International Activities for STEP and STEP-NC Manufacturing Standards
Teil 1

Friedrich Glantschnig
AMT Consulting
fglantschnig@swissonline.ch
Convener ISO TC184/SC1/WG7

Product Data SC4 Framework
Integrated Manufacturing
Participating Organisations and International Projects

ISO STANDARDS

TC 184 Industrial Automation
TC 29 Tools
WG34 Tool Models

SC1 Physical Device Control

STEP-NC Phase 1 EU+Switzerland

IMS+EU Projects

STEP-NC Phase 2 EU Switzerland USA Korea

Fun-STEP Spain, Portugal, Italy Germany

SUPER MODEL USA

Digital Master JAPAN

Europe

US

Korea

Step-nc Phase 1 EU+Switzerland

Task Group 24 Manufacturing

Task Force Group Manufacturing


Manufacturing activities and related Standards

ISO 10303 ISO 13584 Part Lib
ISO 15531 Mandate

ISO 10303 STEP All Integrated Resources
AP201 to AP205
AP214, AP224

ISO 10303 STEP Product-Data
AP213 Manufacturing Process Planning
AP214 Automotive
AP224 Features
AP238 AIM for ISO 14649

ISO 15531 Mandate
ISO 13399 Tools

ISO 14649 CNC-Data Model and Interface
New CNC Data-Interface
Machining Features
NC-Program

ISO 140303 AP219 Inspection

ISO Diverse PLC Robots

Design

Process Planning

Machining and On-Line Inspection

Management

Handling

Off-Line Inspection
ISO TC184 Organisational structure and Manufacturing related Standards

ISO TC184

ISO TC184 Advisory Group

SC 2
Robotic’s

SC 1
Physical Device Ctrl.

SC 4
Product Data

SC 4
Task Force Manufacturing

SC 5
Architecture Communication

DEVICE CONTROL
Technological Models related to Manufacturing
ISO 14649
ARM’s for all CNC
Machining-Technologies
All other CNC Standards
as e.g. ISO 6983 and 841,
ISO 6232, ISO 6234 etc.

PRODUCT DATA and
related Application
Protocols for
Manufacturing
AP203, AP213, AP214
AP224, AP219, AP238
AIM’s for all NC- and CNC
Machining Technologies
PDM - Mandate

CO-ORDINATION for the
Manufacturing Process-Chain
with:
Basic Mathematical Modelling,
Application Activity Model and
Terminology in Manufacturing.
Dedicated workshops for
needed active Liaisons.

Standard Developments, Resources and Step by Step Approach to Final Goals

Steps in Standard Development

- Analyse actual situation
- Develop basic model structure
- Select needed standards
- Harmonize needed standards
- Follow AAM Integrated Manufacturing
- Assure quality and consistency
- Test implementations for functionality and portability

Develop and Harmonize Standards for integrated Manufacturing
Convince Industry on Advantages and Cost savings Implementation and Use

Steps to Final Goals

- Pressure from End-users for products using the new standards to harvest the inherent benefits
- Products to be developed in the CAD- CAM- and CNC areas
- Worldwide use of the new approach for consistent and portable manufacturing data.

Standards existing and in actual development:
ISO 10303, ISO 14649
ISO 15531, ISO 13399

Additional New Standards needed?
xxx........
xxx........

Experts from Industry:
Big and small end users
CAD vendors, CAM vendors
CNC Manufacturers
PDM system vendors
Machine Tool Manufacturers
(all actual technologies)
Inspection Machine vendors

Founding:
Governmental
Industrial Institutions
Manpower, resources
(material, equipment, ..)
Money.

Resources

Standard organisations and Institutions
TC184/SC4 – SC1 – SC5
JTC 1, TC29
IEC:TC44 – TC65, others?
Related International projects

Experts from Universities
Technological orientation
Informatics
Communication
Tools and Machine Tools Measurement

FDIS standards

5
### Standards and Applications and Interfacing

**Standards and Applications and Interfacing (Where everything belongs)**

<table>
<thead>
<tr>
<th>Standards</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 10303</td>
<td>CAM and SFP-Systems</td>
</tr>
<tr>
<td>AP 238</td>
<td>ISO 14649 Parts: 1, 10, 11, 12, 13, 14 and Parts xxx</td>
</tr>
</tbody>
</table>

**Application Details**

- **CAM and SFP-Systems**
  - Vendor specific implementations based on Standards for Input and Output
  - AP 238 is an integrated Part of ISO 14649 and ISO 10303

**Integrated Manufacturing based on International Standards AAM Model**

1. **Develop and Manufacture Mechanical Product**
2. **Manufactured Product**

- **Data Models (STEP APs etc.)**
- **Manufacturing Resource Database**
- **Manufacturing Technology Database**
- **1. Product Model Data**
- **2. Process Data**
- **CAD/CAM PDM CAE**
- **Manufacturing Tools**
- **Raw Material**

**Steps in the Model**

1. Preceding Product Model Data
2. Design Ideas
3. Preliminary Designed Components
4. Standard Parts

**Standardised Manufacturing Data Base**

**CNC, SFP, Expert-Systems**

- Vendor specific implementations based on Standards for Input and Output

**AMT**

---

**REM 2001**

14 September
AAM to Develop and Manufacture Mechanical Product

Design and Manufacture Tool(*)

(*) Activity A4 is composed of Activities A1 - A3.