Results of MTO's 2011 Asphalt Cement Initiatives

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Background

- MTO and Industry collaborated over the last 8 years on 2 new test procedures – ExBBR and DENT.
- A mutually acceptable test protocol and acceptance limits were developed by the MTO-OHMPA Binder Task Group.
- Total of 30 (38) trial projects paved between 2011 and 2015.
- 16 have reached the end of the warranty period with no contract disputes and so the projects are considered closed.
- Data from these 16 projects was shared with Industry and analysed for this presentation.

Background

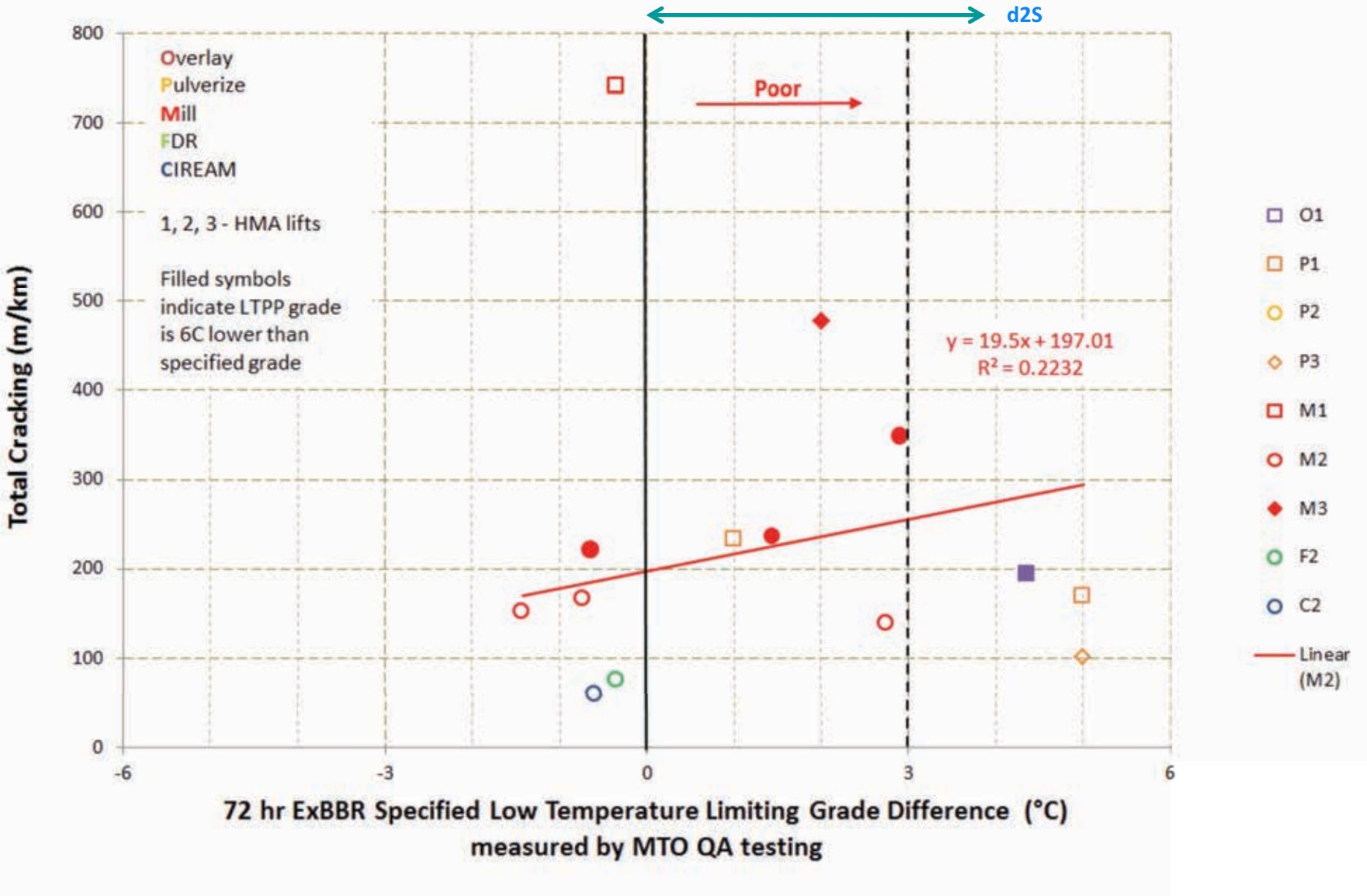
- All testing on new asphalt cement from QA samples and was tested by MTO QA laboratories
- Testing included: Standard (M320) 1 hr BBR test; LTLG and Grade Loss from the Extended (72 hr) BBR test; Ash test; CTOD from the DENT test (Ontario procedure); and MSCR % Recovery
- Crack monitoring was carried out by MTO at 3 years using their new ARAN
- These results are preliminary in nature
- This is Industry's analysis of the results

Correlation between Construction Type and Cracking

Results of MTO ARAN Cracking Measurement at 3 years

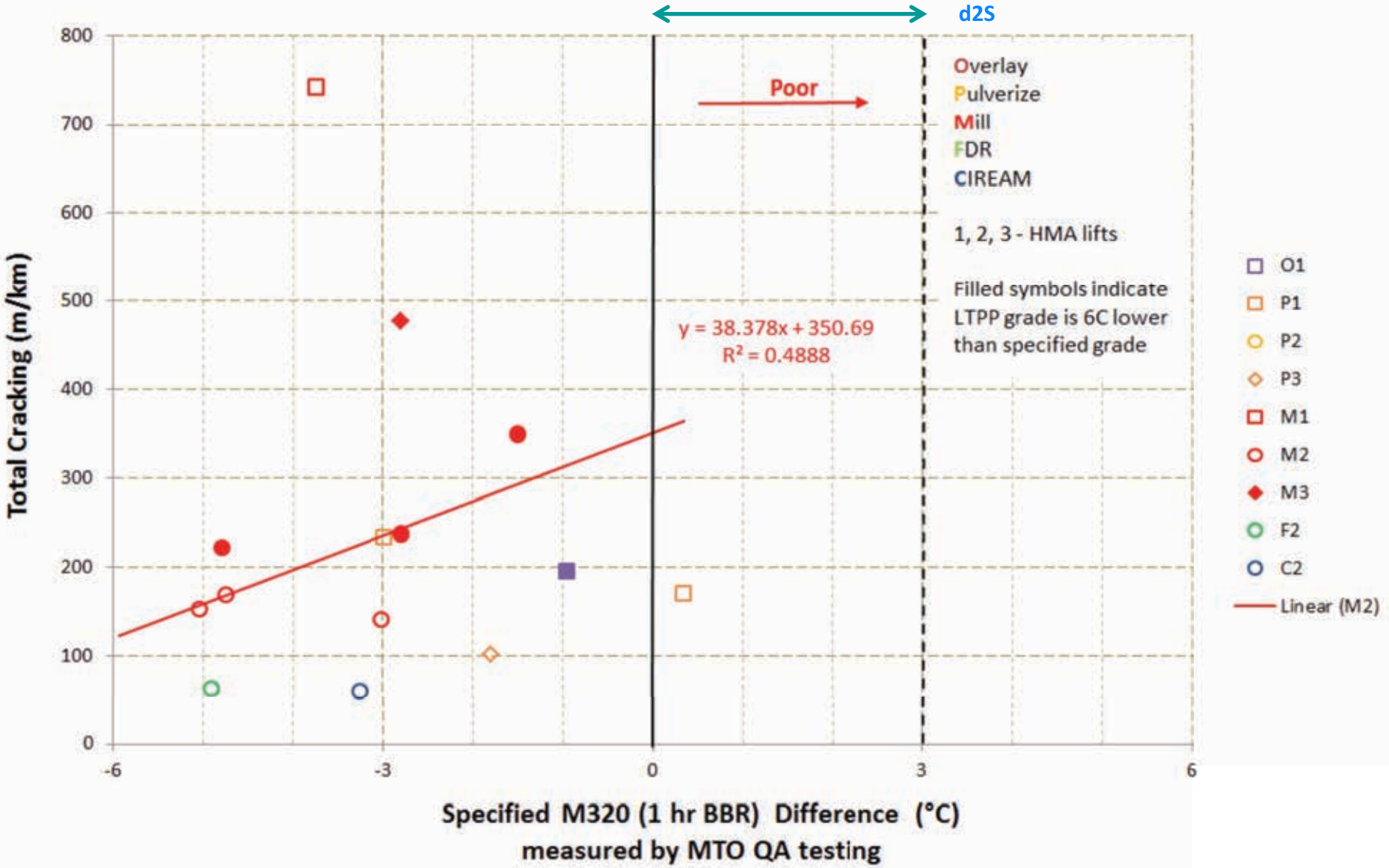
Poor Correlation (trending correctly)

Results of MTO ARAN Cracking Measurement at 3 years



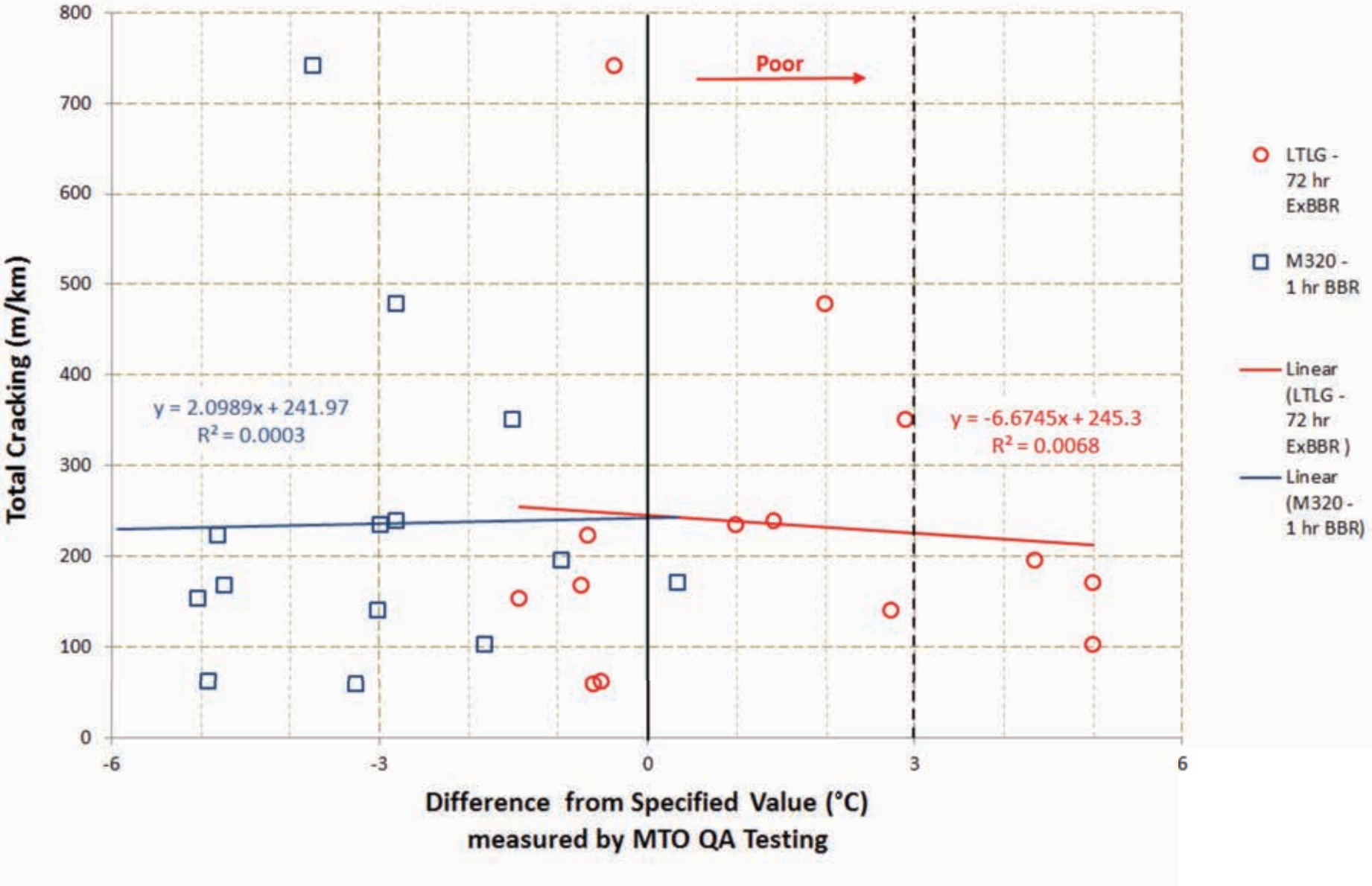
Moderate Correlation (trending correctly)

Results of MTO ARAN Cracking Measurement at 3 years



No Correlation (no trend)

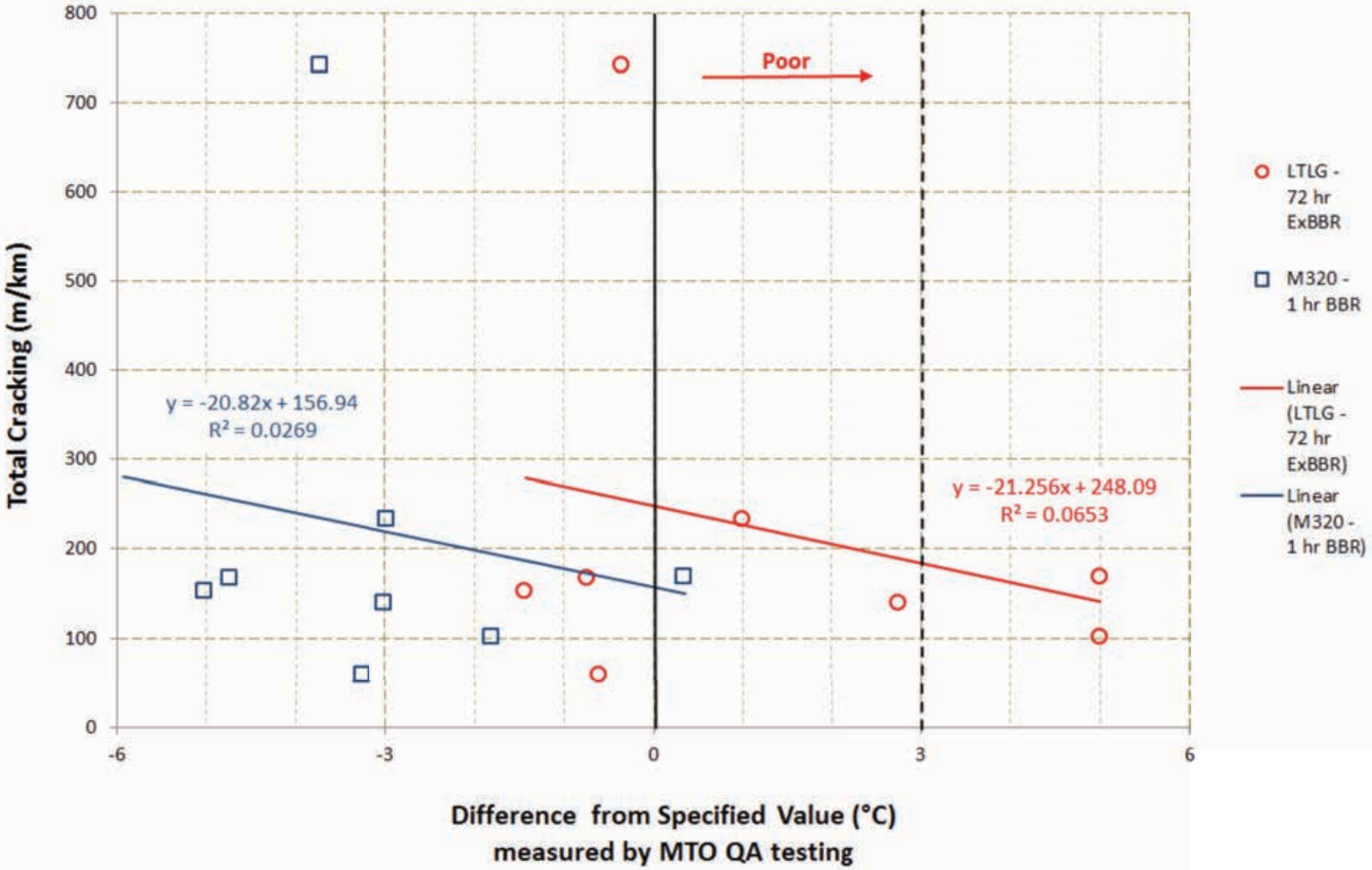
Results of MTO ARAN Cracking Measurement at 3 years



No Correlation (trending incorrectly)

Results of MTO ARAN Cracking Measurement at 3 years

Total Cracking with Proper LTPPBind Grade



No Correlation (trending incorrectly)

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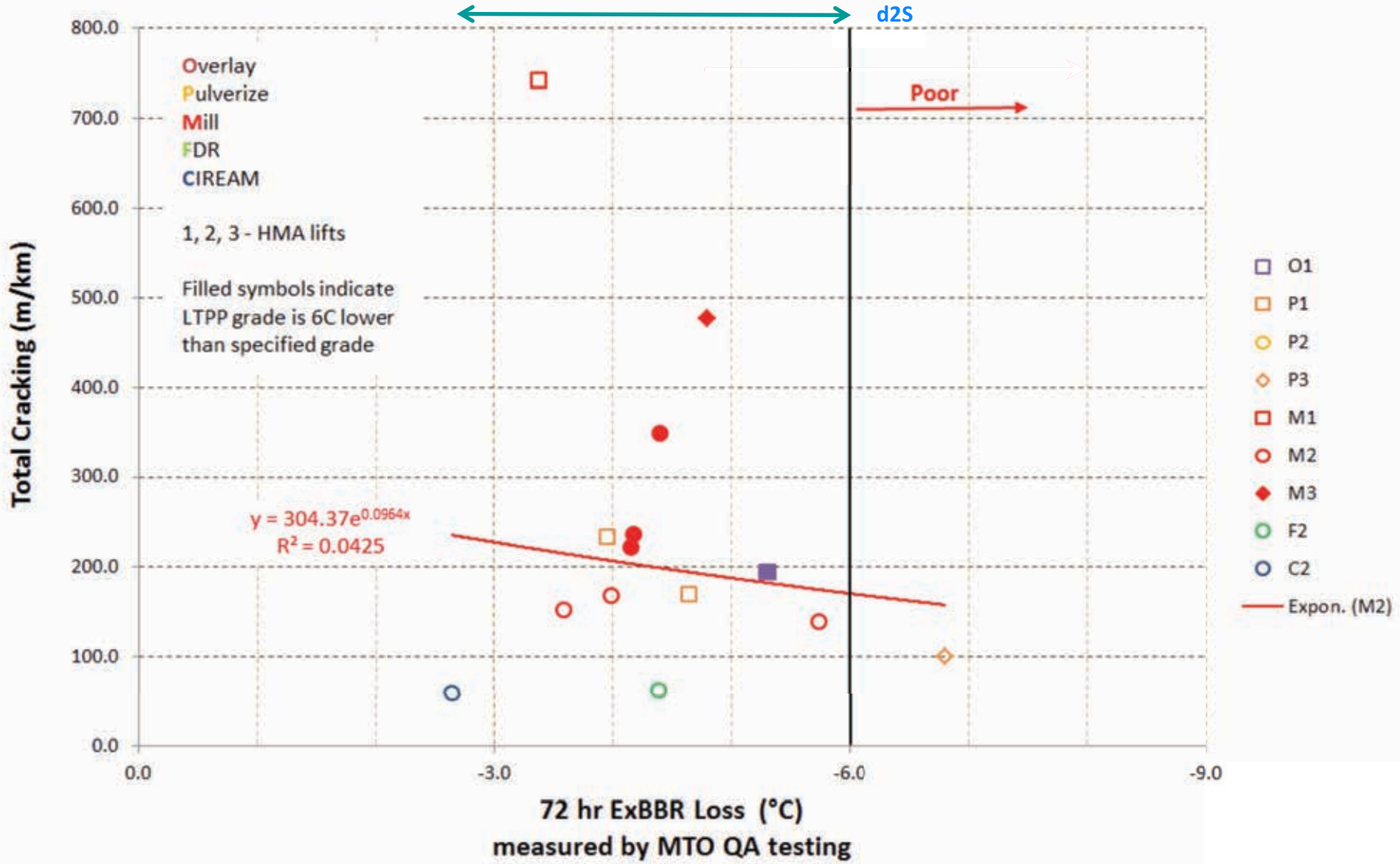
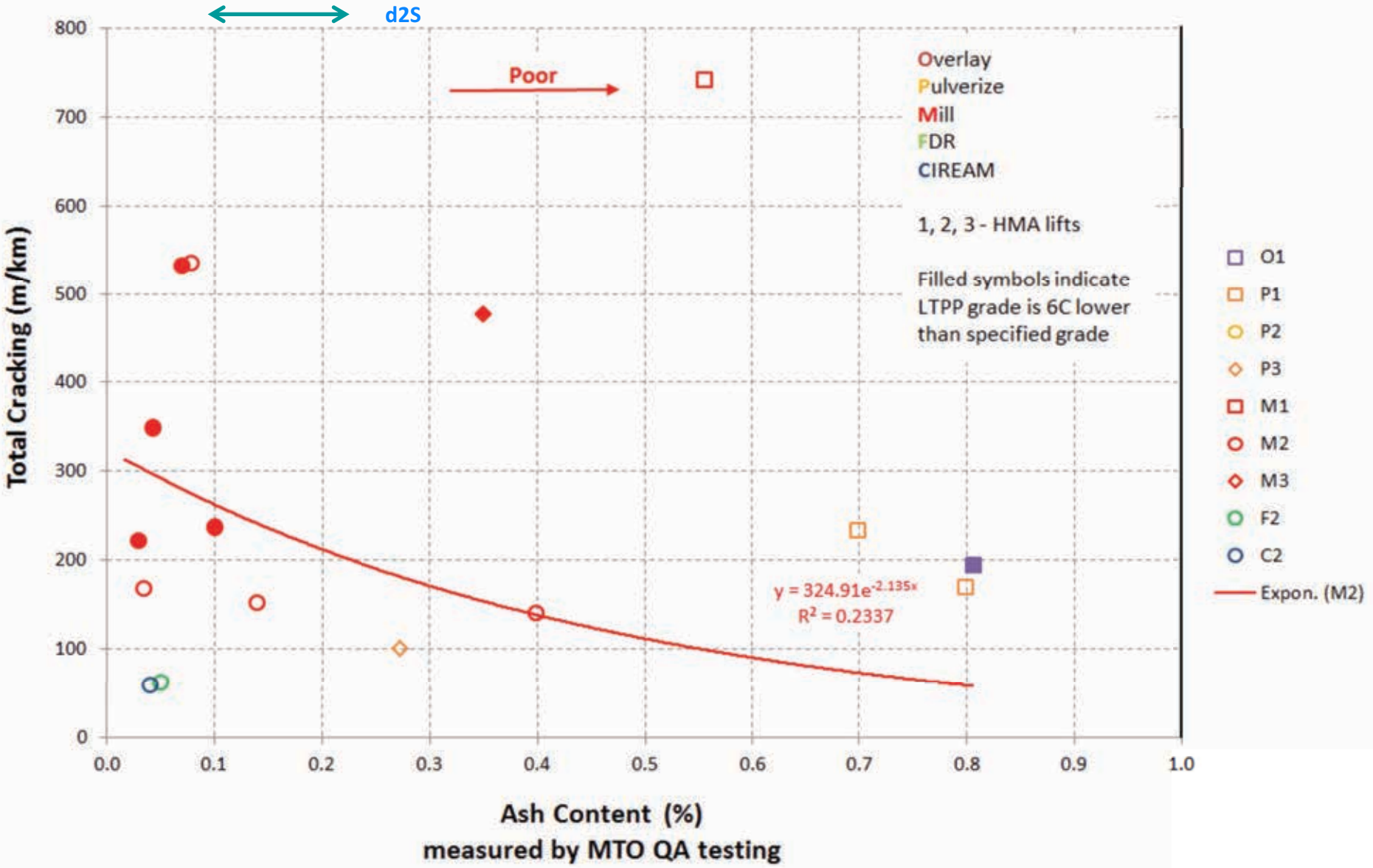


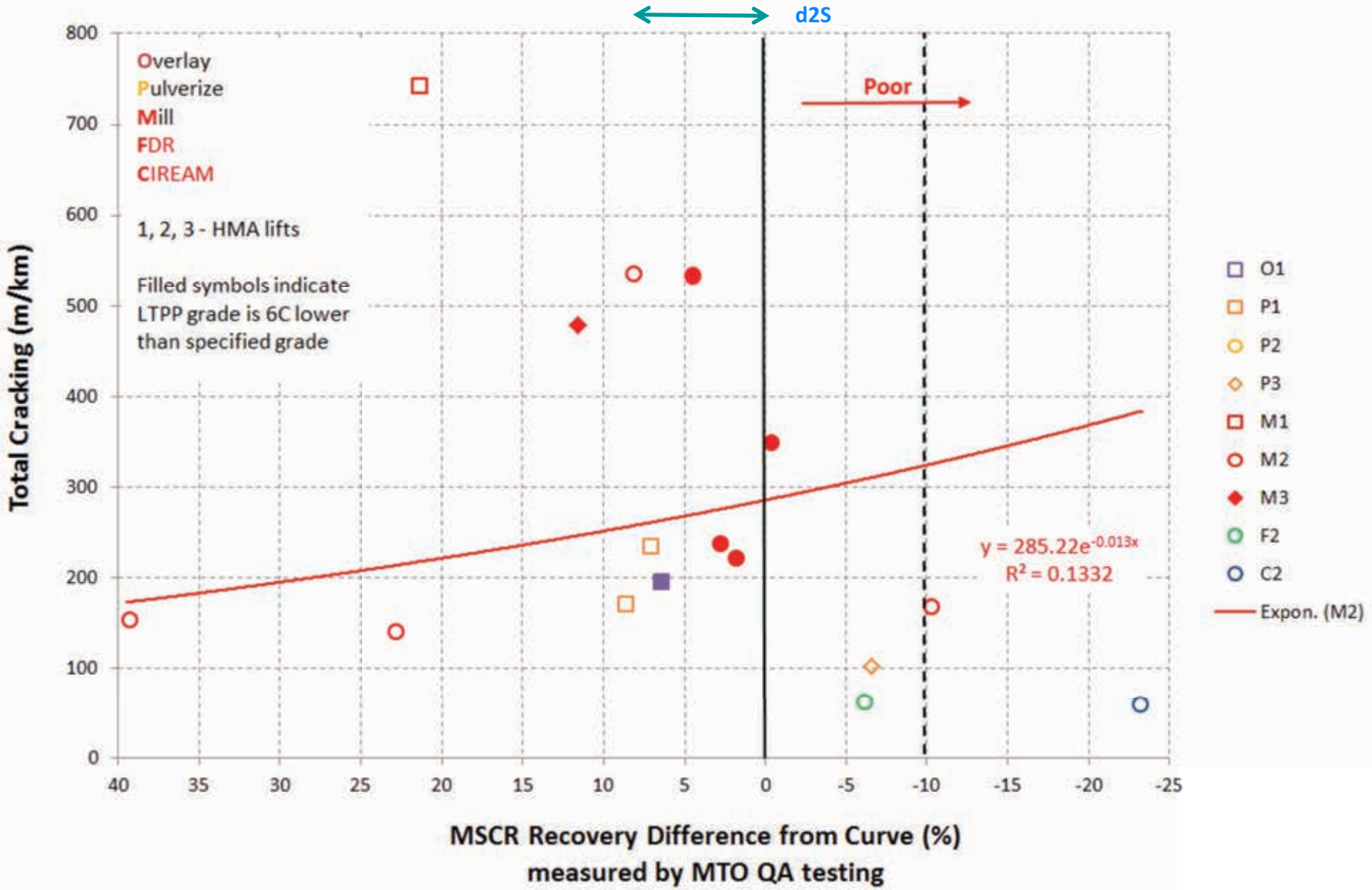
No Correlation (trending incorrectly)

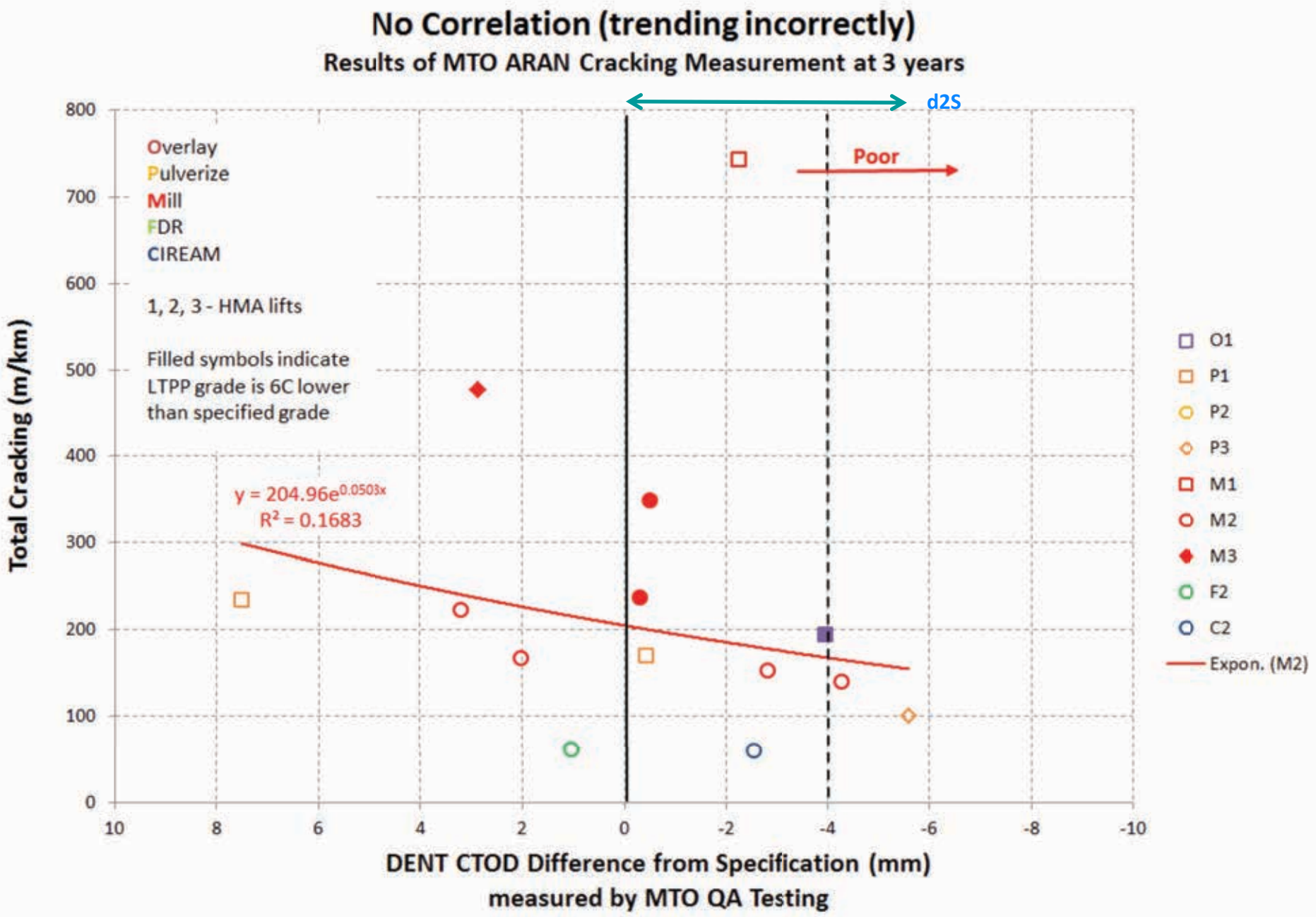
Results of MTO ARAN Cracking Measurement at 3 years



Poor Correlation (trending correctly)

Results of MTO ARAN Cracking Measurement at 3 years




No Correlation (trending incorrectly)
Results of MTO ARAN Cracking Measurement at 3 years
d2S
Poor
Overlay
Pulverize
Mill
FDR
CIREAM
1, 2, 3 - HMA lifts
Filled symbols indicate LTPP grade is 6C lower than specified grade
y = 204.96e^0.0503x
R² = 0.1683
Total Cracking (m/km)
800
700
600
500
400
300
200
100
0
10
8
6
4
2
0
-2
-4
-6
-8
-10
DENT CTOD Difference from Specification (mm)
measured by MTO QA Testing
O1
P1
P2
P3
M1
M2
M3
F2
C2
Expon. (M2)

Summary of the cracking at 3 years based on MTO monitoring and testing

- Industry's analysis of preliminary data
- On Mill and Pave with 2 lifts
  - The standard 1 hr BBR test shows better correlation than 72 hr Extended BBR test
  - Loss doesn't correlate – engineering control
    - Asking for DENT or MSCR seemed to control Loss
  - Ash (REOB?) doesn't correlate – engineering control
  - MSCR has poor correlation (trends correctly)
  - DENT doesn't correlate (trends incorrectly)
- These charts will change – it has only been three years

Discussion