CLASS-D WHEEL PERFORMANCE WITH COAL CARS ON A CANADIAN RAILWAY

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1. Background

• Class C wheels from Japan were tested at TTCI FAST as part of the wheel research program

• No micro alloying

• Very clean steel

• Other wheels tested included different types such as micro alloy forged, bainitic forged, cast

• Results were very favorable for the Class C ultra clean wheels – began thinking about microalloying for further improvement
1. Background, Continued

- Production - Blast furnace iron from Wakayama, Japan for wheel production (very low residual elements such as Cu, Sn, etc.)
- Followed by conversion into steel using BOF
- Then wheel forging/rolling operations

Vacuum degassing and ladle refining (low hydrogen, very clean steel)
1. Background, Continued

- Class-D wheels vs Class C wheels
- Trials - Western Canada Coal Service, 286K GRL
- Initial service trials with 32 Class D wheels
- Subsequent larger trials with 1,000 H36 Class D wheels
Field trial with a Canadian Customer

Class-D wheels were compared with conventional Class-C wheel.

Trial Duration: 2008-2013
Class-C (HB340-360): 32 Pieces
Class-D (HB360-380): 32 Pieces

Initial Trial 32 Cass D Wheels

- Rejected total wheels
- Cause of shelling

- Rejection rate of Class-D wheel is much less than Conventional Class-C
Initial 32 Wheel Test

![Graph showing the survival rate of wheels over running mileage. The graph compares Class-C and Class-D wheels, with Class-D lasting significantly longer than Class-C. The text indicates that Class-D has a 1.8 times or more longer service life.]

Class-D = Longer life!
Later supplied more than 1,000 H36 Class-D wheels to a Canadian Railway for trials - most of them are installed under coal cars.

The condition of the wheels has been investigated every year.
3. Tread Surface Condition

Almost all inspected wheels have a clean surface, though some of Cl. C wheels have tread damage.
4. Rim Thickness Trend

Average Wear Rate is only (1/16") / 100,000 miles
5. Survival Rate of Wheels

Class-D survival rate is more than double to Class-C
6. Rejection Rate of Wheels

Class-D : fewer removals than Class-C.
7. Summary

1) Surface Condition
   - Clean surface observed
   - Very low rejection rate by High impact or Shell
   ⇒ **High Resistance against tread damage**

2) Wear Condition
   - Average wear rate is (1/16” ) / 100kmiles.
   - Very low rejection rate by High flange
   ⇒ **High Resistance against tread wear**

Class-D wheel last much longer than conventional Class-C wheels!
Questions