

Appendix G. MSD Calculation Sheets

Fragmentation Data Review Form



Database Revision Date 9/30/10

Category:

Munition:

Case Material:

Fragmentation Method:

Secondary Database Category:

Munition Case Classification:

DODIC:

Date Record Created:

Record Created By:

Last Date Record Updated:

Individual Last Updated Record:

Date Record Retired:

Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="14.45"/>	<input type="text" value="6.68"/>
Mild Steel:	<input type="text" value="2.74"/>	<input type="text" value="1.29"/>
Hard Steel:	<input type="text" value="2.25"/>	<input type="text" value="1.06"/>
Aluminum:	<input type="text" value="5.30"/>	<input type="text" value="2.61"/>
LEXAN:	<input type="text" value="10.69"/>	<input type="text" value="6.73"/>
Plexi-glass:	<input type="text" value="9.43"/>	<input type="text" value="5.10"/>
Bullet Resist Glass:	<input type="text" value="8.58"/>	<input type="text" value="4.39"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Item Notes

Distribution authorized to the Department of Defense and U.S. DoD contractors only for Administrative-Operational Use (17 October 2002). Other requests shall be referred to the Chairman, Department of Defense Explosives Safety Board, Room 856C, Hoffman Building I, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600.

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Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="14.62"/>	<input type="text" value="7.33"/>
Mild Steel:	<input type="text" value="2.82"/>	<input type="text" value="1.43"/>
Hard Steel:	<input type="text" value="2.31"/>	<input type="text" value="1.17"/>
Aluminum:	<input type="text" value="5.39"/>	<input type="text" value="2.85"/>
LEXAN:	<input type="text" value="11.10"/>	<input type="text" value="7.30"/>
Plexi-glass:	<input type="text" value="9.91"/>	<input type="text" value="5.69"/>
Bullet Resist Glass:	<input type="text" value="9.14"/>	<input type="text" value="4.99"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Item Notes

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Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="14.62"/>	<input type="text" value="7.33"/>
Mild Steel:	<input type="text" value="2.82"/>	<input type="text" value="1.43"/>
Hard Steel:	<input type="text" value="2.31"/>	<input type="text" value="1.17"/>
Aluminum:	<input type="text" value="5.39"/>	<input type="text" value="2.85"/>
LEXAN:	<input type="text" value="11.10"/>	<input type="text" value="7.30"/>
Plexi-glass:	<input type="text" value="9.91"/>	<input type="text" value="5.69"/>
Bullet Resist Glass:	<input type="text" value="9.14"/>	<input type="text" value="4.99"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 106 (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Item Notes

This is the same as the TNT filled 155 mm M107 except that the M101 has a wider rotating band. Therefore the model for the TNT filled 155 mm M107 was used for this round.

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Fragmentation Method:

Secondary Database Category:

Munition Case Classification:

DODIC:

Date Record Created:

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Last Date Record Updated:

Individual Last Updated Record:

Date Record Retired:

Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="7.51"/>	<input type="text" value="3.55"/>
Mild Steel:	<input type="text" value="1.40"/>	<input type="text" value="0.68"/>
Hard Steel:	<input type="text" value="1.15"/>	<input type="text" value="0.56"/>
Aluminum:	<input type="text" value="2.87"/>	<input type="text" value="1.45"/>
LEXAN:	<input type="text" value="6.91"/>	<input type="text" value="4.42"/>
Plexi-glass:	<input type="text" value="5.23"/>	<input type="text" value="2.89"/>
Bullet Resist Glass:	<input type="text" value="4.40"/>	<input type="text" value="2.28"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

Item Notes

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Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="7.48"/>	<input type="text" value="3.46"/>
Mild Steel:	<input type="text" value="1.36"/>	<input type="text" value="0.65"/>
Hard Steel:	<input type="text" value="1.12"/>	<input type="text" value="0.53"/>
Aluminum:	<input type="text" value="2.81"/>	<input type="text" value="1.40"/>
LEXAN:	<input type="text" value="6.67"/>	<input type="text" value="4.23"/>
Plexi-glass:	<input type="text" value="5.03"/>	<input type="text" value="2.74"/>
Bullet Resist Glass:	<input type="text" value="4.21"/>	<input type="text" value="2.14"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

Item Notes

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Munition Information and Fragmentation Characteristics

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Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="6.61"/>	<input type="text" value="3.98"/>
Mild Steel:	<input type="text" value="1.27"/>	<input type="text" value="0.77"/>
Hard Steel:	<input type="text" value="1.04"/>	<input type="text" value="0.63"/>
Aluminum:	<input type="text" value="2.59"/>	<input type="text" value="1.60"/>
LEXAN:	<input type="text" value="6.62"/>	<input type="text" value="5.05"/>
Plexi-glass:	<input type="text" value="4.99"/>	<input type="text" value="3.49"/>
Bullet Resist Glass:	<input type="text" value="4.22"/>	<input type="text" value="2.87"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

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Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="8.05"/>	<input type="text" value="3.43"/>
Mild Steel:	<input type="text" value="1.41"/>	<input type="text" value="0.63"/>
Hard Steel:	<input type="text" value="1.16"/>	<input type="text" value="0.51"/>
Aluminum:	<input type="text" value="2.93"/>	<input type="text" value="1.37"/>
LEXAN:	<input type="text" value="6.71"/>	<input type="text" value="4.06"/>
Plexi-glass:	<input type="text" value="5.06"/>	<input type="text" value="2.60"/>
Bullet Resist Glass:	<input type="text" value="4.21"/>	<input type="text" value="2.01"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

Item Notes

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Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="8.02"/>	<input type="text" value="3.43"/>
Mild Steel:	<input type="text" value="1.41"/>	<input type="text" value="0.63"/>
Hard Steel:	<input type="text" value="1.15"/>	<input type="text" value="0.51"/>
Aluminum:	<input type="text" value="2.92"/>	<input type="text" value="1.37"/>
LEXAN:	<input type="text" value="6.69"/>	<input type="text" value="4.06"/>
Plexi-glass:	<input type="text" value="5.05"/>	<input type="text" value="2.60"/>
Bullet Resist Glass:	<input type="text" value="4.20"/>	<input type="text" value="2.01"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

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Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="4.96"/>	<input type="text" value="2.99"/>
Mild Steel:	<input type="text" value="0.97"/>	<input type="text" value="0.58"/>
Hard Steel:	<input type="text" value="0.79"/>	<input type="text" value="0.48"/>
Aluminum:	<input type="text" value="1.97"/>	<input type="text" value="1.23"/>
LEXAN:	<input type="text" value="5.75"/>	<input type="text" value="4.21"/>
Plexi-glass:	<input type="text" value="4.14"/>	<input type="text" value="2.74"/>
Bullet Resist Glass:	<input type="text" value="3.47"/>	<input type="text" value="2.19"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

Item Notes

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Individual Last Updated Record:

Date Record Retired:

Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="5.24"/>	<input type="text" value="2.89"/>
Mild Steel:	<input type="text" value="1.02"/>	<input type="text" value="0.57"/>
Hard Steel:	<input type="text" value="0.84"/>	<input type="text" value="0.47"/>
Aluminum:	<input type="text" value="2.12"/>	<input type="text" value="1.22"/>
LEXAN:	<input type="text" value="5.92"/>	<input type="text" value="4.13"/>
Plexi-glass:	<input type="text" value="4.24"/>	<input type="text" value="2.63"/>
Bullet Resist Glass:	<input type="text" value="3.51"/>	<input type="text" value="2.06"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Item Notes

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Fragmentation Data Review Form



Database Revision Date 9/30/10

Category:

Munition:

Case Material:

Fragmentation Method:

Secondary Database Category:

Munition Case Classification:

DODIC:

Date Record Created:

Record Created By:

Last Date Record Updated:

Individual Last Updated Record:

Date Record Retired:

Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="5.47"/>	<input type="text" value="2.68"/>
Mild Steel:	<input type="text" value="1.02"/>	<input type="text" value="0.51"/>
Hard Steel:	<input type="text" value="0.84"/>	<input type="text" value="0.42"/>
Aluminum:	<input type="text" value="2.14"/>	<input type="text" value="1.12"/>
LEXAN:	<input type="text" value="5.65"/>	<input type="text" value="3.69"/>
Plexi-glass:	<input type="text" value="4.03"/>	<input type="text" value="2.29"/>
Bullet Resist Glass:	<input type="text" value="3.30"/>	<input type="text" value="1.76"/>

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

Item Notes

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Fragmentation Data Review Form



Database Revision Date 9/30/10

Category:

Munition:

Case Material:

Fragmentation Method:

Secondary Database Category:

Munition Case Classification:

DODIC:

Date Record Created:

Record Created By:

Last Date Record Updated:

Individual Last Updated Record:

Date Record Retired:

Munition Information and Fragmentation Characteristics

Explosive Type:

Explosive Weight (lb):

Diameter (in):

Maximum Fragment Weight (Intentional) (lb):

Design Fragment Weight (95%) (Unintentional) (lb):

Critical Fragment Velocity (fps):

Theoretical Calculated Fragment Distances

HFD [Hazardous Fragment Distance: distance to no more than 1 hazardous fragment per 600 square feet] (ft):

MFD-H [Maximum Fragment Distance, Horizontal] (ft):

MFD-V [Maximum Fragment Distance, Vertical] (ft):

Overpressure Distances

TNT Equivalent (Pressure):

TNT Equivalent Weight - Pressure (lbs):

Unbarricaded Intraline Distance (3.5 psi), K18 Distance:

Public Traffic Route Distance (2.3 psi); K24 Distance:

Inhabited Building Distance (1.2 psi), K40 Distance:

Intentional MSD (0.0655 psi), K328 Distance:

Minimum Thickness to Prevent Perforation

	<u>Intentional</u>	<u>Unintentional</u>
4000 psi Concrete (Prevent Spall):	<input type="text" value="1.15"/>	<input type="text" value="0.79"/>
Mild Steel:	<input type="text" value="0.07"/>	<input type="text" value="0.05"/>
Hard Steel:	<input type="text" value="0.06"/>	<input type="text" value="0.04"/>
Aluminum:	<input type="text" value="0.16"/>	<input type="text" value="0.10"/>
LEXAN:	<input type="text" value="1.61"/>	<input type="text" value="1.23"/>
Plexi-glass:	<input type="text" value="0.73"/>	<input type="text" value="0.51"/>
Bullet Resist Glass:	<input type="text" value="0.55"/>	<input type="text" value="0.37"/>

Required Sandbag Thickness

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Required Wall & Roof Sandbag Thickness (in):

Expected Maximum Sandbag Throw Distance (ft):

Minimum Separation Distance (ft):

Water Containment System and Minimum Separation Distance:

TNT Equivalent (Impulse):

TNT Equivalent Weight - Impulse (lbs):

Kinetic Energy 10⁶ (lb-ft²/s²):

Water Containment System:

Minimum Separation Distance (ft):

Item Notes

Fragment sizes, number of fragments and HFD came from test information. These numbers were used to calculate MFD-H using TP 16 Eq 4-34 & iterating using TRAJ to calculate the initial velocity. With this information, standard TP 16 methods were used to calculate MFD-V and thicknesses to prevent perforation.

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