

TECHNICAL QUALIFICATION OF NEW MATERIALS FOR HIGH EFFICIENCY COAL-FIRED BOILERS AND OTHER ADVANCED FOSSIL ENERGY CONCEPTS

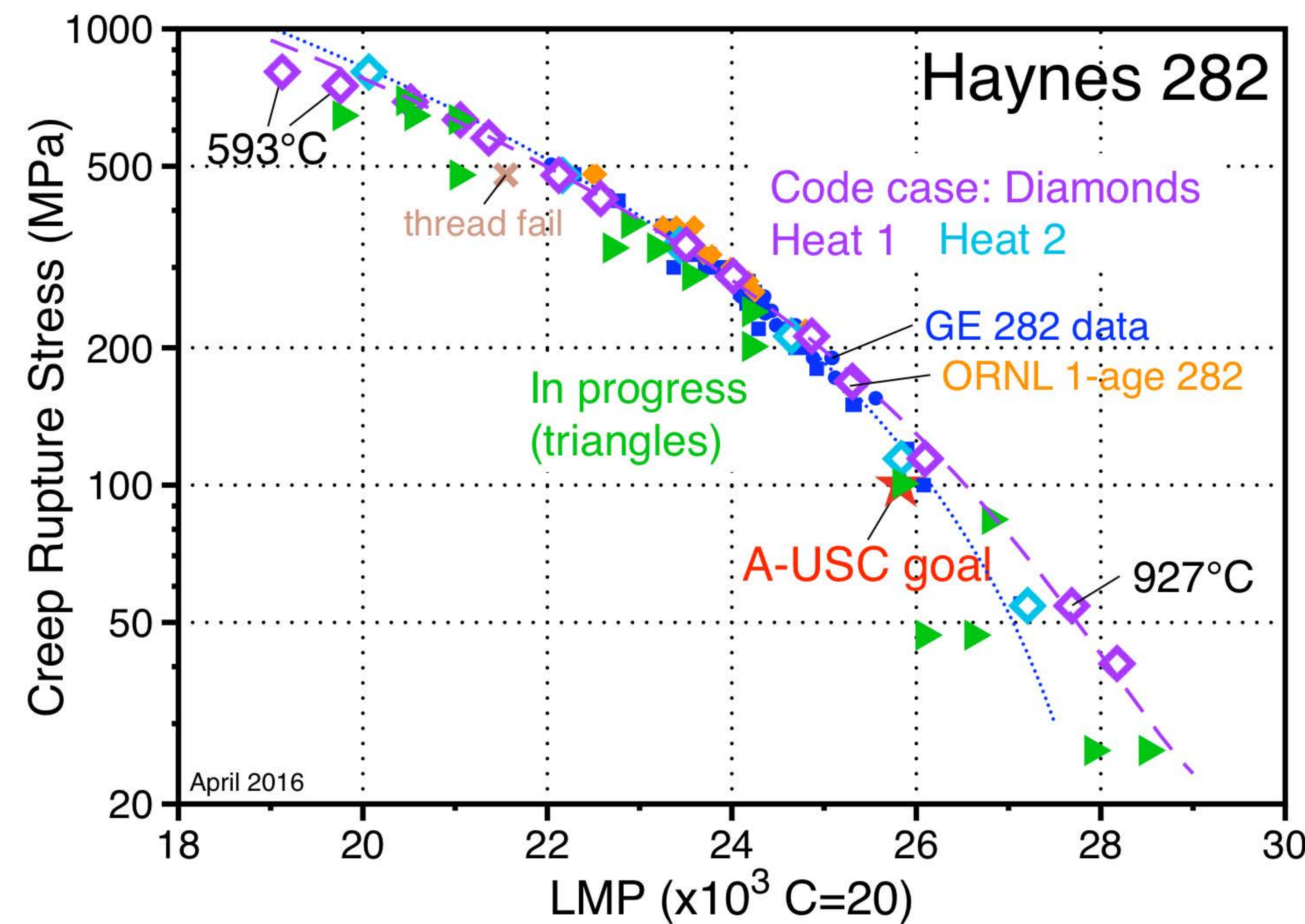
B. A. Pint, H. Wang, C. S. Hawkins and P. F. Tortorelli
Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6156, USA



Partnering with Haynes International to gain ASME Boiler and Pressure Vessel Code Approval for Haynes® 282®



Three heats of creep specimens received from Haynes International with single age heat treatment (4h at 800°C)



Larson-Miller plot of creep rupture lifetimes
Comparing current results to prior work:
General Electric
ORNL

Creep test matrix:

°C	°F	500h	1400h	4000h	10000h
593	1100	3	3	3	3
621	1150	1		1	
649	1200	3	3	3	3
677	1250	1		1	
704	1300	3	3	3	3
732	1350	1		1	
760	1400	3	3	3	3
788	1450	1		1	
816	1500	3	3	3	3
843	1550	1		1	
871	1600	3	3	3	3
899	1650	1		1	
927	1700	3	3	3	3

3: all three base metal heats
1: only Heat 1 at 50°F increments

Year 1 Progress:

- 39 creep tests started
- 22 failed
- 17 in progress

Cumulative: >60,000 h

Total: >500,000 h

Year 2 plans:

- Complete tensile testing (25°-927°C):
 - Three base metal heats
 - Two cross-metal welds (two different welding processes)

Complete 150,000 h creep testing