

PERFORMANCE SPECIFICATIONS AND TEST PROTOCOLS FOR THE QUALIFICATION OF HIGH-STRENGTH HEPA FILTERS

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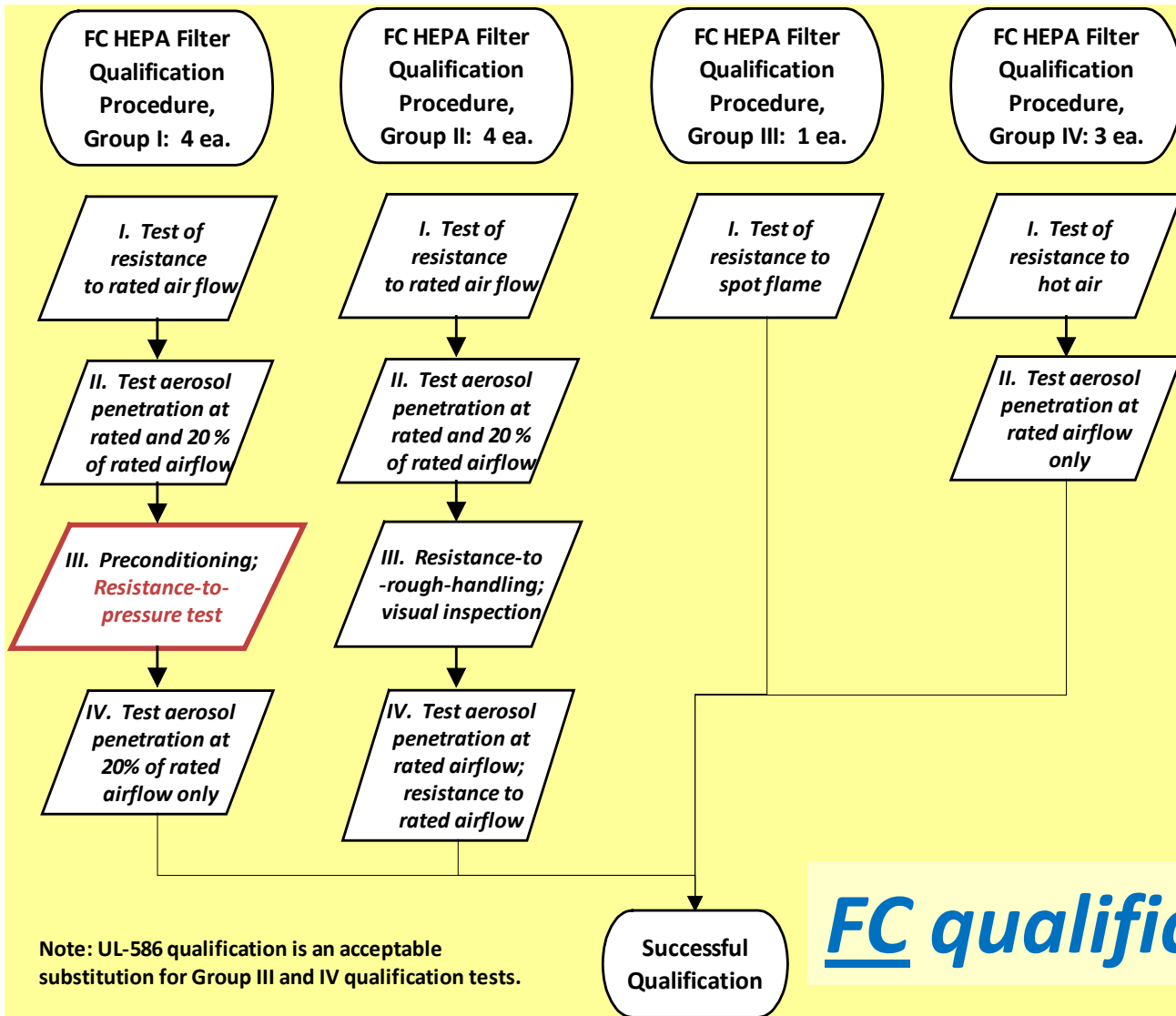


Introduction

- implementation of high-strength HEPA filters contingent upon *new* Code Section for filter qualification
- Code Section prerequisites include filter test protocols and test stand
- HEPA filters degrade in service

Objectives

- Test protocols for high-strength HEPA filter qualification:
 - △ develop and verify
 - △ integrate into Section FM
- Bases for ECBC test stand realization



FC qualification process.

FM HEPA Filter
Qualification
Sequence,
Group I: 4 ea.

FM HEPA Filter
Qualification
Sequence,
Group II: 1 ea.

FM HEPA Filter
Qualification
Sequence,
Group III: 3 ea.

I. Test of
resistance
to rated air flow

I. Test of
resistance to
spot flame

I. Test of
resistance to
hot air

II. Test aerosol
penetration at
rated and 20 %
of rated airflow

II. Test aerosol
penetration at
rated airflow
only

III. Preconditioning;
Test of Resistance-to-
pressure-impulse

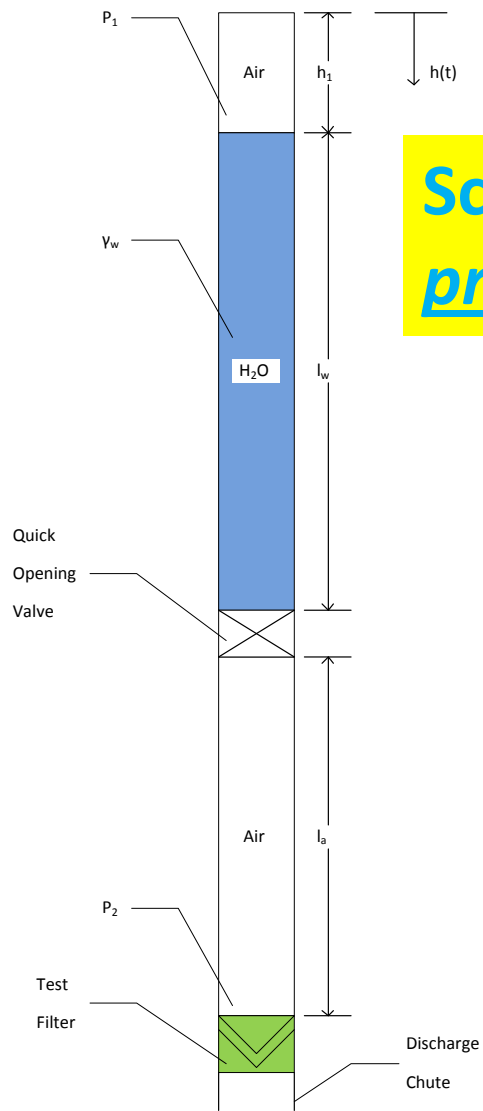
IV. Test of
resistance-to-
rough-handling;
pack tightness;
visual inspection

V. Test aerosol
penetration at 20%
of rated airflow and
at rated airflow

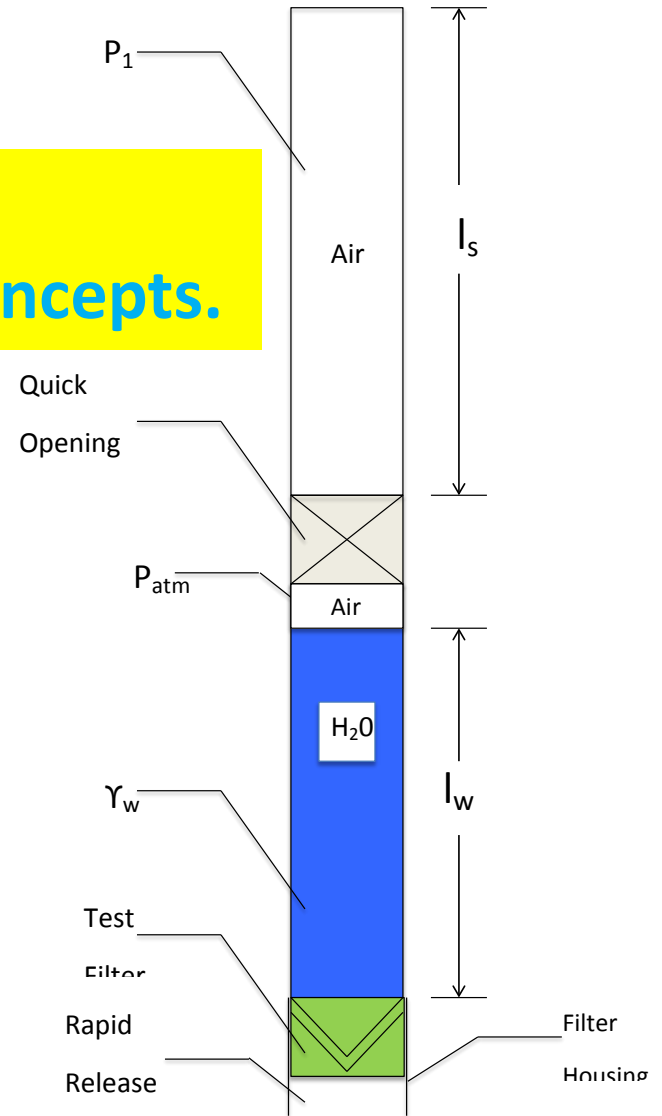
Note: UL-586 qualification is an acceptable sub-
stitution for Group II and III qualification tests.

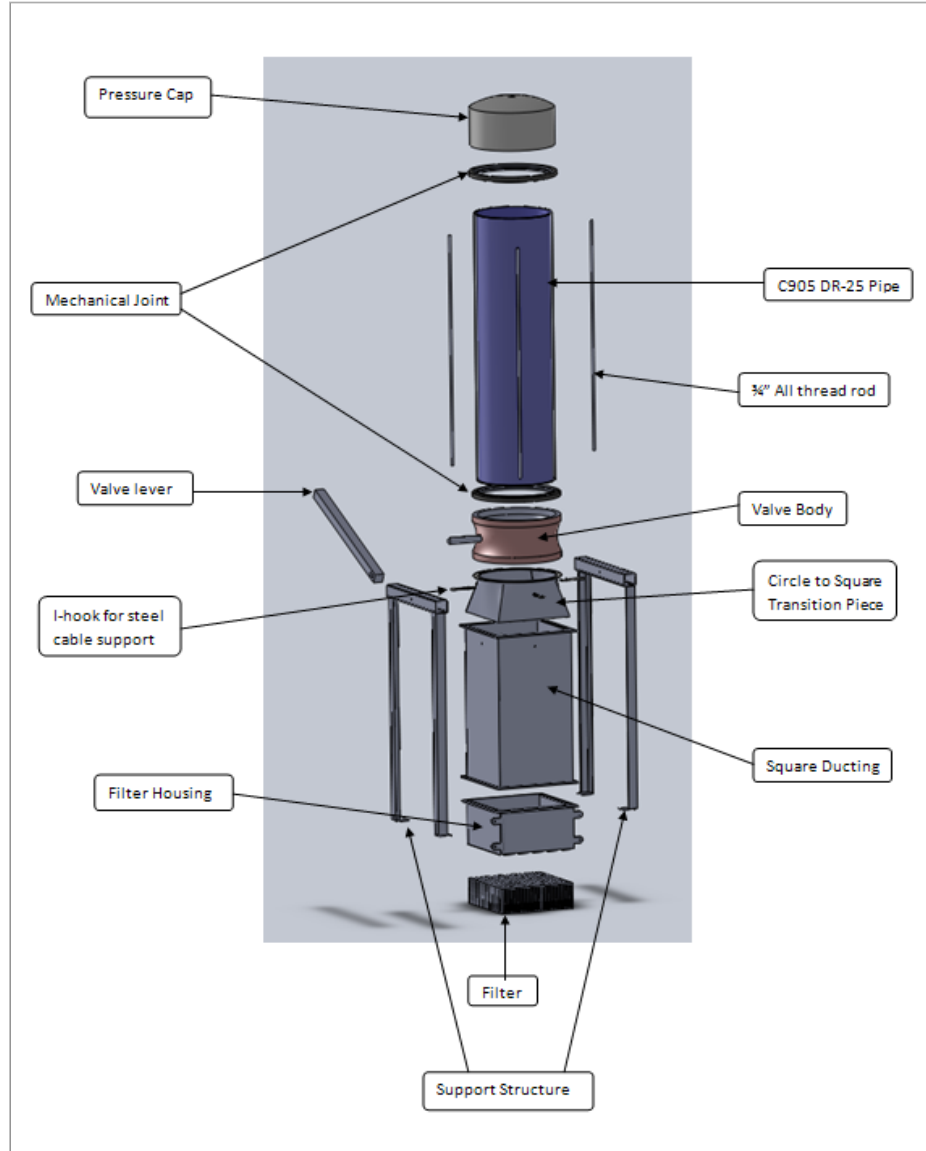
Successful
Qualification

FM qualification process (I).



Schematics of falling and propelled H₂O-column concepts.

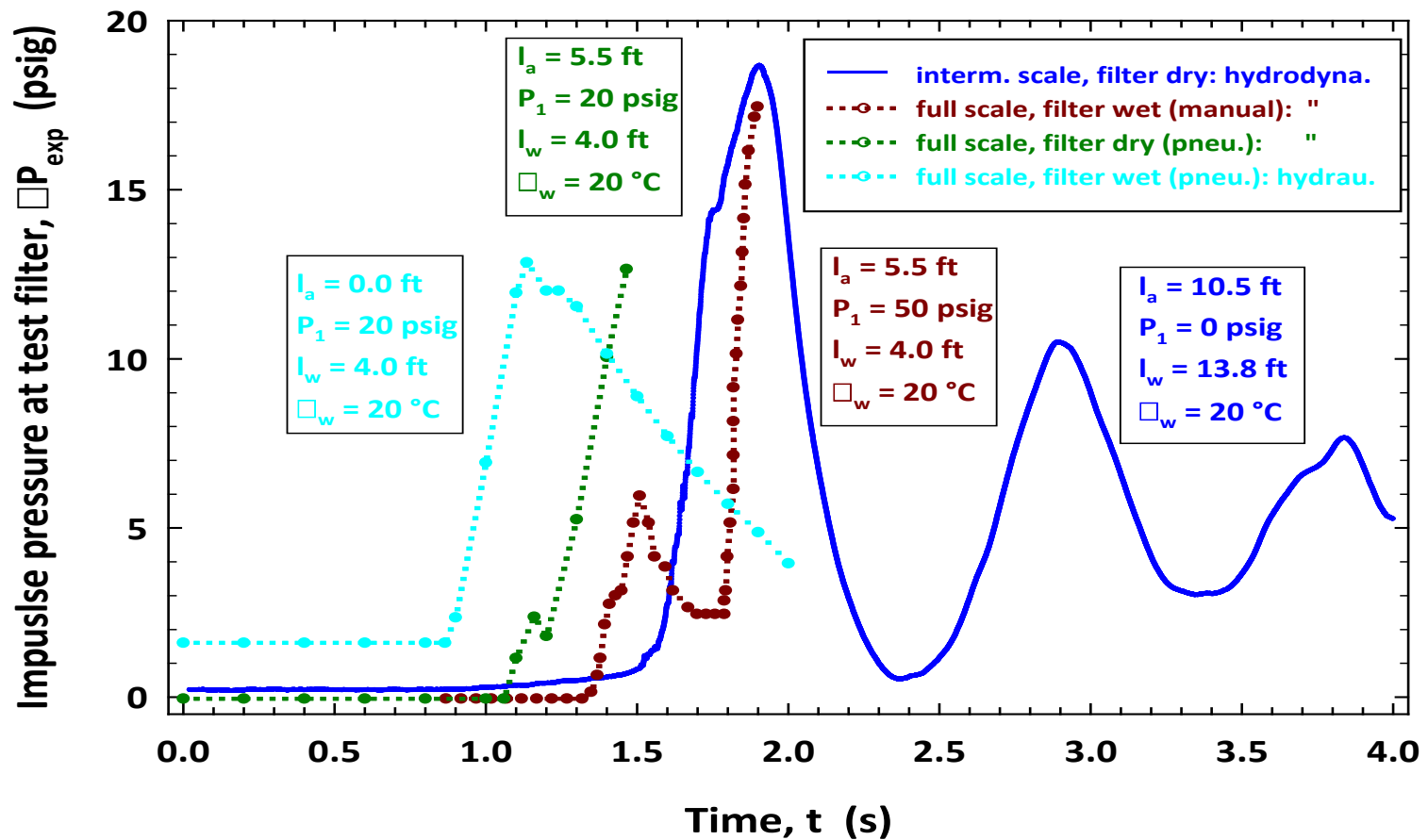




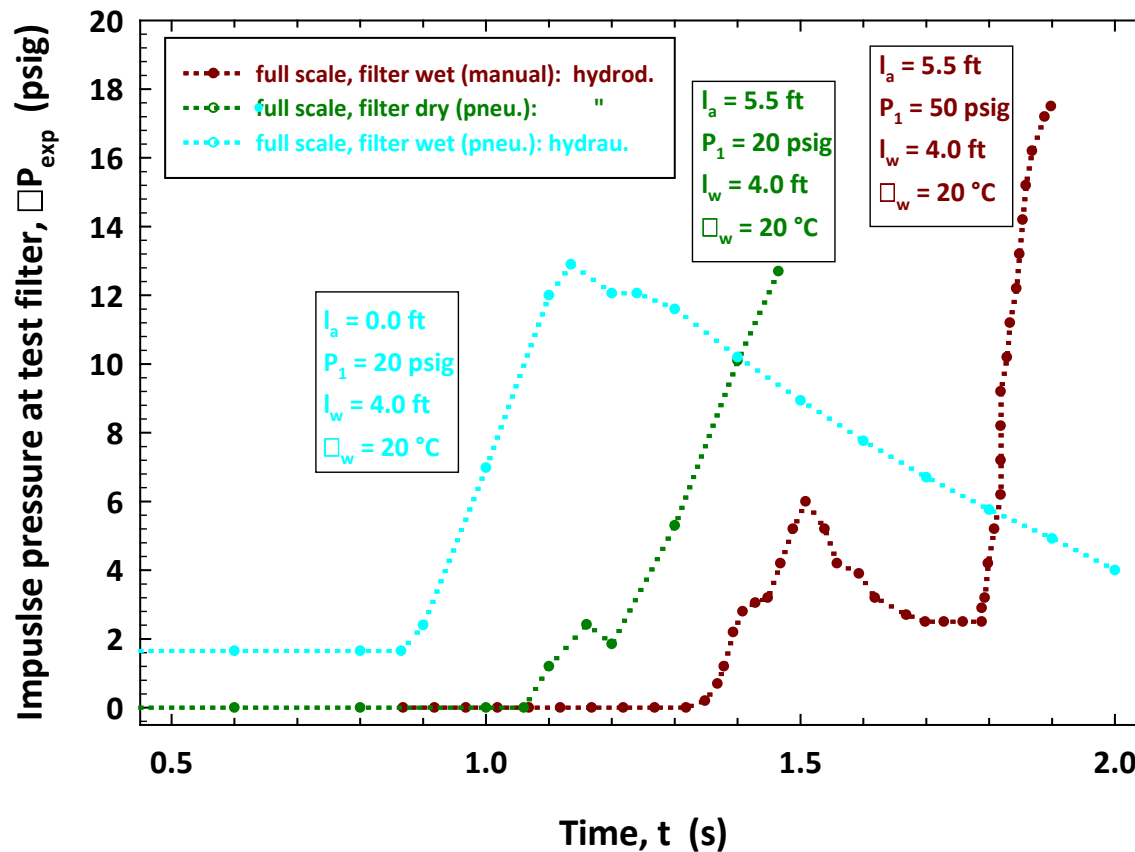
**Assembly rendering
for full-scale proto-
type test rig.**



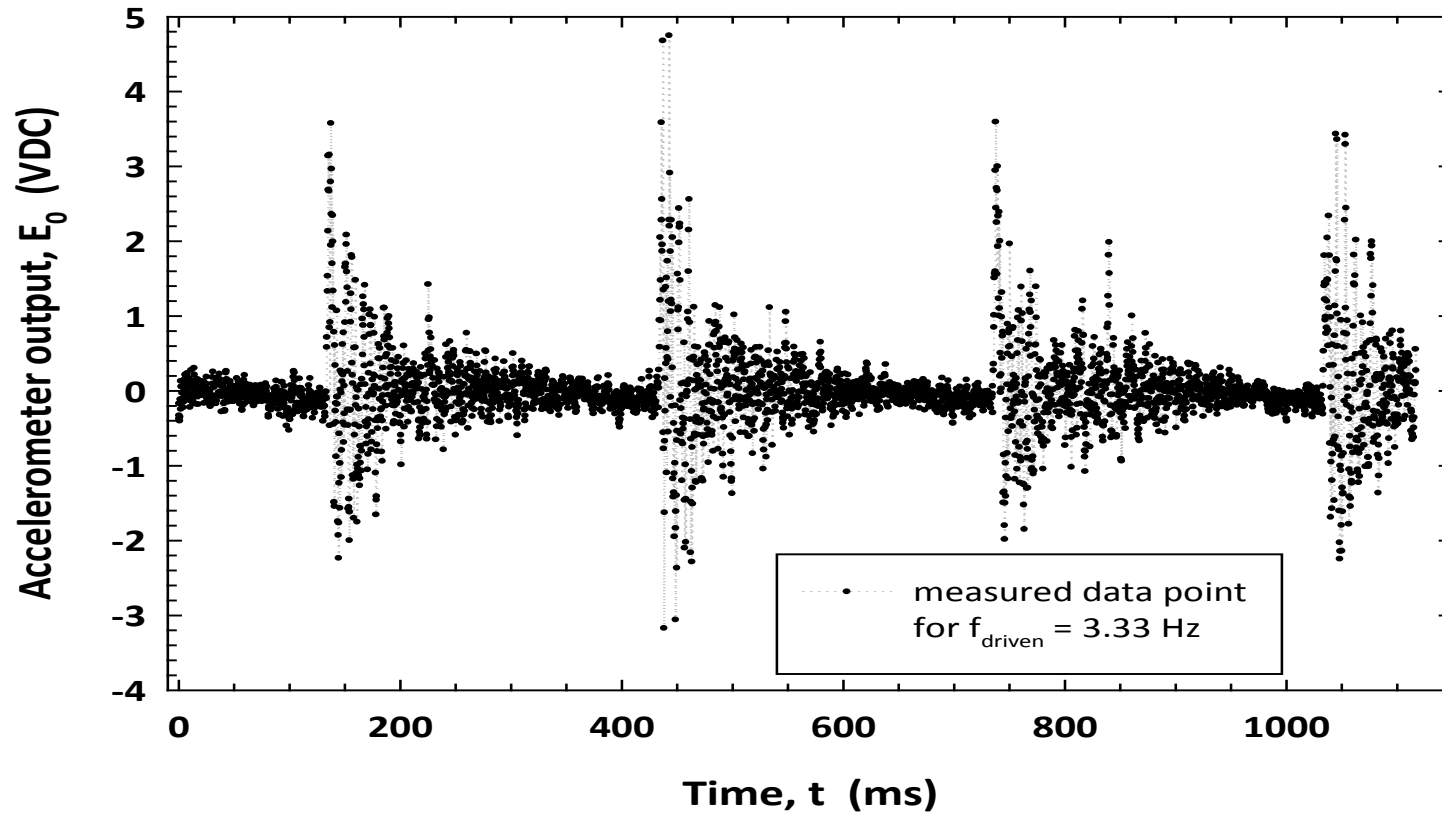
Filter post-impact by falling H₂O column [>25 psid].



Comparison of full- to intermediate-scale rig test results.



Comparison of propelled and falling water column results.



Acceleration waveform for rough handling test (*Dinakaran*).

Summary of Recent Progress

- proposed FM test protocols created
- new pressure-impulse concept adopted
- rough-handling test acc. investigated
- resources toward testing marshaled

Conclusions

- recently implemented refinements will lead to better pressure-impulse test repeatability
- *propelled* column verified as viable concept
- resources and test rig in place to begin evaluation of proposed FM test protocols

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Thank You

for Your kind attention.

Questions?