R18 Roast Analysis - Excellent Optimization

Roast Overview

- **Roast Date:** September 28, 2025 (16:17:49)
- **Batch Number:** R18
- **Green Weight:** 150g → **Final Weight:** 128g
- **Weight Loss:** 14.7% (22g)
- **Total Roast Time:** 10:56 (655.5 seconds)

Key Temperature Milestones

- **Charge BT:** 131.0°C ✓ **Perfect charge temperature**
- **Charge ET:** 90.2°C
- **Turning Point:** 57.0s at ET 91.2°C, BT 109.8°C
- **Dry End:** 259.5s (4:20) at ET 105.5°C, BT 139.9°C
- **First Crack:** 496.5s (8:17) at ET 118.4°C, BT 165.5°C
- **Drop:** 655.5s (10:56) at ET 126.4°C, BT 181.0°C

Phase Analysis Comparison

R17 vs R18 Phase Distribution

Phase	R17	R18	Target	Assessment
Drying	41.5% (291s)	**39.6%** (259.5s)	40-45%	✓ Optimal
Maillard	35.5% (249s)	**36.2%** (237s)	25-30%	Still long but improved
Development	23% (160.5s)	**24.3%** (159s)	25-30%	✓ Good improvement

Rate of Rise Analysis

- **Overall RoR:** 7.1°C/min (vs R17: 6.3°C/min) ✓
- **Dry Phase RoR:** 8.9°C/min (vs R17: 7.8°C/min) ✓
- **Mid Phase RoR:** 6.5°C/min (vs R17: 5.6°C/min) ✓
- **Finish Phase RoR:** 5.8°C/min (vs R17: 5.5°C/min) ✓
- **First Crack RoR:** 7.3°C/min (vs R17: 4.1°C/min) ⚠️

Significant Improvements from R17

1. Timing Optimization ✓

R17: 11:40 total time **R18**: 10:56 total time **Improvement**: 44 seconds faster while maintaining excellent balance

2. Better Heat Application ✓

Evidence: Higher RoR throughout all phases indicates more aggressive heat management

- More efficient moisture removal in drying phase
- Better flavor development in Maillard phase
- Maintained control in development phase

3. First Crack Timing ✓

R17: First crack at 9:00 **R18**: First crack at 8:17 **Improvement**: 43 seconds earlier, closer to optimal 7:30-8:00 target

4. Maintained Excellent Charge Temperature ✓

R18: 131°C BT is perfect - shows consistency in applying lessons learned

Areas for Further Refinement

1. First Crack RoR Management ⚠️

Issue: 7.3°C/min at first crack is higher than optimal **Target**: 3-5°C/min at first crack **Impact**: May create some harshness or uneven development **Solution**: Plan heat reduction 30-60 seconds before expected first crack

2. Maillard Phase Still Extended

Current: 36.2% of total time **Target**: 25-30% **Impact**: Excellent flavor development but may reduce brightness **Note**: This is much improved from R17's lengthy Maillard phase

3. Total Time Fine-Tuning

Current: 10:56 is very good **Optimal**: 9:30-10:30 for maximum brightness **Improvement**: Need another 26-86 seconds reduction

Heat Management Assessment

What You Did Right

1. **Consistent charge temperature** - maintained the breakthrough from R17
2. **More aggressive early heat** - improved RoR in drying phase
3. **Better mid-phase control** - increased RoR without losing control
4. **Smooth progression** - no major temperature crashes or spikes

Heat Application Pattern Analysis

Looking at your burner adjustments (8→7→6.5→7→6→5.5→5→4.5→5→6→5.5→5→6→5.5→4→4.5→6→0), you show:

- Appropriate initial heat reduction after charge
- Good responsive adjustments throughout
- Proper final heat cut for drop

Expected Cup Profile vs R17

R18 Improvements Expected

- **Brightness**: Better than R17 due to shorter time
- **Balance**: Maintained excellent balance
- **Complexity**: High due to good phase distribution
- **Body**: Full but not overwhelming

Compared to R17

- **More vibrant** due to 44-second time reduction
- **Better structured** due to improved RoR control
- **Similar sweetness** due to maintained Maillard development
- **Cleaner finish** due to better heat management

Next Roast (R19) Recommendations

Primary Focus: First Crack Management

1. **Plan heat reduction at 7:45** (30 seconds before expected FC)
2. **Target 4-5°C/min RoR** approaching first crack
3. **Use smaller, more frequent adjustments** in final 2 minutes before FC

Secondary Optimizations

1. **Aim for 9:45-10:15 total time** (reduce by 40-70 seconds)
2. **Target first crack at 7:45-8:00** (reduce by 15-30 seconds)
3. **Maintain current excellent charge temperature** (130-135°C BT)

Heat Management Strategy for R19

- **Start**: Same charge temperature (130-135°C BT)
- **0-2:00**: Current approach is working well
- **2:00-4:00**: Slightly more aggressive to compress drying
- **4:00-7:30**: Current mid-phase heat works well
- **7:30-8:00**: **Key change - planned heat reduction before FC**
- **8:00-drop**: Maintain current development approach

Progression Analysis: R14→R18

Metric	R14	R17	R18	Trend
Charge BT	138.3°C	136.0°C	131.0°C	✓ Improving
Total Time	10:10	11:40	10:56	✓ Optimizing
Drying %	61%	42%	40%	✓ Excellent
Development %	27%	23%	24%	✓ Improving
Overall RoR	9.5	6.3	7.1	✓ Optimizing

Skill Development Assessment

R18 shows mastery of fundamental roasting principles:

- Charge temperature control ✓
- Phase balance optimization ✓
- Heat progression planning ✓
- Time compression while maintaining quality ✓

Remaining skill development:

- Pre-emptive heat management (vs reactive)
- Fine-tuning first crack approach
- Final timing optimization

Conclusion

R18 represents excellent optimization of the breakthrough achieved in R17. You maintained the crucial charge temperature control while successfully compressing the timeline and improving heat application throughout. The 44-second reduction in total time while maintaining excellent phase balance demonstrates real skill development.

Key Achievement: You're now consistently executing the fundamentals and working on advanced optimization rather than fixing basic problems.

Next Challenge: Pre-emptive heat management around first crack to achieve the final 3-5°C/min RoR target.

Your roasting progression from R14→R18 shows textbook skill development in specialty coffee roasting.