
Towards an Adhesives Design Toolkit MMS7

**4th IAG Meeting
Ewen Kellar**

**NPL, Teddington
Thurs 20 November 2003**

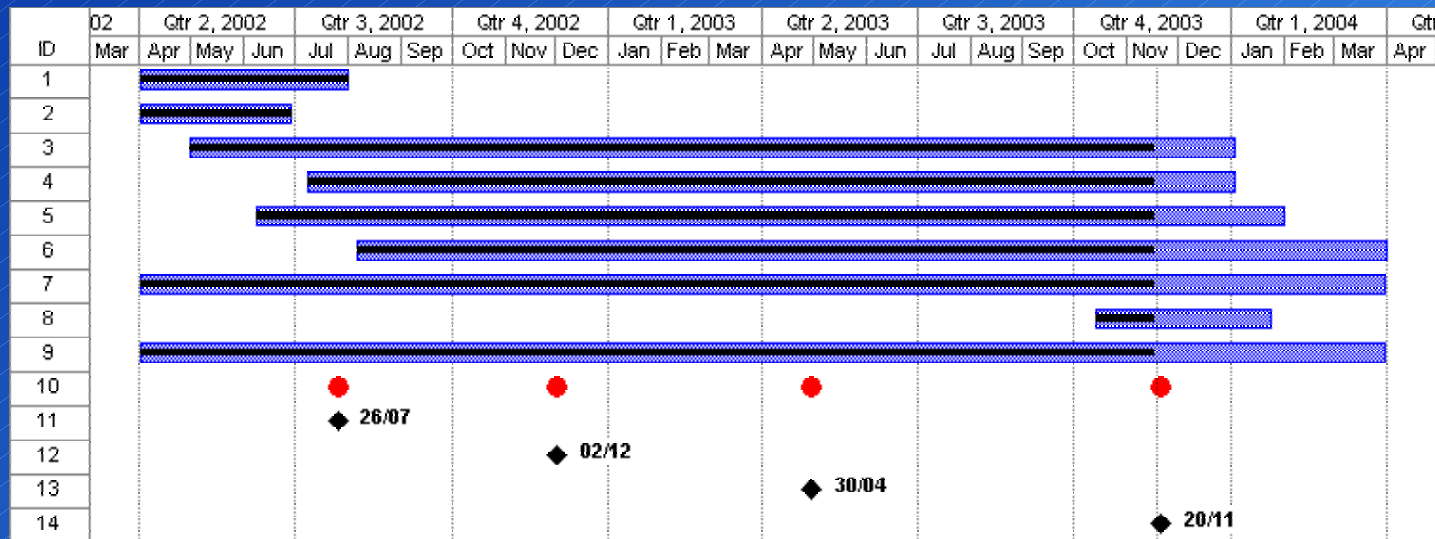


Agenda

- **Update on Project Progress**
- **Progress on Toolkit Modules**
 - **Links selector**
 - **Case histories**
 - **Design guidance**
 - **Adhesive selector**
 - **Stress analysis**
- **Live demonstration of Toolkit and modules**
- **IAG input**



Project Progress - Time



T1 - Identify, audit and select key toolkit modules (AEA)

T2 - Review industry requirements (TWI)

T3 - Develop toolkit infrastructure (TWI)

T4 - Development toolkit modules (TWI)

T5 - Data management (NPL)

T6 - Toolkit validation (NPL)

T7 - Dissemination (TWI)

T8 - Identification of missing modules (AEA)

T9 - Project management (TWI)

10 - Project Management Group Meetings



Project Progress - Financial

- **Currently on target with respect to budget**

AND

- **project is slightly ahead on deliverables**
- **It is still anticipated that the project modules will be completed ahead of schedule i.e. by end of 2003**



Google Search

- **Adhesive - 82nd out of 166,000**
- **Adhesives - not in first 100**
- **Adhesive toolkit - 7 out of 1st 10 (3)**
- **Adhesives toolkit - 10 out of 1st 10 (3)**
- **Adhesive design - 4 out of 1st 10 (not in 1st 10)**
- **Adhesives design - 7 out of 1st 10 (3)**

- **So we are getting there!**



Server Statistics

- Analysed requests from Tue-31-Dec-2002 06:54 to Tues-18-Nov-2003
- Figures in parentheses refer to the 7-day period ending 19-Nov-2003).

Successful requests:

- 145,337 (3,519) [30,688 (2,614)]

Average successful requests per day:

450 (502) [258 (373)]

- **Successful requests for pages:**

1,429 (35) [353 (31)]

Average successful requests for pages per day:

4 (4) [2 (4)]



DTI Report Dissemination

- **Programme overview**
 - Project Description
 - Report summary
 - Full report
- **'New' material available through Toolkit and JoinIT**
 - including best practice guides, FAQs etc
- **Access to all DTI reports (1991 - 2001) now available through the site**



Project Progress - Tasks I

- **T1 - Identify, audit and select key toolkit modules (AEA)**
 - Completed (Adh. sel., Links sel., Case hist. dbase, Stress anal., Design guidance)
- **T2 - Review industry requirements (TWI)**
 - Completed (results available on-line)
- **T3 - Develop toolkit infrastructure (TWI)**
 - Completed (structure all there with ability to expand)
- **T4 - Develop modules (TWI)**
 - Ongoing (2 complete, 2 >80% and 1 >60%)



Project Progress - Tasks II

- **T5 - Data Management (NPL)**
 - Ongoing (data supplied for modules and **draft ISO standard** presented for adhesive material dbase)
- **T6 - Toolkit validation (NPL)**
 - Ongoing (currently awaiting final module completion - final phase in Q1 2004)
- **T7 - Dissemination (TWI)**
 - Ongoing (two workshops planned in Q1 2004, various publications planned once modules finished)
- **T8 - Id of missing modules (AEA)**
 - To start in Q1 2004



Module Progress - Links selector

- **Complete with respect to functionality**
- **Ongoing addition of more content**
 - **RTO and IAG input requested**
- **Additional search options?**



Module Progress - Case Hist. dbase

- **Complete with respect to functionality**
- **Requires more content**
 - **RTO and IAG input requested**
- **Additional search options?**



Module Progress - Design Guidance

- **Complementary to stress analysis module**
- **To cater from novice to expert**
 - **Joint types (single lap, double lap, T, butt, scarf)**
 - **Service requirements (impact, creep, fatigue, environment, reinforcement)**
 - **Design criteria (strength, stress distribution, 'good' design, fracture mech.)**
 - **FEA guidance already available from 'Smart manual**



Module Progress - Adhesive Selector

- **Outline defined**
- **Details filled in**
- **Logic tested (on paper at least)**
- **Programming about to start (estimated duration 4 weeks)**
- **Finish by this Christmas**



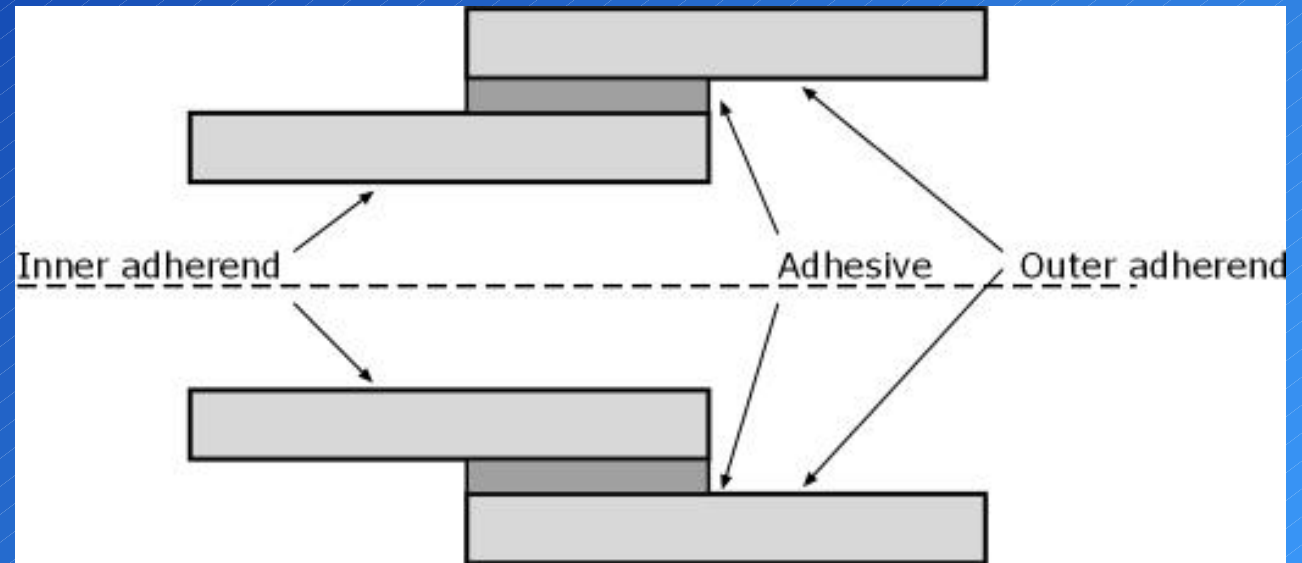
Module Progress - Stress Analysis

- **Developed around Coaxial joint geometry**
- **Very flexible with respect to:**
 - **joint dimensions**
 - **adherends**
 - **adhesives**
 - **load conditions**
- **Currently under early test**
- **Live demonstration**

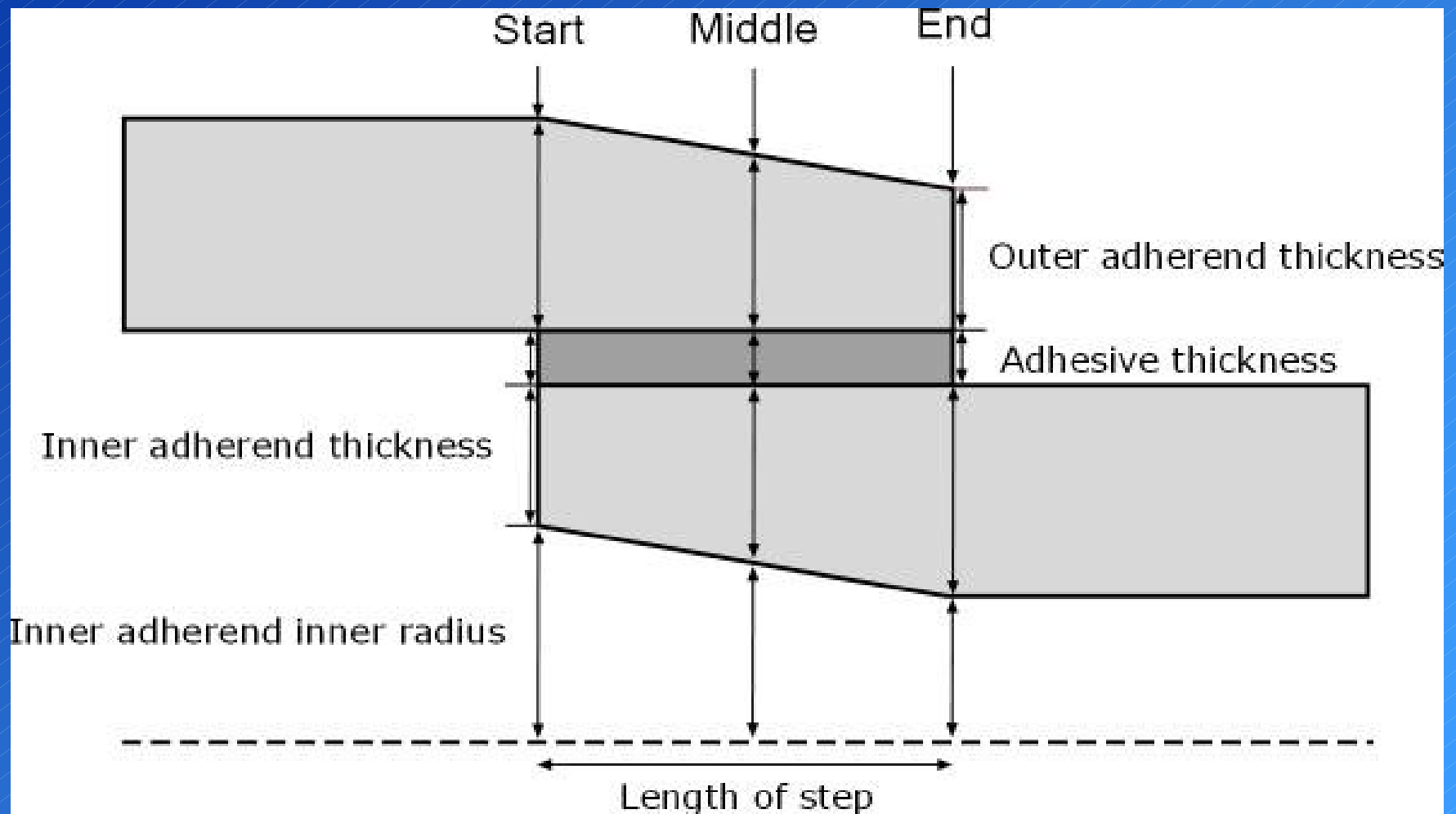


Stress Analysis - Loads and Materials

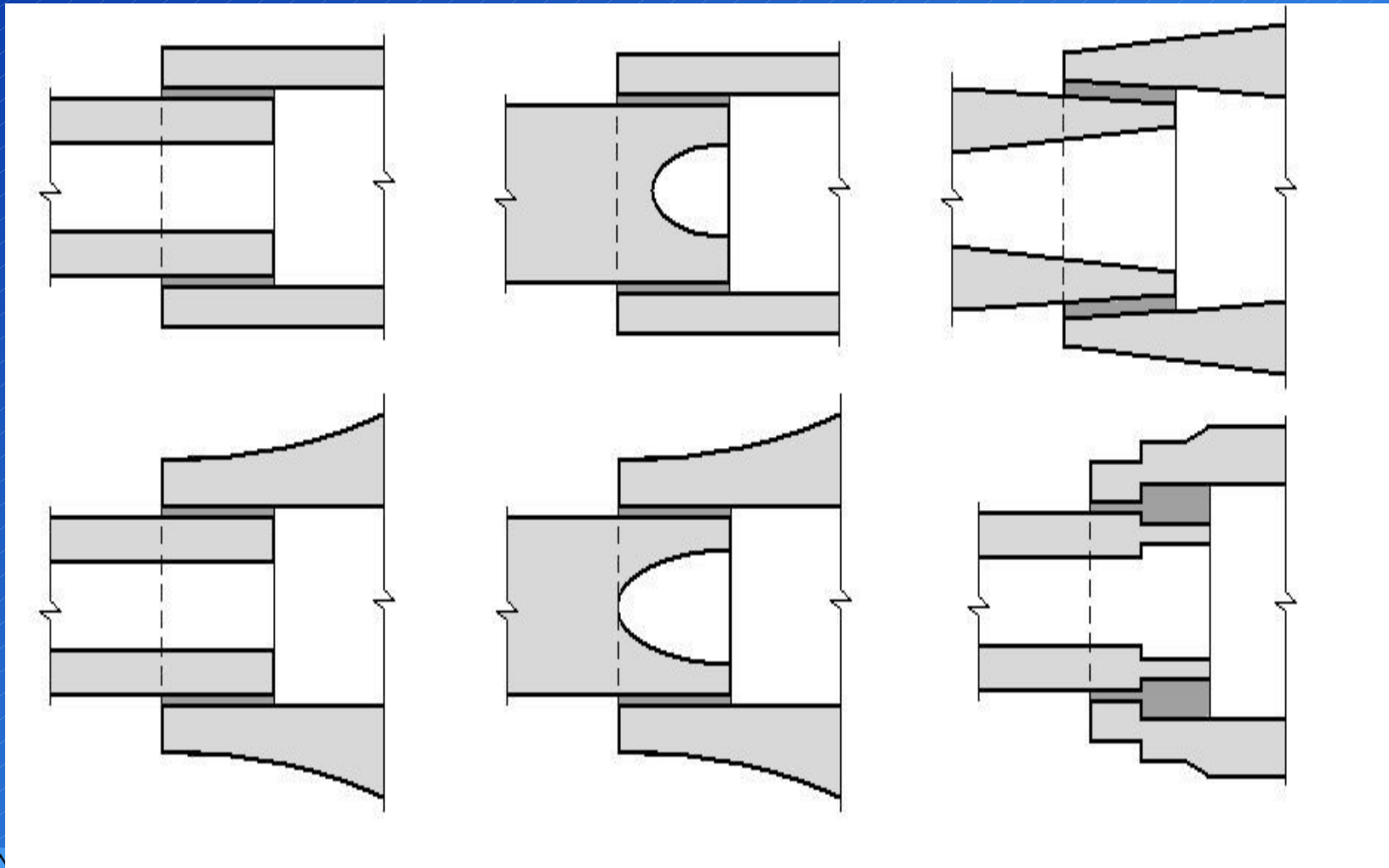
- Loading
 - axial
 - torsional
 - ΔT
- Adherends
- Adhesive



Stress Analysis - Joint detail



Stress Analysis - Joint detail



Stress Analysis - Output

- **Diagram of geometry modelled**
- **Details of joint modelled**
 - joint dimensions, adherends, adhesives, load conditions
- **Graphs**
 - shear stress (adhesive + inner and outer adherend)
 - shear strain (adhesive centreline)
- **Data value table**

IAG Comment

- **Questions?**
- **Comments etc.**

