What determines the Tool Confidence Level (TCL) for a software tool used in ISO 26262 activities?

The Tool Confidence Level (TCL) for a software tool used in ISO 26262 activities is determined by evaluating two key analysis classes: Tool Impact (TI) and Tool error Detection (TD) (ISO 26262-8:2018, Clause 11.2; ISO 26262-10:2018, Clause 13). The determination of TI and TD depends on the specific use cases of the tool and the development process of the element being developed or verified (ISO 26262-8:2018, Clause 11.2).

Here's a breakdown of these factors:

1. **Tool Impact (TI):** This class evaluates the possibility that a malfunction of the software tool could introduce or fail to detect errors in a safety-related item or element being developed (ISO 26262-8:2018, Clause 11.4.5.2; ISO 26262-10:2018, Clause 13).

    - **TI1:** Selected when there is an argument that no such possibility exists (ISO 26262-8:2018, Clause 11.4.5.2).
    - **TI2:** Selected in all other cases (ISO 26262-8:2018, Clause 11.4.5.2).

2. **Tool error Detection (TD):** This class assesses the confidence in measures that either prevent the software tool from malfunctioning and producing erroneous output, or detect such malfunctions and erroneous outputs (ISO 26262-8:2018, Clause 11.4.5.2; ISO 26262-10:2018, Clause 13). These measures can be internal to the tool or external, implemented in the development process (ISO 26262-8:2018, Clause 11.2).

    - **TD1:** Selected if there is a high degree of confidence that a malfunction and its corresponding erroneous output will be prevented or detected (ISO 26262-8:2018, Clause 11.4.5.2).
    - **TD2:** Selected if there is a medium degree of confidence that a malfunction and its corresponding erroneous output will be prevented or detected (ISO 26262-8:2018, Clause 11.4.5.2).
    - **TD3:** Selected in all other cases, typically when no systematic measures are available, and malfunctions can only be detected randomly (ISO 26262-8:2018, Clause 11.4.5.2).

The required software Tool Confidence Level (TCL) is then determined based on the combination of the determined TI and TD values, as specified in Table 3 of ISO 26262-8:2018 (ISO 26262-8:2018, Clause 11.4.5.4):

	Tool error detection		
Tool impact	**TD1**	**TD2**	**TD3**
TI1	TCL1	TCL1	TCL1
TI2	TCL1	TCL2	TCL3

If the correct selection of TI or TD is unclear or doubtful, they should be estimated conservatively (ISO 26262-8:2018, Clause 11.4.5.3).

Additional list of clauses used:

- ISO 26262-8:2018, Clause 11.2
- ISO 26262-8:2018, Clause 11.4.5.2
- ISO 26262-8:2018, Clause 11.4.5.3
- ISO 26262-8:2018, Clause 11.4.5.4
- ISO 26262-8:2018, Table 3
- ISO 26262-10:2018, Clause 13

Correctness = 5P,
Completness = 5P