and displacement.
- Digital closed loop control (force and displacement controlled).
- User-friendly operation and control by menu driven software under Windows.

- 疲劳试验机 1 级精度 符合 DIN EN ISO 7500-1 标准
- 静态、慢动态和交变模式下测试
- 配有适用于动态测试的特殊作动器
- 力值和位移电子自动化测量
- 数字闭环控制（控制力值和位移）
- 采用 Windows 系统下菜单操作和控制，界面友好

III Instrument system and Main technical description
仪器系统及主要技术描述

3.1 Fatigue Testing Machine main technical description

动态试验机技术参数:

Description 描述	Technical data 技术参数
Type 型号	TP 5 HF
Nominal capacity 额定载荷	5kN
Stroke 位移	12mm (±6mm)
Max frequency 最大频率	35Hz
Static pressue 静态气压	6 bar

3.2 Fatigue Testing Machine basic configuration

动态试验机基本配置性能

3.2.1 Testing Machine main configuration

动态测试机主要结构:

Machine frame

机器构架

Very stiff 2-column load frame type TP
高刚度双立柱框架 类型 TP

Base plate

- massive aluminium plate with centered threads for grips and devices
- alternatively the load cell can be mounted at the base plate

基板

- 铝制基板，中央接口，用于安装夹具和工装
- 载荷单元也可以安装于基板上

Traverse

- adjustable in heigth
- lockable by screws in any desired position
- loading cylinder to apply testing force mounted on traverse
- housing for cylinder and valves to reduce noise

横梁

- 可调节高度
- 可在任何位置通过螺丝固定
- 安装在横梁上的加载气缸用于力值测试
- 配备气缸和阀门外罩，减少噪音

Dimensions and type

- clearance (width): 500 mm
- paintwork: RAL 5002

尺寸和类型

- 宽度: 500 mm
- 颜色: RAL 5002

Loading unit

- Equipment for dynamic testing up to approximately 35 Hz. Swelling and alternating loads can be performed.

加载单元

- 动态测试设备大约 35 Hz。可以实现增量或交变载荷。

Test cylinder for dynamic testing

- minimum-friction design for servopneumatic control
- thread at rod for mounting of mechanical adaption

作动缸

- 结构小巧 易于操作
- 端部螺纹接口用于安装工具

Control valve for dynamic testing

- precision servo valve for closed loop control

动态测试控制阀

- 用于闭环控制的精密伺服阀

Safety valve

- electrical valve for on/off of pressure supply in case of emergency stop

安全阀

- 电子阀门开关以防在紧急情况下停止

Connections

- pneumatic connection by quick connect fitting
- compressed air with pressure regulator, filter (5µm) and water seperator has to be provided by the customer

连接

- 通过快速连接管的气动连接
- 压缩空气，需由客户自行提供过滤装置（压力调节器,过滤器(5µm)和水分离器）

Sensors
传感器

Load measuring

- precision load cell (DMS) for tension and compression
- precision amplifier DMV 104 (class 0,1), ranges 100 / 50 / 20 / 10 %
- accuracy better class 1 according DIN EN ISO 7500-1 from 1/100 of nominal capacity

力值测量

- 用于拉伸和压缩测试的精密载荷单元
- 精密放大器 DMV 104 (级别 0,1), 范围 100 / 50 / 20 / 10 %
- 精度高于 1 级，符合 DIN EN ISO 7500-1

Path measurement

- non contact precision displacement sensor (inductiv)
- class: 0,25
- amplifier DTF 100 (class 0,1)

位移测量

- 非接触精密位移传感器
- 级别: 0,25
- 放大器 DTF 100 (级别 0,1)

Electronics CIMTronic 2000 for data acquisition and closed loop control
用于数据采集和闭环控制的 CIMTronic 2000 电子控制器

19"- electronics
- o data acquisition and signal processing by integrated amplifiers
- o bus system for internal communication
- o power amplifier for valve control
- o power supply for measuring electronic and servo valves
- o interface boards for communication between PC and 19"- electronics
- o BNC-output (± 10 V) for all analog sensor signals

19"-电子设备
- o 通过集成放大器获取数据和处理信号
- o 内部通信主线路
- o 用于阀控制的功率放大器
- o 用于电子控制器和伺服阀 的电源
- o 用于计算机 和 19"- 电子设备通讯的接口
- o BNC-输出(± 10 V)适用于 所有模拟传感器信号

PC-system
- o high performance processor for closed loop control and monitoring of testing machine
- o parallel data acquisitioin by highspeed A/D-converter
- o A/D-converter with 16 bit resolution. Additional switching of force amplifier by software (corresponds > 19 bit)
- o standard PC incl. operating system Windows 7

计算机系统
- o 用于闭环控制和测试机监控的高性能处理器
- o 采用高速 A/D-转换器并行采集数据
- o 16 比特分辨率的 A/D-转换器. > 19 比特的力值扩展器
- o 标配计算机 (CD-ROM, 网络控制器,...). Windows7 操作系统

Operating elements
- o remote control with joystick to set up machine
- o test control and operation by software

操作元件
- o 配备遥控器，通过操作杆控制
- o 通过软件控制和运行测试

Control box
- o 84 TE - housing for 19"-electronics
- o PC, TFT-monitor, keyboard / mouse
- o paintwork : RAL 5002 / 6018
- o dimensions : approx. 900 x 800 mm (W x D)
- o connected value 230 V / 50 Hz

控制箱
- o 84 TE - 箱体，用于 19"-电子控制器
- o 计算机, TFT-监视器, 键盘 / 鼠标
- o 油漆 : RAL 5002 / 6018
- o 尺寸 : 约. 900 x 800 mm (W x D)
- o 电源 230 V / 50 Hz

Software

The DYNA-MESS testing software is Windows based and has a modular structure. The software is based on a basic modul and on application oriented test moduls. The basic software is indispensable to run the testing system and consequently is part of the base unit. The additional software packages are configured to meet to the specific tests requirements and can be started from the base modul. Both the basic and the test moduls have a menu driven user surface supporting easy and intuitive use of the test unit. In addition to that all important menu points are shown as functional buttons to allow quick use without mouse or touch pad.

The basic software includes the DYNA-TCC software modul to drive the testing system and the machine independent DYNA-TCC OFFLINE modul for preparation of test reports on a separate computer.

软件

DYNA-MESS 测试软件基于 Windows 系统，并具有模块化结构. 软件有基础模块和基于应用测试的模块组成。基础软件是运行测试系统必不可少的一部分， 配备的额外软件包用以满足特殊的测试需求，可从基础模块中启动。两部分都具有一个菜单驱动元件，支持简单而直观的测试应用。此外，所用重要的菜单显示在功能按钮上，这样既方便快捷又不需要鼠标和触控板
基础软件包括驱动测试系统的 DYNA-TCC 软件模块和在单独的计算机上用以制备测试报告的 DYNA-TCC 独立的离线模块

DYNA-TCC offers the following function

- Selection of test mode
- Test sample library
- Control of test unit (pressure supply on/off)
- Manual status check of test unit including start of test function
- Recalling and displaying results
- Settings /Configuration (user listings, directories, files, definition of sensors etc)
- Service and diagnosis
- Testing system set-up (only accessible for DYNA-MESS)

The single test module include

- General test configuration as
  - Data of test specimen (identification, type, dimensions)
  - Specimen data for library and report
  - Control configuration. The control constellation will be stored related to the specimen
  - Limits (min/max for force and travel, width of tolerance band, additional readings)
  - Start of test run (positioned automatically, positioned manually)
  - End of test run (action of test system after test stop)
  - Layout of test report (definition of data and results with control of tolerances)
  - Definition of desired failure mode (failure mode criteria)
  - Definition of reading timescale (as logon force, test stop)
  - Definition of display (scale etc)

测试模块包括

- 通用测试配置
  - 测试样品参数(定义，类型，尺寸)

        - 样品数据库和报告
        - 控制配置，可用于存储相关样品
        - 范围 (力和位移的最大和最小值，公差范围宽度，额外读数)
        - 测试运行开始 (自动、手动定位位置)
        - 测试运行结束(测试结束后测试系统停止运行)
        - 测试结果排布 (公差控制的数据和结果设定)
        - 破坏模型设定
        - 读数时间设定显示设定(数值范围)
    - 特定测试设定
        - 参数 (速度，频率，等)
        - 目标值
        - 数据采集和显示
    - 基于 ASCII 和二进制的数据存储
    - 打印数据和报告

用户自定义图形设置，如坐标轴系统，已包含在标准模块中。图形显示由用户自行安排，并在测试报告中体现出来，非常人性化。

- Definition of specific test runs
    - Set of parameters (speed, frequencies, etc)
    - Generation of target values
    - Data acquisition and display
- Data storage based on ASCII and binary format
- Print of data and reports possible

User specific definition of the graphic entities such as coordinate system axes is included in the standard module. The graphics can be arranged by the user, therefore supporting a flexible, customized layout of the reports.

DYNA-TCC 功能：

- 选择测试方法
- 测试样品库
- 测试单元控制
- 启动手动检测
- 结果的召回和显示
- 设置/配置 (用户清单、目录、文件和传感器定义等)
- 服务和诊断
- 设置测试系统 (仅适用 DYNA-MESS)

测试模块包括

- 通用测试配置
    - 测试样品参数(定义，类型，尺寸)
    - 样品数据库和报告
    - 控制配置，可用于存储相关样品
    - 范围 (力和位移的最大和最小值，公差范围宽度，额外读数)
    - 测试运行开始 (自动、手动定位位置)
    - 测试运行结束(测试结束后测试系统停止运行)
    - 测试结果排布 (公差控制的数据和结果设定)
    - 破坏模型设定

- 读数时间设定显示设定(数值范围)
- 特定测试设定
  - 参数 (速度，频率，等)
  - 目标值
  - 数据采集和显示
- 基于 ASCII 和二进制的数据存储
- 打印数据和报告

用户自定义图形设置，如坐标轴系统，已包含在标准模块中。图形显示由用户自行安排，并在测试报告中体现出来，非常人性化。

Installed software moduls:

安装软件：

DYNA-TCC

- 用以运行测试系统的基础软件

DYNA-TCC 软件

- 用于操作测试系统的基本的软件

DYNA-TCC OFFLINE

- Independent Software package in order to process the data on a separate PC

DYNA-TCC 离线测试软件

- 可在单独的计算机上处理数据的软件包

Software module "Manual testing"

- Tests (displacement controlled) by using the joystick on the remote control

手动测试软件模块

- 使用有远程控制操作杆的测试

Software module "Tension/compression testing"

- Tests (force/displacement controlled) with defined rate

拉伸和压缩测试软件模块

- 按已定速率测试，通过力和位移控制

Software module "Multi-step Cyclic testing"

- Tests in dynamic mode in force/displacement control
- up to 30 steps

多步骤设置循环测试软件模块

- 由力和位移控制的动态测试
- 最多达 30 步

Software module "Ramp testing"

- Applying and holding of forces and positions
- Features : Goto force level
  Hold force
  Goto position
  Hold position
  Start loop
  End of loop
- cyclic testing is possible

扫描测试模块

- 力和位点应用测试
- 特点 : 到规定力值
  保持力值
  到规定位置
  保持位置
  起始位点
  终止位点
- 可进行循环测试

IV construction、installation and commissioning
土建、安装调试

4.1 Construction
土建

DYNA-MESS Fatigue Testing Machine is made out of lightweight high strength steel, so the instrument can be placed on the general laboratory ground. And the seller issue specific installation requirements.

DYNA-MESS 动态测试机采用轻质高刚度的机身设计，所以该款设备可用于普通试验室地面， 卖方会出具安装要求。

4.2 Installation and Commissioning
安装调试

The installation and commissioning is completed by qualified installation personal appointed by DYNE-MESS shanghai office and a senior installation engineer of DYNA-MESS for two days.

由 DYNA-MESS 驻上海办事处专业安装人员及 DYNA-MESS 公司资深安装工程师（德方）进行安装调试，安装调试时间为二个工作日。

V、Staff training
人员培训

We offer specific training plan included three stages:
我们将提供详细的培训计划，培训将分为三个阶段：

a) During the acceptance, installation and commissioning, DYNA-MESS exclusively offers the complete technical training for technician, operator and maintenance worker in the buyer's company, training involving operation, maintenance and mechanical and electrical repair.
在设备验收、安装、调试期间，DYNA-MESS 应对买方的技术人员、操作人员、维修人员进行全面的操作、保养、机械电气维修等方面的技术培训。

b) After installation and commissioning, we offer application and operation training and use training in the buyer's site（including panel use, software use, data processing and maintenance training）, that ensures the customer can operate the instrument correctly and master maintaining methods. The training time is two days.
设备安装调试后，我们将向客户提供设备的应用操作培训，在买方现场进行设备使用培训（包括面板使用、软件使用、数据处理、设备维修保养培训），确保用户能正确进行设备操作、使用，掌握设备维修保养方法。二个工作日。

c) We provide troubleshooting and maintenance training for the customer after a period of operating instrument.(usually after 2-4 weeks) .
设备在为客户使用一段时期后(一段时期为 2~4 星期后)，向客户再提供疑难问题解答，保养维修培训。

d） To further develop and use software, DYNA-MESS annually hold technical seminar, Q&A and software training in Shanghai. The invitation will be issued before holding
同时 DYNA-MESS 每年不定时在上海总部举行技术交流会，答疑会和软件培训会，进行更深一层次的开发和使用软件，举办前会事先发出邀请函。

VI After-sale-service and Technical support
售后服务及技术支持

Techwin Science（HK） Co., Ltd. was authorized as China office by DYNA-MESS PRÜFSYSTEME GMBH, currently has 30 employees, and sets up professional maintenance service center in Shanghai and Beijing. Techwin completely takes charge of DYNA-MESS products in selling and after-service in China.
法森科技香港有限公司是德国 DYNA-MESS 集团设在中国的办事机构，目前有员工 30 名，在上海北京设有专业维修服务中心。目前我们全面负责 DYNA-MESS 集团产品在中国地区的销售和维修。

We offer customers a warranty for two year after the acceptance. If hardware failure takes place during the free warranty, the seller will ensure a free replacement in a month, and deliver the instrument after completing the acceptance of the installation and commissioning, the warranty of replacements delayed by a year. Beyond warranty, if there is some problems to home repair, we can response quickly in 4 hours and arrive at the site in 48 hours.
我们向贵公司特别提供设备验收后为期两年的质保期，在免费保修期内，如发生硬件故障，卖方保证在一个月内负责免费退换，并安装调试验收完毕交付使用，更换件免费保修期顺延一年。超出保修期后，如设备出现故障，需上门维修时，可在 4 小时内做出快速响应，并在 48 小时内到达现场

After the commissioning, we pay the customers a return visit, including examination of the instrument, inquiring the usage, proposing use and maintenance suggestion and calibration of the machine.
我们在设备调试后，将定期对使用方进行回访，内容包括对设备进行检查，了解使用情况，提出使用维护建议，提供整机校验服务。

Techwin Science（HK） Co., Ltd. Promise to provide quality assurance service for 2 years. If any problem occurs, Techwin will arrange on-site repair for free in 48 hours.
法森科技香港有限公司承诺为客户提供 2 年的质量保证，若期间设备出现运行故障，必须两个个工作日内派人上门免费维修。

During the free warranty period, Techwin Science（HK） Co., Ltd. promise to provide free calibration service once a year, and provide calibration report at the same time.
在免费的质保期内，法森科技香港有限公司承诺每年免费提供一次设备的校准服务，并出具校准报告。

In order to help Otsuka Material Science and Technology (Shanghai) Co., Ltd. to develop more applications of the equipment, DYNA-MESS PRÜFSYSTEME GMBH and Techwin Science (HK) Co., Ltd. promise to provide system interfaces for equipment control, parameter setting, and develop energy control testing mode for Otsuka Material Science and Technology (Shanghai) Co., Ltd.
为配合大冢材料科技（上海）有限公司后续对设备进行应用改造，德国 DYNA-MESS 集团及法森科技香港有限公司承诺提供设备启停、参数设定等设备操控接口，并且为客户开发能量闭环控制的功能。

VII Acceptance of delivery, Quality assurance and Certification
验收交付、质量保证、检定及考核指标

The technical certificate is issued by DYNA-MESS ultimate quality control center after installation and commissioning.
仪器在安装调试检定认证后交付，设备的技术认证由 DYNA-MESS 集团最终质量控制中心提供。

The instrument and attachments are delivered after the quality examination, inspection and test run with certificate of quality, inspection table and qualified certificate.
卖方供货范围内的设备和材料必须进行出厂质量检验、检查和试运行，合格后才能运出。并需出具出厂质量检验书、检验成绩表及合格证书。

Within 10 days after the arrival of the goods at destination, the seller executes installation and commissioning until acceptance.
设备到达买方所在地后，卖方应在 10 天内进行安装调试，直至通过验收。

All disputes shall be settled through friendly negotiation.
如有分歧，双方友好协商解决。

卖方代表: **For and on behalf of the Seller:**	**买方代表:** **For and on behalf of the Buyer:**
DYNA-MESS PRÜFSYSTEME GMBH	大家材料科技（上海）有限公司
日期: **Date:**	**日期:** **Date:**
地点: 上海 中国 **Place:** shanghai, China	**地点:** 上海 中国 **Place:** shanghai, China
2018/12/03	2018/12/04