DIEHL Munitionssysteme

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Insensitive Energetics for Insensitive Munitions

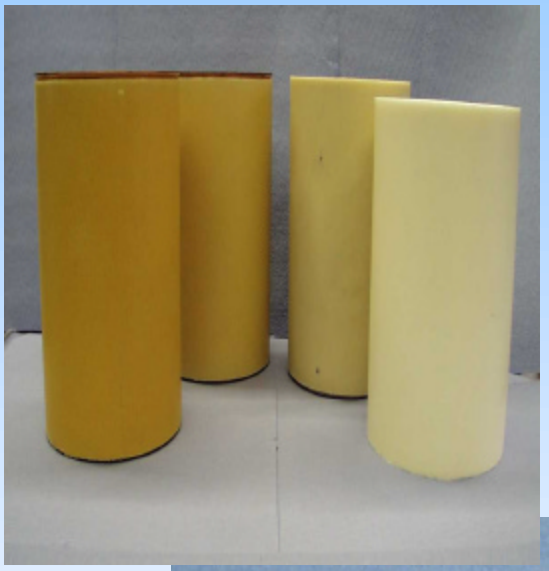
Richard Wild
Diehl Munitionssysteme
Werk Maasberg

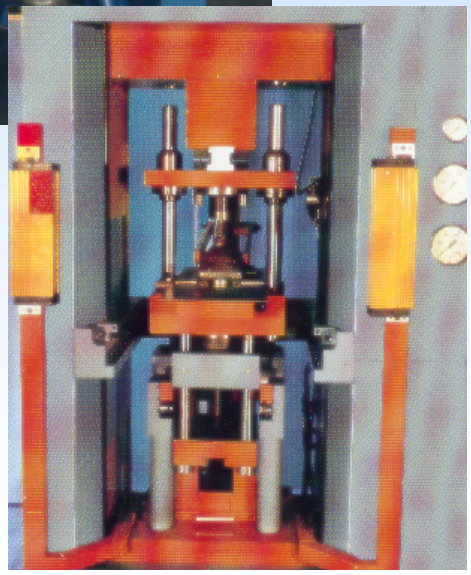
Outline

- DMS IM explosives
  - ➢ **Press and cast fill**
- DMS IM technology for high-G application
  - ➢ **Basis pressable IM explosives**
- DMS PBX charges
  - ➢ **Theoretical Material Density**
  - ➢ **Initiation Threshold**
- High-G survivability
  - ➢ **Small scale and 155 mm IM**
- IM Applications
  - ➢ **Bullet Impact**
  - ➢ **Fast Cook-off**
  - ➢ **Shaped charge jet impact**

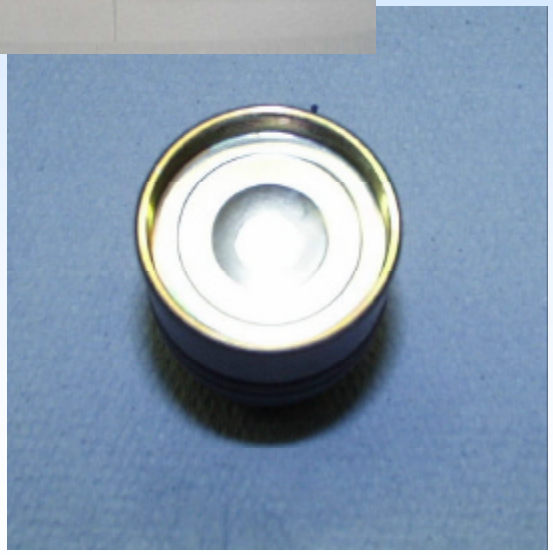
DMS IM Fill Processes

PBX Cure Cast





PBX Pressing



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DMS PBX Family

STANAG 4170 qualified

Blast	Fragments	High Speed Fragments	EFP	Booster
87% DX/HMX/Al	86% RDX/HMX	88 - 92% RDX/HMX	96% HMX	92 - 96% RDX/HMX
3% Binder	14% Binder	8-12% Binder	4% Binder	4-8% Binde
cast	cast	cast/pressed	pressed	pressed

DMS IM Technology for High-G Application

- Basis: pressable IM explosive fill
- Optimization of the WH manufacturing process for IM
- Specific warhead design for IM
- Packaging / Storage for IM

DMS pressed IM PBX

Example:

HE Charge Density

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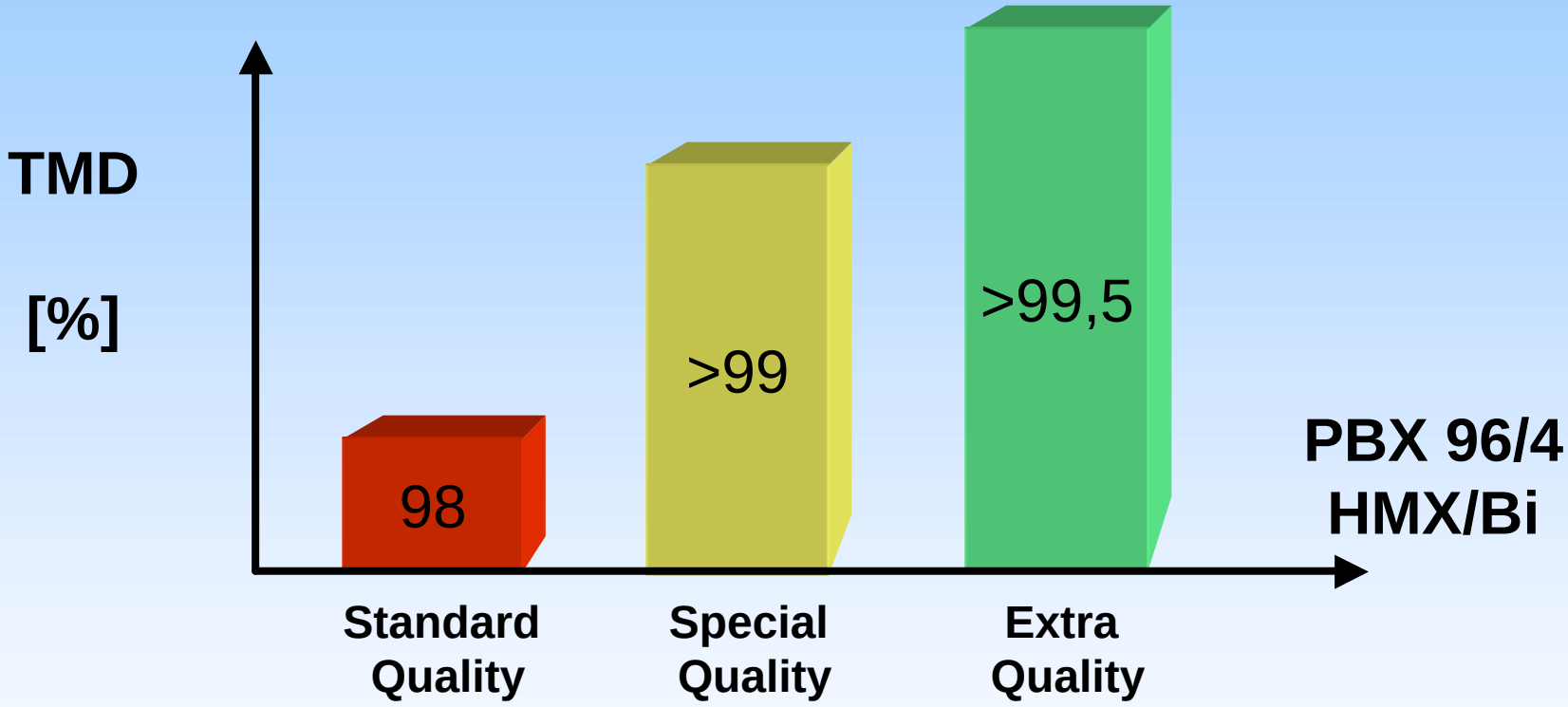
DMS IM TECHNOLOGY



HE Charge Density

DMS pressed IM PBX

Example:

Gap Test

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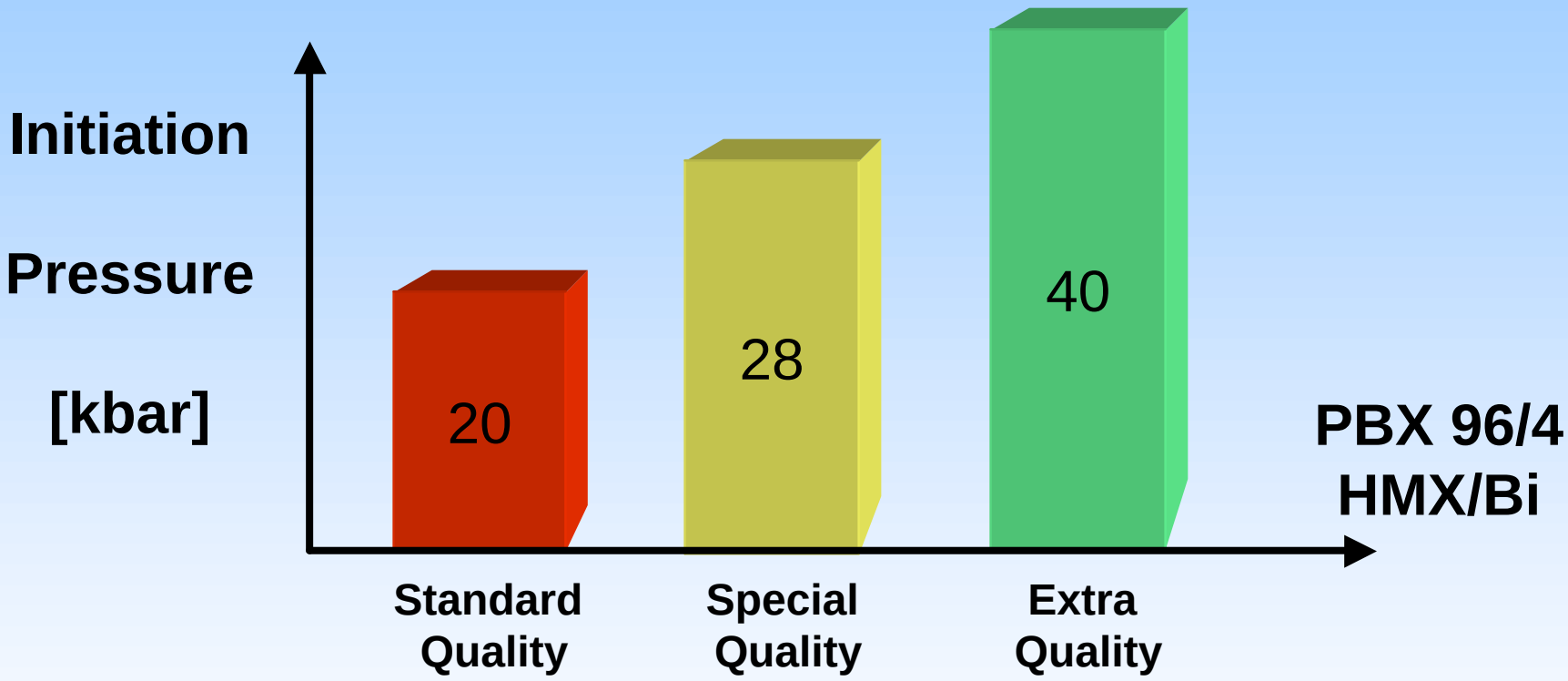
DMS IM TECHNOLOGY



Gap Test

DMS pressed IM PBX

Example:

High-G survivability

High-G Survivability

proof at - 51°C / +21°C / +63°C

- **Small scale,76 mm**
  with artificial
  gaps and cracks
  up to 50.000 g

- **155 mm IM artillery round**
  up to 18.000 g

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IM Application

Example:

Bullet Impact

155 mm HE

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155 mm IM

Bullet Impact Test - 12.7 mm AP

IM Application

Example:

Fast Cook-off

155 mm HE

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155 mm IM

Fast Cook-off

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IM Application

Example:

Shaped Charge 38.7 mm with 10 mm mild steel barrier

120 mm HE

DMS IM TECHNOLOGY

120 mm HE

Shaped Charge Jet Impact Test

Summary

DMS pressable IM explosives for high-G application

- higher energetic than cure cast compositions
- as less vulnerable as cure cast compositions
- easier manufacturing process than cure cast

High-G launch successfully tested up to 18.000 g
with 155 mm IM (-51°C / +21°C / +63°C)