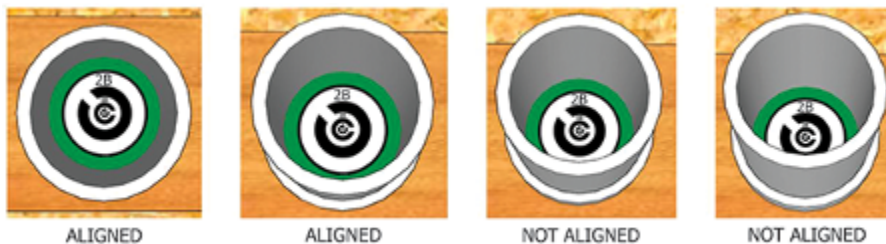


## 05-17-2024 FAQ & Amendments

1. Q: Can teams replace their tokens for slot scheduling?  
A: This is only possible in exceptional circumstances decided by the committee. Strategic reasons are always excluded.
2. Q: What is the order of sand and gravel in the “Sand & Gravel arena”.  
A: It is sand first, then gravel.
3. Q: What is the requirement for scoring points in visual inspection?  
A: The thin black ring on the inside of the colored ring (“alignment ring”, see image) must be unbroken and seen by the Judge. The openings of the two largest C’s have to be called out and confirmed by the judge.



4. Q: Is the victim box still mandatory?  
A: Yes, the victim box is mandatory. There is a 2 minute time slot after the 10 minute dexterity run to do this readiness check. Afterwards, teams have 3 minutes to clear the arena.
5. Q: Will the formulas of the result sheets be made public?  
A: Yes, see this slide:

## OVERALL SCORE CALCULATION

CONTINUOUS RAMPS			
MOB	Auto MOB	DEX	AUTO DEX
20	10	0	0
49	0	10	0
40	40	50	40
20	0	4	0
0	0	0	0
29	0	28	0

Raw Scores

Normalize Scores			
MOB	Auto MOB	DEX	AUTO DEX
49	40	50	40
41%	25%	0%	0%
100%	0%	20%	0%
82%	100%	100%	100%
41%	0%	8%	0%
0%	0%	0%	0%
59%	0%	56%	0%

Max Score

$=IF(B\$25=0,0,B4/B\$25)$

**Normalize Scores** for Mob and DEX are combined for total score.  
**Note: MOB includes AUTO MOB and DEX includes AUTO DEX**


Normalize Scores

MOB	Auto MOB	DEX	AUTO DEX
49	40	50	40
41%	25%	0%	0%
100%	0%	20%	0%
82%	100%	100%	100%
41%	0%	8%	0%
0%	0%	0%	0%
59%	0%	56%	0%

↓ ↓

MOB + DEX = Lane Score (max 200%)

Sum of all lane scores = Total Score (max 2000%)



- Best in Class Autonomy score is calculated by using the sum of all **Normalized Lane Scores** for AUTO MOB and AUTO DEX
- Best in Class Mobility score is calculated by using all **Normalized Lane Scores** for MOB (AUTO MOB and TeleOp MOB)
- Best in Class Dexterity score is calculated by using all **Normalized Lane Scores** for DEX (AUTO DEX and TeleOp DEX)

- Q: What is MAN and MOB? The term is still used in the rules document, but no lanes are assigned.  
 A: The terms are only used for historical reasons and do not have any effect on scoring or best-in-class.
- Q: Can the arena “Avoid Holes” be done in teleoperation?  
 A: No, this arena is for autonomous robots only.
- Q: Can the “labyrinth/maze” arena be done in teleoperation?  
 A: Yes, but the detection of QR-codes, hazmat signs and other objects has to be an autonomous background capability.
- Q: Does the autonomy bonus (4x multiplier) also affect the points for mapping and detections?  
 A: Yes, as mapping and detection are considered more challenging in autonomy, the 4x multiplier also applies to these scores.
- Q: What is the map format and object list format?  
 A: Please see the supplementary material for mapping and object detection to be released soon.
- Q: Can there be more than one operator in the booth?  
 A: No. Only one operator may control the robot at any given time. To enforce this, only one team member (the operator) is allowed to be inside the booth. Switching the operator is still possible, as long as the other member has not actively observed the arena.

12. Q: Can teams modify their robot?

A: Significant modifications beyond simple repairs or replacements are considered a modification. Teams may opt to do this but the new configuration is scored separately as it is now considered a new robot. As usual, the configuration/robot with the highest score is the one that counts for the team.

If a component breaks (off) that can not be replaced in time, it has to be substituted with an object of similar size and weight.

13. Q: For autonomous dexterity, when do the manipulation targets have to be designated by the operator.

A: Manipulation targets have to be designated at the position at which the autonomous operation starts. Specifically, teams are not allowed to specify the targets in front of the manipulation objects to then drive further away in teleoperation before starting the autonomous execution.

14. Q: How are the additional negotiation bars scored?

A: The bonus will be reduced compared to previous years.

Bordeaux: 1 point for the end-to-end repetition and 1 point for each intact bar = 5 maximum per repetition

**Eindhoven:** 1 point for the end-to-end repetition and 1 point if **all four bars are intact** = 2 maximum per repetition