Independent Test Project Developers Guide

A guide for the delivery of Independent Test Projects for use at EuroSkills Competitions

Independent Test Project Developers Guide

This document has been developed to help support those organisations or individuals who have been asked or who have volunteered to produce a test project or modules for a specific skill that operates as part of EuroSkills. It provides guidance on the required outputs, process steps, timing, security & confidentiality, and the type of information that the Independent Test Project Developer (ITPD) will be required to produce to ensure a successful and high-quality competition that identifies the best competitor(s).

What is a test project?

A test project can be made up of single element or a collection of elements called modules. The test project or modules within EuroSkills are the assessment vehicle used for each skill competition. It is akin to the conventional examination paper that a student may take during their secondary education that tests their knowledge and understanding of a specific taught curriculum. A test project / module however is a physical or practical test of the competitor's abilities and skills set against the requirements outlined within the WorldSkills Occupational Standard (WSOS) or WorldSkills Europe Standard Specification (WSESS) for their selected occupation or work role. Here the occupational standards reflect the global occupations or work roles. The competition itself replicates the work environment and the test project/module is the means of directly assessing the performance and knowledge of the competitor by having them deliver a set of real-world tasks, behaviors, or projects. A test project is required to have between 14 -18 assessment hours spread over a 3-days.

Other key competition documents

Besides the Occupational Standard for the specific skill the other key document is the Technical Description that is published for the same skill competition.

A Technical Description is the document that defines how the specific competition should operate. It reinforces the required competencies that should be shown by the competitor and expresses their relative importance. It outlines the assessment structure needed for that the skill along with highlighting key criterion and the type of assessment (Judgement or Measurement) best used for the various aspects. The document also covers Health & Safety requirements for the skill and identifies the tools which all the competitors are expected to bring along themselves to the competition.

The Independent Test Project Developer (ITPD) should familiarize themselves with both the Occupational Standard and the Technical Description for the skill to which they are developing the test project / modules for.

The profile of Independent Test Project Developer (ITPD)

The Independent Test Project Developer (ITPD) would ideally have both an up-to-date industry knowledge complemented with the experience of how the specific skills competitions operates. However, provide the Independent Test Project Developer (ITPD) has the relevant industry knowledge they can initially work with the appointed Chief Expert, Deputy Chief Expert and Skills Advisor to ensure that their gain the necessary understanding of the how the skill competition works and its requirements.

Independent Test Project Developer (ITPD) can be found typically:

- Current WSI Expert in that skill but not involved in EuroSkills
- Main skill sponsor personnel directly related to the skill.
- Related European Sector organisations personnel to the skill.
- Passed WSI or WSE Expert from the skill
- Passed WSI or WSI competitors
- Organisations or businesses with personnel related with the skill.

Information Inputs and required Outputs Materials

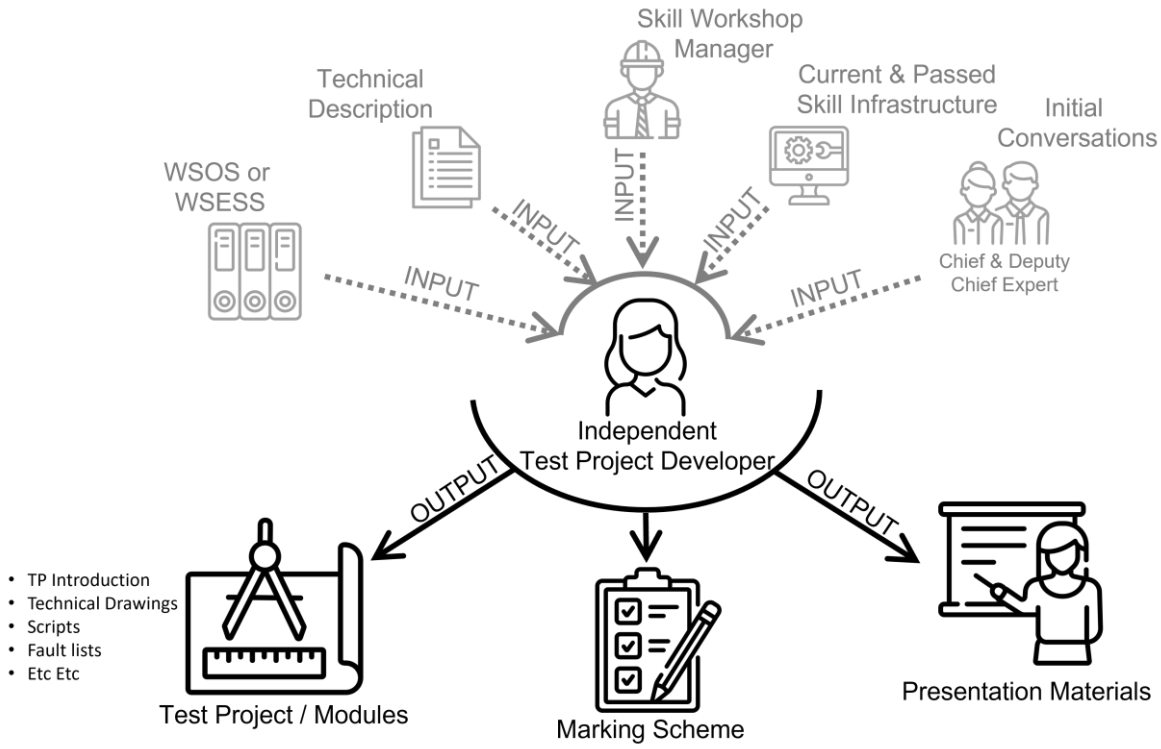
Diagram A shows both the required information inputs and the required outputs that a Test Project Develop should seek to obtain and thereafter be prepared to deliver.

INFORMATION INPUTS - The Occupational Standard and Technical Description documents have been discussed above. These documents can be obtained either directly from the Chief or Deputy Chief Expert of the skill or from the WSE Competition and Operational Director on request.

The other important input is the initial discussions that a Test Project Developer must have with the appointed Chief (CE) and Deputy Chief Expert (DCE). This is to ensure the overall goal of the skill can be expressed in more detail to the Independent Test Project Developer (ITPD). The CE and DCE may have more specific instructions or guidance for the ITPD. There may be some constraints or schedule limitations that the ITPD must be aware of. Some skills do produce very detail supporting documents in respect to how the test project should be designed (See **Appendix A**). Here the CE and DCE can talk through such documents if they do exist. Depending on the Competition experience of the Independent Test Project Developer (ITPD) they may need to have several conversations with the CE and DCE to ensure they gain a comprehensive understanding of how they wish their competition to work and work with the test project.

Once the Independent Test Project Developer (ITPD) has started his/her development on the test project direct communication with the CE and DCE should be restricted. Communication can still occur after this point if so required but the WSE Competition and Operations Director or coordinate must be included in any meetings or emails to ensure that no inadvertent advantage is being given to the CE and DCE. If either the CE or DCE are without a competitor competing in the EuroSkills competition, then communication with that Expert can be less restrictive throughout the development process. Communication with the wider expert group in the skill should not happen.

Diagram A.



OUTPUT MATERIALS - the Independent Test Project Developer (ITPD) is required to deliver a test project / modules that aligns with the objectives of occupational standard and the Technical Description for the competition. This could be in the form of technical or detailed drawings of something that is to be produced by the competitor. It can also be a

script(s) or set of scenarios to be given to professional actors to follow. Sometimes it can be a list of faults that the competitor should find and resolve or an outline of a theme that the competitors need to adhere to.

This information is normally wrapped around an introduction that describes the test project or each of individual module. In some cases, the Test Project Developer may have to construct a schedule to go along with the Test Project especially if there are test modules that must be done in a specific order.

The Independent Test Project Developer (ITPD) is required to provide a marking scheme to accompany the Test project / modules they have developed. The Independent Test Project Developer (ITPD) can seek the assistance of the appointed Skills Advisor for the given skill to give advice, guidance, and information on how best to develop a robust marking scheme.

Once the Independent Test Project Developer (ITPD) has the final version of the test project and approved (approved by the Skills Advisor) marking scheme they should seek to produce supporting presentation material that allows them to efficiently brief the jury of Experts on the Test project or on each module. If the Independent Test Project Developer (ITPD) is present at the EuroSkills competition, then they themselves are expected to deliver these introduction or explanation presentations on the Test Project or modules and they to answer questions on it. However, if the Independent Test Project Developer (ITPD) is absent then they should produce an automated presentation or ideally a video presentation giving this same information on the Test projects.

If the Independent Test Project Developer (ITPD) is physical absent at the EuroSkills competition, then they must be prepared and available to still answer questions at the time of when the Test project or modules are being presented. This ideally should be done by zoom, skype or teams but as a minimum must be by phone from the Chief Expert and Deputy Chief Expert.

Before starting to develop a Test Project

You must register your intent to act as the Independent Test Project Developer (ITPD) for a given skill(s) with the WorldSkills Europe secretariat before proceeding. Only after the WorldSkills Europe Competition secretariat has received back the signed confidentiality and professionalism agreement (appendix B) may the Independent Test Project Developer (ITPD) proceed with their work.

Costs associated with Developing a Test Project

It must be understood that WorldSkills Europe has limited funds to support the development of independently developed test projects. Independent Test Projects are therefore normally developed purely from the goodwill and enthusiasm for the skill from the individual acting as the Independent Test Project Developer (ITPD). Alternatively, for sponsors the Test Project Development can be part of a sponsorship agreement between the WSE or the EuroSkills host organisation.

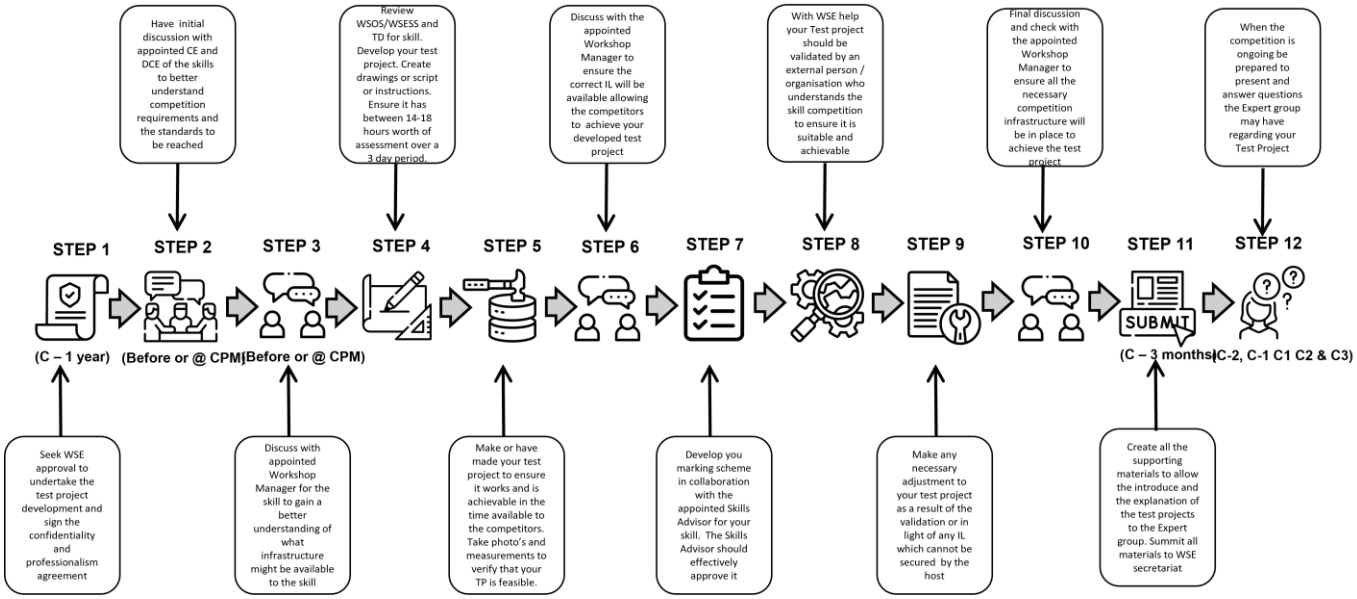
Attending the EuroSkills competition by the Independent Test Project Developer (ITPD) although ideal and recommended is however not mandatory. WSE does not currently have the budget to support all Independent Test Project Developer (ITPD) to attend the EuroSkills competition by funding the associate travel to/from the EuroSkills competition and their package whilst at the competition itself. WSE can however facilitate access to EuroSkills competition and the associated workshops for Independent Test Project Developer (ITPD) should they wish to self-fund their attendance and participation.

[Note: With the approval of the Trinity Proposal set for introduction at EuroSkills 2027 these challenges should be significantly reduced by the release of greater funding to support the increased use of Independent Test Projects.]

Process steps of Developing a Test Project

See diagram B for the main process steps and some key timing for the successfully delivering a test project for a skill at a EuroSkills Competition.

Diagram B.

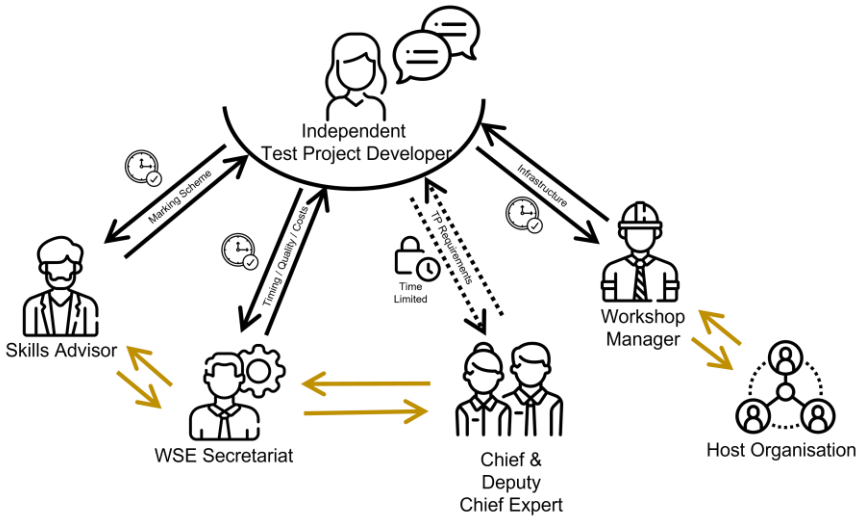


All the materials associated with the Independent Test project (Drawings, scripts, introductions, explanations, fault sheet, videos, and photographs) must be submitted to WSE **three month before the start of the EuroSkills competition. The distribution and communication of the test project to the Expert group after submission is the responsibility of the WorldSkills Europe Secretariat.**

Communicating the Developed Test Project

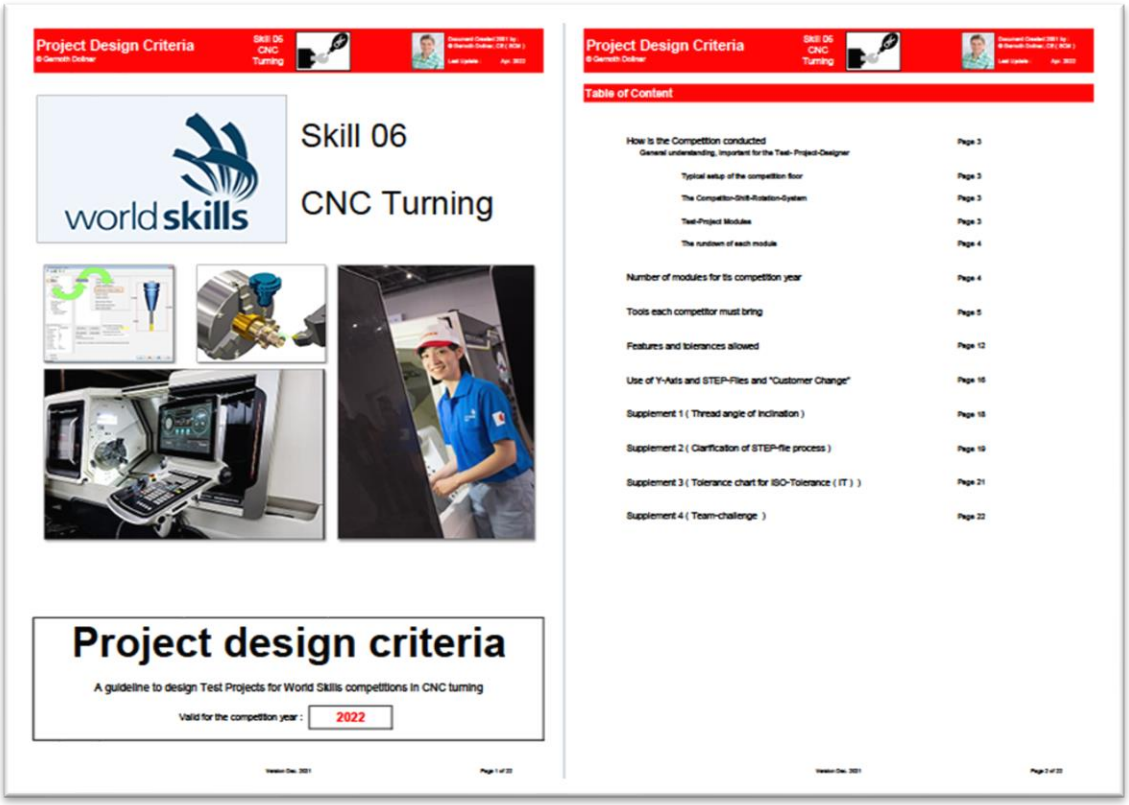
Diagram C below highlights who the Independent Test Project Developer (ITPD) can and should communicate with during the various development steps of creating the test project. The Independent Test Project Developer (ITPD) should treat the work outside of this group as strictly confidential and on a need-to-know basis. Clearly if the Independent Test Project Developer (ITPD) needs to make the test project then they will need to discuss it with various suppliers or contractors involved in its manufacture or testing. The Independent Test Project Developer (ITPD) in this case must safeguard the ongoing confidential and dissemination of the information of their selected suppliers. The Independent Test Project Developer (ITPD) will be accountable for their confidentiality.

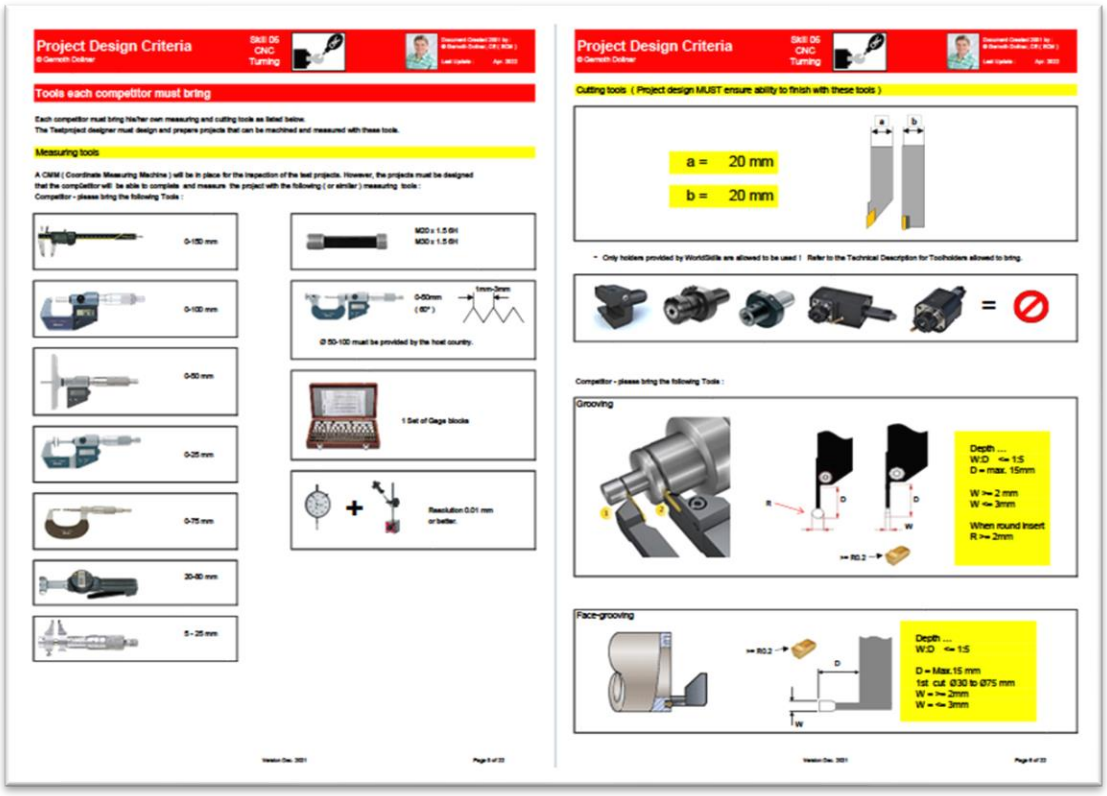
Diagram C.

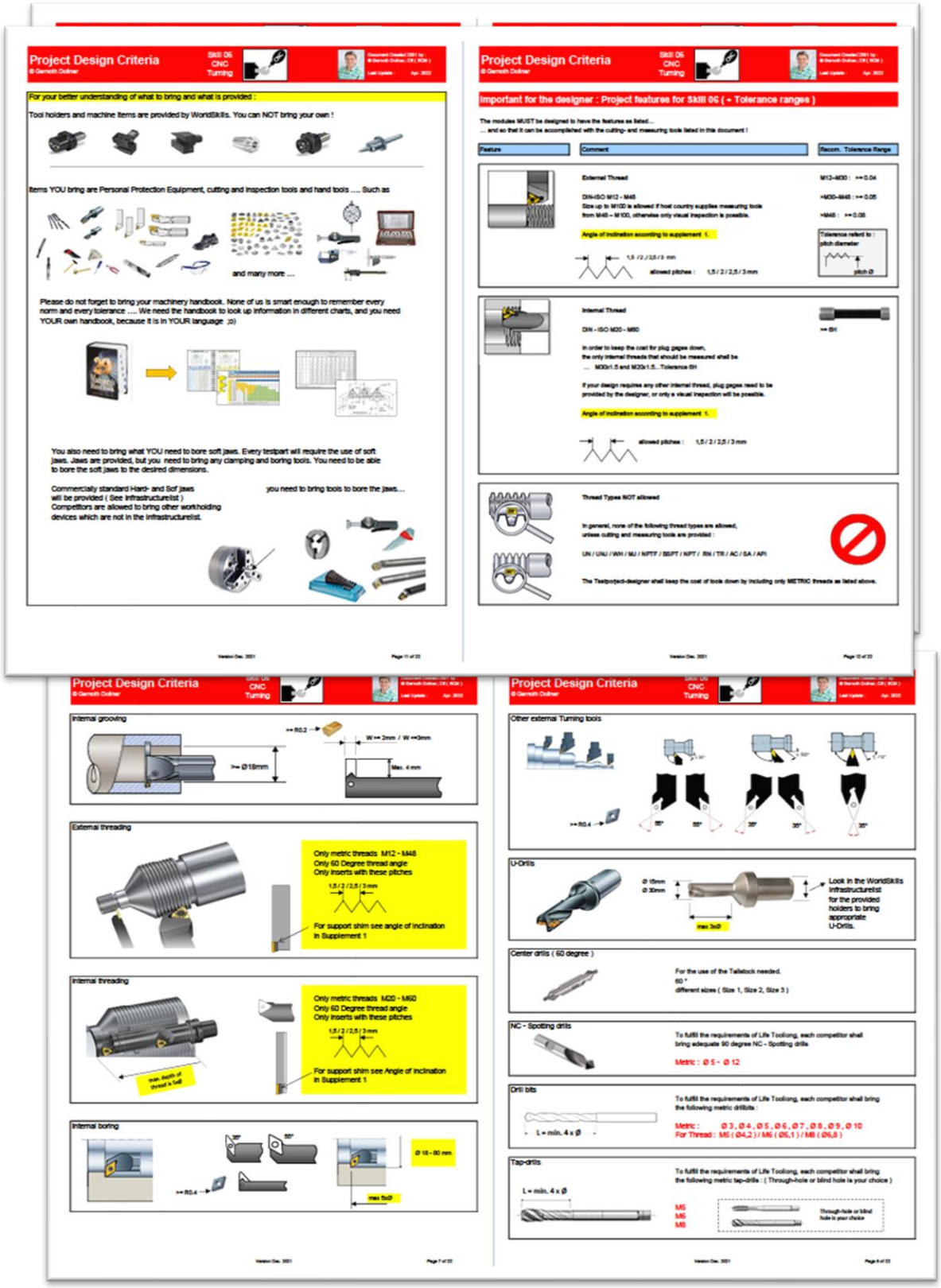


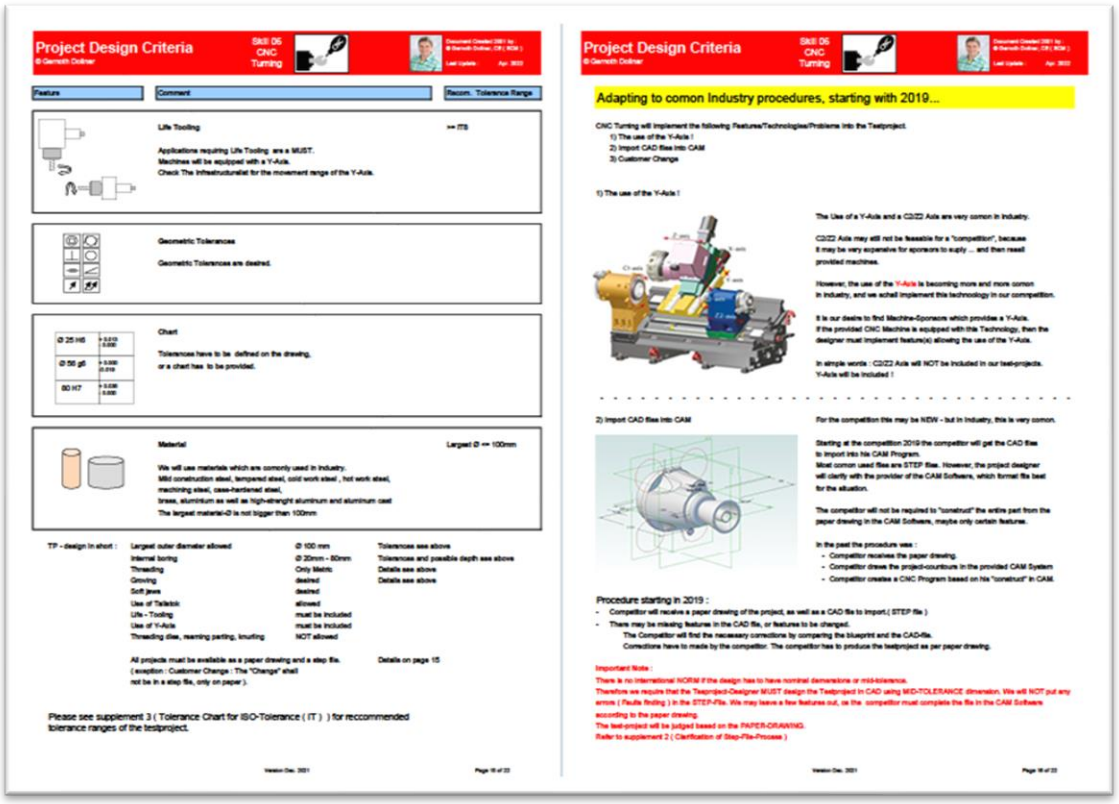
APPENDIX A

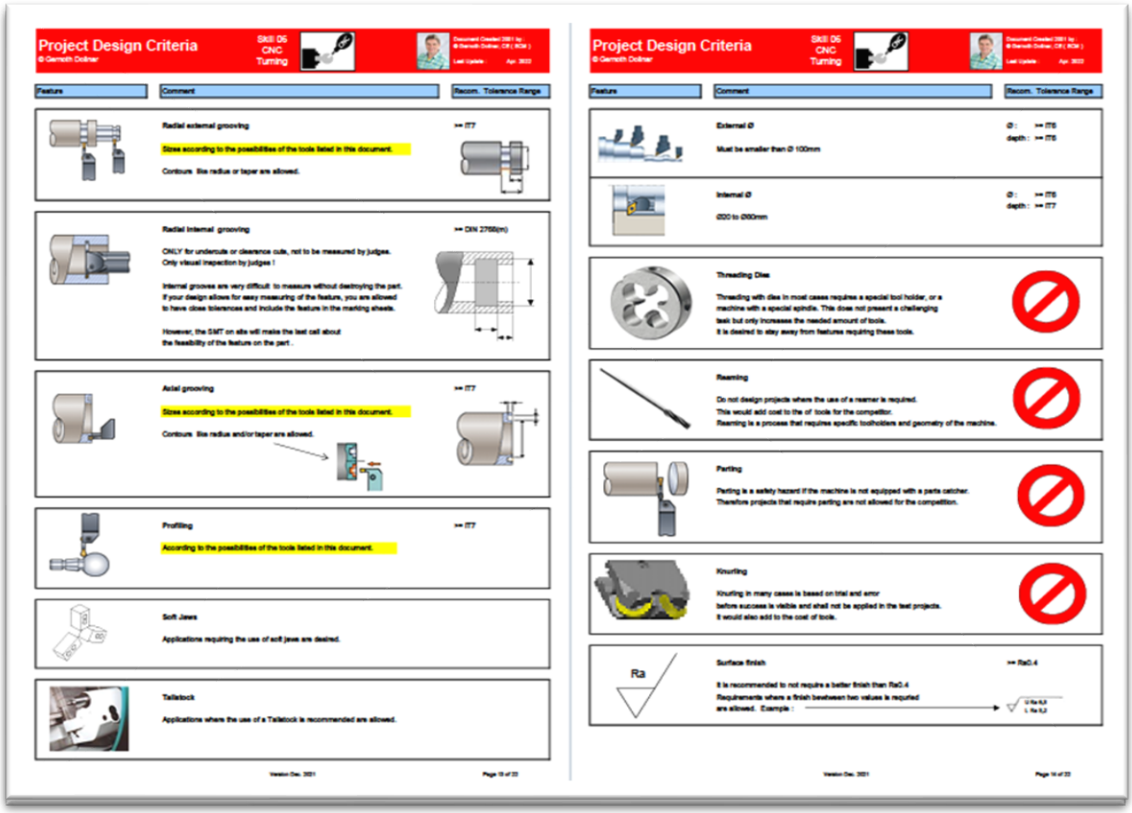
Authored by Gernoth Dolinar (AT)

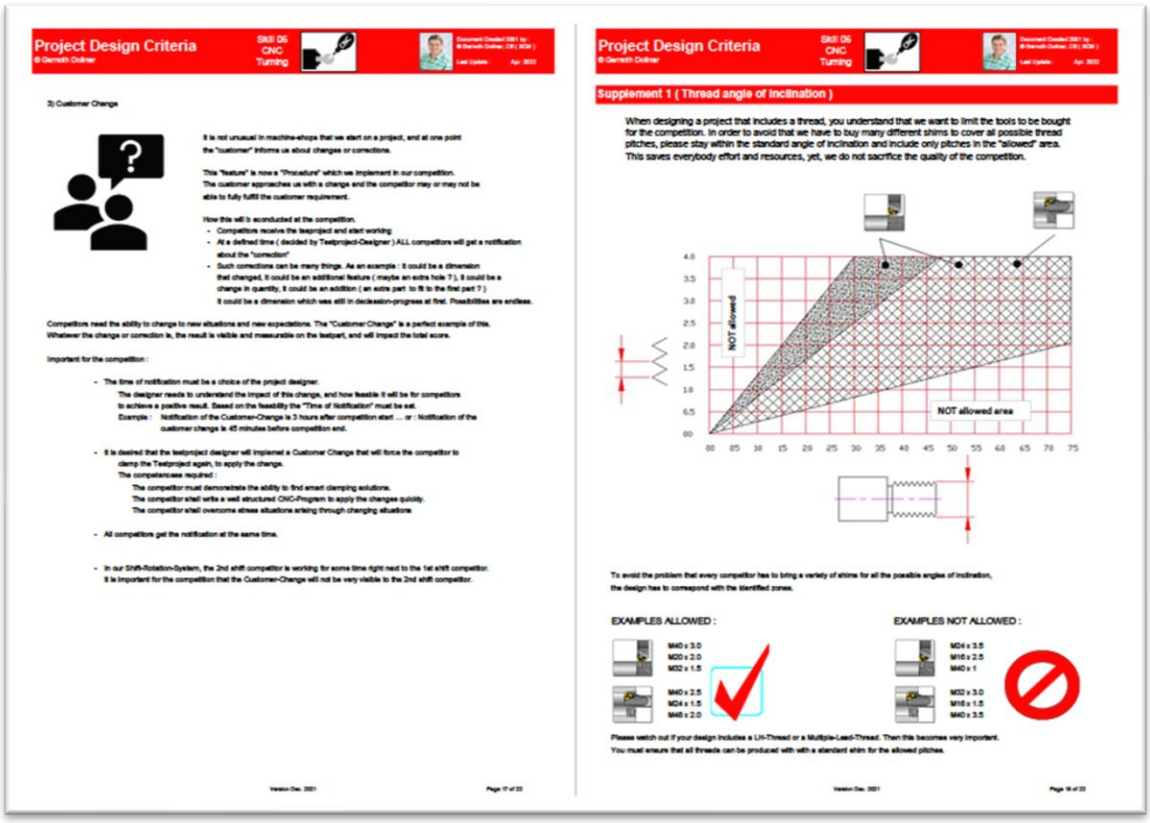





Project Design Criteria
Skill 06 CNC Turning
For your better understanding of what to bring and what is provided :
Tool holders and machine items are provided by WorldSkills. You can NOT bring your own !
Items YOU bring are Personal Protection Equipment, cutting and inspection tools and hand tools .... Such as
and many more ....
Please do not forget to bring your machinery handbook. None of us is smart enough to remember every norm and every tolerance .... We need the handbook to look up information in different charts, and you need YOUR own handbook, because it is in YOUR language ;o)
You also need to bring what YOU need to bore soft jaws. Every testpart will require the use of soft jaws. Jaws are provided, but you need to bring any clamping and boring tools. You need to be able to bore the soft jaws to the desired dimensions.
Commercially standard Hard- and Sof jaws will be provided (See Infrastructurelist)
Competitors are allowed to bring other workholding devices which are not in the Infrastructurelist.
you need to bring tools to bore the jaws...
Project Design Criteria
Skill 06 CNC Turning
Important for the designer : Project features for Skill 06 (+ Tolerance ranges)
The modules MUST be designed to have the features as listed...
... and so that it can be accomplished with the cutting- and measuring tools listed in this document !
Feature
Comment
Recom. Tolerance Range
External Thread
DIN-ISO M12 - M48
Size up to M100 is allowed if host country supplies measuring tools from M48 – M100, otherwise only visual inspection is possible.
Angle of inclination according to supplement 1.
allowed pitches : 1,5 / 2 / 2,5 / 3 mm
Tolerance refers to : pitch diameter
M12–M30 : >= 0,04
>M30–M48 : >= 0,05
>M48 : >= 0,08
Internal Thread
DIN - ISO M20 - M60
In order to keep the cost for plug gages down, the only internal threads that should be measured shall be ... M30x1,5 and M20x1,5...Tolerance 6H
If your design requires any other internal thread, plug gages need to be provided by the designer, or only a visual inspection will be possible.
>= 6H
Thread Types NOT allowed
In general, none of the following thread types are allowed, unless cutting and measuring tools are provided :
UN / UNJ / WH / MJ / NPTF / BSPT / NPT / RN / TR / AC / SA / API
The Testproject-designer shall keep the cost of tools down by including only METRIC threads as listed above.
Internal grooving
>= Ø18mm
Max. 4 mm
External threading
Only metric threads M12 - M48
Only 60 Degree thread angle
Only inserts with these pitches
For support shim see angle of inclination in Supplement 1
Internal threading
Only metric threads M20 - M60
Only 60 Degree thread angle
Only inserts with these pitches
For support shim see Angle of inclination in Supplement 1
Internal boring
Ø 18 - 60 mm
max 5xD
Other external Turning tools
U-Drills
Look in the WorldSkills Infrastructurelist for the provided holders to bring appropriate U-Drills.
Center drills (60 degree)
For the use of the Tailstock needed.
60 °
different sizes (Size 1, Size 2, Size 3)
NC - Spotting drills
To fulfill the requirements of Life Tooling, each competitor shall bring adequate 90 degree NC - Spotting drills
Metric : Ø 5 - Ø 12
Drill bits
To fulfill the requirements of Life Tooling, each competitor shall bring the following metric drillbits :
L = min. 4 x Ø
Metric : Ø 3 , Ø 4 , Ø 5 , Ø 6 , Ø 7 , Ø 8 , Ø 9 , Ø 10
For Thread : M5 (Ø4,2) / M6 (Ø5,1) / M8 (Ø6,8)
Tap-drills
To fulfill the requirements of Life Tooling, each competitor shall bring the following metric tap-drills : (Through-hole or blind hole is your choice)
L = min. 4 x Ø
M5
M6
M8
Through-hole or blind hole is your choice


Project Design Criteria
SkillDS CNC Turning
Feature
Comment
Recom. Tolerance Range
Life Tooling
Geometric Tolerances
Chart
Material
Please see supplement 3 (Tolerance Chart for ISO-Tolerance (IT)) for reccommended tolerance ranges of the testproject.
Project Design Criteria
SkillDS CNC Turning
Adapting to comon Industry procedures, starting with 2019...
CNC Turning will implement the following Features/Technologies/Problems into the Testproject.
1) The use of the Y-Axis !
2) Import CAD files into CAM
3) Customer Change
1) The use of the Y-Axis !
2) Import CAD files into CAM
Procedure starting in 2019 :
Important Note :


Project Design Criteria
SkillDS CNC Turning
Feature
Comment
Recom. Tolerance Range
Radial external grooving
Radial internal grooving
Axial grooving
Profiling
Soft Jaws
Tailstock
Project Design Criteria
SkillDS CNC Turning
Feature
Comment
Recom. Tolerance Range
External Ø
Internal Ø
Threading Dies
Reaming
Parting
Knurling
Surface finish
Ra



Project Design Criteria

SKill 05 CNC Turning

3) Customer Change

It is not unusual in machine-shops that we start on a project, and at one point the "customer" informs us about changes or corrections.

This "feature" is now a "Procedure" which we implement in our competition. The customer approaches us with a change and the competitor may or may not be able to fully fulfill the customer requirement.

How this will b aconducted at the competition.

- Competitors receive the testproject and start working.
- At a defined time (decided by Testproject-Designer) ALL competitors will get a notification about the "correction"
- Such corrections can be many things. As an example : It could be a dimension that changed, It could be an additional feature (maybe an extra hole ?), It could be a change in quantity, It could be an addition (an extra part to fit to the first part ?) It could be a dimension which was still in decission-progress at first. Possibilities are endless.

Competitors need the ability to change to new situations and new expectations. The "Customer Change" is a perfect example of this. Whatever the change or correction is, the result is visible and measurable on the testpart, and will impact the total score.

Important for the competition :

- The time of notification must be a choice of the project designer.
  The designer needs to understand the impact of this change, and how feasible it will be for competitors to achieve a positive result. Based on the feasibility the "Time of Notification" must be set.
  Example : Notification of the Customer-Change is 3 hours after competition start ... or : Notification of the customer change is 45 minutes before competition end.
- It is desired that the testproject designer will implemet a Customer Change that will force the competitor to clamp the Testproject again, to apply the change.
  The competences required :
  The competitor must demonstrate the ability to find smart clamping solutions.
  The competitor shall write a well structured CNC-Program to apply the changes quickly.
  The competitor shall overcome stress situations arising through changing situations.
- All competitors get the notification at the same time.
- In our Shift-Rotation-System, the 2nd shift competitor is working for some time right next to the 1st shift competitor. It is important for the competition that the Customer-Change will not be very visible to the 2nd shift competitor.

Project Design Criteria

SKill 05 CNC Turning

Supplement 1 (Thread angle of inclination)

When designing a project that includes a thread, you understand that we want to limit the tools to be bought for the competition. In order to avoid that we have to buy many different shims to cover all possible thread pitches, please stay within the standard angle of inclination and include only pitches in the "allowed" area. This saves everybody effort and resources, yet, we do not sacrifice the quality of the competition.

To avoid the problem that every competitor has to bring a variety of shims for all the possible angles of inclination, the design has to correspond with the identified zones.

EXAMPLES ALLOWED :

M40 x 3.0
M20 x 2.0
M32 x 1.5

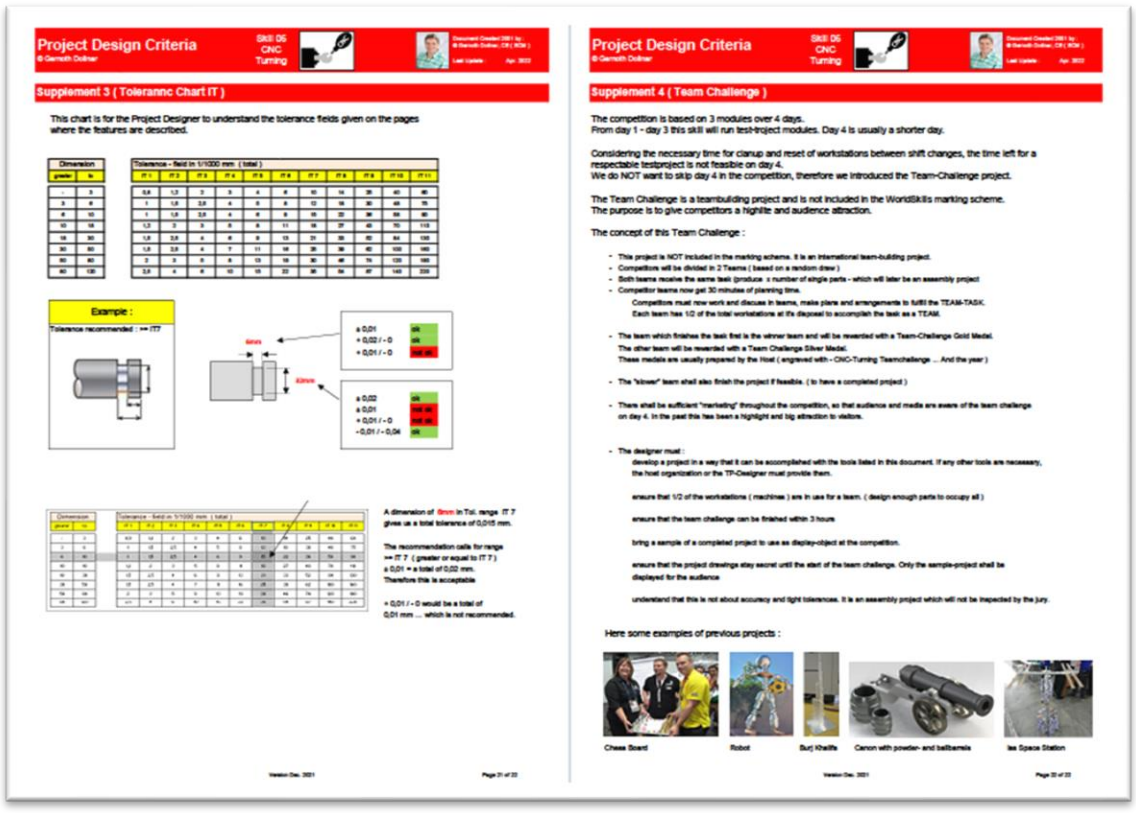
M40 x 2.5
M24 x 1.5
M48 x 2.0

EXAMPLES NOT ALLOWED :

M24 x 3.5
M16 x 2.5
M40 x 1

M32 x 3.0
M16 x 1.5
M40 x 3.5

Please watch out if your design includes a LH-Thread or a Multiple-Lead-Thread. Then this becomes very important. You must ensure that all threads can be produced with with a standard shim for the allowed pitches.



Project Design Criteria

SKill 05 CNC Turning

Supplement 3 (Toleranne Chart IT)

This chart is for the Project Designer to understand the tolerance fields given on the pages where the features are described.

Dimension		Tolerance - field in 1/1000 mm (total)										
greater	to	IT 1	IT 2	IT 3	IT 4	IT 5	IT 6	IT 7	IT 8	IT 9	IT 10	IT 11
-	3	0,8	1,2	2	3	4	6	10	14	25	40	60
3	6	1	1,5	2,5	4	5	8	12	18	30	48	75
6	10	1	1,5	2,5	4	6	9	15	22	36	58	90
10	18	1,2	2	3	5	8	11	18	27	43	70	110
18	30	1,5	2,5	4	6	9	13	21	33	52	84	130
30	50	1,5	2,5	4	7	11	16	25	39	62	100	160
50	80	2	3	5	8	13	19	30	46	74	120	190
80	120	2,5	4	6	10	15	22	35	54	87	140	220

A dimension of 6mm in Tol. range IT 7 gives us a total tolerance of 0,015 mm.

The recommendation calls for range >= IT 7 (greater or equal to IT 7).
± 0,01 = a total of 0,02 mm.
Therefore this is acceptable

+ 0,01 / - 0 would be a total of 0,01 mm ... which is not recommended.

Project Design Criteria

SKill 05 CNC Turning

Supplement 4 (Team Challenge)

The competition is based on 3 modules over 4 days.
From day 1 - day 3 this skill will run test-troject modules. Day 4 is usually a shorter day.

Considering the necessary time for clanup and reset of workstations between shift changes, the time left for a respectable testproject is not feasible on day 4.
We do NOT want to skip day 4 in the competition, therefore we introduced the Team-Challenge project.

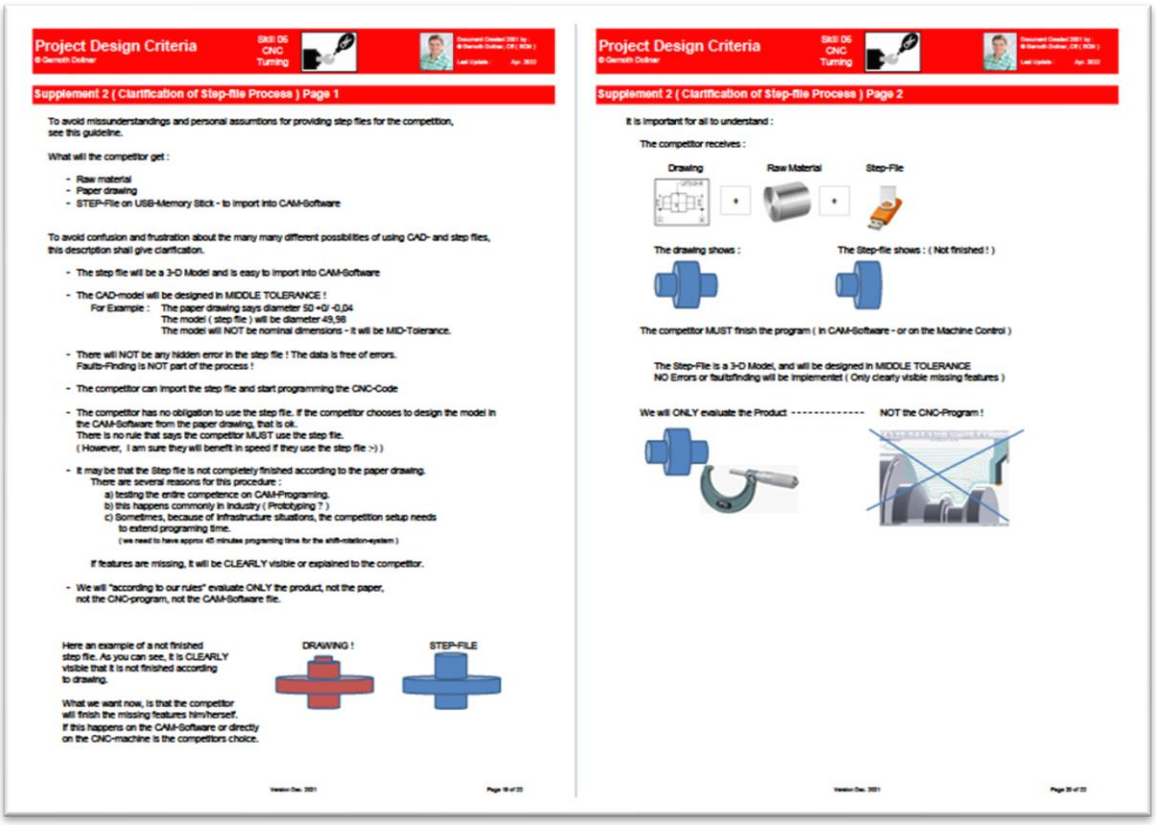
The Team Challenge is a teambuilding project and is not included in the WorldSkills marking scheme.
The purpose is to give competitors a highlite and audience attraction.

The concept of this Team Challenge :

- This project is NOT included in the marking scheme. It is an international team-building project.
- Competitors will be divided in 2 Teams (based on a random draw)
- Both teams receive the same task (produce x number of single parts - which will later be an assembly project
- Competitor teams now get 30 minutes of planning time.
  Competitors must now work and discuss in teams, make plans and arrangements to fulfill the TEAM-TASK.
  Each team has 1/2 of the total workstations at its disposal to accomplish the task as a TEAM.
- The team which finishes the task first is the winner team and will be rewarded with a Team-Challenge Gold Medal.
  The other team will be rewarded with a Team Challenge Silver Medal.
  These medals are usually prepared by the Host (engraved with - CNC-Turning Teamchallenge ... And the year)
- The "slower" team shall also finish the project if feasible. (to have a completed project)
- There shall be sufficient "marketing" throughout the competition, so that audience and media are aware of the team challenge on day 4. In the past this has been a highlight and big attraction to visitors.
- The designer must :
  develop a project in a way that it can be accomplished with the tools listed in this document. If any other tools are necessary, the host organization or the TP-Designer must provide them.
  ensure that 1/2 of the workstations (machines) are in use for a team. (design enough parts to occupy all)
  ensure that the team challenge can be finished within 3 hours
  bring a sample of a completed project to use as display-object at the competition.
  ensure that the project drawings stay secret until the start of the team challenge. Only the sample-project shall be displayed for the audience
  understand that this is not about accuracy and tight tolerances. It is an assembly project which will not be inspected by the jury.

Here some examples of previous projects :

Chess Board | Robot | Burj Khalifa | Canon with powder- and ballbarrels | Iss Space Station



Project Design Criteria

Skill 05 CNC Turning

Supplement 2 (Clarification of Step-file Process) Page 1

To avoid missunderstandings and personal assumtions for providing step files for the competition, see this guideline.

What will the competitor get :

- Raw material
- Paper drawing
- STEP-File on USB-Memory Stick - to import into CAM-Software

To avoid confusion and frustration about the many many different possibilities of using CAD- and step files, this description shall give clarification.

- The step file will be a 3-D Model and is easy to import into CAM-Software
- The CAD-model will be designed in MIDDLE TOLERANCE !
  For Example : The paper drawing says diameter 50 +0/ -0,04
  The model (step file) will be diameter 49,98
  The model will NOT be nominal dimensions - it will be MID-Tolerance.
- There will NOT be any hidden error in the step file ! The data is free of errors.
  Faults-Finding is NOT part of the process !
- The competitor can import the step file and start programming the CNC-Code
- The competitor has no obligation to use the step file. If the competitor chooses to design the model in the CAM-Software from the paper drawing, that is ok.
  There is no rule that says the competitor MUST use the step file.
  (However, I am sure they will benefit in speed if they use the step file :-))
- It may be that the Step file is not completely finished according to the paper drawing.
  There are several reasons for this procedure :
  a) testing the entire competence on CAM-Programing.
  b) this happens commonly in Industry (Prototyping ?)
  c) Sometimes, because of infrastructure situations, the competition setup needs to extend programing time.
  (we need to have approx 45 minutes programing time for the shift-rotation-system)

  If features are missing, it will be CLEARLY visible or explained to the competitor.
- We will "according to our rules" evaluate ONLY the product, not the paper, not the CNC-program, not the CAM-Software file.

Here an example of a not finished step file. As you can see, it is CLEARLY visible that it is not finished according to drawing.

What we want now, is that the competitor will finish the missing features him/herself. If this happens on the CAM-Software or directly on the CNC-machine is the competitors choice.

DRAWING !

STEP-FILE

Project Design Criteria

Skill 05 CNC Turning

Supplement 2 (Clarification of Step-file Process) Page 2

It is important for all to understand :

The competitor receives :

Drawing + Raw Material + Step-File

The drawing shows :

The Step-file shows : (Not finished !)

The competitor MUST finish the program (in CAM-Software - or on the Machine Control)

The Step-File is a 3-D Model, and will be designed in MIDDLE TOLERANCE
NO Errors or faults/finding will be implementet (Only clearly visible missing features)

We will ONLY evaluate the Product ---------- NOT the CNC-Program !

Appendix B

Confidentiality and professionalism agreement – Independent Test Project Developer (ITPD)

Confidentiality

[Type your full name and organisation if appropriate here] as the agreed independent Test Project Developer (ITPD) for the Skill of *[Type the name of the Skill(s) here]*, declare that I will not discuss any details of the Test Project, nor pass or share any information, details or materials, relating to the Test Project or part thereof, to any other person except for the those persons in competition roles that have been outlined within the Independent Test Project Developer (ITPD) guide.

I confirm that I have read the Independent Test Project Developer (ITPD) guide and agree to carry out and deliver the work relating to the Independent Test Project Developer (ITPD) role and to the best of my ability shall deliver the required information, at the required time and to the required standard.

I acknowledge that any confidentiality non-compliance will be considered as a breach of the WorldSkills Code of Ethics and Conduct and dealt with accordingly.

I have read and agree to follow these confidentiality and professionalism requirements.

Agreed by Independent Test Project Developer (ITPD)

NAME: *[Type your full name here]*

SKILL(s): *[Type the name of the skill(s) here]*

YOUR SIGNATURE:

DATE:

WSE_Confidentiality_Agreement_v1

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